

Section 9  
Regional Economics and Land Use



This page has been left intentionally blank

## 9. Regional Economics and Land Use

### 9.1 Introduction

This section of the Draft EIS presents the existing economics and land use environment within the vicinity of the Blacktip Project. A number of desktop reviews and specialist studies were undertaken to supplement data deficiencies and data gaps. This section discusses both the onshore and offshore economic and land use environment.

#### 9.1.1 Baseline Studies and Surveys

The following studies and surveys were undertaken:

- Archaeology and heritage survey undertaken by Begnaze at the location of the proposed onshore gas plant and along a 100 m wide corridor for the onshore pipeline.
- Identification and assessment of species with Indigenous cultural values prepared by Smyth and Bahrtd Consultants.
- Regional economic assessment undertaken by ACIL Tasman to describe the economic environment within the vicinity of the project location and assessment of potential economic impacts.
- Social Impact Assessment (SIA) undertaken by ImpaxSIA Consulting (detailed further in **Section 14**).

The complete findings of these reports can be found in **Appendix I, L and M, Volume 2** of this Draft EIS.

### 9.2 Land Use and Land Tenure

#### 9.2.1 Land Use

The coastal region of the Joseph Bonaparte Gulf is sparsely populated and infrastructure is poorly developed (LDM 1994). Land in the vicinity of the Blacktip Project is comprised of dense vegetation and therefore does not lend itself to any commercial use such as farming. The principal land use in the project vicinity is traditional hunting, fishing and other food gathering activities. The geographical extent of these activities and seasonal occurrence are not known.

Land is also used for outstations of which there a number located in the region. **Table 9-1** lists these outstations and their approximate location from the township of Wadeye. The closest stations to the Blacktip Project onshore facilities are Thindi, Dithi and Ngardinitchi. Locations of all the stations are identified in **Figure 9-1**.

■ **Table 9-1 Location of Stations in the Vicinity of the Blacktip Project**

Outstation	Distance from Wadeye (km)	Location in Relation to Wadeye
Thindi, Ngardinitchi, Wurrudin, Werntek, Kuy	10–20	North west
Ditchi, Nangu, Nanthak, Kulhill, Ngarithi, Kuduntiga, Fossil Head	20–30	South west
Yedderr, Nadiri, Nganthawuddi, Thinti, Perrederr, Kubiyirr, Wudapuli, Nama, Merrepen, Nermaluk	Up to 60	North east

Other land uses include mineral exploration leases, which are located in the vicinity of the project area. Onshore oil investigations have been carried out in the past in the Wadeye area, and there is interest in the exploration of diamond and base metals. There are also existing diamond exploration licences within the Land Trust area and a pending application for an onshore petroleum exploration permit.

**Zoning and Land Use Planning:** There is no formal zoning of land in the Wadeye Township located 12 km from the proposed plant or in the general project vicinity. Land use organisation is in the form of the ‘Wadeye Land Use Structure Plan and Infrastructure Development Strategy’ (SKM 2004b) which has recently been prepared in consultation with traditional Aboriginal owners, Thamarrurr Regional Council and other key agencies, to provide future planning direction for the town of Wadeye.

The plan has a number of objectives related to specific land use categories such as residential, commercial, community, industry, open space and recreation, and tourism. The Plan aims to promote sustainable development and improvement to the well being and life chances of the people of Wadeye and the Thamarrurr Region.

The Blacktip Project is consistent with several of the key planning objectives including the industrial land use objective, which aims to develop new sustainable industries in the region to enhance the employment prospects of the people of Wadeye and the surrounding areas by ‘Enhancing employment prospects and opportunities by taking into account the potential for agricultural, mining, *oil/gas* and tourism development’.

**Local Jurisdiction:** Thamarrurr Regional Council is the responsible authority in the area occupied by the Blacktip Project. The council covers an area of approximately 320 km<sup>2</sup>; includes the estates of twenty clan groups; and has ten different languages and sub-dialects. The region became formally recognised as an incorporated council through the *Local Government Act* in 2003.

The Thamarrurr Regional Council structure is unique in the Northern Territory, in that it is based on a traditional form of governance and cooperation. The structure is the outcome of seven years of community discussions and planning. The Council’s constitution blends customary decision-making and governance with the principles that guide the western democratic system.

Thamarrurr Regional Council provides municipal and community development services in the region, as well as financial and other support to a range of community infrastructure, training, employment and development projects that would otherwise not be viable. The council is in the process of increasing its capacity so that it can position itself to tender for minor and major contracts associated with the Blacktip Project.

### 9.2.2 Land Tenure

The underlying land tenure of the proposed Blacktip Project site is inalienable Aboriginal freehold (Commonwealth), vested in the Daly River/Port Keats Aboriginal Land Trust, which holds all lands in the area to the north of the Fitzmaurice River.

### 9.3 Protected Areas

**Conservation Reserves & National Parks:** The conservation reserves and national parks located in the Joseph Bonaparte Gulf are presented in **Figure 9-2**. The main reserves and national parks with a presence in the coastal waters of the project vicinity include:

- Pelican Island Nature Reserve located approximately 100 km south of the Blacktip offshore field;
- Cambridge Gulf Marine Reserve located approximately 100 km south of the Blacktip offshore field;
- Londonderry Marine Reserve located approximately 100 km west of the Blacktip offshore field.

There are several National Parks located inland from the Joseph Bonaparte Gulf, including the Gregory National Park, Litchfield National Park and Keep River National Park (**Figure 9-2**). Litchfield National Park is situated approximately 140 km north-east of the landfall site. Both the Gregory National Park and the Keep River National Park are greater than 150 km away from the landfall site.

There are three internationally designated RAMSAR wetlands in the broader region of the Northern Territory, these being Lake Argyle, Lake Kununurra/Ord River and Kakadu. These wetlands are located over 100 km from the offshore project area (**Figure 9-2**).

Several other wetlands in the region have also been nominated for National Significance under the EPBC Act, including:

- Parry Floodplain (containing the Parry Lagoons Nature Reserve);
- Legume Wetlands;
- Moyle Floodplain and Hyland Bay System;
- Daly-Reynolds Floodplain-estuary System;
- Finniss Floodplain and Fog Bay Systems.

The closest of these wetlands to the project area is the Moyle Floodplain and Hyland Bay System located approximately 50 km north of Wadeye.

**Wilderness:** An inventory of national wilderness areas was developed in the early 1990s according to a number of nationally adopted criteria (Australia's State of Environment Report 2001). The National Wilderness Inventory is now referred to as The Australian Land Disturbance Database (ALDD). The most significant criteria are the indicators of:

- Remoteness from settlement, measured as the distance from centres of permanent occupation.
- Accessibility measured as distance from established access routes, including unsealed roads.
- Biophysical naturalness, measured as the degree to which the natural environment is free from disturbances caused by modern society, such as power lines, water and air emissions.

Indigenous people often have problems with the concept of 'wilderness', which denies their occupation of, and impact on, those places over time. The Blacktip Project area meets some of the criteria for 'wilderness', including biophysical naturalness, but the location of the proposed pipeline and plant were not mapped as 'wilderness' areas due to their proximity to large communities and a complex of main access roads.

#### 9.4 Infrastructure and Transport

**Infrastructure:** Infrastructure in the remote Wadeye region is generally confined to areas close to townships. Some infrastructure and utilities, including drinking water supplies; waste disposal; electricity and telecommunications are available from the Wadeye townsite. Utilities required by the Blacktip Project which cannot be provided by the use of existing utilities will need to be developed by the Project.

**Transport:** The Wadeye/Port Keats Road is the major access route to Wadeye from the Daly River Crossing. The Wadeye/Port Keats road is a public road that is maintained by the Northern Territory Government. In 2003, the Thamarrurr Region had a road network of approximately 234 km providing access to outstations (Matchplay Engineering 2003).

It is envisaged that supplies and equipment will be transported to the site by road from Darwin during the dry season, and by barge during the wet season.

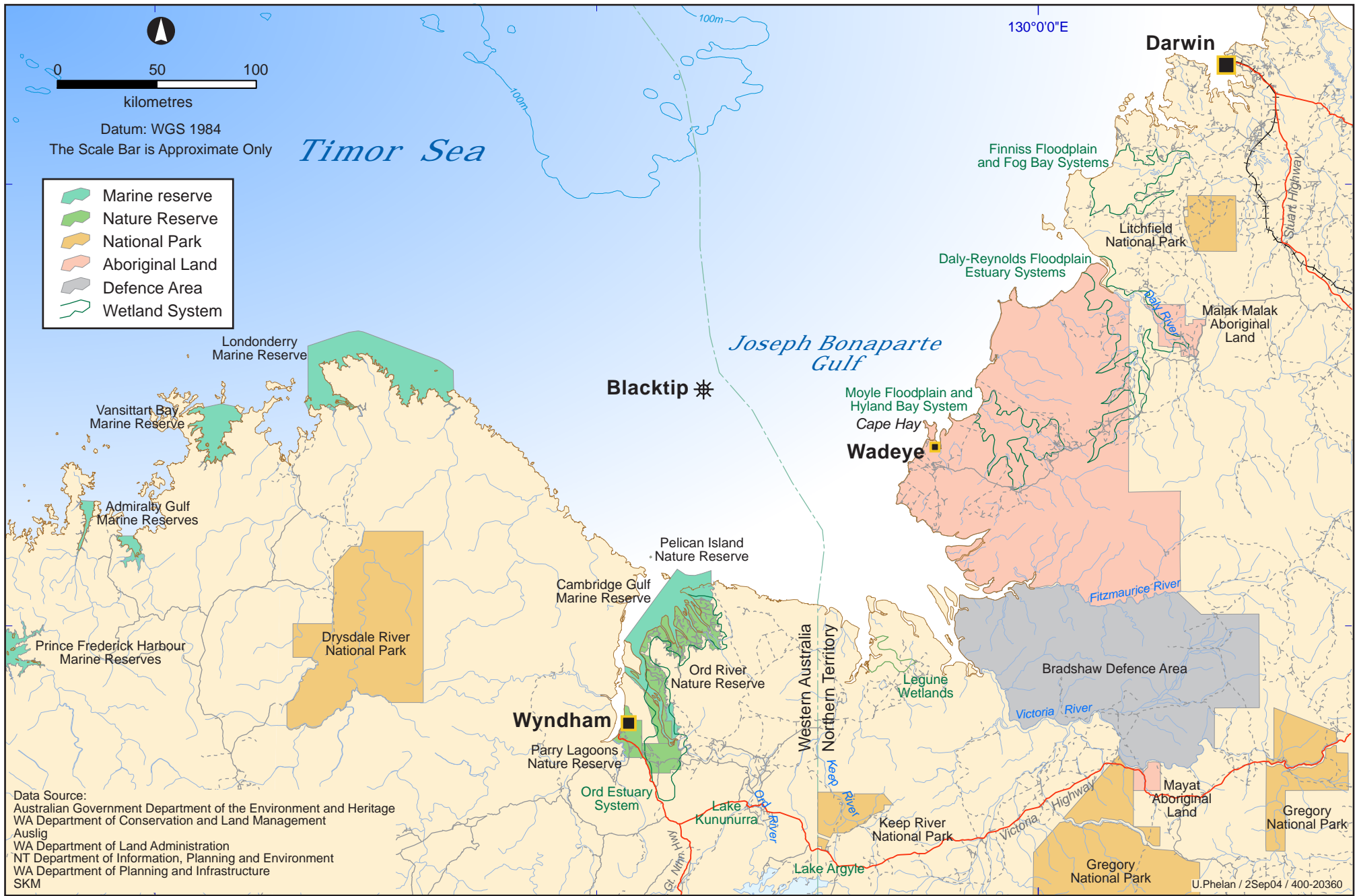
With the approval of traditional Aboriginal owners a new access road will be built from the Wadeye airstrip linking to an existing track. This track will need to be upgraded in the future and runs to the proposed plant site (**Figure 4-12**). The alignment of the proposed new section of access track has been selected on the results of consultation with local communities. The provision of this new section of access road and the upgrading of existing access tracks will result in all weather access to the plant site from the airstrip.



