

**THE  
ECONOMIC IMPACT OF  
PROTECTED AREAS  
ON THE  
GREATER SHOALHAVEN REGION**



**FINAL REPORT**

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**ENVIRONMENT AND CONSERVATION  
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ENVIRONMENT AND CONSERVATION**

# THE ECONOMIC IMPACT OF PROTECTED AREAS ON THE GREATER SHOALHAVEN REGION

## SUMMARY

The main focus of this study is the impact of protected areas on the local economy and community of the Greater Shoalhaven Region. This impact is assessed in terms of the contribution which park management and park visitor expenditure make to regional economic activity.

For the purposes of this study, the Greater Shoalhaven region has been defined as the area comprising the Shellharbour, Kiama and Shoalhaven LGAs, plus the Commonwealth Jervis Bay Territory and the NSW Jervis Bay Marine Park.

The objectives of this study were:

- to develop a socio-economic profile of the region;
- to identify the current socio-economic impact of the DEC reserve system and other protected areas (PAs) on the regional economy of the Greater Shoalhaven region using trend analysis and input-output analysis; and
- to identify the broad implications of recent and current socio-demographic and economic trends in the region for PA planning and management for the next 5-10 years.

The principal activities carried out for the study were:

- review of the demographic and employment characteristics of the region;
- development of an input-output table for the region to be used to describe the economic structure of the regional economy;
- analyses of the economic characteristics of the region including location quotients, shift-share analysis and other measures that indicate the level of diversity in economic structure and the level of access to local services by households and businesses; and
- use of a regional input-output table to calculate the direct and flow-on impacts on the regional economy associated with park management expenditure, and local expenditure made by park visitors.

These main findings of the study are as follows.

### Regional Profile

The Greater Shoalhaven region as defined in this study is located within commuting distance of Wollongong and Sydney and 25 percent of the employed residents work outside of this region. The resident population of The Shoalhaven has been growing rapidly over the past 20 years and is close to the age profile of NSW. However, the population projections indicate that it will be subject to rapid ageing with immigrant retirees and rising dependency ratios.

The economy of the Greater Shoalhaven region represents 1.4 percent of the NSW economy and has a significant manufacturing industry in food manufacturing, paper products and a range of smaller operations that are produced mainly for export. Primary production is small. The economy is dominated by the provision of services to the residents including those working outside the region. Some of the specialised

personal services are limited but presumably are readily accessed in nearby Wollongong. Business services tend to be relatively weak.

The Greater Shoalhaven region has been a high growth area and that is expected to continue and to be based on the quality residential characteristics of the region. The average income of households in the region is close to the NSW average and is less dependent on welfare and retirement incomes.

### **The economic impact of PAs**

Analysis of the current socio-economic impact of the DEC reserve system and other protected areas (PAs) on the regional economy of the Greater Shoalhaven region using input-output analysis, produced the findings below.

#### *Summary of PA Economic Impacts on the Greater Shoalhaven region*

IMPACTS	Total Impact			Region	
	PA Management	Visitor Expenditure	Total	Share of Region	Total
				%	
GROSS OUTPUT (\$'000)	25,405	407,040	432,445	7.92	5,462,483
VALUE-ADDED (\$'000)	13,005	152,922	165,927	5.15	3,222,092
HOUSEHOLD INCOME (\$'000)	8,064	67,816	75,880	6.30	1,204,492
EMPLOYMENT (no.)	208	3,219	3,427	7.73	44,346

The following points are notable:

- Regional economic impacts associated with the expenditure of visitors are much greater than the impacts of park management expenditure.
- On average, park management expenditure and visitor expenditure contribute over 6 percent of the gross regional output, household income and employment.
- Park management expenditure and visitor expenditure contribute around 5 percent of the gross regional product (value-added activity).

### **The Future**

The attractiveness of the South Coast to residents, retirees and visitors will continue to be an important driver of economic growth in the Greater Shoalhaven region. This attractiveness will be an important driver of growth in the region, resulting in continuing growth in those service sectors relating to households and visitors. Growth in these services will accompany growth across a wide range of industries related to the other economic activity within the region.

Services associated with PAs will be part of the attraction of the Greater Shoalhaven region and will continue to grow. However, the proportion of the regional economy that these services represent is expected to remain constant into the immediate future. Growth in services associated with PAs is dependent upon a number of factors, including a higher number of local residents and visitors, and the creative development of new ways of using the PAs to provide services to these users.

## **ACKNOWLEDGMENTS**

Sections 3, 4 and 5 of the report were prepared by the Centre for Agricultural and Regional Economics (CARE) in Armidale NSW. Park management expenditure data and some park visitation data used in Section 4 were provided by staff from DEC (Parks and Wildlife Division) South Coast regional office. Staff from Booderee National Park, Jervis Bay Commonwealth Territory, provided data for Section 4 and financial assistance for the research, and their support and is gratefully acknowledged.

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# **1 INTRODUCTION AND OVERVIEW: SOCIO-ECONOMIC IMPACTS OF PROTECTED AREAS**

## **1.1 Introduction**

Protected areas (PAs) in NSW provide a wide range of benefits to individuals, private firms, and the community in general, including benefits from the direct and flow-on effects of expenditure made by the park management agency and by park visitors in the region, benefits from the biophysical functions provided by ecosystems and processes protected within PAs, and benefits in terms of improved quality of life for members of communities. These benefits are described in this section (Section 1) of the report.

The main focus of this study is the impact of PAs on the local economy and community of the Greater Shoalhaven region. This impact is assessed in terms of the contribution which park management and park visitor expenditure make to regional economic activity.

For the purposes of this study, the Greater Shoalhaven region (the region) has been defined as the area comprising the Shellharbour, Kiama and Shoalhaven LGAs, plus the Commonwealth Jervis Bay Territory and the NSW Jervis Bay Marine Park.

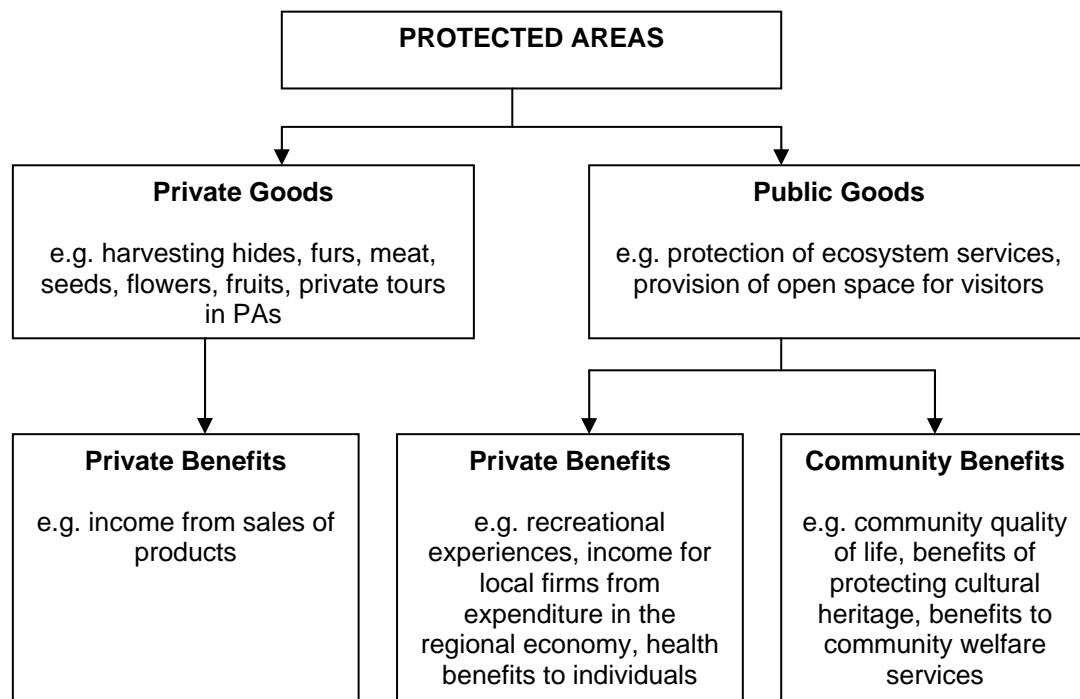
Section 2 of the report provides background information on the natural environment and protected areas within region. The socio-economic characteristics of the region is then discussed in Section 3. The report assesses the contribution of PAs to the economy of the region in Section 4.

The final part of the study considers the broad social and economic trends within the region and suggest possible implications of these trends for PA planning and management (Section 5).

## **1.2 Overview**

As shown in Figure 1, individuals, businesses and communities derive socio-economic benefits from PAs in a variety of ways. These include using the products of PAs, obtaining recreational experiences from visiting PAs, obtaining direct and indirect income from goods and services sold to visitors, benefiting from the biophysical services provided by PAs, and obtaining health benefits from environments protected by PAs. These benefits arise from the provision of 'private' goods and 'public' goods as shown in Figure 1.

Figure 1.1: Provision of Benefits to Individuals and Communities from Protected Areas



### 1.3 Benefits To individuals and businesses

#### Direct use of PA products

In some locations, individuals and businesses derive direct economic benefits from operating guided tours in PAs, or harvesting or collecting the resources provided by PAs such as flowers and seeds, for subsistence use or sale. In developed countries, and particularly in urban and peri-urban areas, if such harvesting activity is permitted by park agencies it is likely to be strictly regulated.

The supply of these types of goods would generally be managed through licences, quotas, permits or some other allocation system that enabled their consumption to be restricted by PA managers to prevent degradation.

#### Purchases from local businesses and flow-on effects

PA agencies can stimulate local businesses and commerce by purchasing local goods and services for park management. This expenditure results in flow-ons to other local businesses as they supply goods and services to the businesses dealing directly with the PA agency.

Flow-ons to other business sectors also occur when the households directly employed in PA management spend their income on locally supplied goods and services. The business activity generated by this spending leads to incomes for, and spending by, the households employed in producing these goods and services, further stimulating local business activity.



Expenditure on major capital works such as the upgrading or construction of roads and infrastructure in PAs can also generate local economic activity when local contractors and/or locally purchased goods and services are used.

PAs attract visitors into the areas where they are located. While in the area, these visitors may purchase a range of goods and services such as accommodation, food and beverages, shopping, motor vehicle needs and other recreational activities. This expenditure has a positive direct impact on local businesses, producing flow-ons to other sectors of the economy, and creating new jobs. Local businesses may also operate concessions within parks selling food, souvenirs, recreational activities etc.

Several studies which have calculated the regional economic impact of individual PAs on the NSW South Coast are listed in Appendix 4. The present study is concerned with assessing the combined impact of all PAs on the Greater Shoalhaven region, as discussed in Section 4 of the report.

### Recreational benefits

PA visitors obtain a variety of psychological and physical benefits from the use of PAs for passive and active recreation. The economic value of these benefits for visitors can be estimated by using the costs that visitors are willing to incur in travelling to the park, plus any park entry fees, as a proxy for the value of the benefits they obtain there. Some studies which have calculated the recreational value of PAs on the NSW South Coast are listed in Appendix 4 below.

### Real estate values

Crompton (2003) provides an extensive discussion of the influence of attractive park and open space environments on property values. In many countries, the higher price of residential properties close to PAs, relative to more distant properties, indicates the value individual purchasers place on the quality of the surrounding environment. The higher value of these properties results in their owners paying higher property taxes to governments. Thus public sector agencies receive benefits in the form of rate revenue as a consequence of the amenity values provided by PAs.

### Ecosystem services

Natural environments provide a range of biophysical functions that provide economic benefits to firms and communities in urban and non-urban areas. These functions include natural regulation of water flow and water quality, modification of microclimates, and assimilation of wastes. In many countries, the creation of protected areas helps to safeguard these biophysical functions (ecosystem services), and thus to maintain the economic benefits they contribute.

The role of PAs in safeguarding the natural regulation of water quality and water flow is recognised by water utilities in major cities such as New York and Sydney, where drinking water supplies are derived from strictly protected water supply catchments.

The costs of protecting (and/or rehabilitating) areas which provide water-related ecosystem services may be considerably cheaper than the cost of obtaining the same levels of resource quality and volume by alternative methods such as inter-basin transfers, increased water storage capacity, advanced chemical/biological treatment, and recycling (see Atech Group [1999], Stroud Water Research Center [2000], but also see Sagoff [2002] on institutional constraints on implementing rehabilitation works to achieve potential benefits).

### Existence benefits

Many of the benefits that communities obtain from PAs relate to physically visiting these areas. However, residents may also obtain benefits from the knowledge that particular values are being safeguarded by PAs in remote locations that they are unlikely to ever visit. For example, urban communities in developed countries can obtain benefits from the knowledge that PAs in different, often developing countries are currently safeguarding natural and cultural heritage, and will do so for future generations.

### Personal health

Medical research from developed countries (e.g. the USA and England) indicates that when people visit, or otherwise observe, natural environments they experience particular physiological and psychological effects such as lowered heart rate, lower blood pressure, stress reduction and feelings of relaxation. These effects are in addition to the more direct effects associated with exercise and recreation in PAs and other natural environments. (See Countryside Agency 2003a, for a list of medical studies on the health benefits of activity in natural environments). In addition, many people enjoy the aesthetic qualities of open space and find this adds a further psychological benefit to their experience (Hamilton-Smith, 2001).

Interest in the health benefits of PAs has tended to focus on the physical and mental health effects of walking. Agencies in the USA and England for example are promoting the idea of using natural environments such as PAs for physical activity. The US National Parks Service has signed a Memorandum of Understanding with the US Departments of the Interior, Agriculture, Health and Human Services, and the Army Corps of Engineers, to promote physical activity on public lands through their Rivers and Trails Program (National Parks Service, 2002). Similarly, the Countryside Agency (which manages the English national parks system and public access to the countryside) and the British Heart Foundation sponsor and coordinate the 'Walking the Way to Health' program, which is based on the use of local walking tracks and countryside footpaths (see Countryside Agency, 2003b).

A number of studies have described the physical health benefits for older and more sedentary groups of walkers, especially in natural environments such as PAs (see Countryside Agency, 2003b). A recent study of bush walking, power-walking, walking groups and other organised recreational walking in Australia identified the following characteristics of participants. In 2000, an estimated 77,880 people over the age of 18 participated in organised walking activities. Participants were predominantly female, aged over 55, married, and resident in capital city regions of New South Wales and Victoria. Whereas women make up 45% of participants in all sports and physical activities, over 67% of walkers are women. The majority of walkers do not participate in other sport and physical activities. Unlike the majority of other organised sports and physical activities, participation rates do not start to decline until old age (Active Australia, 2003).

#### **1.4 Benefits to communities**

PAs provide benefits to communities through providing opportunities for community interaction. Such interaction can promote community cohesion and the quality of life of the members of these communities. This in turn can lead to a reduction in anti-social behaviour and delinquency, and reduced need for policing and legal

enforcement. These effects will also provide consequential benefits to individuals in terms of reduced personal and property offences.

### Community quality of life

Hamilton Smith (2001) has identified a range of benefits that national parks and other forms of protected open space can provide for communities; including the following:

- enabling public access to 'green space' (especially in high-density cities, with little green environment and high costs of other forms of recreation);
- providing opportunities for activities (e.g. organised and informal sport and exercise, and educational activities);
- providing opportunities for socialising (e.g. picnics, family gatherings, and club outings);
- providing opportunities for spiritual connection with nature and a sense of place;
- developing personal and community identity (e.g. rehabilitation and development of self-esteem and identity after life crises);
- providing opportunities for productive open space (e.g. for schools programs, and demonstration projects in wetland management and sustainable land management);
- strengthening the community (e.g. increasing contact with other community members, contributing to local knowledge and pride of place and heritage, and providing opportunities for contribution to community action through volunteer work in parks on environmental improvement schemes).