Data Source: Taylor 2003

U.Phelan / 27Aug04 / 400-20345

This page is left intentionally blank



This page has been left intentionally blank

There are no roads, railway lines or watercourses located in the vicinity of the Blacktip Project and hence none will be crossed by the pipeline or affected by the location of the onshore gas plant. The Wadeye community is serviced by a bituminised airstrip. Transfer of operations and maintenance personnel to and from the site will most likely be by plane, utilising the Wadeye airstrip. Further detail on the various options for accessing the site during construction and operation is included in **Section 4**.

## **9.5 Military Zones**

### **9.5.1 Onshore Military Exercise Zone**

**Figure 9-3** identifies the military zones in the vicinity of the Blacktip Project. The R202K military exercise zone encompasses the onshore components of the Blacktip Project. This zone is used for aerial military exercises above a height of 5,000 feet. The zone is “restricted” meaning that access for civilian aircraft is allowed only with permission from the authority controlling the zone. It is unlikely that this zone will have any impact upon aircraft servicing the Blacktip Project, as they are unlikely to need to fly at altitudes greater than 5,000 feet (Squadron Leader Busser, *pers comm.*, 2004).

### **9.5.2 Offshore Military Exercise Zone**

The offshore components of the Blacktip Project are located within the R202G offshore military exercise zone. This zone is located west of Darwin and extends south into the Joseph Bonaparte Gulf (**Figure 9-3**). The proposed wellhead platform and export pipeline overlap the extreme southern end of this military exercise zone, which is used by the Royal Australian Navy (RAN) and the Royal Australian Air Force (RAAF) for a wide range of military exercises including live firing (Squadron Leader Busser, *pers comm.*, 2004).

## **9.6 Marine Traffic and Navigation**

There is very little shipping traffic in the vicinity of the offshore Blacktip Project components. Existing shipping routes exist between Darwin and Wadeye, and from Darwin to the Kimberley coast including the Cambridge Gulf and Wyndham. These routes are located at least 60 km away from the Blacktip wellhead platform. The closest port to the west of the wellhead platform is Wyndham, which can accommodate vessels of up to 26,000 tonnes in weight, with a maximum draft up to 8.5 m. The Wyndham port’s monthly throughput averages between 4,000 and 5,000 tonnes.

The Port of Darwin is the most significant port located approximately 300 km north-east of the Blacktip Project. This port handles approximately 4,500 vessel movements per year, of which 800 are trading vessels moving over 1 million mass tonnes of cargo in 2002/03. The major shipping routes used by these trading and cargo vessels to and from Darwin are located over 150 km north of the Blacktip wellhead platform (**Figure 9-4**).

## 9.7 Fisheries

### 9.7.1 Summary of Commercial Fisheries

There are a range of fisheries located within or adjacent to the Blacktip Project area. Fishing zones classified as Territory, State and Commonwealth are presented in **Table 9-2**, and illustrated in **Figure 9-5** and **Figure 9-6**.

■ **Table 9-2 Territory, State and Commonwealth Fisheries**

Commonwealth	Western Australian (State)	Northern Territory (Territory)
Northern Prawn Fishery	Kimberley Prawn Fishery	Trepang Fishery
Western Tuna and Billfish	Northern Shark Fishery (North Coast)	Mud Crab Fishery
	Northern Demersal Scalefish Fishery (formerly Kimberley Demersal)	Demersal Scalefish Fishery
	Zone 4 Pearl Oyster Fishery	Barramundi Fishery and Coastal Net Fishery
		Shark Fishery
		Mackerel Fishery
		Coastal Line Fishery

### 9.7.2 Commonwealth Commercial Fisheries

**Northern Prawn Fishery:** The Northern Prawn Fishery (NPF) is a major fishery covering in excess of 700,000 km<sup>2</sup> from Cape York in the east to Cape Londonderry, which is west of the Blacktip Project area. The NPF is managed by the Australian Fisheries Management Authority (AFMA) on behalf of the Commonwealth Government. In terms of revenue, the NPF is the second biggest fishery in Australia after the Western Rock Lobster Fishery. Fishing in the NPF is managed through a combination of input controls (limited entry, seasonal closures, permanent area closures, gear restrictions and operational controls). In 2003, the two seasons were from 1 April to 13 May and from 1 September to 1 December. In 2004, there are two designated operating periods for the NPF, from 15 March to 27 May and from 1 September to 30 November.

The fishery targets nine prawn species including white banana (*Fenneropenaeus merguensis*), red-legged banana (*F. indicus*), brown tiger (*Penaeus esculentus*), grooved tiger (*P. semisulcatus*), blue endeavour (*Metapenaeus endeavouri*) and red endeavour (*M. ensis*). Scampi, squid, scallops and bugs are also taken. Red-legged banana prawns make up the bulk of the catch from the Joseph Bonaparte Gulf. NPF statistical reporting areas that cover the Joseph Bonaparte Gulf are Bonaparte in the west and Fog Bay in the east. The total effort and catch in Bonaparte was roughly double the catch in Fog Bay in 2003. Fishing effort in the Fog Bay statistical reporting area is primarily concentrated to the north of Wadeye (Buckworth R. *pers. comm.*, 2004).

More detailed data is available from AFMA as fishing data for the NPF is reported in 1-degree blocks (**Figure 9-7**). The Blacktip platform is located in Block Number 1328 and the pipeline traverses 1328, 1428 and 1429. Most fishing activity in the Joseph Bonaparte Gulf is carried out in

the deeper waters (50–80 m), offshore from the Berkeley River (Longeragan N., *pers. comm.*, 2004), approximately 40 km or more west of the proposed Blacktip platform but still in Block Number 1328 and the adjoining Block Number 1327. This is confirmed by AFMA logbook data for 2002 and 2003 which indicates that fishing effort was concentrated in blocks 1327 and 1328 with lower effort reported in blocks 1427 and 1428. There was no NPF activity reported in block 1429 (Adams J. *pers. comm.*, 2004). Closer inspection of AFMA data for the period from 1994 to 2000, indicates that only two fish trawl shots were recorded near the Blacktip well location, both in February 2000 (Woodside 2003h).

Although the main prawn fishing grounds are located away from the permit areas, juveniles may periodically migrate through the permit area from the inshore mangrove creeks to the offshore fishing grounds (Woodside 2003h).

***Western Tuna and Billfish Fishery:*** The management area of the fishery encompasses the west and north coast of Australia; however fishing effort in 2002 was limited to the west coast of Western Australia with no fishing effort in the vicinity of the proposed Blacktip Project (AFFA 2002).

### **9.7.3 Western Australian Commercial Fisheries**

***Kimberley Prawn Fishery:*** This fishery is relatively small with the total catch averaging 369 tonnes annually. The fishery encompasses the Kimberley coast as far east as Cape Londonderry, which is over 150 km west the Blacktip field.

***Northern Shark Fishery:*** The Northern Shark Fishery overlaps the Blacktip permit area, but very little fishing effort occurs in the Joseph Bonaparte Gulf (Woodside 2003h). This fishery extends from North-west Cape to the Northern Territory border and is divided into two zones. Western Australia is responsible for managing the western area between North-west Cape and Koolan Island. The area east of Koolan Island is managed jointly by Western Australia and the Commonwealth. Fisheries in the western area are restricted to using droplines and long-lines, while in the eastern area they may use long-lines and gill-nets. The number of fishers in the western zone was limited in 1992, while the eastern zone became limited in 1995. Currently, 11 fishers have licences to work one or both zones.

***Kimberley Gillnet and Barramundi Fishery:*** The Kimberley Gillnet and Barramundi Fishery (KGBF) covers the taking of all finfish by net, and barramundi by any method, within three nautical miles of the WA coastline at low water mark and within tidal waters in the rivers (Fisheries WA 1999a). It came under management in 1989, limiting the number of licences to 17. Prior to this, the fishery was open access, with fishing by means of nets being prohibited in some of the major rivers for specified periods. Licences are non-transferable so natural attrition and a Fisheries Adjustment Scheme has resulted in the number of licences dropping to seven by 1998.

Fishing in the Joseph Bonaparte Gulf forms a very small part of the total catch for the Kimberley Gillnet and Barramundi Fishery. The total catches of barramundi and threadfin from Joseph Bonaparte Gulf (Blocks 1327 and 1428) are generally less than 10% of the total catch for the

Kimberley Gillnet and Barramundi Fishery. The total number of vessels fishing in the Joseph Bonaparte Gulf (Blocks 1327 and 1428) have also steadily declined, from seven in 1987–88 to only four in 1997/98 and 1998/99

**Northern Demersal Scalefish Fishery:** The Northern Demersal Scalefish Fishery (NDSF) was established on 1 January 1998. The boats with access to this fishery previously operated in the Kimberley Demersal Trap and Line Fishery. The vessels in the fishery are mainly based in the Broome, with some operating from Darwin at certain times of the year. During 1998/99, seven boats participated in the fishery, catching a total of 544 tonnes (Fisheries WA 1999b). The fishery is divided into two zones, an inshore zone (Zone 1), within State waters, and an offshore zone (Zone 2).

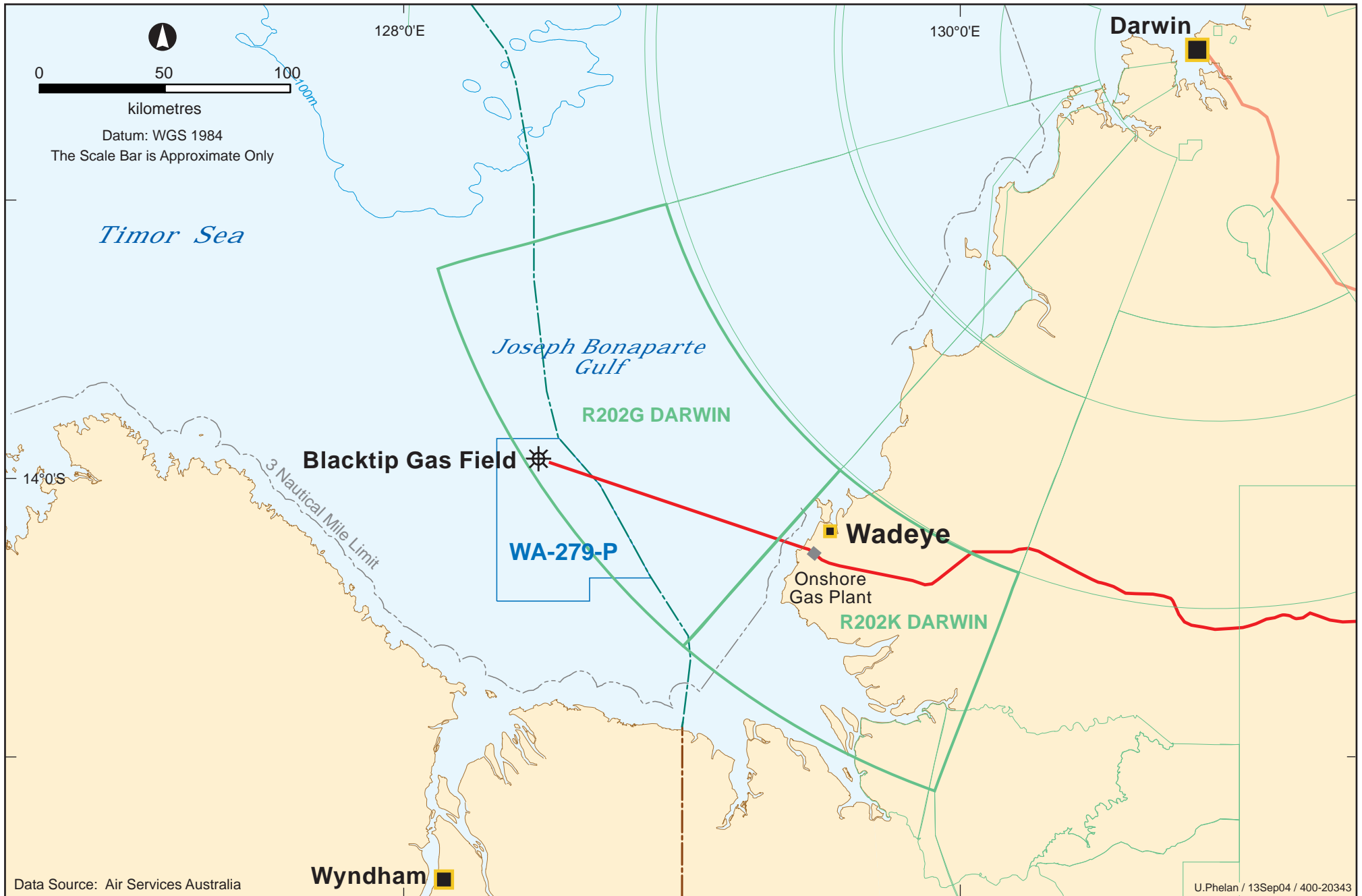
**Zone 4 Pearl Oyster Fishery:** Although the Joseph Bonaparte Gulf is overlapped by this pearl fishery, it contains neither pearl farms nor known live shell grounds. The nearest aquaculture lease area is located at Cape Talbot approximately 100 km to the south of the project (Dan L., *pers comm.*, 2004).

**Beche-de-Mer Fishery:** The beche-de-mer, trepang or sea cucumber, fishery involves one licence collecting in the Joseph Bonaparte Gulf. Holothurians are mainly collected on low tide from sand/mud flats, but diver operations occur in water depths up to 12 m (Woodside 2003h).

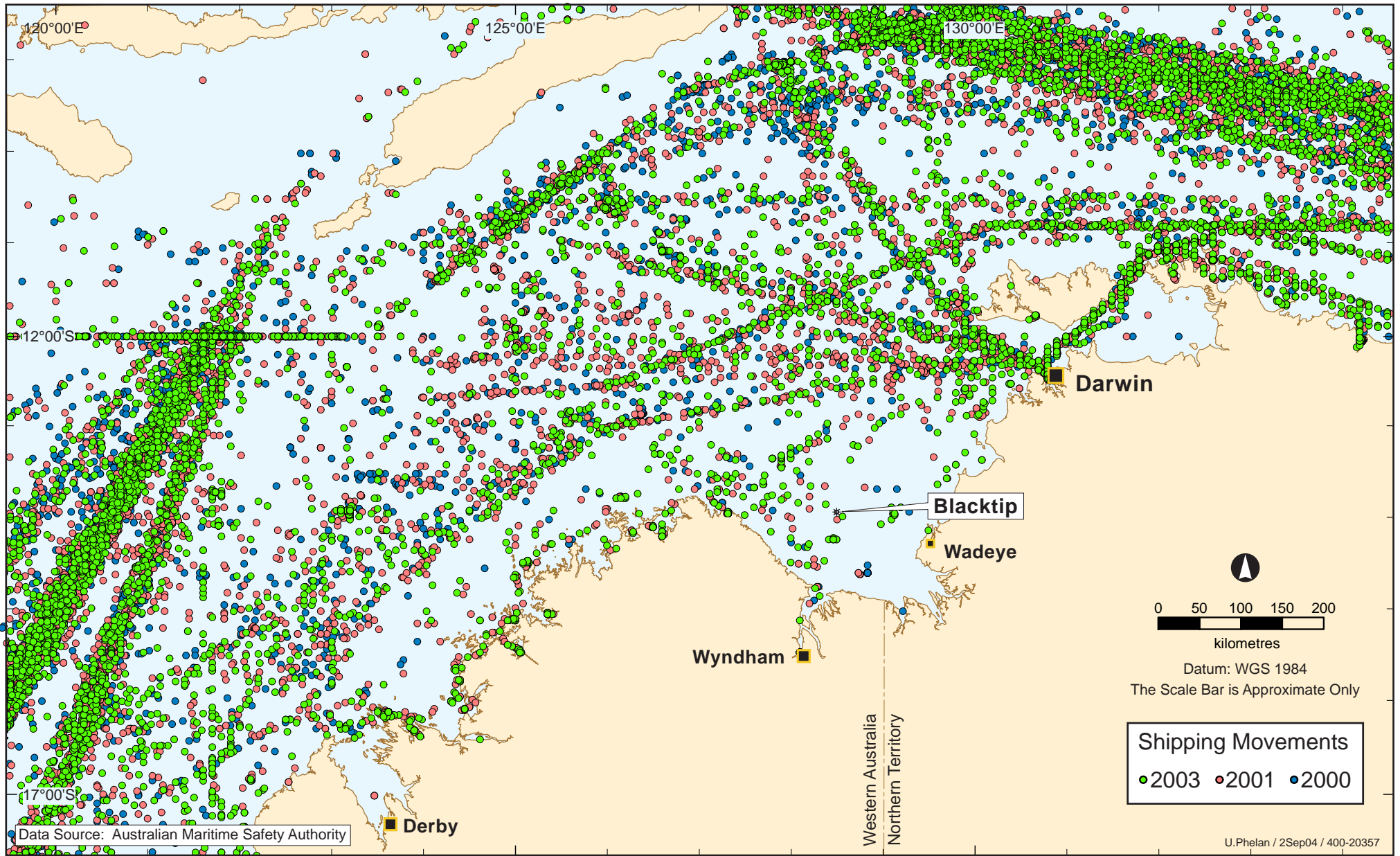
#### 9.7.4 Northern Territory Commercial Fisheries

All data for Northern Territory Fisheries has been sourced from the Fishery Status Reports (DBIRD 2002) except for the information specific to the lower Joseph Bonaparte Gulf (grid area 1429 - refer to description of Northern Prawn Fishery) which was supplied by Leonie Cooper (in 2004), Senior Fisheries Manager, Northern Territory Fisheries or where otherwise stated.

**Trepang Fishery:** Trepang fisheries throughout northern Australia date back to at least the 1700s when Aboriginals, including those at Wadeye and at Werntek Nganayi, traded trepang with Maccasans. However, the current fishery was established in the late 1980s. Fishing is conducted by hand in intertidal and shallow subtidal areas. The total harvest for the trepang fishery across the Northern Territory peaked at 241 tonnes in 2000 with landings in 2002 of 207 tonnes. Initially, the fishery was divided into three separate management areas, with two licences permitted to operate in each area. However, licensees covering the western area of the Northern Territory, which covers the Blacktip Project area, indicated that there was insufficient product for their operations to be economically viable, particularly given the more extreme tidal fluctuation in this management area.



This page has been left intentionally blank



Blacktip Project  
 DRIMS-#1572636

# SHIPPING LANES AROUND THE JOSEPH BONAPARTE GULF

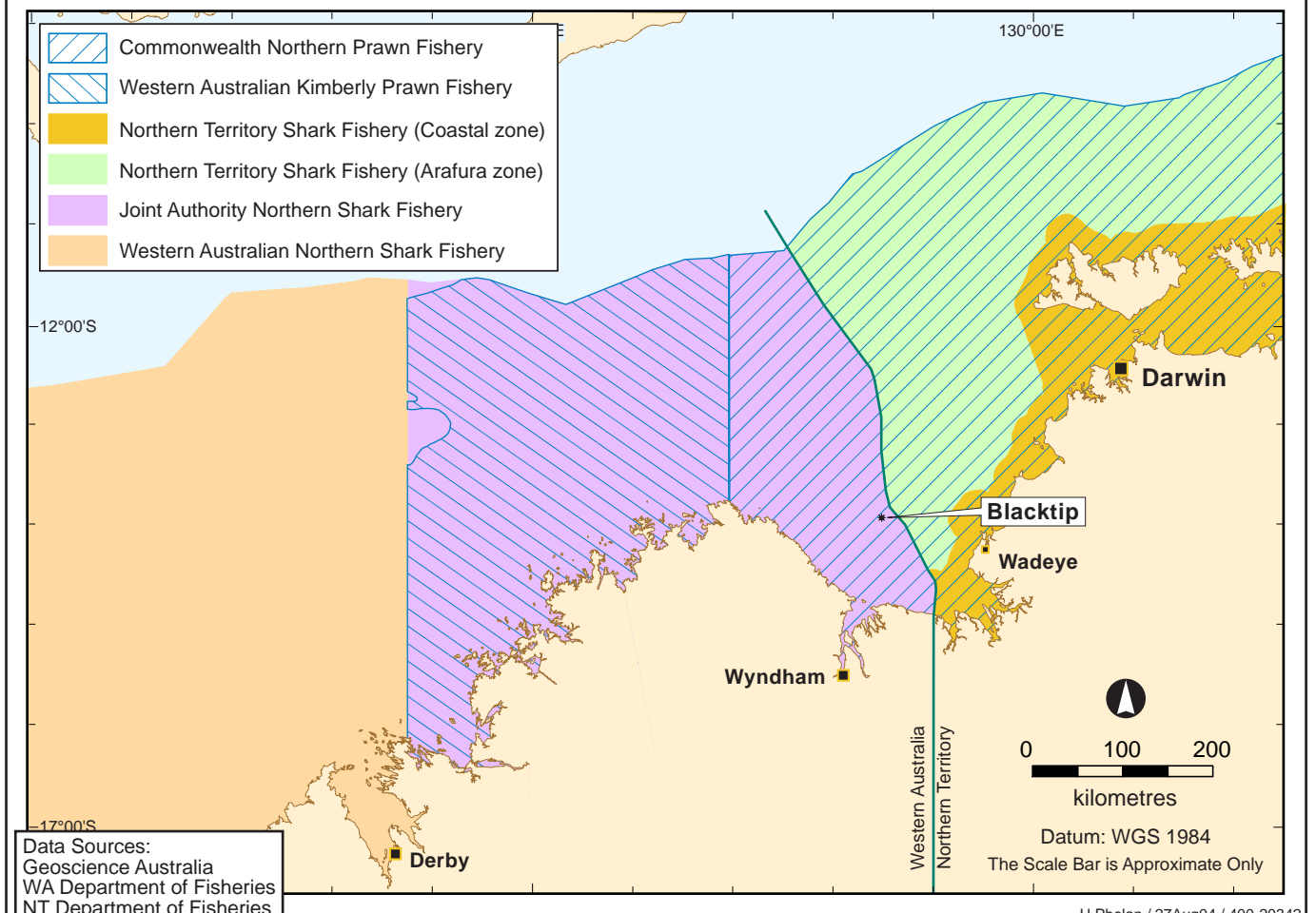
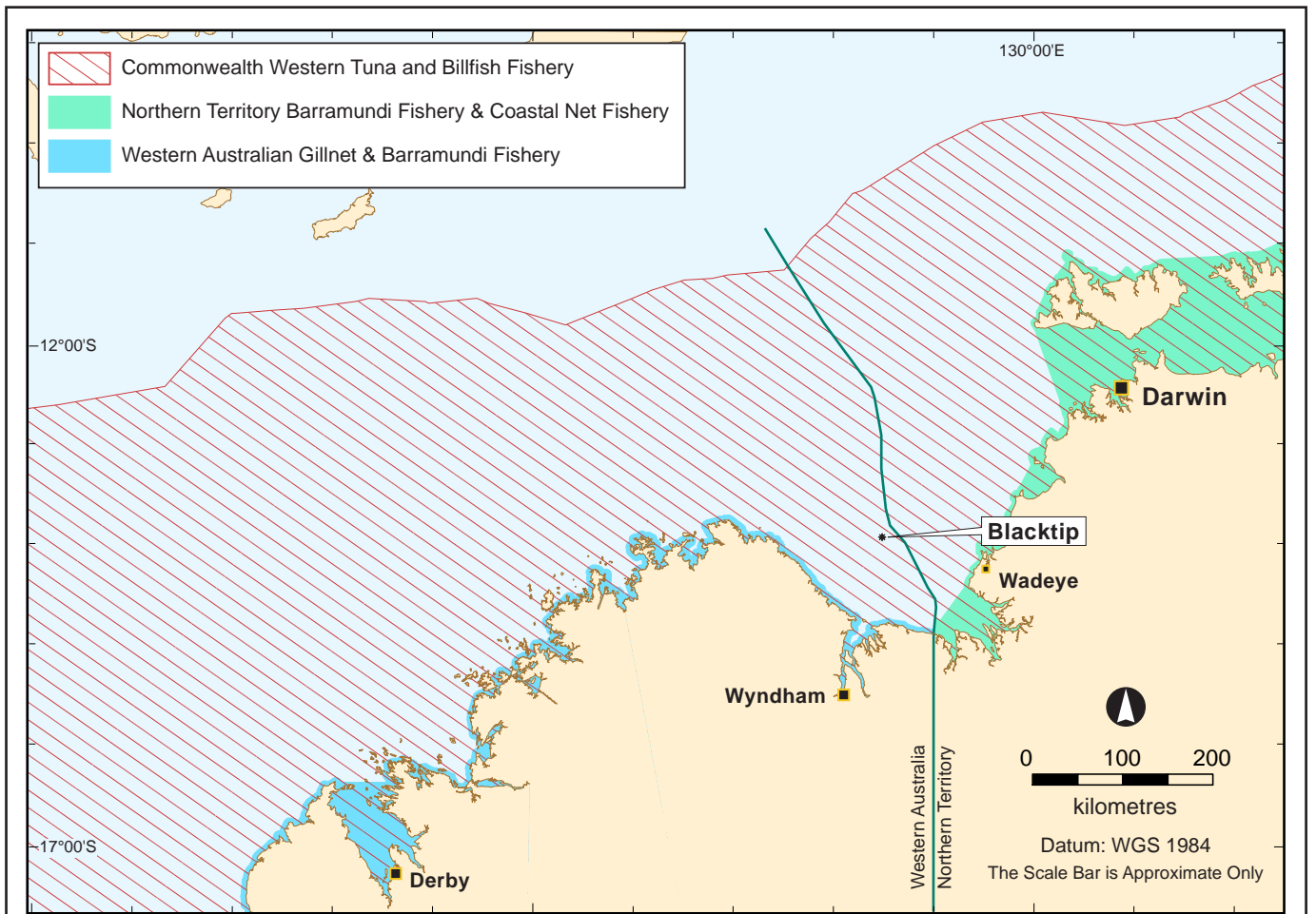
Figure 9.4