The NSW Department of Environment and Conservation (DEC) is currently collaborating with staff from the University of Western Sydney on a four-year research project to assess the contribution of PAs to community quality of life. This project will develop quality of life indicators in conjunction with a case study community, and identify the role of PAs in contributing to community quality of life aspirations in this community. Local perceptions of the value of PAs will then be compared and contrasted with the values attributed to these areas by external 'experts', and management initiatives sought to bridge differences in perceptions. It is intended that this research will provide information for PA managers to help to improve the effectiveness of their planning and delivery of park management to the community (Bushell, Staiff and Conner, 2002).

### Cultural heritage

PAs provide community benefits through supporting cultural heritage, by protecting environments that have cultural value and by providing venues for communities to meet to carry out cultural activities.

For example, national parks around Sydney provide benefits to communities through their role in protecting examples of the history of colonial settlement and development in Australia since 1788. The Blue Mountains National Park for example, has considerable value as a record of the European exploration and settlement of NSW. The park contains large areas of land identified as wilderness, which provides benefits to communities through the value they attach to the knowledge that such special areas are being protected.

### *Indigenous cultural heritage*

PAs also provide community benefits through protecting aboriginal cultural heritage for indigenous and non-indigenous communities. Aboriginal places of cultural significance on the NSW South Coast include cave shelters, axe grinding grooves, middens, rock engravings and art sites.

PAs can also play a role in improving community understanding of indigenous heritage through their educational activities. For example, DEC and the Commonwealth Department of Environment and Heritage (DEH) conduct community education program of guided walks, talks and tours in national parks. This program aims to foster appreciation and understanding of Aboriginal cultural heritage by non-indigenous participants, and to build capacity in aboriginal communities to gain social, economic and environmental benefits through cultural education and tourism.

### *Multicultural heritage*

Parks and other protected areas are used by a wide range of different visitors for a variety of purposes, whether for education, passive or physical recreation and enjoyment, social gatherings, ceremonies and cultural events. DEC has an ongoing program of research into the relationship between ethnicity and landscape and the ways different cultural groups perceive the natural environment and PAs.

The above discussion illustrates the valuable role that protected areas can play in the maintenance and reinforcement of cultural networks, and is providing information to help park planning and management.

### Community services

As well as providing quality of life and cultural benefits to communities, protected areas can support the services provided by government community service agencies.

### *Education*

One of the objectives of many PA agencies is to encourage learning about natural and cultural heritage through the use of national parks and other protected areas. For example, DEC and DEH operate field studies in various locations. Many PAs provide valuable venues for higher education through PA agencies collaborating with universities, with students working on projects managed jointly by the park agencies.

### *Welfare*

As well as being used by individuals and social groups for various activities, community service agencies use PAs as a venue for providing a range of services such as sport and recreational programs, environmental education, health care, and skills development for target groups. The US National Association of State Park Directors also identifies the positive value of state parks in reducing anti-social behaviour by providing a venue for recreational opportunities (National Association of State Park Directors, 2001).

Protected areas can play a role in utilising the labour and skills of people on Community Service Orders for example by involving juvenile offenders required to work on community service programs.

## **2 THE NATURAL ENVIRONMENT AND PROTECTED AREAS IN THE GREATER SHOALHAVEN REGION**

This section of the report provides background information on the study area.

### **2.1 Background to the Greater Shoalhaven region**

#### The Greater Shoalhaven

The Greater Shoalhaven region is defined in this study as comprising the LGAs of Shellharbour City, Kiama City, the Jervis Bay Territory and Shoalhaven City. This area broadly corresponds to coastal parts of the DEC Parks and Wildlife Division (P&WD) South Coast Region.

Information on natural environments provided below draws heavily on local government State of the Environment reports (Shellharbour City 2004, Kiama City 2004, Shoalhaven City 2004), and material available from ACT Commissioner for the Environment, (2004).

The Shellharbour City local government area covers 154 km<sup>2</sup> and is situated on the Illawarra Coastline, approximately 100 km south of Sydney between the Wollongong and the Kiama Local Government Areas (LGAs). The Shellharbour LGA is bounded on the west by the Illawarra escarpment and by ocean beaches on the east.

The LGA has a variety of landforms ranging from coastal sand dunes, beaches, and rocky headlands to flat alluvial floodplains, hills and lower slopes composed of volcanics and sandstone cliffs. The coastal plains and lower slopes have been substantially cleared for agricultural purposes and urban development. The upper slopes remain substantially wooded with wet sclerophyll forest and sub-tropical rainforest. The area contains several significant stands of remnant vegetation protected in nature reserves (Shellharbour City, 2004).

Shellharbour has a high proportion of young people, with 24.2 percent of the population less than fifteen years of age. Only 10.6 percent of the City's population is aged sixty-five years and over.

The Kiama City LGA covers an area of 256 km<sup>2</sup>, and is bordered by Shellharbour, Shoalhaven and Wingecarribee LGAs. The area has a diverse range of physical habitats including beaches, rainforests and rural landscapes. The area also has a number of creeks that are part of large catchments such as the Macquarie Rivulet, Minnamurra River, Werri Lagoon, Crooked River and Shoalhaven River catchment, and numerous small streams draining to the ocean (Kiama City, 2004).

Shoalhaven City Council covers an area of 4,660 km<sup>2</sup> and spans 160 km of the NSW South Coast from Berry to Durras Lake, to the north of Batemans Bay. The area is predominantly hilly, or mountainous, country to the west, with a narrow coastal strip to the east.

Eucalypt forests and woodlands dominate the area, with cleared land prevalent in the alluvial valleys and in areas closer to the coast. Various specialised flora and fauna have developed in the rainforests, wetlands, coastal sand dunes and heath areas.

Much of the Shoalhaven LGA is in public ownership (68 percent), consisting of Crown Land (11 percent), State Forest (23 percent) and National Park (34 percent).

These lands provide valuable habitat for flora and fauna, and combined with the diverse habitats of coastal beaches, estuaries, wetlands and lakes, make the area important for both wildlife conservation and commercial and recreational fishing.

The Shoalhaven LGA has two major river systems (the Shoalhaven and the Clyde Rivers), a major coastal bay (Jervis Bay) and numerous coastal lakes and estuaries.

The City consists of 49 separate towns and villages; however most people live in the larger urban areas of Nowra/Bomaderry, Bay/Basin and Milton/Ulladulla (Shoalhaven City, 2004).

The traditional industries of dairying, timber and fishing are giving way to growing tourism, building and services sectors. Shoalhaven LGA is the most popular local government area in NSW for tourism. There are significantly more caravan parks in the Shoalhaven in comparison to other NSW LGAs, and many houses in the coastal villages of the LGA are holiday homes. (The 1996 ABS Census indicated that 28.7 percent of the dwellings in the Shoalhaven were unoccupied on census night, compared to 8.9 percent for the rest of the State). During peak holiday periods the population increases by about 400 percent, and this additional population places extra demands on services such as water supply, sewerage and solid waste disposal as well as creating additional pressure on natural environments in the LGA.

#### Jervis Bay Commonwealth Territory

The Jervis Bay Territory (JBT) is approximately 74 km<sup>2</sup> in area, located on the southern shore of Jervis Bay, approximately 200 km south of Sydney. The Territory consists of a mainland area of just over 65 km<sup>2</sup>, some 8 km<sup>2</sup> of marine waters, and Bowen Island (0.51 km<sup>2</sup>). Ninety percent of the Territory has been granted to the Wreck Bay Aboriginal Community, which leases the land and water comprising Booderee National Park to the Commonwealth Director of National Parks. The lease provides for the Park to be jointly managed between the Director and representatives of the Wreck Bay Community.

There are four distinct settlement areas in JBT: HMAS Creswell, the adjacent Jervis Bay Village, lease areas at Sussex Inlet and the Wreck Bay Aboriginal Community. The total population of the JBT fluctuates significantly depending on the intake of students to courses at the Royal Australian Navy College at HMAS Creswell, and the numbers of campers and day visitors to the national park.

## **2.2 Protected Areas in the Greater Shoalhaven region**

Figure 2.2 gives a general picture of the distribution of protected areas managed by DEC on the NSW South Coast (N.B. the map does not show Booderee National Park or Jervis Bay Marine Park).

#### Protected Areas in the Greater Shoalhaven

Table 2.1 shows protected areas in the Greater Shoalhaven region and estimated average annual visitation. This table excludes those protected areas managed by the Highlands Area of the DEC South Coast region, which do not fall within the Greater Shoalhaven region as defined in this study. The region also includes the Commonwealth Jervis Bay Territory, which contains Booderee National Park (managed by DEH), and the Jervis Bay Marine Park (managed by the NSW Marine Parks Authority (jointly representing NSW Fisheries and DEC).

### Jervis Bay - Booderee National Park

The Jervis Bay region lies on the boundary between northern and southern climatic zones. The resulting climatic conditions, and a range of habitats such as oceanic waters and bay waters of varying depths, intertidal rock platforms and beaches, estuarine waters, recent and ancient dune systems, coastal cliffs, heaths, forests, swamps and perched lakes, support a wide variety of flora and fauna. For example, approximately 206 species of birds, 27 species of mammals, 15 species of amphibians, 23 species of reptiles and 180 species of fish occur within Booderee National Park. The Park and Botanic Gardens are also on the Register of the National Estate.

The Jervis Bay area contains sites of great spiritual significance to Aboriginal people and human presence in the region has been traced back more than 20,000 years. Descendants of the traditional landowners live in Wreck Bay and were granted land rights over 4 km<sup>2</sup> of land in 1986. A further grant of the Commonwealth's Jervis Bay National Park was made to the Wreck Bay Aboriginal Community in December 1995 and the park was renamed Booderee in 1998. The Park is now under a joint management arrangement based on the model successfully applied to Uluru-Kata Tjuta and Kakadu National Parks in the Northern Territory. (Department of Transport and Regional Services, 2005).

Although visitor numbers may fluctuate on an annual basis, average visitation to Booderee National Park is around 450,000 visitors per year, as shown in Table 2.1.

### Jervis Bay - Marine Park

Jervis Bay Marine Park covers an area of approximately 220 km<sup>2</sup>, including over 100 km of coastline and adjacent ocean.

The park was established in 1998 and is managed by the NSW Marine Parks Authority. The Marine Parks Authority and DEH have a memorandum of understanding to ensure co-operative management of the waters of Jervis Bay.

The park includes a diverse range of habitats such as seagrass beds, mangroves, sandy beaches, intertidal rocky shores, sub-tidal rocky reefs, soft substrate habitats and drift algae communities.

The marine park is a multiple-use park intended to protect representative examples of marine biodiversity and provide for a range of recreational and commercial activities such as commercial and recreational fishing, scuba diving, whale and dolphin watching, research, boating, surfing and other beach activities.

The 2002 zoning plan for the marine park established sanctuary zones (20 percent of the marine park), habitat protection zones (72 percent) and General zones (8 percent). (see Marine Parks Authority, 2005).

As shown in Table 2.1, marine park visitor use has been estimated at 58,000 visitors per year, but see section 2.1.4 in Appendix 1 for details of the assumptions made in calculating this figure.

Figure 2.1: South Coast LGAs

### SOUTH COAST LGAs

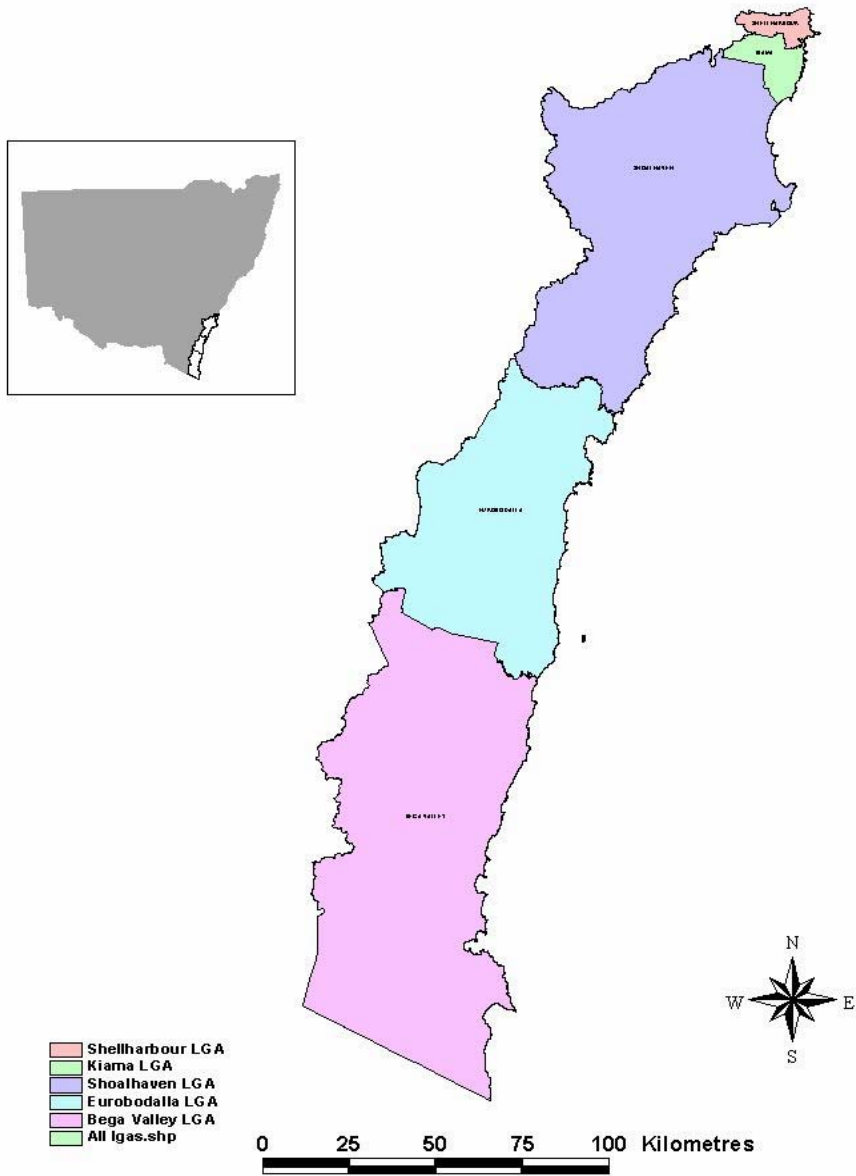




Figure 2.2: DEC Estate South Coast 1991-2001

### South Coast NPWS Estate

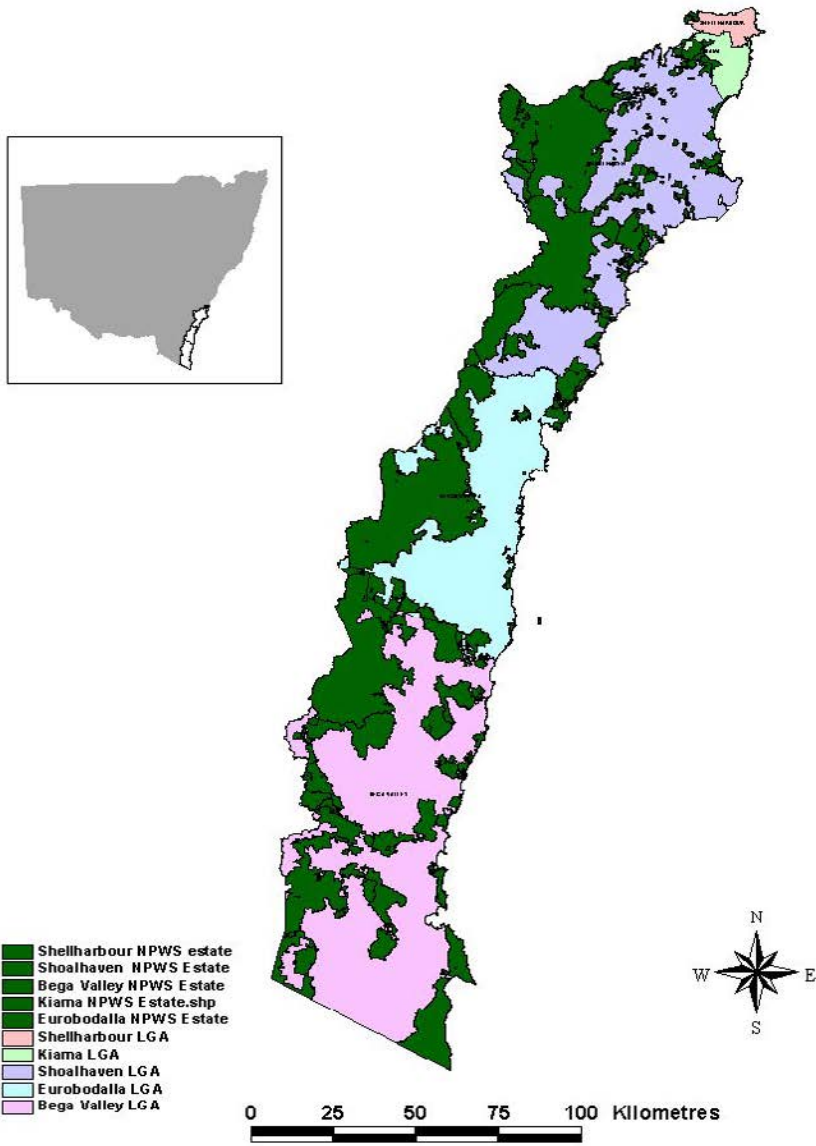


Table 2.1 Protected areas in the Greater Shoalhaven region and estimated average annual visitation (based on 2003/4 figures)