Data Source: Australian Maritime Safety Authority

Shipping Movements  
 ● 2003 ● 2001 ● 2000

U.Phelan / 2Sep04 / 400-20357

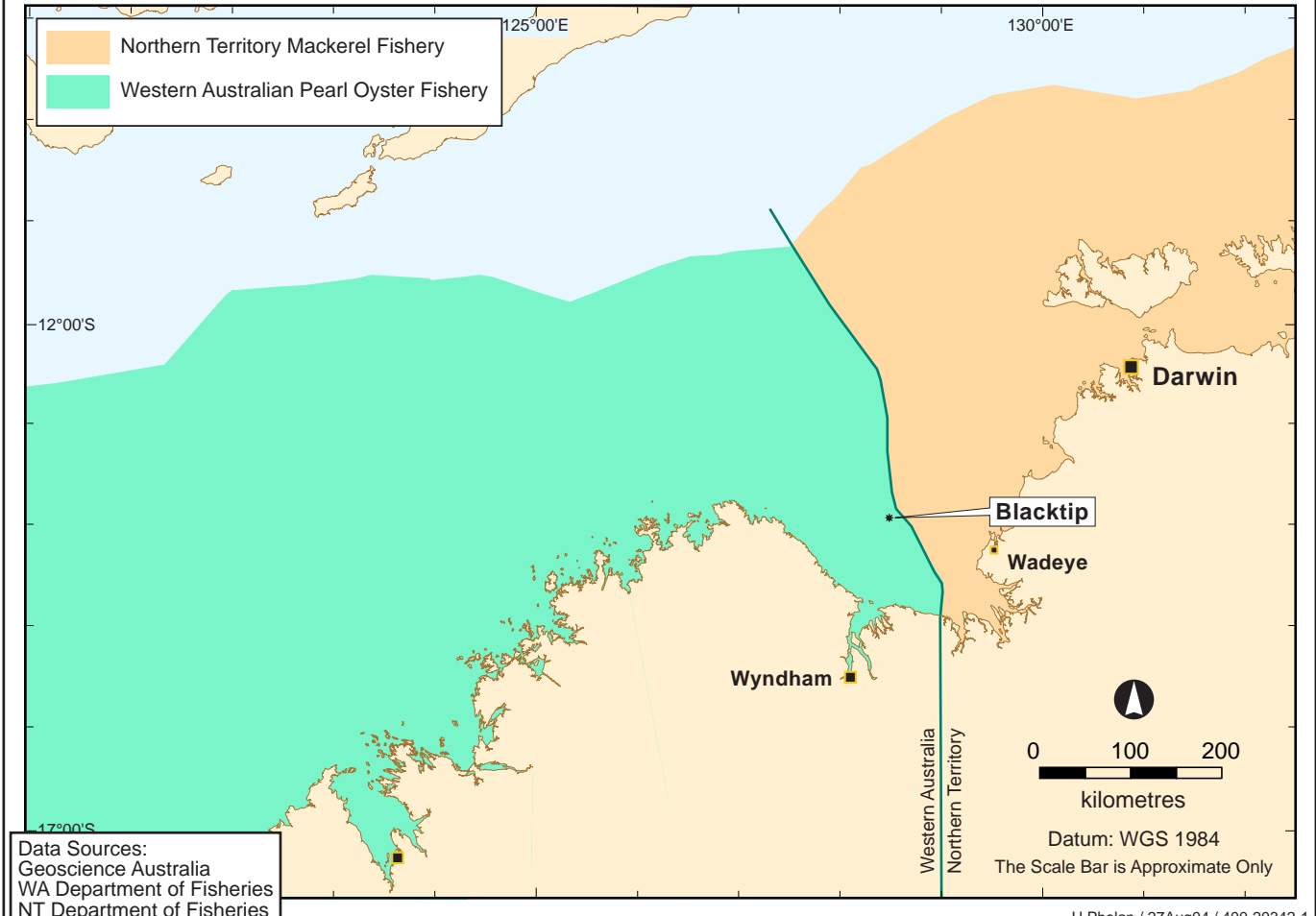
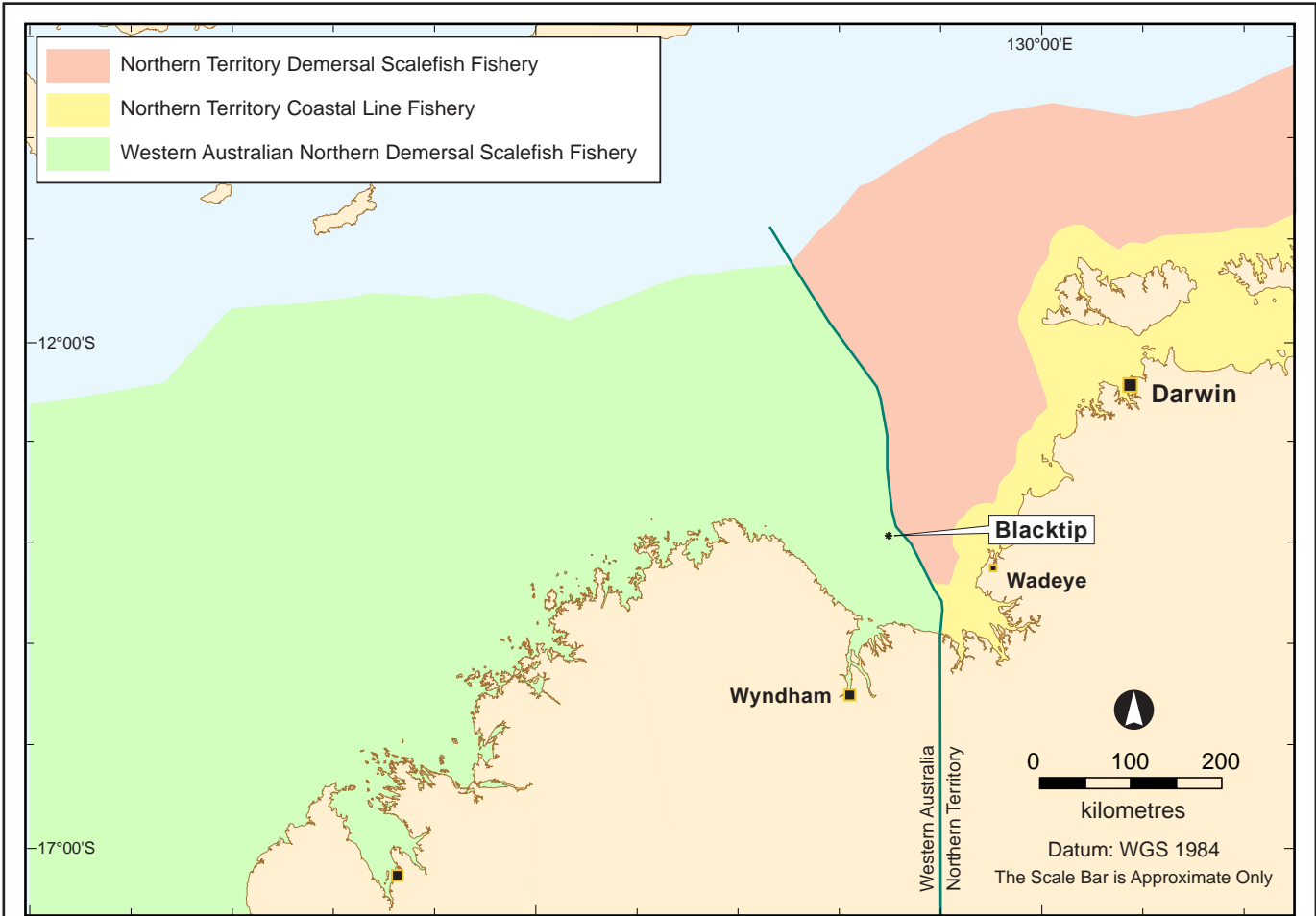
This page has been left intentionally blank



Data Sources:  
 Geoscience Australia  
 WA Department of Fisheries  
 NT Department of Fisheries

U.Phelan / 27Aug04 / 400-20342

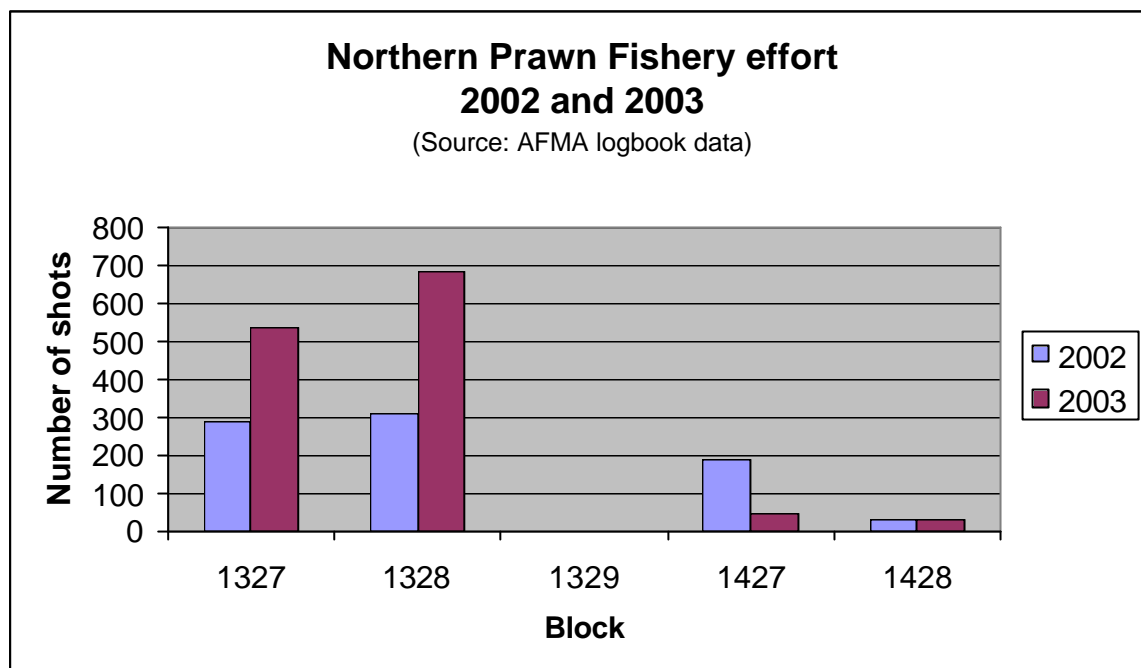
This page has been left intentionally blank



Data Sources:  
 Geoscience Australia  
 WA Department of Fisheries  
 NT Department of Fisheries

U.Phelan / 27Aug04 / 400-20342-1

This page has been left intentionally blank



Note: Block 1428 relates to 1 degree area between 14 and 15 degrees south and 128 and 129 degrees east. A shot refers to the fishing process and is measured from the deployment to the retrieval of the trawl net.