Reserve	Visitor Nos.	Reserve	Visitor Nos
Bamarang NR	2,000	Jerrawangala NP	2,000
Barnunj SCA	5,000	Kangaroo River NR	100
Barren Grounds NR	15,000	Macquarie Pass NP	10,000
Barrengarry NR	50	Meroo NP	18,000
Bees Nest NR	50	Morton NP (excl FFVC)	650,000
Belowla Island NR	50	Fitzroy Falls Visitor Centre (FFVC) 50% attributed to study area	175,000
Bimberamala NP	3,000	Murramarang NP	400,000
Black Ash NR	50	Murramarang AA	25,000
Bomaderry Creek RP	50	Narrawallee Creek NR	40,000
Brundee Swamp NR	50	New South Wales Jervis Bay NP	60,000
Brush Island NR	50	Parma Creek NR	10,000
Budderoo NP	160,000	Red Rocks NR	400
Budawang NP	30,000	Rodway NR	50
Bugong NP	500	Saltwater Swamp NR	50
Bunundah Res	6,000	Seven Mile Beach NP	200,000
Cambewarra Range NR	1,000	Tapitallee NR	500
Colynea SCA	5,000	Tollgate Islands NR	50
Comerong Island NR	25,000	Triplarina NR	2,000
Conjola NP	20,000	Wogamia NR	800
Corramy SCA	3,500	Woollamia NR	2,500
Clyde River NP	15,000	Worrigeer NR	2,000
Cudmirrah NP	45,000	Yattheyattah NR	200
Cullendulla Creek NR	15,000		
Devils Glen NR	50		
<b>SUBTOTAL DEC Reserves</b>	<b>351,400</b>		<b>1,598,650</b>
<b>TOTAL</b>			<b>1,950,050</b>
<b>Other Pas</b>			
Booderee NP	450,000	Jervis Bay MP	58,120
<b>TOTAL ALL</b>			<b>2,458,170</b>

The following section of the report provides detailed socio-economic profile of the Greater Shoalhaven region.

### **3 SOCIO-ECONOMIC PROFILE OF THE GREATER SHOALHAVEN REGION**

#### **3.1 Analytical Techniques used in developing profiles**

The socio-economic profile of the region described in this section is based on two analytical tools: input-output analysis and trend analysis. Input-output analysis involves the construction of regional input-output tables to describe the economic structure of the regions in question. Trend analysis based on population census data is used here to highlight how the economies of these regions have changed between 1981 and 2001, particularly in comparison with trends in the NSW economy. Trend analysis is based on the use of shift-share analysis and location quotients. These techniques are described below.

##### Input-Output Tables and Analyses

Input-output models are an established part of the system of national accounts and are integral to the estimation of Gross National Product (GNP). (The detailed tables used in developing the models are published by the ABS in Cat No 5209.0 with details of the model, the classification system [shown in Appendix 2] and their relationship to the national accounts). Input-output tables detail the inter-industry trade that occurs among industries in an economy. The tables are constructed on a 'double entry' system that ensures that the supply of product from any industry has to be equal to the use of the products of that industry including any exports and imports.

The input-output table has an important role in describing some characteristics of an economy, in particular the nature and intensity of inter-industry trade. A subsistence economy where all business/household entities are self-sufficient, will have no inter-industry trade. Economic development involves an increase in the level of inter-industry trade as businesses and households specialise in the production of goods and services and trade with other entities for the supplies that they need. The consistent development of input-output tables under a set of conventions makes it possible to compare these characteristics of an economy at different points of time, and to compare economies in a consistent way. For this study, input-output tables are used to describe certain characteristics of the Greater Shoalhaven regional economy.

The inter-industry linkages are the basis of flow-on effects that occur when one industry has an impact on other industries. Those flow-on impacts will operate through:

- Changes in the demand for inputs by the affected industry, or
- Changes in their production that will impact on the downstream marketers, handlers and users of the product.

The model is structured in a way that makes it mathematically possible to estimate those flow-on effects through the use of 'multipliers'. Larger multipliers indicate that there is a high level of inter-industry trade among the affected industries. This study is an analytical application of input-output models to estimate the flow-on effects to the regional economy from the activities associated with PAs.

The multipliers are calculated on the basis of a number of assumptions. The most important are:

- A linearity assumption that implies that any change has proportionate effects throughout the economy so that there are no substitutions among inputs and products. That applies to both inputs used in production and goods and services used in consumption. This assumption may not be critical over a range of types of change and effects of price changes on production, as it often takes time to adjust production systems.

There is a general concern that production systems involve a set of fixed costs that do not change in response to short-run adjustments in production. In consumption, the same effect occurs in relation to discretionary and non-discretionary expenditures on goods and services. Multipliers are mostly regarded as reflecting long-run effects after all of the adjustments have occurred, and in that case, the linearity assumptions need to be seen in a context of possible structural changes that may occur in the industry or economy. However, in the present study, the model is to be used describe that structure. Thus, linearity is not an important issue here, in comparison to a study in which an analysis of change in the level of activity would be the main task.

- A set of homogeneity assumptions that mean all of the entities in the specified sectors are the same in terms of production technology, products produced, goods consumed, etc. This is probably the most critical assumption, given that the modern economy is comprised of such a multitude of differentiated products and production systems. These are aggregated into 106 sectors or groups that are intended to be similar within those groups (see Appendix 2). As a result, there is an important initial task in any impact analysis to make an assessment of whether the 'average' structure that appears in the sector to which an industry belongs is appropriate for the analysis. If it is not, then a separate sector needs to be compiled. In this case, specific expenditure data will be used that reflects the particular characteristics of the activities related to the PAs.
- There is no consideration of market effects in the input-output model, and all results are based on real changes in production of goods and services. There can be a range of price effects that may influence outcomes including changes in input prices, product prices, wages and interest rates. Exchange rate changes may also be an important factor in price changes. If the issues to be analysed are related to price changes, then some type of model that allows consideration of the effects of price changes is required. In this case, the issue will be to describe the current level of activity such that these effects do not apply.

The use of input-output models in the present study can be justified in a number of ways.

- The input-output models can be readily compiled relative to other types of models that include market effects.
- In assessing regional impacts, many of the industries that will be affected are likely to be a small proportion of the total market for that industry, so that any price effects are likely to be small.

There are two complications that impact on the use of input-output methods in the present study. The first relates to the seasonality effects on the analysis. These arise from the use of the detailed employment data in the population census. The census was taken in August 2001, which for the South coast of NSW is a low period for visitors. As a result, the estimated level of economic activity in those regions is likely to be conservative, particularly for those industries servicing visitors.

This problem cannot be readily overcome unless detailed information is available on the seasonality of business activity in the region. Although seasonality effects are unlikely to impact on the primary, manufacturing, utilities and building activities in the region, most of the impact will be in the personal services sectors such as retail trade, restaurants and accommodation, transport and related activities and entertainment, gambling, etc. Information on the seasonal pattern of visitation to the region would help to resolve this issue, particularly if the information concerned all visitors, and not just those in rented accommodation. In some areas of the South Coast (such as Eurobodalla), there are areas where residents from outside the region own holiday accommodation. These people also represent additional demand from outside the region when they visit their coastal accommodation.

The second problem has particular importance in the Shoalhaven area. There are many residents in the Shoalhaven area that work outside the Shoalhaven area in Wollongong and in Sydney. These commuters appear to account for around 25 percent of the residents who are in employment. This boundary issue results in large transfers of earnings from outside the region, most of which is likely to be spent on consumption within the region.

The compiled input-output tables for this study take this factor into account to some degree. Employment-by-workplace data is used to compile the inter-industry part of the table (for those sectors where there are no other estimates of the gross value of production), while the household consumption estimates are based on the resident population. However, there is no allowance made for the possibility that the local consumption of residents working outside the region may be less than that of residents that both work and reside in the area.

This issue can be resolved in part through analysis of the journey-to-work data collected in the population census, and analysed across NSW for the first time using 2001 census data. That analysis has not been carried out in this study as it is only one of a number of factors that influence household income and expenditure. The preferred approach would involve a full assessment of disposable income including the payment of income taxes and the receipt of social welfare payments. In addition, there are incomes earned from investments (as distinct from wages and salaries) and superannuation payments, which tend to increase in relative importance in areas where retirees represent an above-average proportion of the population.

There is a substantial task associated with developing significantly improved information on household income. While household income is a relevant issue in relation to PAs, it is not likely to be a leading factor that would justify that effort. Some general observations have been made in this report on the likely level of household income and its components in the three regions of the study area.

### Trend Analysis

This analysis comprises two parts. The first part provides Location Quotients based on key demographic information derived from the population censuses on:

- trends in population and employment levels;
- the age profile of the population;
- trends in employment by broad industry categories: i.e. primary, manufacturing, utilities and building and services; and
- trends in unemployment.

The second part of the analysis (Shift-share Analysis) is a detailed analysis of the employment-by-industry data from the population censuses. This is provided for 106 industries, and uses information from the five censuses between 1981 to 2001. The objective is to identify overall, and specific, industry trends, and to use shift-share analysis to relate those trends to trends in NSW.

Other measures are also included which indicate the level of services provided to the population, the level of key business services and measures of industry diversity, industry mix and industry competitiveness.

The Location Quotients and the Shift-Share analysis are based mainly on data on detailed employment by industry obtained from population censuses since 1981.

The analysis starts with 4-digit industry data. Adjustments are then made to compensate for the lack of information from those census respondents who did not answer the relevant census question or provide adequate descriptions. This adjustment involves allocating employment data to industries in the same proportion as the data provided by those census respondents who did answer this question. The inadequacies in the information include errors that may arise from poor definition of the industry in which the respondents work, and errors in the way the ABS interprets the response and allocates the respondent to a particular industry. In addition, census data is based on where the respondent lives; this may not be the same location as the respondent's place of work.

The employment data have not been adjusted for hours worked, and reflect the number of people employed. Those people will have the employment characteristics associated with that industry in terms of hours worked, wages rates and other conditions.

#### *Location Quotients*

A location quotient (LQ) is a ratio that shows the relative importance of particular economic sectors to the region in question, compared to its importance to Australia as a whole i.e.:

$$\frac{\% \text{ of } \textit{local} \text{ employment in sector } x}{\% \text{ of } \textit{national} \text{ employment in sector } x}$$

Where the local share is larger than the national share, the LQ is greater than 1, and where the local share is smaller, the value is less than 1. Where the value is high (greater than 2) it indicates that those industries are likely to be key strengths in the region. In rural areas, these will often be agricultural or primary industries based on natural resources and associated manufacturing.

#### *Shift-share Analysis*

A region's growth is linked to its industrial structure. Shift-share analysis is a procedure for analysing the contributors to regional growth. It compares regional growth with the growth in the state or the nation, for each industry. It is a form of benchmarking, and identifies the contribution of each industry to a region's growth or decline.

Not all industries will grow at the same rate. Their performance will be determined by many factors including developments in technology, market access and growth, industry leadership and management, and government policy. Some regions may

benefit from having a mix of industries that include a large number of rapidly growing industries, while others may have predominantly declining or low-growth industries.

The shift-share analysis involves taking those factors into account. In effect, this benchmarks the regional economy and its industries against the performance of the State economy and its industries. If an industry grew at the same rate in both the region and the State, then the region would be maintaining its share of that industry and there would be no 'local' effect. Where there is a positive local effect, the industry is growing faster in the region than in the State, and so is increasing its share of that industry. The converse holds for negative local effects. Those local factors could include localised seasonal and price conditions, loss of market share due to scale factors, infrastructure impediments, and the choices made by members of the community and business sector about where they make purchases.

The positive industry mix effect for a region indicates whether the region has a higher proportion of jobs in high-growth industries than NSW as a whole. High-growth industries are defined at the State level as having a higher rate of growth than the average for all industries. Where this effect is negative, then the region has a majority of employment in industries that are growing at less than the State average rate of growth.

The competitiveness index is a measure of the proportion of regional employment in those regional industries that have been increasing their share of the NSW industry over the selected period.

The level of diversity in an economy is measured as the coefficient of specialisation (CS). The CS is calculated as the sum of the differences between the proportions of local and national employment in each sector. The more the local economy emulates the structure of the national economy, the lower (or closer to zero) the value of the CS as shown by the low CS for NSW.

The share-of-employment-in-business-services measure is used to reflect the capacity of the local area to support the growth of businesses through the adoption of improved business practices, and the application of knowledge to business operations. The business service industries also have a high proportion of employees with professional qualifications who can contribute to the operation of community organisations.

The servicing capacity of the regional economy is shown as a population employment ratio (PER), represented by the number of residents serviced per employee in a particular sector. This allows a comparison of the region's share relative to NSW as a whole. The trend over time in the level of service is also measured. In all cases, the lower the PER, the more intensive is the service level. This service level would normally represent a higher rate of service and, perhaps, a higher quality of service. An improvement in the service level would lead to a smaller PER.

The following sections of the report use the techniques described above to provide the socio-economic profile for the Greater Shoalhaven region.

### **3.2 The Greater Shoalhaven region**

The Greater Shoalhaven region is defined in this study as comprising the LGAs of Shellharbour City, Kiama City, the Jervis Bay Territory and Shoalhaven City. In terms of 2001 population, Shoalhaven LGA represented 52 percent of the total, Shellharbour LGA 36 percent, Kiama LGA 12 percent and the Jervis Bay Territory 0.3 percent. In 2001 employment terms the shares were 48 percent, 39 percent, 13 percent and 0.3 percent, respectively. That implies that there is a higher dependency rate in Shoalhaven LGA than in Kiama and Shellharbour LGAs.

The definition of this region poses some special problems for the construction of the input-output tables and the trend analysis in relation to employment. This arises because the Greater Shoalhaven region is adjacent to the City of Wollongong and it is within commuting distance of Sydney. Thus a proportion of Greater Shoalhaven residents will earn income from outside the region.

Two definitions of employment are used in this study. The first is employment based on residence and amounts to 59,582 for the region (including Jervis Bay). The second is based on place of work, and amounts to 44,346 (including Jervis Bay). This measure represents 75 percent of the residence figure. Thus 15,236 Greater Shoalhaven residents commute to work outside the region. Expressed another way, a net 25 percent of Greater Shoalhaven households earn their employment incomes from outside the region.