■ **Figure 9-7 Per Block Catch Data from NPF in Joseph Bonaparte Gulf, 2002–03**

**Mud Crab Fishery:** The mud crab fishery is the most valuable Northern Territory managed wild harvest fishery with the 2002 catch of 736 tonnes valued at approximately \$9.6 million. The mud crab resource is also significant to the recreational and Indigenous fishing sectors, where 82,000 and 86,500 crabs were harvested in 2000 by the recreational and Indigenous sectors respectively, which equates to approximately 135 tonnes. The mud crab fishery operates in tidal waters between the Queensland and Western Australian borders. Crabbing operations are confined to coastal and estuarine areas, predominantly on mud flats. Most crabbing activity is concentrated in the Roper River - Borroloola region (81% of the catch), although crabs are also harvested east of this area to the Queensland border, Blue Mud Bay and creeks and rivers close to Darwin. Negligible activity has been reported on the western coast of the Territory including the Joseph Bonaparte Gulf.

**Demersal Fishery:** The demersal fishery is a multi-species dropline and trap fishery operating in waters 15 nm from shore to the outer limit of the Australian Fishing Zone (AFZ) off the entire Northern Territory coast. However, only a relatively small area around Darwin (less than 5% of that available area) is currently fished due to the added cost of exploring grounds and fishing further away from the Port of Darwin. Therefore, nil or negligible fishing is expected to occur in the Joseph Bonaparte Gulf. The demersal fishery targets goldband snapper (*Pristipomoides multidentis*), but also catches significant quantities of red snappers (*Lutjanus malabaricus*, *L. erythropterus*), red emperor (*Lutjanus sebae*) and cods (Family *Serranidae*), all of which are reef associated fish which are unlikely to occur in the large numbers in the Joseph Bonaparte Gulf.

**Barramundi Fishery and Coastal Net Fishery:** The commercial barramundi fishery operates from the high water mark to the three nautical mile limit with various exclusion areas. The commercial fishery uses monofilament nylon gill nets and has a fishing season from 1 February through to 30 September each year. The primary target species are barramundi and threadfin salmon but there is also significant by-product of other species such as blue salmon, black jewfish, triple-tail and shark. The major commercial fishing areas include the North Arnhem, Blue Mud Bay, Murgarella, Roper River and Daly River regions and parts of Van Diemen Gulf. Between 2001–2004, 2,593 days were fished in grid area 1429 and 58,785 kg of fish was caught.

**Shark Fishery:** A joint authority between the Northern Territory and the Commonwealth, established under an Offshore Constitutional Settlement (OCS) arrangement, manages the shark fishery with the Northern Territory managing the day to day operations of the fishery. Target species for the commercial shark fishery are the blacktip sharks (*Carcharinus tilstoni* and *C. sorrah*) and grey mackerel (*Scomberomorus semifasciatus*) with a variety of other sharks and pelagic finfish landed on longlines and pelagic nets.

There are three management zones being the Coastal, Arafura and Gulf of Carpentaria zones with the majority of the fishing undertaken within the coastal zone (within 12 nm of coast or baseline) and the Gulf of Carpentaria. Little fishing was undertaken in the offshore component of the fishery during 2002. Total catch is variable but in 2002 the total catch of all species was 1,167 tonnes, with a total catch of sharks of 670 tonnes. Between 2001–2004, 725 days were fished in grid area 1429 and 4,280 kg of fish was caught.

**Mackerel Fishery:** The fishery is based on the capture of Spanish Mackerel (*Scomberomorus commerson*) by way of lures or baited lines in all waters seaward of the Northern Territory coast. The principal fishing areas include waters near Bathurst Island, New Year Island, northern and western Groote Eylandt, the Gove Peninsula, and the Wessel Islands, the Sir Edward Pellew Group and suitable fishing grounds on the western and eastern mainland coasts. Fishing generally takes place in coastal areas around reef, headlands and shoals. The Spanish Mackerel catch for 2002 was 404 tonnes which is a reduction of almost 20% over 2001, but is still substantially higher than the five year average of 320 tonnes.

**Coastal Line Fishery:** The fishery commenced largely as a lifestyle fishery; however, it has developed into a professional, expanding industry. Since 1998, a trend of increasing catch has been observed. The fishery extends from the high water mark to 15 nm across all of the Northern Territory coast and operators are permitted to use a variety of fishing gear, including: vertical line, cast net, scoop net, drop line and fish traps. However, line fishing remains the most common method for the coastal fishery. Commercial harvests have continued to grow over the last five years, reaching a new high in 2002 of 189 tonnes. This represents an increase of over 20% on the previous year. Between 1990 to 1998, the catch fluctuated between 60 tonnes and 138 tonnes. Historically, the coastal line fishery has operated as a multi-species line fishery, targeting reef associated species such as snappers, emperors, cod and various pelagic species. However, recent changes in the composition indicate the coastal line fishery catch is now dominated by two species,

golden snapper (*Lutjanus johnii*) and the black jewfish (*Protonibea diacanthus*). From 2001–2004, five days were fished in grid area 1429 and 2,490 kg of fish was caught.

### 9.7.5 Recreational Fisheries

Joseph Bonaparte Gulf is a very isolated area with very few population centres and only limited access to the coast. Consequently, recreational boating and fishing in the region is limited to areas near coastal access points. Fishing is a popular recreational activity in the Cambridge Gulf with access by boat from Wyndham and the Ord River. Fishing is also common on the inland areas of the Ord, Keep, Victoria and Daly rivers and many other smaller tidal creeks in the region. Recreational fishing and camping is permitted at Legune Station along the western side of the Keep River.

The coastal land in the project area belongs to the traditional Aboriginal owners and access to the coast in this area is strictly limited. Consequently there is not expected to be any non-Indigenous recreational boating or fishing activity in the immediate vicinity of the project.

Charter fishing and tourism operations from Darwin and the Kimberley generally target areas of high scenic value and/or offshore coral reef areas. As these attributes are generally sparse in the offshore area of the Joseph Bonaparte Gulf, the level of charter fishing and tourism is also expected to be low in this isolated area.

### 9.7.6 Traditional Fisheries

Aboriginal and Torres Strait Islander people have lived along the Australian coastline for over 40,000 years. Today, subsistence fishing continues to form an important part of their culture and as a source of food. Statewide, most fishing occurs in the close vicinity of communities and outstations, in inshore and estuarine waters (61% and 11% of fishing events, respectively) and rivers (17%) with over 1.5 million individual fish and other aquatic organisms harvested in 2000 by Indigenous people living in communities. The most important species group of finfish were mullet (83,000 individuals or 5% of the total harvest), catfish (60,000 or 4%) and barramundi (44,000 or 3%). The most important non-fish were mussels (580,000 individuals or 35% of the total harvest) and mud crabs (86,000 individuals or 5%). Indigenous fishers also harvested a range of species that are prohibited for or not taken by non-Indigenous people. These species included turtles, dugongs, crocodiles and mangrove worms.

Wadeye is the main community in the Thamarrurr Region and is populated by landowners who own land from Cape Scott in the North to the Fitzmaurice River in the south. Subsistence fishing occurs throughout this region using traditional methods, as it does across the Northern Territory. The most important species reflect those typically important across the territory and include mullet for bait, barramundi and catfish. Species of mussels and mudcrabs are also highly significant. There is limited harvest of dugong and turtle species according to season and as traditionally appropriate. Most fishing is conducted from the shoreline at several significant locations along the coast. These locations include Wadeye, Kuy, Moyle River, and numerous locations to the south of Wadeye, including Old Mission, Nuntamelli, and Tchindi. There is also limited fishing conducted

from vessels that tend to stay at or near the same locations. Traditionally, hunting was conducted with spears and this still occurs at all these locations (McIntrye, *S. pers. comm.*, 2004).

## 9.8 Tourism and Recreation

The Northern Territory has become an increasing popular visitor destination for Australian and international tourists. Almost 1.6 million interstate and international tourists visited the Territory in 2000/01, and the Northern Territory has experienced annual growth of 8% from 1990 to 2000 (Northern Territory Tourism Commission 2001). Although international tourist numbers were down slightly from 461,000 in 2000/01 to 416,000 in 2002/03, expenditure increased by \$2.5 million to \$305.8 million in 2002/03 (Northern Territory Tourism Commission 2004).

Tourism in the Northern Territory is generally restricted to the dry season with an estimated 60% of tourists arriving between April and September. Tour companies in the Northern Territory offer holidays based on fishing, sightseeing, riding and hunting. Aboriginal tourism ventures also operate in the Territory and are aimed at providing visitors with the opportunity to experience Aboriginal culture and remote areas.

The Joseph Bonaparte Gulf has not been significantly developed for tourism due to its inaccessibility. Access to the Gulf region is restricted to boat or helicopter for up to five months of the year, and road access to areas of Aboriginal freehold land requires prior permission from the NLC. However, the remote wilderness of the region is the main attraction for people who visit this area (Dames and Moore 1994). Charter boats operating out of Darwin and Western Australia (mainly Broome and Derby) occasionally visit the Joseph Bonaparte Gulf. Activities undertaken by charter groups in the Kimberley and Northern Territory include fishing, camping and swimming. No information is available on any future tourism opportunities that may eventuate.

## 9.9 Archaeology

### 9.9.1 Marine Archaeology

A summary of ships lost in the Joseph Bonaparte Gulf, associated inlets, estuaries and rivers is provided in **Table 9-3**. There are no records that these ships have ever been found, therefore their exact position within the Gulf is uncertain. Furthermore, detailed geotechnical surveys conducted for the Blacktip Project, which include the use of a magnetometer, failed to detect any shipwrecks within the proposed pipeline corridor, platform location and condensate export mooring.

#### ■ Table 9-3 Historic Shipwreck Records

Ship Name	Location Lost
Essington	Victoria River
Kathie	Blunder Bay, Victoria River
Loellen N.	Off Cape Hay
Margaret Mary	Off Cape Hay
Polpye	Wadeye (Wadeye)
Sedco Helen	Joseph Bonaparte Gulf

Source: National Shipwreck Database

### 9.9.2 Terrestrial Archaeology

A study of archaeological and historic heritage at the onshore project area was undertaken by Begnaze, including a desktop review and field survey, in consultation with the Heritage Conservation Branch of DIPE. This section summarises the results of the study, which is detailed in full in **Appendix I, Volume 2**.

**Regional Archaeology:** The Heritage Conservation Branch (DIPE) has recorded three archaeological sites in the region (covered by the 1:100 000 Port Keats map sheet) (**Figure 9-8**). None of these sites are located in the project area. These sites are summarised as follows:

- 1) **Jarra (Yarrar):** The site known as Jarra is a rock shelter that contains rock art, rock engravings, stone artefacts and a low stone wall, and is located approximately 25 km south-east of the onshore project area. Most of the paintings are of abstract designs in red and white pigment, and there is also a series of short parallel lines engraved on the rock surface. The site also contains an assemblage of stone tool types and raw materials. The site would have been occupied in the late wet to early dry season, as they are located near creeks that contain water only in the wet season (Flood 1967; Gregory 1998).
- 2) **Papangarla:** The site known as Papangarla is a rock art shelter located in a dissected weathered sandstone scarp south-west of Wadeye. The main designs at this shelter are parallel red and white lines. The site also contains five grinding hollows.
- 3) **Tamarind Tree:** This site is approximately 30 km north of the onshore project area and consists of a tamarind tree, a jetty and a fish trap.

A further two archaeological sites, Nyik and an unnamed site at Munda Beach, have been recorded in previous surveys but are listed on the Heritage Register.