This issue is addressed in the input-output tables in the following way. The production sectors are based on the employment-by-place-of-work data, which disregard where those workers reside. This approach provides a realistic assessment of the structure of the business activities in the Greater Shoalhaven. The household consumption expenditure is based on the number of households in the Greater Shoalhaven irrespective of where members of those households may work. This is the most appropriate base for the household expenditure estimates. As a result, the estimates of household consumption will be considerably higher than if they were based only on households where members worked within the region.

### **3.3 Demographic Trends**

The trends in population and employment as recorded in the population censuses are shown in Table 3.1. The Greater Shoalhaven region is notable for:

- Continuous population growth over the years since 1976. This has been at rates that were high relative to the NSW rate up to 1991, but with a slowing rate in the 1990s.
- Employment has been rising since 1976, and at a rapid rate since 1986. Even in the early 1990s when there was slower growth throughout NSW as a result of Federal Government policy to slow economic growth, and widespread drought conditions over much of NSW, there was still significant growth in the Greater Shoalhaven region.
- The proportion of the population in employment declined between 1981 and 1996, but has regained the 1981 level from 2001. The 2001 figure of 36.8 percent of the population in employment compares with the figure of 43 percent for NSW as a whole.

An alternate perspective on employment and unemployment is provided from the data prepared from unemployment data and information from the labour force survey. These data make it possible to estimate the size of the labour force and show the



level and percentage of the labour force that is unemployed. These estimates are shown in Table 3.2 using data from the ABS June quarter labour force survey. These data are estimates, and are of lower quality than those from the population census. However, they do allow a consideration of annual estimates and a comparison of the unemployment rate with that for all of NSW.

These data indicate strong growth from 1984 although show some volatility. The unemployment rate has always been higher than the rate for NSW as a whole, and has fallen sharply since the late 1990s to reach its lowest level in 2002.

*Table 3.1: Population and Employment Trends, Greater Shoalhaven Region*

Census Year	Total Employment	Total Population	Employment Share of Population	Average Annual Change Between Census Years	
				Employment	Population
1976		87,600	%	%	%
1981	37,773	103,900	36.4		3.47
1986	39,224	116,860	33.6	0.76	2.38
1991	46,212	135,280	34.2	3.33	2.97
1996	52,298	151,315	34.6	2.51	2.27
2001	59,133	160,892	36.8	2.49	1.23

Note: These data do not include information for Jervis Bay, which in 2001 had 544 residents and 449 employed.

*Table 3.2: Employment and Unemployment, Greater Shoalhaven region*

Year	Labour Force	Derived Employment	Unemployment		NSW
	no.	no.	no	%	%
1984	46,797	39,826	6,971	14.9	9.5
1985	46,803	40,203	6,600	14.1	9.0
1986	51,195	43,586	7,609	14.9	8.2
1987	48,461	41,464	6,997	14.4	8.8
1988	50,781	45,819	4,962	9.8	7.6
1989	53,585	47,817	5,768	10.8	6.4
1990	54,102	48,525	5,577	10.3	6.2
1991	54,060	48,526	5,534	10.2	8.2
1992	56,869	49,118	7,751	13.6	9.8
1993	64,107	54,657	9,450	14.7	10.6
1994	62,352	53,427	8,925	14.3	9.7
1995	66,106	58,195	7,911	12.0	7.5
1996	69,495	61,739	7,756	11.2	7.8
1997	64,407	55,243	9,164	14.2	7.8
1998	66,064	57,877	8,187	12.4	7.3
1999	62,201	55,108	7,093	11.4	6.5
2000	68,267	61,897	6,370	9.3	5.8
2001	71,981	67,221	4,760	6.6	5.6
2002	73,028	67,607	5,421	7.4	6.1
2003	73,135	66,542	6,593	9.0	5.9

Source: Department of Employment and Workplace Relations (2003 and earlier)

The trends in employment by industry on a residence basis are shown in Table 3.3. There has been a steady decline in employment in all categories other than services, which have increased from 56 percent of employment to 74 percent. The share of employment in primary industries has more than halved over the 20 years to 2.6 percent, and now represents a small part of the economy. Manufacturing employment has declined substantially from 26 percent to 13 percent in 2001 (although much of that would be a decline in those industries outside the Greater Shoalhaven region). Building and utilities data shows a small decline in its share to 10 percent in 2001 and is relatively large based on the rapid growth of the population.

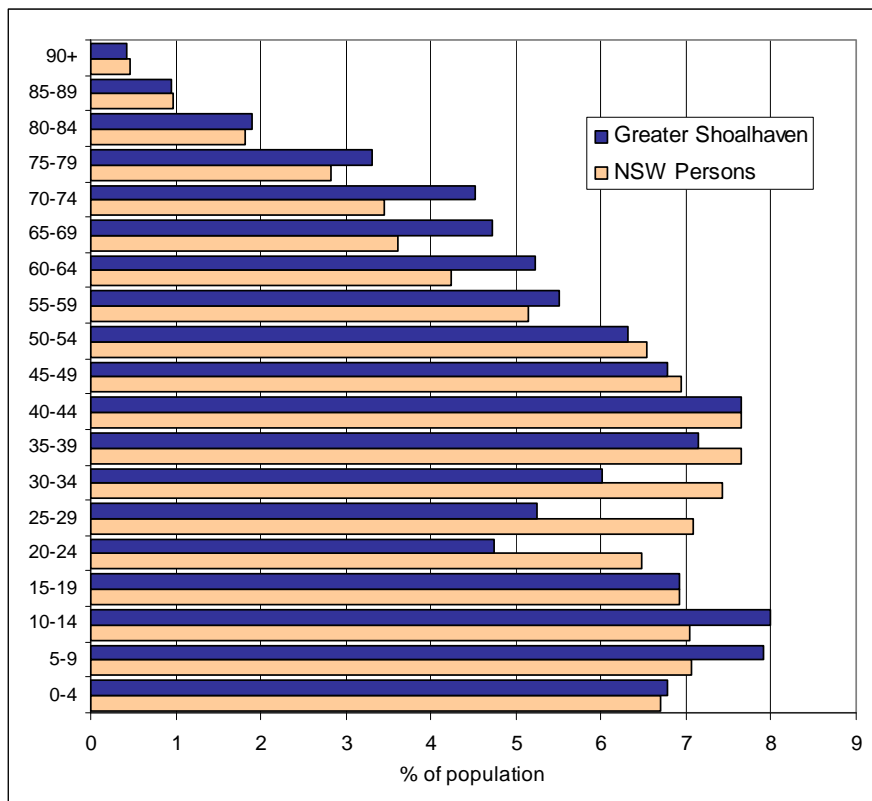
*Table 3.3: Industry Composition of Employment, Greater Shoalhaven region*

<b>Industry Group</b>	<b>1981</b>	<b>1986</b>	<b>1991</b>	<b>1996</b>	<b>2001</b>
Primary Industries	2332	2221	1963	1950	1557
Manufacturing	9811	7700	7581	7315	7624
Building/Utilities	4565	4506	5052	5556	6120
Services	21066	24797	31616	37477	43833
<b>Total</b>	<b>37774</b>	<b>39224</b>	<b>46212</b>	<b>52298</b>	<b>59134</b>

The Greater Shoalhaven region reflects the manufacturing characteristics of the Illawarra region and the recreational characteristics of the coastal areas. There is a significant amount of commuting across LGA boundaries from residence to employment. A more accurate analysis of the economic structure would need some analysis of the journey to work data.

An important characteristic of the regions considered here is the age profile of the population. The profile for Greater Shoalhaven region compared to NSW is shown in Figure 3.1. The overall ageing of the population is reflected in the lower shares in the 20 and 30 years age groups relative to those age groups that are approaching retirement. The Greater Shoalhaven region is different from NSW in this case, with a much more pronounced deficiency in the 20 to 39 age groups and higher proportions in all age groups from 55 onwards. However, there is a significant proportion in the 5 to 15 years age groups, where the share exceeds that for NSW as a whole. The deficiency in the 20's age group and the ageing characteristic is much less prominent in the Greater Shoalhaven region than in the Eurobodalla and Bega Valley LGAs.

Figure 3.1: Age profile of the Population, Greater Shoalhaven Region



DIPNR population projections for NSW (NSW Department of Infrastructure, Planning and Natural Resources, 2004) indicate that one of the fastest growing areas in NSW for population growth will be the Illawarra Region, in which Greater Shoalhaven is located, with over 1 percent population growth per year. A major component of the projected population growth will come from internal migration of older people to the region. This will result in a rapid ageing of the population and will produce an age profile similar to that of the Eurobodalla Shire region.

The following part of this section of the report provides a more detailed analysis of trends in the Greater Shoalhaven regional economy.

### 3.4 The Greater Shoalhaven regional Input-output Table

The input-output table for Greater Shoalhaven region is shown in Appendix 3 and in an aggregated form in Table 3.4 and Figure 3.2. The economic structure of the Greater Shoalhaven region can be compared with that for NSW as a whole in Figure 3.5.

Table 3.4: Aggregated Input-Output Table, Greater Shoalhaven region

	Ag Forestry	Mining	Manufacturing	Utilities	Building	Trade Accommodation	Business Services	Public Personal Services	TOTAL	H-hold Exp	O.F.D	Exports	Total
Ag/Forest/Fish	2502	2	36536	3	120	6349	217	791	46521	10233	9033	21393	87180
Mining	13	615	2751	87	1066	185	254	400	5371	87	2765	6651	14874
Manufacturing	7090	1773	187293	2861	101094	51820	40432	45838	438200	156853	20216	641405	1256674
Utilities	742	73	8302	4347	516	4555	9570	5298	33404	40893	2512	851	77660
Building	240	65	133	43	281	1696	12949	5336	20743	0	401349	0	422092
Trade/Accommodati	5750	815	45339	2119	19011	37434	41823	25552	177842	698995	36919	77622	991378
Business Svcs	5241	2189	97564	5898	46122	196306	284843	85322	723486	679405	61154	46931	1510977
Public/Personal Svc	508	116	5381	322	909	8079	12683	30550	58548	311498	724518	7084	1101648
<b>TOTAL</b>	<b>22087</b>	<b>5647</b>	<b>383299</b>	<b>15680</b>	<b>169119</b>	<b>306425</b>	<b>402772</b>	<b>199087</b>	<b>1504115</b>	<b>1897964</b>	<b>1258467</b>	<b>801936</b>	<b>5462483</b>
H-hold Income	30982	4124	118330	12257	132508	274892	177625	453774	1204492	0	0		1204492
O.V.A.	5492	2509	196747	32824	59000	183113	750840	267036	1497561	478340	41699		2017600
Imports	28619	2594	558299	16899	61464	226948	179741	181752	1256315	1030052	277991		2564359
<b>TOTAL</b>	<b>87180</b>	<b>14874</b>	<b>1256674</b>	<b>77660</b>	<b>422092</b>	<b>991378</b>	<b>1510977</b>	<b>1101648</b>	<b>5462483</b>	<b>3406357</b>	<b>1578157</b>	<b>801936</b>	<b>11248933</b>
Employment	1146	116	3538	284	4653	13913	6180	14516	44346				

The key characteristics of the Greater Shoalhaven regional economy are indicated as follows (the equivalent NSW figures are shown in parenthesis):

Table 3.5: Comparison between Greater Shoalhaven and NSW economies

Gross Regional Product (GRP)	\$3222m
Gross Regional Product per person employed	\$72,656 (\$82,150)
Average earnings from employment	\$27,150 (\$34,286)
Exports from Shoalhaven	\$802m
Imports to Shoalhaven	\$2564m
Household income from employment	\$1204m
Household expenditure	\$3406m

The Greater Shoalhaven regional economy is 1.4 percent of the NSW economy with a Gross Regional Product (value added activity) of \$3,222m. Productivity per person employed is 88 percent of the NSW average, and average earnings per employee are 79 percent of the NSW level.

The Greater Shoalhaven regional economy is a more diversified economy than other regional economies on the NSW South Coast (Eurobodalla or Bega Valley). However, that diversity is associated more with the volume and range of services for residents than with primary and manufacturing industries, that tend to be operated in nearby regions, with many Greater Shoalhaven workers commuting to employment in those industries. Consequently, the Greater Shoalhaven region is a relatively modest exporter, with exports amounting to \$802m, or only 25 percent of gross regional product (compared to 36 percent of the NSW economy). On the other hand, imports are relatively large (\$2,564m), particularly for consumer goods, which amount to \$1,030m.

The most interesting characteristic of the Greater Shoalhaven regional economy is the very large gap between household earnings from employment and household expenditure on consumption. To some extent, this reflects a national trend in household income and expenditure patterns where net savings are low. Information from the Reserve Bank of Australia indicates that the sources of household income on a national basis are as follows:

Source of household income	National proportion
Employment earnings	55%
Mixed sources	10%
Social welfare benefits	12%
Other	23%

The ABS has recently prepared data on personal income based on population census and taxation data as shown in Table 3.6. These indicate a share of wage and salary income higher than that indicated by the Reserve bank, but similar to that for NSW as a whole, at 67 percent of total income. Most of the other sources of income represent similar shares of total income to that for NSW, apart from the higher share attributed to social welfare benefits, which are more than six percent higher. This likely reflects unemployment rates that were higher than the NSW average in 2001 and the higher than average share of retirees in the population.

*Table 3.6: Estimates of Personal Income, Greater Shoalhaven region, 2000-01*

Income Component	Income Estimate, Shoalhaven*		NSW Total
	\$m	% of total	% of total
Wages and salaries	1,853.8	67.1	71.9
Unincorporated business	170.3	6.2	6.3
Investment	167.1	6.1	8.7
Superannuation	93.5	3.4	2.1
Government benefits	457.4	16.6	10.0
Other income	15.5	0.5	0.9
Total income	2,757.6	100	100
Net tax paid	497.8	18.0	22.6
Household disposable income	2,259.8	82.0	77.4

Source: ABS (2005)

\* Includes the LGAs of Shoalhaven, Kiama and Shellharbour

The ABS data indicates that the average weekly household disposable income in the Kiama City LGA is \$857, \$808 in the Shellharbour City LGA, and \$661 in the Shoalhaven City LGA. Those values compare with an average for NSW of \$895.

Data from Bray and Mudd (1998) based on census and other data from 1996, indicated that Federal Government social welfare benefits amounted to 11 percent of estimated household income in Kiama City, 16 percent in Shellharbour City and 3 percent in Shoalhaven City (in all cases this is higher than the NSW average of 10 percent). The share of income paid in taxes shown in Table 3.6 is lower than the NSW average. It appears likely that the future will see a rise in the contribution of superannuation to total income as the proportion of retirees in the population grows. This will be supported by the effect of widespread access to superannuation among retirees and the increasing value of funds that individuals have accumulated in superannuation accounts.

The input-output tables generated for this study include those earnings that are derived from employment, plus an imputed wage to self-employed persons equivalent to the average earnings in that sector (part of gross operating surplus). The estimate of \$1,204m shown in the input-output table is considerably lower than the \$1,853 for wage and salary earnings shown in Table 3.6. The input-output table figure is that paid by businesses within the Greater Shoalhaven region while the value in Table 3.6 indicates the wages and salaries earned by Greater Shoalhaven residents. This reflects the large number of people who are resident in the Greater Shoalhaven region but work outside the region. The measure of household income in the input-output table also does not include other earnings from social welfare payments, the non-imputed wage part of unincorporated businesses, investments and superannuation payments. The payment of income taxes is also not included;

ABS information indicates this to be 18 percent of household disposable income in the Greater Shoalhaven region.

The household consumption expenditure shown in the input-output table is \$3,406m (see Table 3.4). This is 1.5 times the estimated household disposable income. The difference can be attributed to a number of factors that are difficult to quantify:

- The input-output table includes \$532m as payments for ownership of dwellings that is only partly included in the estimates of household disposable income.
- The population census data relating to visitation and population in the region is influenced by seasonal effects, and is collected during the low season (August).
- Household consumption expenditure made from dis-saving by households or from borrowing may have an effect.