- 1) **Nyik:** This site is an artefact scatter located 2–3 km southwest of Jarra (Gregory 1998). At Nyik the majority of stone artefacts were manufactured from quartzite with minor quartz, silcrete and volcanic material. Types of artefacts identified were cores, retouched flakes and points. Gregory (1998) proposed that this site was used as a base camp or procurement site. This site would have been occupied in the late wet to early dry season, as it is located near creeks that contain water only in the wet season (Flood 1967; Gregory 1998).
- 2) **Munda Beach site:** This site is a highly disturbed shell scatter on a grass-covered coastal sand dune at the northern end of Munda Beach approximately 15 km north of the onshore project area (Crassweller 2001). This scatter consisted of a low density (12 shells per square metre) of mostly highly fragmented *Telescopium telescopium* and a few *Anadara granosa* and *Terebralia sp.* The dimensions of the shell scatter were 22 by 10 m. The presence of a green coloured glass flake on the shell scatter indicates that this is a contact site. Crassweller (2001) also noted four large shell scatters of mostly *Terebralia sp.* on sand dunes that ran south along the back of Munda Beach for approximately 5 km.

**Archaeological Sites and Objects:** The archaeological and heritage survey of the onshore project area identified one archaeological site, a large shell midden located in the sand dunes immediately landward of the shore crossing (**Figure 9-9**). No other archaeological or historic sites or objects were located in the onshore project area. The small number of sites recorded during the archaeological surveys was as predicted by Crassweller (2004) who, based on a review of the environmental and ethnographic context of the region, concluded:

- Visibility of sites located on the Moyle Land System, which is the land system on which the proposed gas plant and export pipeline are located, can be as low as 10% where the vegetation is not burnt, resulting in a low likelihood of recording sites.
- Based on the ethnographic research and evidence presented by Stanner (1933a) and Gregory (1998), and the regional archaeological record, fresh water sources and rocky outcrops were probably a focal point for past Aboriginal activities in the Wadeye region, which leads to the conclusion that there is a low likelihood of recording sites in the project area, which does not contain any surface water bodies or rocky terrain.
- Ethnographic evidence and sightings of shell scatters on sand dunes along the coast near Wadeye (Crassweller 2001) suggests that there has been an intense use of coastal areas and marine resources in the region and therefore there is a high probability of locating archaeological material in the Littoral Land System, which is traversed at the proposed pipeline shore crossing.

The site recorded as Shell Midden 1 is located over the length of the sand dunes, which run in a north to south direction parallel to Yelcherr Beach (**Plate 9-1** and **Plate 9-2**). The site dimensions are approximately 600 m (north-south) by 40 m (east-west). The highest density of archaeological material (60 shells per square metre) appears in the eroded areas along the western side of the highest part of the most easterly sand dune. A lower density of archaeological material (10 shells per square metre) is eroding from patches on a more level section of the sand dunes closer to the beach (**Plate 9-3**).

The highly fragmented shell that comprises the site consists of 90% *Terebralia sp.*, 5% *Telescopium sp.*, 2% *Saccostrea sp.* (oyster) with smaller proportions of *Volema sp.*, *Nerita sp.*, *Turbo sp.*, and *Anadara sp.* The stone artefacts noted during the survey consisted of ten hammer-stones, one ground edge axe and one ground axe (**Plate 9-3**) (both also used as hammer-stones), one sandstone rock with drill marks (**Plate 9-4**), and possible cooking stones carried from a type of ironstone that is found outcropping from the promontories at both ends of the section of Yelcherr Beach where the shore crossing is located. There were also small sandstone manuports eroding from the sand. Macropod, fish and possibly dugong bone were located over the southern section of the sand dunes.

The proposed onshore pipeline will cross over the northern end of the Shell Midden 1 site in a west to east direction.

***Significance of the Shell Midden:*** The limited archaeological research and survey work carried out along the coast between Darwin and the Victoria River makes it difficult to assess whether the archaeological attributes of the Shell Midden 1 site are a rare occurrence in the region or not. When compared with shell midden sites in other areas of coastal Northern Territory, the size, surface archaeological material and integrity of the site found at the onshore project area would suggest that the site has a high potential for further research. Crassweller (2004) considers that for this reason the site has high archaeological significance.

***Register of National Estate:*** There are no historic or archaeological sites recorded on the Register of the National Estate located in proximity to the onshore project area. The closest site included on the Register is the Jarra (Yarra) rock shelter, which is located 25 km to the south-east of the onshore project area.

***Sites Recorded on Commonwealth and/or NT Heritage Registers:*** There are no historic or archaeological sites recorded on the National Heritage List that occur in proximity to the onshore project area.

There are no known declared places or objects as described by the *NT Heritage Conservation Act 1991* in close proximity to the onshore project area. The closest known declared heritage place is the Jarra rock shelter described above.

***Macassan Sites and Aboriginal and Torres Strait Islander Archaeological and Heritage Places and Objects:*** The archaeological site, Shell Midden 1, identified and recorded during the field survey of the onshore project area, is a prescribed site under the *NT Heritage Conservation Act 1991*. In accordance with the Act, the Shell Midden is protected, making it an offence to disturb the site without permission from the Heritage Conservation Branch of the DIPE.

***European Historic Sites:*** No European historic sites were located during the survey of the onshore project area, and no sites are recorded in the Northern Territory Heritage Register records for the area. Crassweller (2004) considers that it is highly unlikely that any historic sites will be located in the proposed onshore project area as there have been only minor physical European intrusions into the region since the 1880's and these have mainly been related to the mission at Wadeye.

## **9.10 Aboriginal Heritage**

### **9.10.1 Aboriginal Sites of Significance**

***Sacred Sites:*** Pursuant to the *Northern Territory Aboriginal Sacred Sites Act 1989*, Authority Certificates were issued by the Aboriginal Areas Protection Authority (AAPA) in relation to all on-ground work undertaken for the Blacktip Project. Sacred site surveys of the Blacktip Project area were undertaken by the NLC in consultation with traditional Aboriginal owners. Reconnaissance permits, negotiated between Woodside and the NLC, governed the conduct of all the works that were undertaken.

It has been a high priority of Woodside that the location of the Blacktip Project must not damage or impact sacred sites. None of these sites will be impacted on from the proposed development.

A summary description of the Aboriginal sacred and significant sites located in the vicinity of the Blacktip Project area, as communicated to Woodside by the NLC is provided in **Table 9-4** and **Table 9-5**. The sites are specific to the different Aboriginal groups, and sites sacred to the Yak Maning People are shown separately from those sacred to the Yak Dimihin people. The indicative locations of these sacred sites are shown on **Figure 9-10**.

■ **Table 9-4 Yak Maning Sacred Sites**

Name	Description
Maning	Coastal point covered by distinctive black rocks.
<i>Kurlangor</i> trees near Maning	Two Woollybutts ( <i>Eucalyptus miniata</i> ) standing on eastern side of coastal track
<i>Karrinthanmoi</i> stone	A stone located among rocks on northern side of Maning Point, exposed at low tide.
<i>Mamut</i> trees	A cluster of seven or eight Cheesefruit trees ( <i>Morinda citrifolia</i> ) with pungent smelling fruit, located on northern side of Maning point.
<i>Walpinhthi</i> reef	A submerged reef located approximately 1.5 km west of Yulow Point - the point or headland south of the pipeline landfall.

■ **Table 9-5 Yak Dimihin Sacred Sites**

Name	Description
Restricted Men's Area 4869-27	A ceremonial ground near a creek crossing south of Wadeye/Port Keats airstrip.
Restricted Women's Area	A ceremonial ground located west of the Wadeye/Port Keats airstrip, and immediately south of Wadeye/Port Keats community. A tributary of Sandfly Creek runs through the site area.
Thawytkam (Air Force Hill) 4869-28	Airforce Hill (Mt Goodwin) recorded by AAPA as MIKUMILU, but locally known as Thawytkam.



This page has been left intentionally blank



This page has been left intentionally blank



■ Plate 9- 1 Shell Midden 1 On Sand Dunes -Facing South



■ Plate 9-2 Shell Midden 1 - Facing North

This page is left blank intentionally



- Plate 9-3 Edge Ground Axe And Broken Axe Used As Hammer Stones



- Plate 9-4 Stone with Drill Hole

This page is left intentionally blank



This page has been left intentionally blank

## 9.10.2 Species with Indigenous Cultural Values

### 9.10.2.1 Background

EIS Guidelines set by the Commonwealth Government and Northern Territory Government outline the value of undertaking a range of assessment studies, including baseline descriptions and assessments of the potential impact of the proposal on the biophysical and social environments in the Wadeye region.

Section 4.4.1 of the EIS Guidelines requires a baseline assessment of the ecology of the area to be undertaken, including a description of the fauna, flora and biological communities (including marine, estuarine, terrestrial and aquatic). This Section also states that ‘species with Indigenous conservation values should also be described’.

Specialist consultants were commissioned to specifically address this aspect of the Draft EIS. In discussions between representatives of the proponent, the NLC and the consultant it was decided to address this EIS requirement within the broader context of considering environmental cultural values held by traditional Aboriginal owners in the area. This broadening of the project objective arose from recognition that ‘Indigenous conservation values’ apply not only to individual species but also to the biological communities, habitats and environments in which those species live. It was further decided to consider the potential impact of the Blacktip proposal not only on species and environments with Indigenous conservation values, but also on the Indigenous conservation values themselves. A methodology was therefore developed to address the following objectives:

- To describe species with Indigenous conservation values.
- To gain an understanding of the nature and scope of those values.
- To assess potential impacts (positive and negative) on species with Indigenous conservation values.
- To assess the potential impact (positive and negative) on environmental values held by traditional Aboriginal owners.

***Interpretation of ‘Indigenous Conservation Values’:*** The term ‘Indigenous conservation values’ is not commonly used in EIS documentation or as a component of general environmental planning jargon. Representatives of the NLC and Woodside explained that the term had been introduced to the Draft EIS to ensure that species of importance to traditional Aboriginal owners for cultural, economic, nutritional, medicinal or other reasons were considered in the environmental assessment process. The term is therefore used in this report to mean species about which traditional Aboriginal owners hold values which give the species significance to traditional Aboriginal owners over and above the significance of the species as members of biological communities, or as rare, threatened or endangered etc.

This approach allowed species of particular interest to traditional Aboriginal owners to be considered as a subset of the values that make up the relationship between Aboriginal people and their traditional Country. That relationship is based on inherited rights and responsibilities of particular groups of people to particular areas of land and sea, combined with complex culture-

specific knowledge, kinship and belief systems. While this project was initiated to address a component of the ecological requirements of the EIS, the broadening of the objectives means that the project also contributes to aspects of the ‘Historic and Cultural Heritage Values’ (Section 4.10.2.1 of the Draft EIS Guidelines), which states in part:

‘Identify Indigenous and non-Indigenous places of historic or contemporary cultural significance, including: Areas of special values to indigenous and non-indigenous people (for example traditional land use, landscape, visual environment, recreational, commercial, fisheries, scientific, educational, marine archaeological sites) (emphasis added)’.

### 9.10.2.2 Methodology

Field work for this aspect of the EIS took place over four consecutive days. While this was sufficient time to visit each of the key locations potentially impacted by the Blacktip proposal with representatives of the appropriate clan groups for each location, it was not possible or intended to undertake a detailed study of Aboriginal environmental knowledge and values in the region. Rather, the intention was to undertake a scoping study to explore the spectrum of cultural values associated with key environments and species, to gain an understanding of potential impacts and to propose appropriate management responses.

The consultant’s preparation prior to visiting Wadeye and the project site included:

- Familiarisation with anthropological literature for the area (Ward 1983).
- Familiarisation with ethnobiological literature for relevant ecological regions in the NT (Raymond *et al.*, 1999, Blake *et al.*, 1998).
- Reading relevant sections of the Draft EIS for the Blacktip project, in particular those sections dealing with ecology, fauna, flora, cultural heritage, archaeology and social impact assessment.

***Collaboration with Traditional Aboriginal Owners:*** The primary tool for assessing environmental cultural values is collaboration with traditional Aboriginal owners, who are the holders of the values under consideration (Smyth 2002). With the assistance of NLC Field Officers and anthropologist, traditional Aboriginal owners from Yak Maninh and Yak Dimininh clans were invited to collaborate in the assessment of environmental cultural values for their respective traditional areas (clan estates) potentially affected by the Blacktip proposal. Collaboration with traditional owners involved the following activities:

- Discussing the project with individuals and small groups at various locations (including traditional Aboriginal owners’ houses/camps, Woodside camp, Thamarrurr Ranger base).
- Discussing Aboriginal use, knowledge and significance of particular species, habitats and environments during visits on Country – including the identification (language names, English names and scientific names) of some animals and plants at each location.

- Discussing the preservation, transmission and presentation of Aboriginal cultural information about plants and animals by reviewing existing ethnobiological publications (including Blake *et al.*, 1998; Nambatu *et al.*, 2004; and Raymond *et al.*, 1999).
- Looking through existing ethnobiological publications (including Blake *et al.*, 1998; Nambatu *et al.*, 2004; and Raymond *et al.*, 1999).

**Consultation with Thamarrurr Rangers:** The Thamarrurr Rangers were established in Wadeye in 2001 as an outcome of the Top End Aboriginal Land Management and Employment Strategy (TEALMES). TEALMES is a multi-agency agreement to develop land management activities and create employment opportunities within the Daly River / Port Keats Aboriginal Land Trust. TEALMES seeks to formalise Indigenous land management through operational and financial support from the NLC, the NT Dept of Business, Industry and Resource Development, the Indigenous Land Corporation, the Dept of Workplace relations and the NT Dept of Employment, Education and Training.

Discussions were held with Thamarrurr Rangers and their co-ordinator (Scott McIntyre) to gain an understanding how species, habitats and environments of significance to Aboriginal people are currently being managed in the Wadeye region, and the role of the Ranger programme in the protection and transmission of associated environmental cultural values and how these issues are currently being addressed within the Thamarrurr region.

**Wadeye Aboriginal Languages Centre:** Discussions were held with the coordinator of the Wadeye Aboriginal Languages Centre (Mark Crocombe) to gain an understanding of current initiatives to document, protect and transmit environmental Aboriginal knowledge of plants, animals and associated environmental cultural values in the Wadeye region.

### **9.10.2.3 Cultural Values and Connection to Country**

Yak Maninh and Yak Dimininh traditional owners, and the other Aboriginal groups of the Wadeye region, have a holistic view of their traditional country, in which all elements (land, sea, estuaries, rivers, animals, plants, people etc.) are linked through creation stories, tracks of creation ancestors, kinship systems, traditional knowledge, subsistence use and other cultural mechanisms (Ward 1983). In this broad sense, therefore, all species and other elements of country potentially have 'Indigenous conservation values'.

Visits were made with traditional Aboriginal owners to discuss the cultural significance of country and species at the following locations:

With Yak Maninh traditional owners:

- coastal area in vicinity of proposed pipeline shore crossing;
- proposed route of pipeline corridor between the shore and gas plant;
- proposed gas plant site;
- proposed route of all-weather access road.

With Yak Dimininh traditional owners:

- proposed route of all-weather access road.

Within these locations traditional Aboriginal owners identified distinct environment types in the local Murrinh Patha language. Traditional Aboriginal owners from both clan groups have a detailed knowledge of the names, properties, seasonality, ecological relationships, cultural attributes and uses of a large number of animals and plants in each of these environments. Each of the environments visited contain species that are used for food, medicines, implements or other cultural purposes, but country is valued by traditional owners for more than just the usefulness of particular species that live there. Traditional Aboriginal owners expressed a strong sense of responsibility to country, to look after it, to keep it healthy and to protect it for the generations to come. Some of the key resources for each environment category are summarised in **Table 9-6**, though, as noted above, the cultural significance of these environments is not limited to these resources.

Detailed information about the languages names, uses and other cultural significance of plants and animals in the Wadeye region has been recorded by the Wadeye Aboriginal Languages Centre. Some of this information has been transcribed into a draft report on Aboriginal knowledge of flora and fauna from the Wadeye and Kuy regions (Nambatu *et al.*, 2004).

To date the Wadeye Aboriginal Languages Centre has collected Aboriginal language names, uses and other associated cultural information for 206 plant species and 434 animal species. While it is not appropriate to report details of this Aboriginal knowledge in a public Draft EIS document, **Table 9-7** and **Table 9-8** provide an indication of the scope of Aboriginal knowledge and cultural significance of plants and animals in the Wadeye region. The attributes listed in these tables are based on information collected by the Wadeye Aboriginal Languages Centre, supplemented by information provided by Yak Maninh and Yak Dimininh traditional owners during consultations for this report. To protect intellectual property associated with this knowledge, no attributes or language names are identified with individual species.

■ **Table 9-6 Summary of Key Resources within Yak Maninh and Yak Diminh Environments Associated with the Blacktip Proposal**

Environment (English name)	Environment (Murrinh Patha name)	Key Resources <sup>1</sup>
Deep sea	Langarr	Dugong, turtles (several species), fish (many species)
Beach	Darrimun	Turtle eggs & some food plants
Mangrove	Dara	Molluscs, crustaceans, fish & mangrove worms
Rocky shelf	Kalpa	Fish, crabs, oysters
Jungle (notophyll vine forest)	Da Dulpungu	Yams and other food plants, fibre, dyes, shade trees
Dune woodland	Da	Yams and other food plants, fibre, dyes
High ridge (open woodland)	Da Bengkunh	Food plants, honey, mammals, birds, reptiles, invertebrates
Pandanus / Mellaleuca community	Da Bepi	Food plants, fibres, water

*Note: Da is the pronoun for place or country.*

*\* The cultural significance of these environments is not limited to the resources listed.*

■ **Table 9-7 Some Attributes and Uses of Aboriginal Knowledge of Plants**

Category	Attribute and uses
Food	Fruit flesh Pith / shoots Fruit seeds Tuber Nectar and sap Water source
Plant and animal associations	Edible animals associated with specific plants Food for animals Calendar plants (indicating seasonality or species availability)
Implements	Clap-sticks Didgeridoos Digging sticks Fighting sticks Fire carriers Fire sticks Spears Throwing sticks Tools Water craft (dugout and bark canoes) Woomeras

<b>Category</b>	<b>Attribute and uses</b>
Material culture	Carrying baskets Water carriers Caulking compounds (for repairing leaks) Dyes Fibres Fish poisons Glues Harmful / poisonous Insect repellent Ornament / decoration Sandpaper Shelter / bedding Smoking pipes Tobacco Toys Drinking cups Straws Stone axe handles
Medicines	Respiratory ailments Skin ailments Headaches Others
Other uses	Firesticks Firewood and kindling Wrapping food for cooking Ceremonies Shade

*Source: Based on information from Nambatu et al (2004) and consultations with Yak Maninh and Yak Dimininh traditional owners.*

■ **Table 9-8 Some Attributes and Uses of Aboriginal Knowledge of Animals**

Category	Attribute / Uses
Food	Flesh of mammals, birds. Fish, reptiles, amphibians Eggs or birds and reptiles Marine and terrestrial invertebrates Bait
Spiritual	Many species are totems for particular people and groups Dreaming sites associated with particular species Particular species of spiritual importance to men Particular species of spiritual importance to women Particular species feature in creation stories
Clothing and decoration	Feathers Shells
Medicine	Some species have medicinal properties
Calendar species	Some species indicate seasonal changes and availability of particular plant foods
Other uses	Water carriers Smoking pipes Lead people to water Look after country

*Note: Based on information from Nambatu (2004) and consultations with Yak Maninh and Yak Dimininh traditional owners.*

**Summary of Indigenous Environmental Cultural Values:** The plant and animal species in the vicinity of the proposed Blacktip gas plant, pipeline, shore crossing and access road form part of Yak Maninh and Yak Dimininh cultural landscapes. A large number of species have specific utilitarian and other cultural values, and collectively they are an integral part of country for which traditional owners have an inherited responsibility. All country has inherent value to traditional owners, over and above the value or usefulness of particular animal and plant species within it.

The gas plant site and access road corridor are located in open woodland environments that are well represented elsewhere in Yak Maninh and Yak Dinininh clan estates. While this does not negate the cultural value of environments at the gas plant site and along the road corridor, traditional owners reported that culturally significant resources available at these locations are also available elsewhere within their clan estates.

Marine and terrestrial environments adjacent to the shore crossing (mangrove, rocky platform, intertidal zone, beach, vine thicket etc.) are rich in culturally significant resources and comprise only a small portion of traditional owners' clan estates.

Impacts on Indigenous conservation values are discussed in **Section 13.10**.

### 9.11 Visual Amenity

A Landscape Architecture Survey was undertaken in June 2004 to photograph and record views of the proposed onshore gas plant from several vantage points. The vantage points were chosen to

represent locations frequently used by locals including Wadeye township, the beach and any elevated areas. The intention was to combine any information obtained during the survey with conceptual modelling of the plant site to assess the impacts of the development on visual amenity, and thereby determine whether or not the plant will be visible from these vantage points once constructed. However, based on the final outputs conceptual modelling was not deemed necessary.

**Methodology:** The survey used eleven vantage points (**Figure 9-11**). The locations selected were as follows:

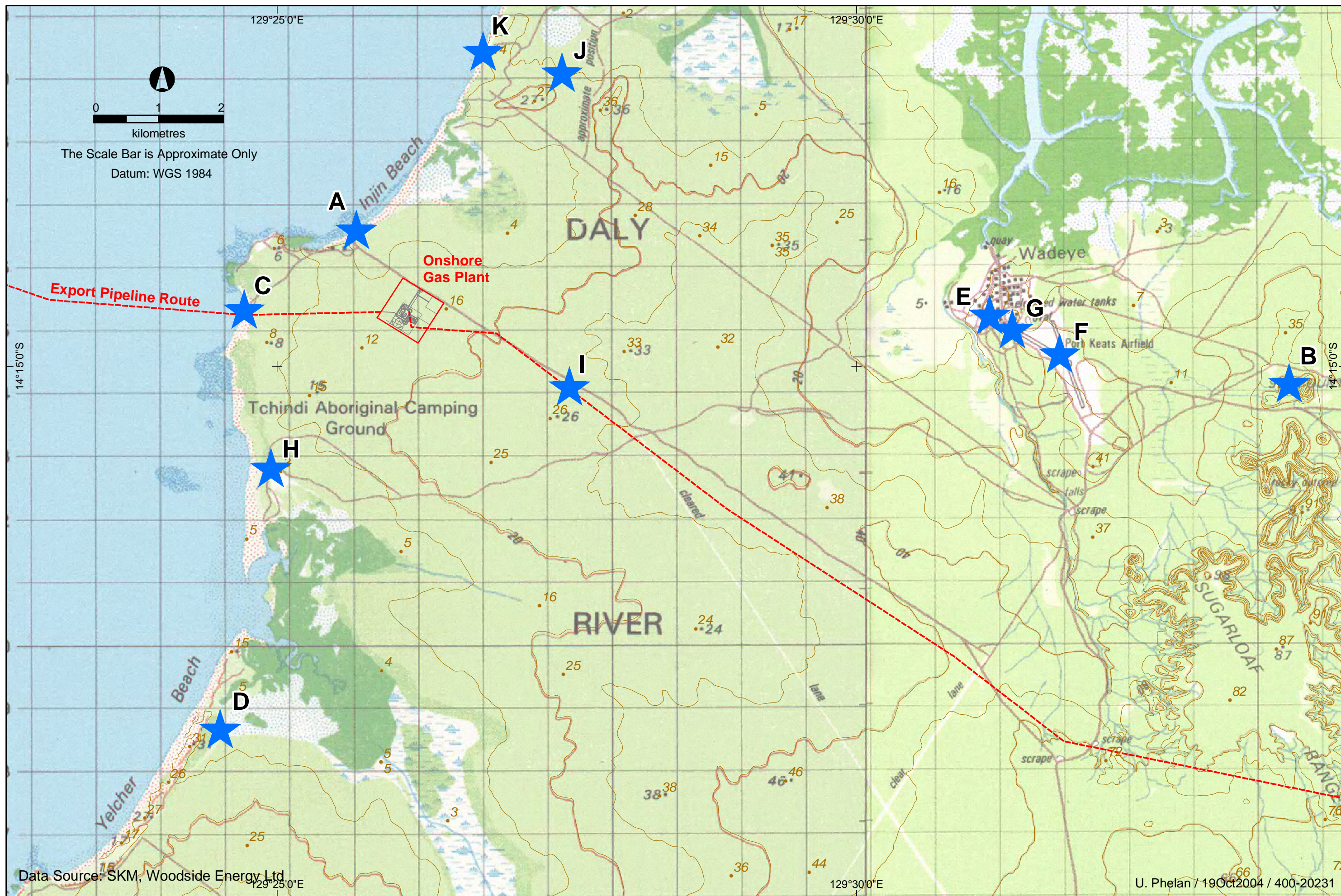
- a) Injin Beach located north west of plant elevation 0 m.
- b) Airforce Hill - located 14 km immediately west of the plant (elevation 92 m).
- c) North Yelcherr Beach (shore crossing) – located immediately west of plant (elevation 0 m).
- d) Ditchi – located several kilometres southwest of landfall (elevation of 27 m); locals use this outstation.
- e) Wadeye Township (elevation 5 m).
- f) South end of Wadeye Airstrip - located east of plant (elevation 5 m).
- g) Town end of Wadeye Airstrip - located east of plant (elevation 5 m).
- h) Tchindi Camping Ground - located south of plant (elevation 15 m). Used by locals as a camping ground on an ad hoc basis.
- i) East (3 km) of onshore gas plant - located along the main unsealed access road east of plant (elevation 33 m).
- j) Elevated ground north-east of onshore gas plant - the closest elevated ground/ridge to north east (elevation 36 m).
- k) North of Injin Beach – immediately north of landfall on coast (elevation 0 m).