The implication of the above is that the Greater Shoalhaven region has a broadly-based set of industries as the source of income for its households. This includes the derivation of earnings from surrounding regions, including Wollongong and to some extent Sydney. Households in this region also have a slightly higher dependence on government benefits than the NSW average. These patterns may vary somewhat among the three LGAs included in the Greater Shoalhaven region.

Figure 3.2 and Figure 3.3 provide a comparison between the Greater Shoalhaven economy and the NSW economy.

The key differences are:

- A lower dependence on agriculture, forestry and fishing, mining and utilities in the Greater Shoalhaven region than in NSW.
- Overall, manufacturing is of lower importance in the Greater Shoalhaven region than in NSW, but manufacturing exports from the Greater Shoalhaven region are the dominant source of export earnings and provide a larger share of the economy than in NSW.
- The role of business services in the Greater Shoalhaven region is much lower than in NSW.
- Trade, accommodation, and restaurants are of higher importance in the Greater Shoalhaven region, reflecting the importance of the area as a place of residence for both commuters and retirees.
- The contributions by personal and public services are also higher in the Greater Shoalhaven region than in NSW, although they are shown as small contributors to exports.

Figure 3.2: Aggregated Industry Structure, Greater Shoalhaven region

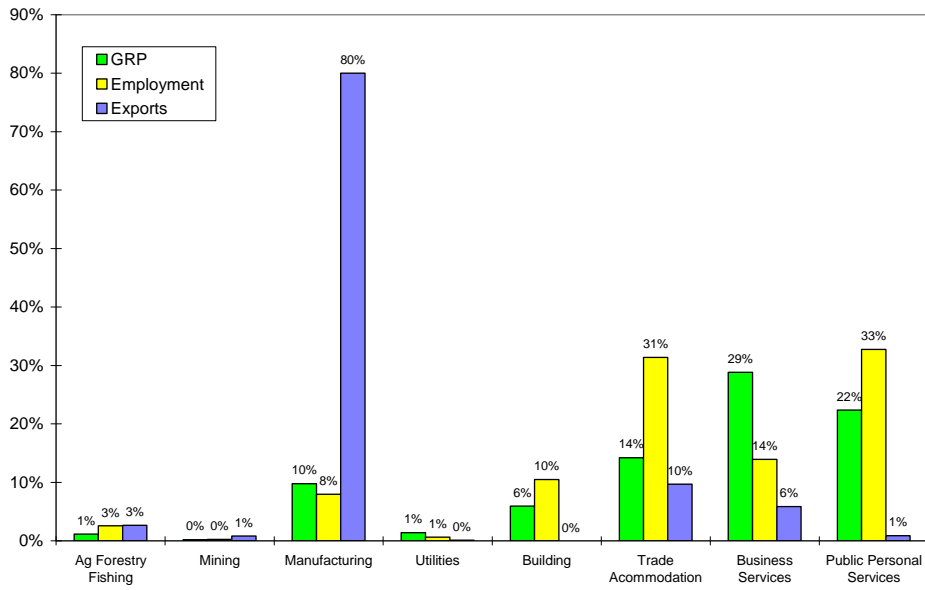
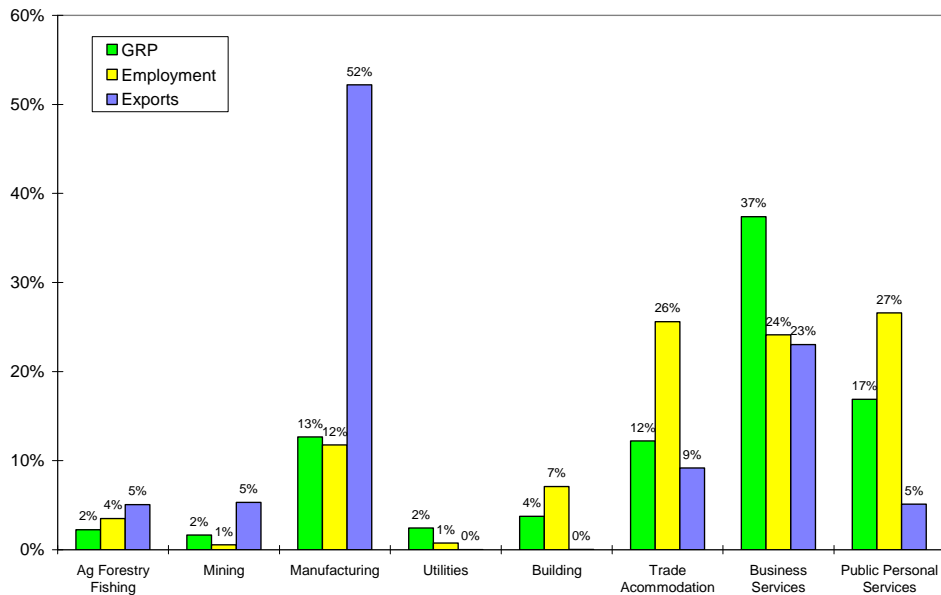


Figure 3.3: Aggregated Industry Structure, NSW – 2000-01



In general terms, Figures 3.2 and 3.3 also indicate a much greater diversity in the NSW economy compared to the Greater Shoalhaven regional economy, which has a small number of critical industries. The weakness in business-related services is considered significant for two reasons. These businesses tend to employ a large number of people with professional training and so the Greater Shoalhaven region will tend to be at a disadvantage in terms of the various roles that ‘knowledge’ plays in business and community development. It also means that businesses in the region have local access to mainly basic businesses services and have to access specialist services in larger cities, usually at a higher cost.

A detailed industry composition of the Greater Shoalhaven regional economy is shown in Figures 3.4 to 3.8 based on the 106 sector data shown in Appendix 2. These figures highlight key characteristics of the Greater Shoalhaven regional

economy. In the case of Figure 3.4 the limited role of primary industries is highlighted. However, there is a broad base of production across most areas of manufacturing. There is a notable importance attached to those activities that support residents, namely residential building, trade, accommodation and restaurants, ownership of dwellings and property services, while the sectors with substantial public funding, public administration, education and health are also prominent. Community care is surprisingly small along with most of the services that support business activity.

A somewhat different picture emerges in terms of employment with small numbers in primary and manufacturing industry, but with most employment concentrated in services to residents and visitors as shown in Figure 3.5. There are notably low levels of employment in most areas of transport, banking and finance with slightly higher levels of employment in technical and accounting, etc. services for business.

Exports (Figure 3.6) are primarily of manufactured products, with food products and paper products being dominant industries. This pattern also indicates a low level of export of services, which may reflect the low season for visitors at the time of the August population census.

Average earnings (Figure 3.7) are higher in the Greater Shoalhaven region than in either Eurobodalla or Bega Valley. At \$27,150, they are close to 80 percent of the NSW level. It is likely that the earnings of households in the Greater Shoalhaven region may be higher because of the access of many residents to employment in Wollongong and Sydney.

### **3.5 Trends in the Shoalhaven Economy**

This analysis is primarily based on employment data from the population censuses held each five years since 1981. The employment-by-residence data are used in these analyses.

Location quotients are an indicator of the specialist industries in an economy. The value indicates the importance of the industry to the region relative to the importance to the nation. Thus a value of 1.0 indicates the same level of importance, while a value of 5.0 for pulp and paper indicates that this industry is 5 times more important to the Greater Shoalhaven region than it is to Australia. The location quotients are shown in Table 3.7 and are based on employment by residence data. (Employment by place of work was not available for censuses prior to 2001)

The most important industry shown is iron and steel. However, this plant is not located in the area studied to a significant degree (only 99 persons were shown as employed in iron and steel). While the main iron and steel operations are not located in the defined Greater Shoalhaven area, employment in that industry (and Wollongong generally) is an important factor in the local economy. It is notable that the location quotient for iron and steel has declined significantly since 1996.



Figure 3.4: Industry composition of Gross Output, Greater Shoalhaven region

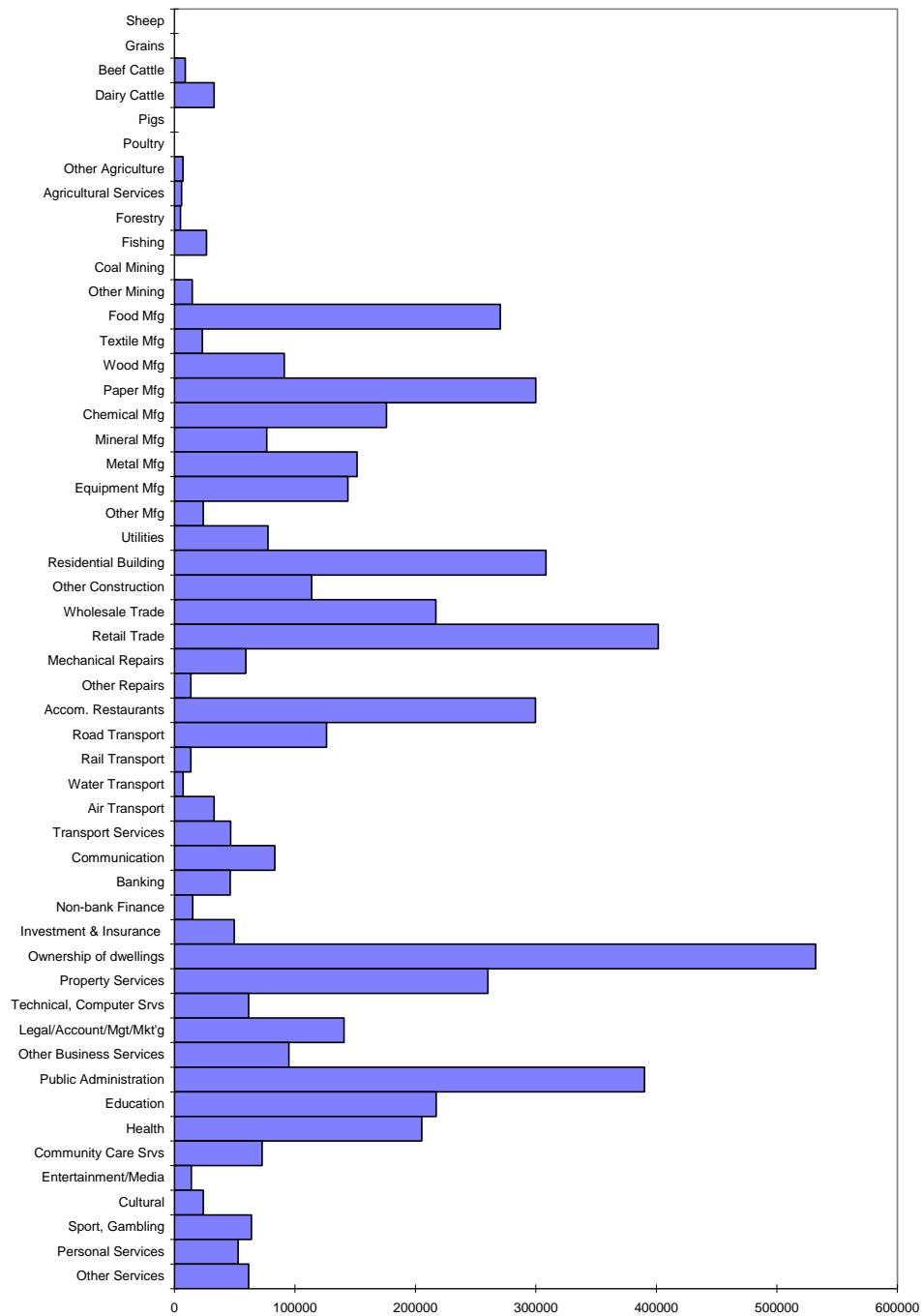


Figure 3.5: Industry Composition of Employment, Greater Shoalhaven region

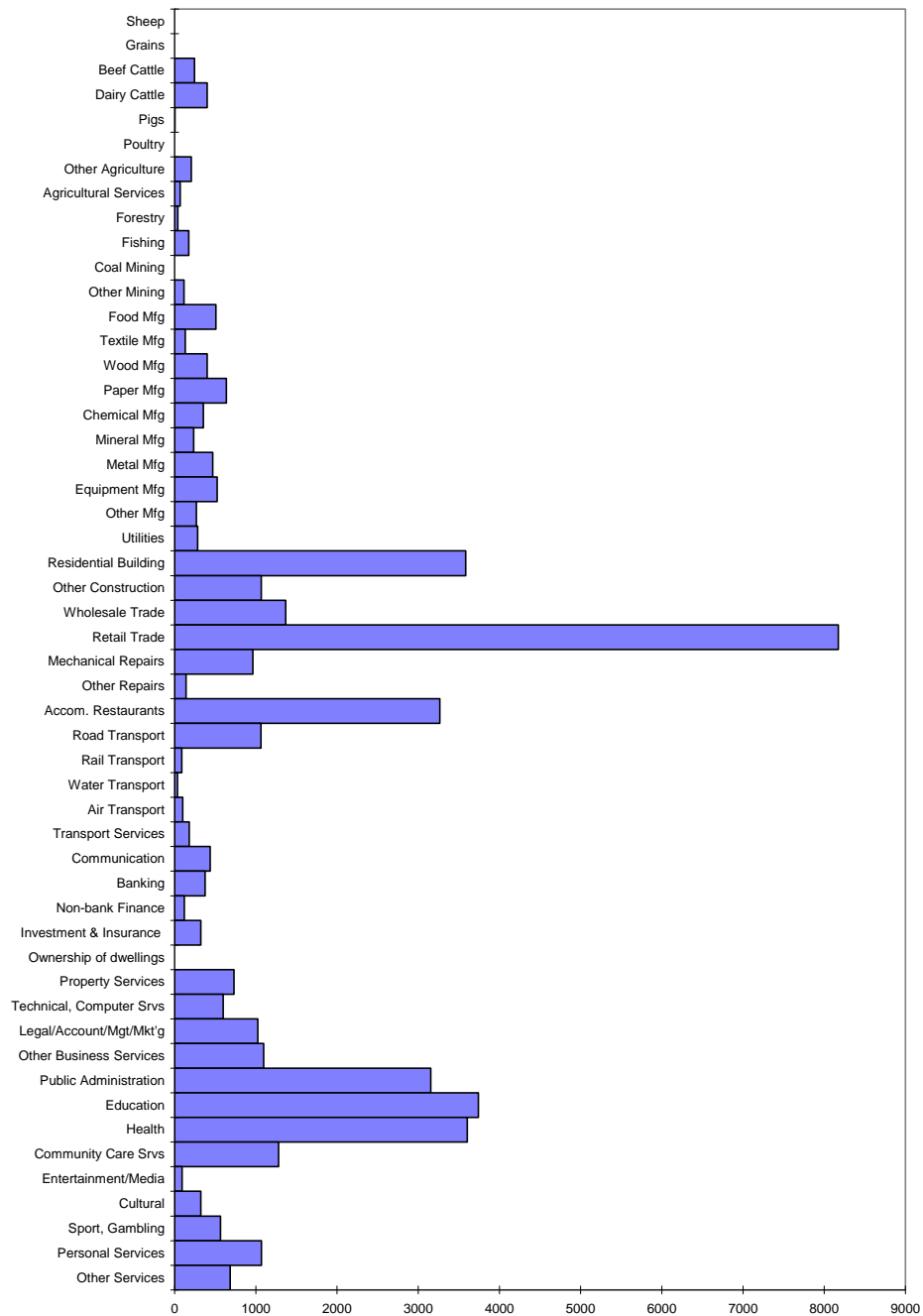


Figure 3.6: Industry Composition of Exports, Greater Shoalhaven region

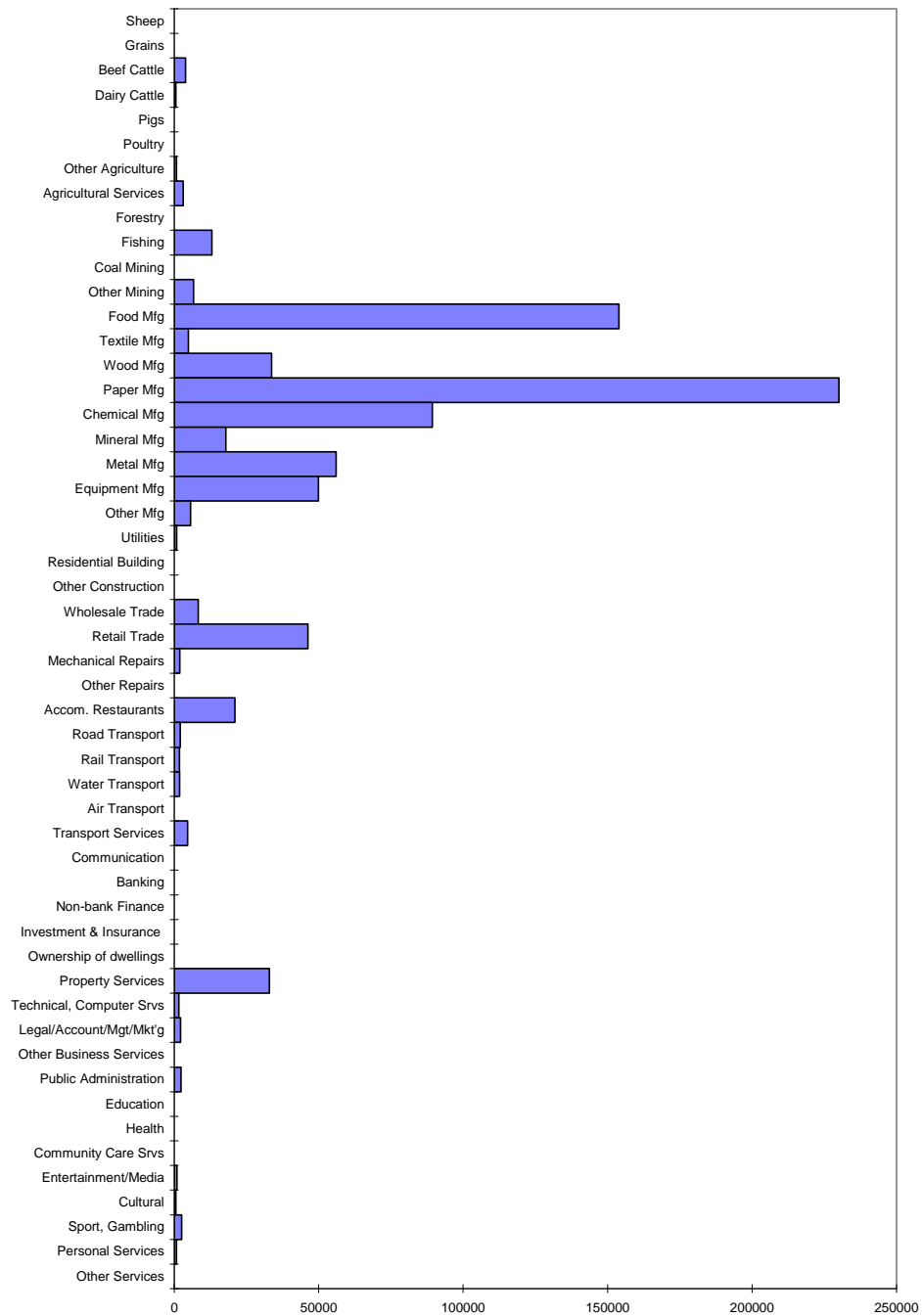


Figure 3.7: Industry Average Earnings, Greater Shoalhaven region

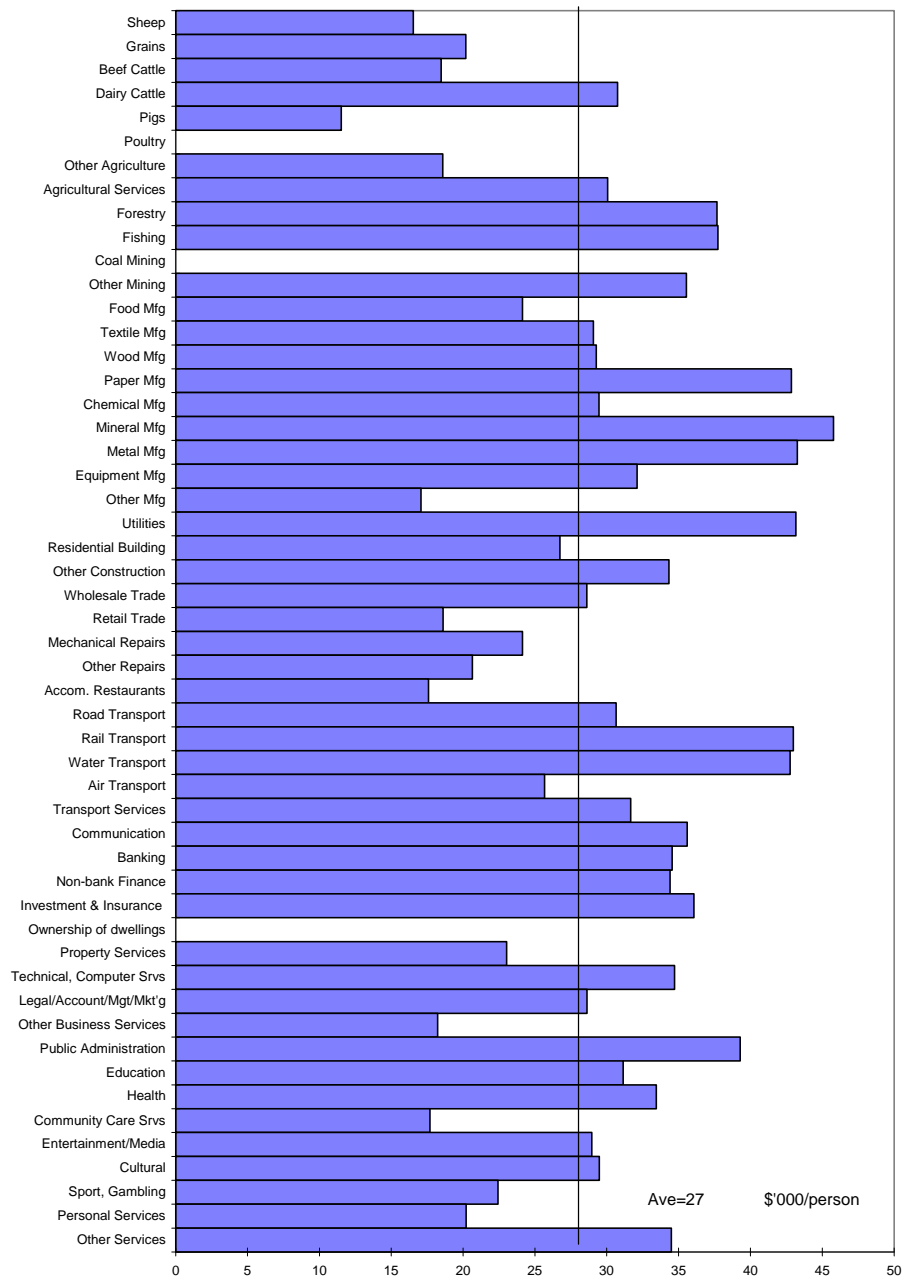


Table 3.7: Location Quotients, Greater Shoalhaven region

Ranked Sectors by 2001	LQs					Employment
	1981	1986	1991	1996	2001	2001
Iron and steel	12.5	12.6	11.3	10.8	<b>7.1</b>	2367
Pulp, paper and paperboard	8.7	11.6	8.9	9.1	<b>5.0</b>	270
Flour and cereal foods	0.7	1.1	1.7	2.0	<b>3.6</b>	194
Rubber products	0.5	1.9	2.2	2.8	<b>3.3</b>	171
Defence	3.9	2.5	2.9	2.8	<b>3.2</b>	1444
Ceramic products	1.5	1.2	2.5	1.9	<b>2.0</b>	133
Commercial fishing	3.5	3.9	3.2	3.0	<b>1.9</b>	171
Other chemical products	0.3	0.7	0.0	1.2	<b>1.8</b>	74
Dairy cattle	2.6	2.4	1.9	1.8	<b>1.8</b>	393
Concrete, cement, lime	2.0	1.7	2.1	2.4	<b>1.7</b>	101
Structural metal products	1.4	1.8	1.9	1.6	<b>1.7</b>	294
Basic non-ferrous metals etc	2.3	2.2	2.0	0.8	<b>1.7</b>	361
Aircraft	0.2	0.3	0.4	1.8	<b>1.7</b>	161
Residential building	1.7	2.1	2.1	1.8	<b>1.6</b>	4304
Beef cattle	0.5	0.7	0.7	0.8	<b>1.5</b>	255
Water, sewerage & drainage	1.2	1.1	1.0	1.6	<b>1.4</b>	210
Other wood products	1.0	1.4	1.3	1.4	<b>1.4</b>	380
Other mining	2.4	1.9	2.2	2.1	<b>1.4</b>	77
Coal; oil and gas	3.4	2.3	2.1	1.9	<b>1.4</b>	255
Ships and boats	0.8	0.6	1.1	1.2	<b>1.4</b>	142
Accom. & restaurants	1.3	1.3	1.3	1.3	<b>1.2</b>	3680
Retail trade	1.0	1.1	1.1	1.1	<b>1.2</b>	9423
Mechanical repairs	1.0	1.0	1.2	1.1	<b>1.2</b>	1170
Other repairs	0.9	0.8	1.1	1.1	<b>1.1</b>	179
Community care services	0.7	1.1	0.9	1.1	<b>1.1</b>	1663
Personal services	0.8	0.8	1.0	1.1	<b>1.1</b>	1263
Other property services	1.0	0.9	1.2	1.3	<b>1.1</b>	953
Road transport	3.1	1.1	1.1	1.0	<b>1.1</b>	1408
Gas	0.3	0.5	0.8	3.2	<b>1.0</b>	29
Health services	0.6	0.9	0.9	1.0	<b>1.0</b>	4481
Education	0.9	1.0	1.0	1.0	<b>1.0</b>	4424
Other business services	1.1	1.0	1.0	0.9	<b>1.0</b>	1798
Rail & other transport	0.5	0.7	0.9	1.2	<b>1.0</b>	230
Fabricated metal products	0.6	0.8	1.0	0.8	<b>1.0</b>	245
Dairy products	0.8	1.3	1.0	1.3	<b>1.0</b>	125
Other services	0.7	0.7	0.8	0.8	<b>1.0</b>	1026
Public administration	0.8	0.9	0.9	1.0	<b>1.0</b>	2174
Other construction	1.2	0.7	0.8	1.0	<b>1.0</b>	1368
Non-bank finance	0.8	0.8	1.2	0.8	<b>0.9</b>	223
Legal, accounting svcs	0.4	0.4	0.5	0.6	<b>0.6</b>	1318
Banking	0.7	0.7	0.7	0.7	<b>0.6</b>	573
Scientific research etc	0.4	0.4	0.6	0.6	<b>0.6</b>	1017

The Greater Shoalhaven region is a significant manufacturing area with large paper and cereal food processing industries. There are several other manufacturing industries with values over 1.4. The defence operations based at Jervis Bay are significant, and have a link to the operation of an aircraft manufacturing enterprise in the Greater Shoalhaven region. The region contains some primary industries, including commercial fishing and dairy production, both of which are declining in importance, with beef cattle replacing dairy cattle.

Apart from defence, the service industries are not as significant in the Greater Shoalhaven region as they are in Eurobodalla and Bega Valley (as measured by the location quotients). Retail trade and accommodation and restaurants are just above the national level at 1.2, although building and related sectors have higher values, reflecting the high growth in the number of households in the Greater Shoalhaven region.

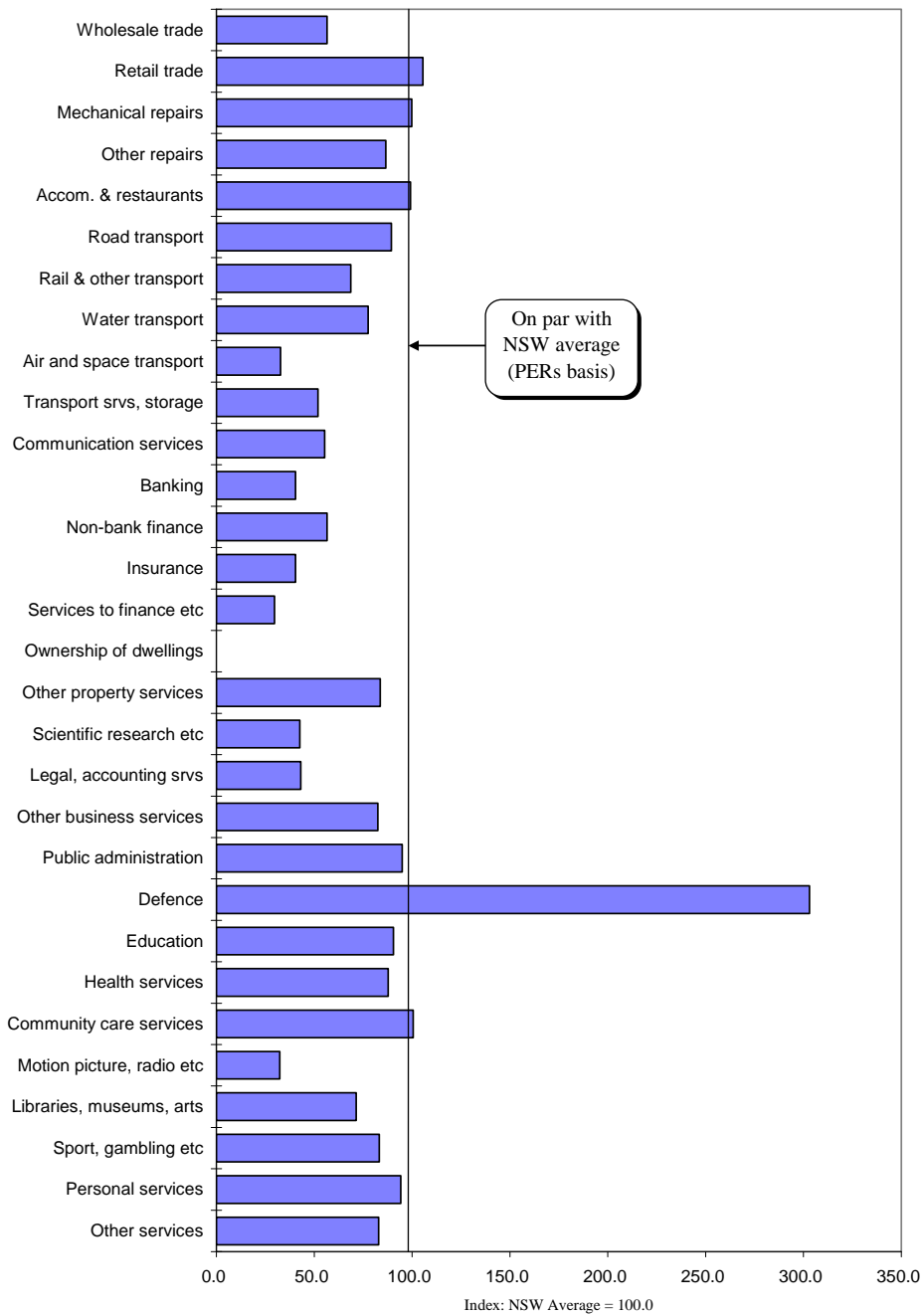
The delivery of services to Greater Shoalhaven residents is at a relatively high level overall, with a value of 3.7 compared to the NSW level of 3.0 (Table 3.8). There has been a steady improvement in service levels over the past 20 years.