At each location a tripod-mounted camera with a 50 mm lens was used to obtain several panoramic, overlapping shots. A 50 mm lens offers the best impression of a view as seen by the human eye at a particular location. A GPS reading was used to record the exact location from which the photograph was taken, and a compass bearing taken to ensure the correct camera viewing angle.

**Existing Environment:** The area surrounding the proposed development is mostly flat and uncleared, covered in low eucalyptus forests. The landscape is gently undulating with several low rises offering the best local vantage points. From these areas, there are long views of forested landscapes.

The plant elevation is at approximately 10 m AHD. The plant is set 2.5 km back from the beach, with a gentle rise in elevation from the beach to the plant site. The terrain generally is gently undulating to flat.

The photographs taken from each vantage point looking towards the onshore gas plant are presented in **Plate 9-5** to **Plate 9-15**.



This page has been left intentionally blank



■ Plate 9-5 Vantage Point A: Injin Beach looking towards Proposed Gas Plant



■ Plate 9-6 Vantage Point B: Airforce Hill looking towards Proposed Gas Plant

This page has been left intentionally blank



- **Plate 9-7 Vantage Point C: North Yelcher Shore Crossing looking towards Proposed Gas Plant**



- **Plate 9-8 Vantage Point D: Ditch looking towards Proposed Gas Plant**

This page has been left intentionally blank



■ Plate 9-9 Vantage Point E: Wadeye Town looking towards Proposed Gas Plant



■ Plate 9-10 Vantage Point F: South End of Wadeye Airstrip looking towards Proposed Gas Plant

This page has been left intentionally blank



- **Plate 9-11 Vantage Point G: Town End of Wadeye Airstrip looking towards Proposed Gas Plant**



- **Plate 9-12 Vantage Point H: Tchindi Camping Ground looking towards Proposed Gas Plant**

This page has been left intentionally blank



- **Plate 9-13 Vantage Point I: Access Road 3 km East of Proposed Plant Site, looking towards Proposed Gas Plant**



- **Plate 9-14 Vantage Point J: Elevated Ground North-East of Plant Site, looking towards Proposed Gas Plant**

This page has been left intentionally blank



- **Plate 9-15 Vantage Point K: North of Injin Beach looking towards Proposed Gas Plant**

This page has been left intentionally blank

## 9.12 Existing Economic Environment

### 9.12.1 Wadeye Township

The economic circumstances of the Wadeye Township indicate that it is a relatively poor community. The individual weekly income of persons 15 years and over, distends at the \$199 income barrier, reflecting the absence of employment opportunities in the Thamarrurr Region. Aboriginal people at Wadeye are comparatively poor. There is an almost exclusive reliance on the Community Development Employment Projects Scheme (CDEP) for employment, and this means that few individuals are able to move beyond the \$399 income barrier (ImpaxSIA Consulting 2004).

The total gross annual personal income accruing to adult residents of the Thamarrurr Region in 2001 amounted to \$10 million but that only two-thirds of this (\$6.6 million) went to Aboriginal residents despite the fact that they accounted for 92% of the adult population. There are no data on expenditure patterns at Wadeye, but that a common pattern in similar communities is one of cash “feast and famine” against a background of high costs for essentials such as food and transport. This accords with anecdotal evidence gathered during community consultations at Wadeye (ImpaxSIA Consulting 2004).

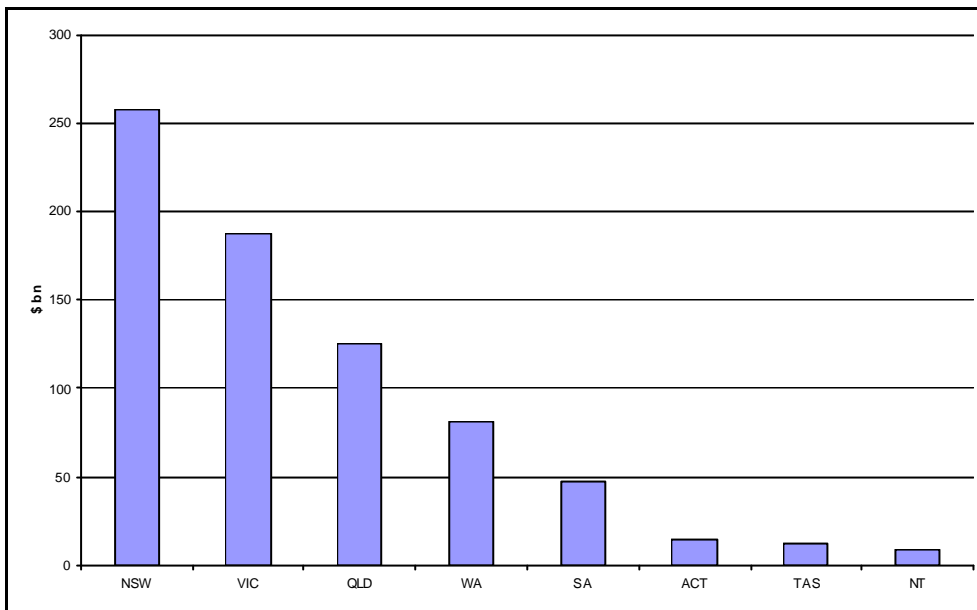
The economic base in the Thamarrurr Region is limited. Other than service provision, a fledgling construction industry being developed by the Council, a small-scale cattle industry based at Palumpa Station and the remotely operated tourism and fishing industries described previously, opportunities for income generation are limited. There are very few employment opportunities for local Aboriginal people. Thamarrurr Regional Council, local Indigenous enterprises and the Northern Territory Government provide some employment for local people in the delivery of a range of municipal and social services and in the provision of other goods and services (ImpaxSIA Consulting 2004).

Profits generated by locally-owned Indigenous organisations are channelled back into the Wadeye community and regional homelands for community benefit. The Thamarrurr Regional Council plays a critical role in providing financial and other support to a range of community infrastructure, training, employment and development projects. Profits from these organisations have been used for local community projects such as the establishment of a local swimming pool, and funding for weddings, funerals and community ceremonies. Profits are also used to support a range of additional initiatives and community development opportunities (ImpaxSIA Consulting 2004).

### 9.12.2 Gross State Product and Economic Growth

The Northern Territory’s Gross State Product (GSP) provides only a small share of Australia’s economic activity, but has grown strongly over the course of the last decade (**Figure 9-12**). Annual real GSP growth has averaged 4%, compared to an average annual real GDP growth for the Australian economy of 3.8%. However, because of its small size and large exposure to the world economy, growth in the Northern Territory’s GSP has been significantly more volatile than Australian real Gross Domestic Product growth.

■ **Figure 9-12 Gross State Product by State 2002–2003**



Source: ABS Cat. 5220: Australian National Accounts State Accounts

**Figure 9-13** illustrates this volatility and shows that the Northern Territory’s economy recorded negative growth in the most recent financial year. According to the recent economic outlook for the Northern Territory, this was largely due to several major infrastructure projects drawing to a close combined with new projects yet to begin construction.

■ **Figure 9-13 Growth in GDP and GSP**



Data source: ABS Cat. 5220: Australian National Accounts State Accounts

There has been a surge of investment into the Territory over the past five years, mainly associated with the construction of the Alice Springs to Darwin Railway and Stage One of the Bayu-Undan gas field. Construction of these projects is drawing to a close creating a relative fall in investment spending. The impact of the decline in investment spending has been exacerbated by the contraction in the global tourism market in recent years.

Care needs to be taken in interpreting GSP figures, as part of their volatility is due to the ‘lumpy’ nature of investment in offshore petroleum projects, which, while important to the Northern Territory economy, have greater impact on statistical measures such as GSP than they do on local business activity. Moreover, the value of petroleum production is relatively volatile due to movements in oil prices and the value of the Australian dollar.

There are, however, a number of prospects that are likely to stimulate economic activity in the Territory in the medium term. The Wickham Point LNG Plant and associated gas pipeline from the Bayu Undan project, and the Darwin City waterfront project already have done or will boost construction considerably over the next five years. The Territory economy is also likely to benefit from a recovery in tourist numbers and from increased freight on the AustralAsia Rail Link and through the East Arm Port facilities.

### 9.12.3 Northern Territory Main Industries

The most significant industry in the Northern Territory is the mining sector (dominated by the petroleum and gas industry), which produces 23% of GSP, whilst the next most valuable sector is the property and business services sector which contributes 9% of GSP.

The Government and Defence sectors are responsible for a higher proportion of employment in the Territory than in other jurisdictions, due to the large Australian Defence Force presence and long-standing structural issues. Compared to Australia, the Territory also comprises relatively more employees in the areas of mining, education (given the relatively younger population of the Territory), transport and storage (given longer distances to cover) and the tourism related industries of accommodation, cafes and restaurants and cultural and recreation services.

■ **Table 9-9 Major Northern Territory Industries by Percentage of State Employment**

Industry	NT	Australia
Government & Defence	17.3%	4.6%
Retail Trade	12.4%	14.9%
Health & Community Service	9.2%	9.9%
Property & Business Service	8.8%	11.4%
Education	8.3%	7.3%
Mining*	3.5%	1.1%

Source: ABS Census 2001, \* ABS Census 1996

### 9.12.4 Northern Territory Local Businesses and Services

The major population centres in the Northern Territory are modern and well serviced and well equipped to provide the relevant businesses and services for major projects.

Recent major projects such as the Alice Springs to Darwin to Railway and projects currently under construction such as the Wickham Point LNG plant have successfully used a high percentage of local employment and business content.

The Alice to Darwin Railway was particularly successful in providing jobs for Indigenous people with over 150 placements in the first two years of the project, which was well above the target rate of 50 placements. This project also resulted in a sleeper factory being built at Katherine to service the railway. The lesson from the construction of the railway and other major project developments is that with the right lead time and skill development, the Northern Territory can provide many of the relevant skills and business services for major projects.

However, the pool of available employees and skills (particularly specialised skills) in the Territory is limited. Supply and service businesses similarly are limited. For this reason, it is expected that a substantial supply of labour, supplies and services will be sourced from interstate for major construction projects. Furthermore, in the event that several major projects are constructed during the same time period, a situation of demand for construction services outstripping supply could eventuate.

#### **9.12.5 Darwin Supply and Service Capability**

As the Territory's largest city, Darwin has the greatest range and capability of supply and service businesses. While a comprehensive assessment of capability is beyond the brief for this assessment, information from the NT Industry Capability Network suggests that Darwin can supply substantial services in many areas, including:

- transport (passengers and goods - road, air and sea);
- civil works (earthmoving, trenching, road and bridge construction etc);
- concrete formwork and concreting;
- building trades and services (for example electrical, plumbing, carpentry);
- electrical switchboards etc;
- metal fabrication;
- civil design and engineering.