Table 3.8: Service Delivery (PERs), Greater Shoalhaven region

Service Sectors	Greater Shoalhaven					NSW		Change	
	1981	1986	1991	1996	2001	1996	2001	Local 2001 vs 1996	2001 NSW vs local
Residential building	51	47	44	43	38	62	49	6	11
Other construction	63	107	110	106	118	88	97	-12	-21
Wholesale trade	87	78	67	70	73	38	41	-3	-32
Retail trade	24	21	20	21	17	21	18	4	1
Mechanical repairs	261	261	234	138	138	136	138	0	0
Other repairs	1199	1429	916	827	900	710	779	-73	-121
Accom. & restaurants	66	67	52	47	44	47	43	3	0
Road transport	107	130	129	146	115	123	102	31	-12
Rail & other transport	332	299	387	514	703	372	482	-189	-221
Water transport	1999	1847	2454	3494	2366	1984	1834	1128	-532
Air and space transport	2459	3737	1190	989	905	314	296	84	-609
Transport srvs, storage	268	300	374	358	412	175	214	-54	-199
Communication services	161	162	191	178	203	112	112	-25	-91
Banking	201	178	199	217	282	104	114	-65	-168
Non-bank finance	586	527	384	733	725	355	410	7	-316
Insurance	724	828	695	662	464	247	187	199	-277
Services to finance etc	1685	1156	848	857	701	263	208	157	-493
Ownership of dwellings	0	0	0	0	0	0	0	0	0
Other property services	236	275	176	162	169	163	142	-8	-28
Scientific research etc	478	385	255	180	159	91	68	21	-91
Legal, accounting srvs	309	287	205	125	123	58	53	2	-70
Other business services	231	225	173	135	90	91	74	45	-16
Public administration	79	69	71	76	74	70	71	1	-4
Defence	46	78	79	105	112	249	339	-6	227
Education	48	45	43	41	36	35	33	4	-3
Health services	65	48	43	39	36	33	32	3	-4
Community care services	499	235	195	111	97	108	98	14	0
Motion picture, radio etc	1182	1427	1208	977	979	369	316	-2	-663
Libraries, museums, arts	1198	1006	831	576	458	330	327	118	-131
Sport, gambling etc	532	488	405	313	251	236	209	62	-42
Personal services	297	264	195	138	128	133	120	10	-7
Other services	260	230	181	183	157	131	130	26	-27
<b>TOTAL SERVICES</b> (excluding building & construction)	<b>4.9</b>	<b>4.7</b>	<b>4.3</b>	<b>4.1</b>	<b>3.7</b>	<b>3.2</b>	<b>3.0</b>	<b>0.4</b>	<b>-0.7</b>

The level of services in each industry relative to the NSW level is shown in Figure 3.8 where all services are expressed as an index, with 100 representing the NSW level. Industries that exceed 100 and have service levels above the NSW level include defence and retail trade, while accommodation and restaurants and community care are at the NSW level. Residential building is also at a high level as indicated in Table 3.8, which is consistent with the high level of population growth. For the same reason, property services is a well-developed sector although it is below the NSW average.

Figure 3.8: Service Delivery Indexes, Greater Shoalhaven region



There are many sectors that are significantly below the NSW level. These include wholesale trade, many of the transport and communication industries, and business services, with the exception of property services and other business services. Among the personal services sectors, motion pictures, etc. is notably well below the NSW level, although these services are likely to be available in the nearby Wollongong area.

### 3.6 Shift Share Analysis

There has been substantial growth in employment in the Greater Shoalhaven region for over 20 years. There was employment growth in the early 1980s when total employment in NSW was declining. Since then, employment has increased (on a residence basis) by over 5,000 persons in each intercensal period. An overview of the trends using shift-share analysis is shown in Figure 3.9.

Figure 3.9: Employment Change in the Greater Shoalhaven region, 1981 to 2001

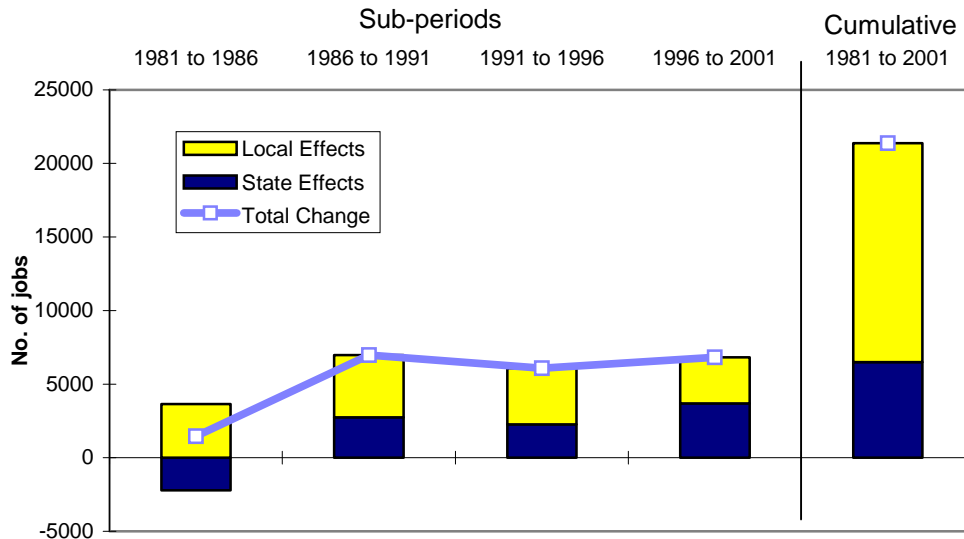
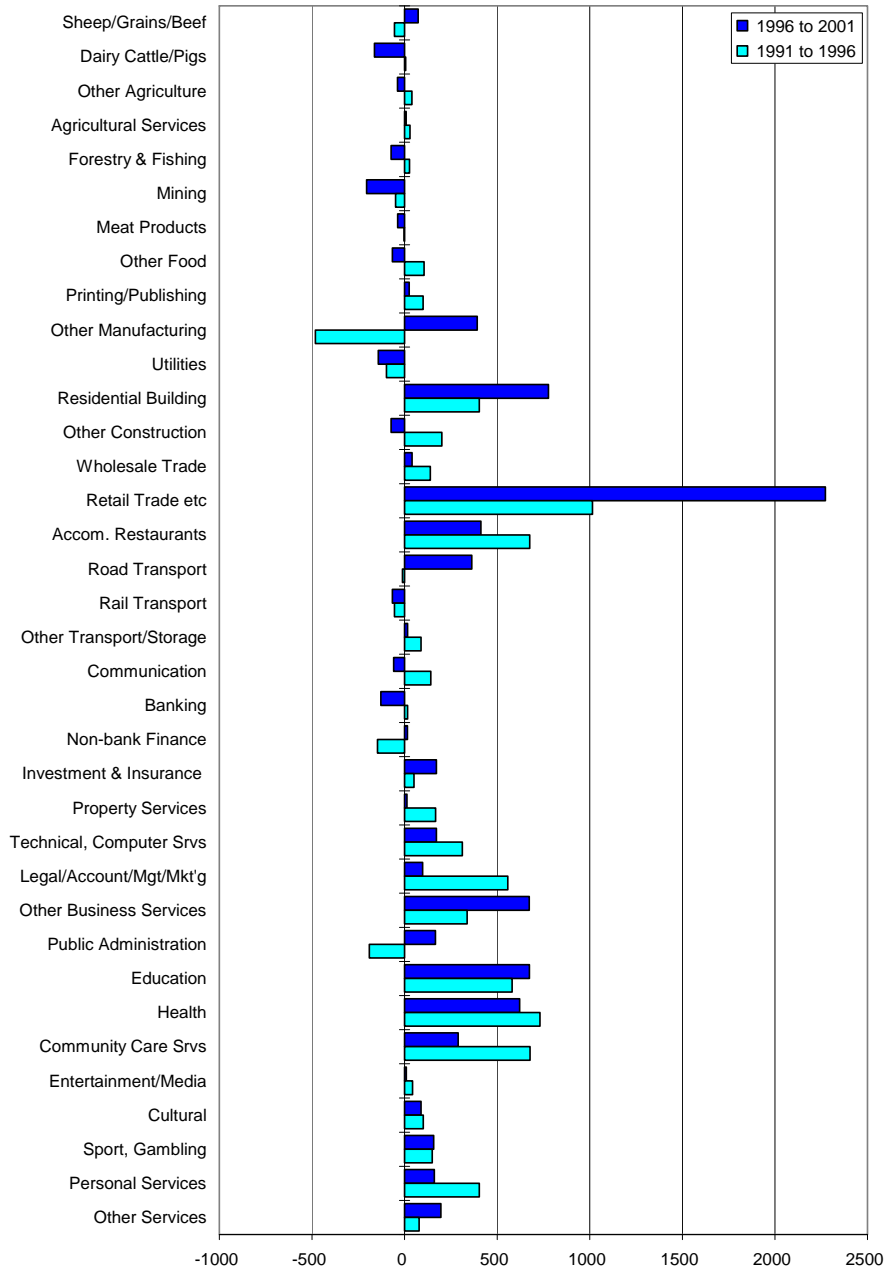


Figure 3.9 shows the growth of employment that would have occurred if the Greater Shoalhaven region had shared in State growth (State effects) along with actual growth (total change). The difference between these two measures is shown as the local effect, and reflects factors at the local level that meant the area was growing or declining relative to state growth. In all periods the local effect has been positive, showing that the Greater Shoalhaven region has been growing faster than NSW as a whole. The principal local factor is the region's proximity to Wollongong, and to some extent Sydney, with many residents commuting to jobs in those major centres.

Some additional insights into the trends over the 1990s are provided in Figure 3.10 which indicates the change in employment by industry for Greater Shoalhaven residents. It is apparent that the Greater Shoalhaven region is a strong growth area. However, between the 1981 and 2001, there have been marked declines in employment in dairy farming, iron and steel, clothing manufacture, paper and pulp and electricity. Significant growth has occurred in printing, publishing, flour and cereal manufacturing, rubber products, aircraft, agricultural machinery and furniture making. Even in a growth situation such as in the Greater Shoalhaven region, there is still a considerable amount of restructuring occurring that leads to a change in the industry mix.



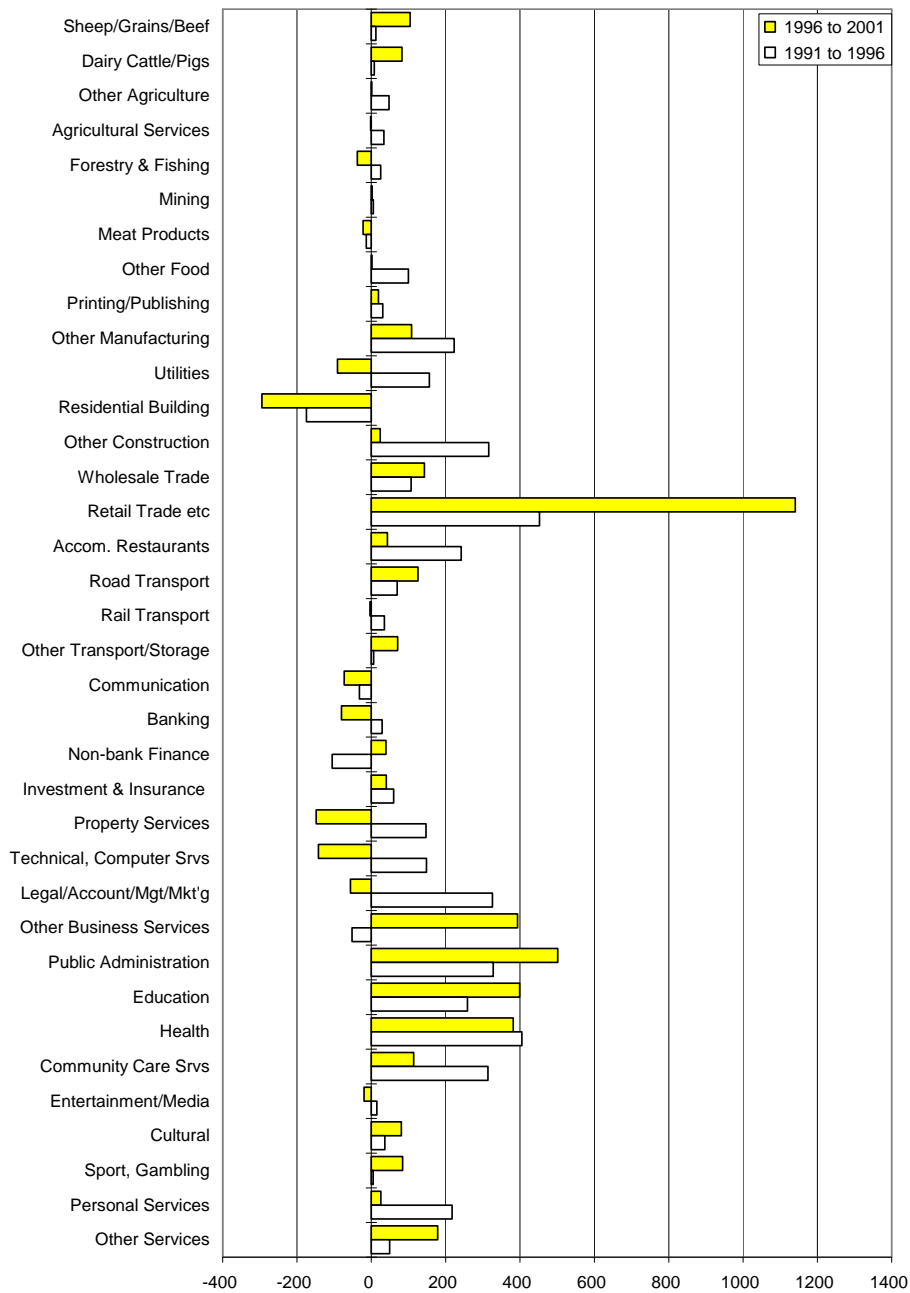
Figure 3.10: Total Change in Employment by Industry, Greater Shoalhaven region, 1991 to 2001



The information in Figure 3.10 suggests that there has been a strengthening and acceleration of the growth in employment in the second half of the 1990s. Most growth has occurred in those industries that service the residents of the region, including building, retail, accommodation and restaurants, road transport, a range of other personal services and some businesses services related to property and its maintenance.

The level of these changes relative to the NSW trends is indicated in Figure 3-11. The left of the '0' line indicates that the industry did not grow as quickly as the industry at the NSW level, thereby indicating that the region industry lost share of the NSW industry. To the right of the '0' is indicative of an increase in the share of the NSW industry. This information can be interpreted as a general indicator of the competitive advantage of the industry within NSW.

Figure 3.11: Local Change in Employment, Greater Shoalhaven region, 1991 to 2001



These results indicate that the Greater Shoalhaven region performed a little better relative to NSW in the second half of the 1990s. Residential building was notably lagging behind NSW along with property services and legal accounting, etc. There was strong growth in trade, other business services, public administration, education and health.

The shift-share analysis also provides some indicators on the structure and composition of the Greater Shoalhaven regional economy. The industry mix appeared to be generally favourable, with 57 percent of employment in fast-growth industries (those that within NSW were growing faster than average). However, it was not those industries that were the major contributors to growth in employment in the Greater Shoalhaven region. The industries that were competitive in terms of

increasing their market share within NSW (noted above in relation to Figure 3.11) were the main contributors to growth. Many of those industries were not necessarily the high growth industries within NSW.

A final measure relates to the diversity of the Greater Shoalhaven regional economy. Between 1996 and 2001, this improved to a value of 16. This indicates a high level of diversity in the economy and is a similar value to other regional centres where there is a substantial manufacturing component to the economy. This is partly a reflection of the potential for Greater Shoalhaven residents to work in a range of industries outside the region as well as the array of industries within the region.

### **3.7 Summary**

The Greater Shoalhaven region is located within commuting distance of Wollongong and Sydney and 25 percent of the employed residents work outside of the region as defined in this study. The Greater Shoalhaven resident population has been growing rapidly over the past 20 years and is much closer to the age profile of NSW than either Eurobodalla or Bega Valley. However, the population projections indicate that it too will be subject to rapid ageing with immigrant retirees and rising dependency ratios.

The Greater Shoalhaven region economy is 1.4 percent of the NSW economy and has a significant manufacturing industry in food manufacturing, paper products and a range of smaller operations that are produced mainly for export.

Primary production is small. The economy is dominated by the provision of services to residents including those working outside the region. Some of the specialised personal services are limited, but presumably are readily accessed in nearby Wollongong. Business services tend to be relatively weak.

The Greater Shoalhaven region has been a high growth area and that is expected to continue and to be based on the quality residential characteristics of the region.

## **4 REGIONAL ECONOMIC IMPACTS OF PROTECTED AREAS**

### **4.1 Introduction**

The regional economic impact of Protected Areas (PAs) in the Greater Shoalhaven region has been calculated through the use of input-output models developed for this project. Technical aspects of the development and use of input-output models are described in Section 3 above.

The economic impact of PAs on regional economies comprises two parts: the operating and maintenance costs associated with the PAs in question, and the economic activities associated with the PAs. These activities primarily consist of visitation for recreation, but a range of other activities may be considered. These activities may include apiary and grazing, and in some cases the collection of biological material for pharmaceutical purposes.

There are four steps involved in the economic impact analysis. These are:

1. The gathering of information on the primary activity. This includes the expenditures made on the PAs by the relevant government and related agencies. It also involves estimating the number of visitors to the PAs and the expenditures they make during their visits. This study focuses on the expenditures visitors to PAs make in the region where the PAs are located.
2. The formulation of the data into a structure that complies with the conventions used in input-output models (see Section 3). This includes making adjustments to the valuations used, the handling of indirect taxes, and identifying expenditures on imports rather than locally supplied goods and services.
3. Application of the input-output model to estimate the flow-on effects of the expenditures in question. This involves the appropriate application of multipliers to the level of 'direct expenditure' gathered in the previous steps.
4. Preparation of appropriate tables to report the total impacts. This usually involves identifying the direct and flow-on impacts; indicating the main sectors or industries where the impacts occur; measuring the effects in terms of gross regional output (business turnover), gross regional product (value added activity), household income and employment terms; and relating the total impacts to the overall size of the regional economy.

The following section of the report is structured around the above steps. The data used in these analyses has been compiled from information obtained by visitor surveys carried out by DEC and information provided by DEC, the Commonwealth Department of Environment and Conservation (DEH) and Marine park managers.

### **4.2 Impacts of Protected Area Management expenditure in the Greater Shoalhaven region**

#### PA Expenditure Data

Data on park management expenditure was obtained from DEC South Coast region staff, DEH Booderee National Park staff and Jervis Bay Marine Park staff. The expenditure data was derived from DEC and DEH management budgets and

expressed in terms of the operating expenditure on items such as wages and salaries, travel, motor vehicle running costs, and other operating costs. Expenditure concerned operational activities associated with on-going park management, and excludes one-off expenditure on capital items such as new buildings, vehicles or road construction.

In some cases it was necessary to make minor adjustments to these data to take account of geographical differences between the DEC management areas to which the park management expenditure related, and the boundaries of the local government areas to which the input-output table related (see Appendix 1).

DEC, DEH and Marine Park staff also provided information on the percentage of each expenditure item that was purchased from businesses within the relevant study region. Such information on the proportion of park management expenditure on different items made within the local region is necessary to calculate the direct and indirect impacts of park management on the local economy.

Issues relating to data collection and analysis, and assumptions made in allocating data to different expenditure categories for use in the regional input-output tables are discussed in detail in Appendix 1.

### Compiling the Data

The approach taken to estimate the economic impacts of park management expenditure has been to prepare a specific sector in the input-output table representing PA operations and maintenance. This increases the accuracy of the multipliers that are estimated for these operations and was possible given the detailed expenditure information provided to the project.

The compilation of the data involved taking into account GST, allocating expenditures to the relevant ANZSIC industry/sector, revising margins and valuations where appropriate, and determining import shares. The final adjustment is to adjust the values to the year 2000-01, which corresponds to the year for the input-output tables. The resulting specification of the sector for each region is then added into the input-output table for each of the regions. (Summaries of the regional input-output tables are shown in Appendix 3).

The expenditures (including GST) and employment in the various regions of the study area are:

*Table 4.1: Park management expenditure and Employment in the region*

<b>Region</b>	<b>Expenditure</b>	<b>Employment</b>
Greater Shoalhaven	\$13.531m	108

The Greater Shoalhaven area has a high level of expenditure and employment related to park management. There are substantial expenditures on support services, machinery and equipment and a range of other materials and services.

### The Results

The results are presented in two parts, as multipliers, and as total impacts. The multipliers are shown in Table 4.2 and comprise:

- the *direct effect*, which is the actual expenditures on PA management;

- the *production-induced effect*, which shows the flow-on effects generated through the purchase of goods and services;
- the *consumption-induced effect*, which shows the flow-on effects that are generated through the payments of wages and salaries to households and the subsequent expenditure of those incomes of purchasing household goods and services;
- the *total flow-on*, which is the sum of the production-induced and consumption-induced effects;
- the *total impact*, which is the sum of the direct and total flow-on effects; and
- the *Type II multiplier*, which is a ratio between the total impact and the direct effect.

All of these multipliers are 'Final Demand Multipliers'. This means that they are calculated as if the direct effects are sales to final demand (to consumption, exports, capital formation or government consumption). The multipliers are used by applying the appropriate value to the gross output value to estimate the total impact shown in Table 4.2. The multipliers should be interpreted as indicating the flow-on effects generated by a \$1 change in PA management expenditure (in the case of employment it is the flow-on effects of a \$1m change).

The multipliers are calculated for the following measures:

- *Gross regional output*, which is equivalent to regional business turnover.
- *Gross regional product (regional value-added)*, which is the payment to labour and capital.
- *Household income*, which is the wage and salary component of gross regional product, but includes an imputed wage for self-employed labour.
- *Employment*, which is the number of employed unadjusted for hours worked or other factors.

Table 4.2: PA Management Multipliers, Greater Shoalhaven region

MULTIPLIERS	Flow-on Effects				TOTAL IMPACT	Type II
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on %		
GROSS OUTPUT (\$'000)	1.000	0.431	0.446	0.877	1.877	1.877
VALUE-ADDED (\$'000)	0.545	0.170	0.247	0.417	0.961	1.765
HOUSEHOLD INCOME (\$'000)	0.408	0.100	0.089	0.188	0.596	1.462
EMPLOYMENT (no./\$m)	8.2	3.4	3.8	7.2	15.4	1.874

The estimated impacts are shown in Table 4.3. PA management is deemed to contribute \$8m in total to the incomes of households, and employ 208 people. These are the two measures most used as an indicator of the contribution to the social and economic conditions of the region.

Employment impacts tend to be used as a preferred indicator of impacts. However, that measure is difficult to interpret given the growing flexibility that now exists in the labour market. In this case, the 208 jobs would be a combination of full-time, part-time, juniors, etc. Further, experience suggests that the employment effects are the least reliable of the indicators as they can be affected by underemployment in workplaces, variations in hours worked and intensity of work and a changing mix of experience and skills. Thus, it is suggested that contribution to household income should be the preferred indicator of the impact on socio-economic conditions in the regions.

The expenditure associated with activities including employment costs, accessing some specialist services and equipment and travel related costs result in consumption-induced flow-on effects. Production-induced flow-on effects result from the local supply of some equipment and specialist services.

*Table 4.3: Total Impact of PA Management, Greater Shoalhaven region*

IMPACTS	Flow-on Effects				TOTAL IMPACT
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	
GROSS OUTPUT (\$'000)	13,531	5,834	6,039	11,873	25,405
VALUE-ADDED (\$'000)	7,368	2,294	3,343	5,637	13,005
HOUSEHOLD INCOME (\$'000)	5,517	1,347	1,199	2,546	8,064
EMPLOYMENT (no.)	111	46	51	97	208

### **4.3 Impacts of Park related visitor expenditure in the Greater Shoalhaven region**

A similar process to that described in relation to PA management is followed in estimating the economic impacts of the expenditure made by visitors to PAs in the Greater Shoalhaven region.

#### Visitor Expenditure Data

Estimates of visitor expenditure were based on the results of a number of visitor expenditure surveys carried out for protected areas in the region. These surveys covered a range of protected area types, from park visitor centre to nature reserve. Data relating to a variety of different locations and PA types was chosen to reflect the range of park visitor expenditure that would occur through the region, from low expenditure associated with visitors making day trips to parks near Sydney in the north of the region, to higher daily expenditure made by park visitors spending week of fortnight-long vacations in the south of the region.

Data on visitor expenditure by category, and a detailed explanation of sources, methods, and assumptions used in deriving the expenditure data used in the study are given in Appendix 1.

## Compiling the Data

The compilation of the visitor expenditure data involves taking the eight categories of expenditure for which survey data was collected, and allocating it to the relevant sectors in the input-output table. (A summary of the regional input-output table is shown in Appendix 3).

Those values are then adjusted for imports and indirect taxes to reach a set of final demand expenditures. The relevant multipliers are applied to those values to estimate the flow-on effects that are associated with those expenditures.

A summary of the resulting estimates of visitor expenditure is shown in Table 4.4. The total expenditure is estimated to be \$271m, of which the local component used to estimate flow-on impacts is \$207m. Further details of the industry allocation of these expenditures are provided in Appendix 3.

*Table 4.4: Estimation of Local Direct Visitor Expenditure, Greater Shoalhaven region*

<b>Region</b>	<b>Total Expenditure</b>	<b>Taxes</b>	<b>Imports</b>	<b>Local Expenditure</b>
	\$'000	\$'000	\$'000	\$'000
Greater Shoalhaven Region	271,064	33,420	30,287	207,356

## The Results

The discussion earlier in this section on the presentation of findings for multipliers and total impacts also applies to these results. However, in this case, the impacts are not derived from the application of a single multiplier, as was the case with PA management expenditures described above. The multipliers for visitor expenditure impacts shown in Table 4.5 below are composite multipliers that are applied to each of the 22 expenditure items estimated from the initial visitor expenditure data (see Appendix 2). The multipliers shown in Table 4.5 represent a weighted average multiplier for that particular set of visitor expenditures in the region.

*Table 4.5: Visitor Expenditure Multipliers, Greater Shoalhaven region*

<b>MULTIPLIERS</b>	<b>Direct Effect</b>	<b>Flow-on Effects</b>			<b>TOTAL IMPACT</b>	<b>Type II</b>
		<b>Production Induced</b>	<b>Consumption Induced</b>	<b>Total Flow-on %</b>		
GROSS OUTPUT (\$'000)	1.000	0.314	0.187	0.502	1.502	1.502
VALUE-ADDED (\$'000)	0.325	0.136	0.104	0.239	0.564	1.737
HOUSEHOLD INCOME (\$'000)	0.156	0.057	0.037	0.094	0.250	1.602
EMPLOYMENT (no./\$m)	8.2	2.1	1.6	3.7	11.9	1.446

The production-induced multipliers are considerably larger than the consumption-induced multipliers. This is a reflection of the high share of services in the expenditure pattern of visitors that use significant amounts of locally supplied goods and especially of locally supplied services of retailers, road transport operators and business services.



The level of the economic impacts is shown in Table 4.6. These values are considerably larger than the impacts associated with PA management discussed earlier. The total value in terms of gross output is \$407m, which generates over 3,200 jobs and contributes \$67m of income to households in the region.

The final step is to put these findings into the context of the overall economy. This is shown in a summary form in Table 4.7 where the total impacts are related to the total measure for the regional economy.

The following points are notable:

- Regional economic impacts associated with the expenditure of visitors are much greater than the impacts of park management expenditure.
- On average, park management expenditure and visitor expenditure contribute over 6 percent of the gross regional output, household income and employment.
- Park management expenditure and visitor expenditure contribute around 5 percent of the gross regional product (value-added activity).

*Table 4.6: Economic Impacts of Visitor Expenditure, Greater Shoalhaven region*

IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production Induced	Consumption Induced	Total Flow-on	
GROSS OUTPUT (\$'000)	271,064	85,183	50,793	135,976	407,040
VALUE-ADDED (\$'000)	88,054	36,751	28,117	64,867	152,922
HOUSEHOLD INCOME (\$'000)	42,344	15,384	10,088	25,472	67,816
EMPLOYMENT (no.)	2,226	565	429	994	3,219

*Table 4.7: Summary of PA Economic Impact on the Greater Shoalhaven region*

IMPACTS	Total Impact			Region	
	PA Management	Visitor Expenditure	Total	Share of Region	Total
GROSS OUTPUT (\$'000)	25,405	407,040	432,445	% 7.92	5,462,483
VALUE-ADDED (\$'000)	13,005	152,922	165,927	5.15	3,222,092
HOUSEHOLD INCOME (\$'000)	8,064	67,816	75,880	6.30	1,204,492
EMPLOYMENT (no.)	208	3,219	3,427	7.73	44,346

## **5 CONCLUSION**

### **5.1 Implications of socio-demographic and economic trends for conservation in the Greater Shoalhaven region**

The South Coast of NSW is experiencing economic development and population growth at rates above the NSW average. That trend is expected to continue.

The Greater Shoalhaven region has experienced industry-led growth associated with manufacturing and related activities, and provides the potential for residents to work in a range of industries in Wollongong and even in Sydney. Much of the Greater Shoalhaven region is also attracting residents because of the lifestyle attributes that exist throughout the South Coast.

Protected areas on the South Coast can also help to meet the needs of local communities by providing venues for passive and active recreation. Expenditure patterns associated with retirees in, and visitors to, the NSW South Coast have significant implications for the nature and structure of the workforce there. A relative expansion in businesses providing services to retirees and visitors may tend to provide more jobs for females than males. Economic development based on provision of services to retirees and visitors may contribute to a higher proportion of younger females than males staying in the region for employment and family reasons. From a gender balance perspective, economic development strategies for the South Coast may need to include some specific actions in relation to development industries that tend to employ young males.

This study has described a range of economic and demographic characteristics and trends for the Greater Shoalhaven region, and estimated the economic impact on the regional economies of the area associated with expenditure on park management and expenditure made by PA visitors in the region. The above economic and demographic trends will have various implications for PA planning and management.

The Greater Shoalhaven region has an advantageous location on the perimeter of Sydney and adjacent to Wollongong and Port Kembla; this location will nurture much more broadly-based economic growth as well as economic growth associated with recreation and visitation activities that may include visitation to PAs. Activities associated with PAs are expected to continue to grow, however, it will be more difficult for those activities to increase their share of the regional economy.

## 6 REFERENCES

- ABS (2005). *Experimental Estimates of Personal Income for Small Areas* (Cat. No 6524.0). ABS, Canberra.
- ACT Commissioner for the Environment (2004). *State of the Environment Reporting for the Australian Capital Region (draft)*. Office of the Commissioner for the Environment. Dickson, ACT. <http://www.environmentcommissioner.act.gov.au>
- Active Australia (2003). *Active facts - The numbers game: Walking*. <http://www.ausport.gov.au>.
- Atech Group (1999). *Southern Forests Catchment Values and Threats*. Paper prepared for NSW Forest Alliance as input into the NSW Government Southern Comprehensive Regional Assessment (unpublished).
- Bushell, R., R.Staiff, and N. Conner. (2002). *The role of nature-based tourism in the contribution of protected areas to quality of life in rural and regional communities in Australia*. *Journal of Hospitality and Tourism Management* 9 (1).
- Countryside Agency (2003a). *Walking the Way to Health Initiative. Medical evidence*. <http://www.whi.org.uk>.
- Countryside Agency (2003b). *Walking the Way to Health Initiative*. <http://www.whi.org.uk>.
- Crompton, J. (2003). *The impact of parks and open space on property values and the property tax base. Appendix 1: The three collective public benefits that may accrue from park and recreation services*. <http://www.rpts.tamu.edu/Faculty/CROMPTON.HTM>.
- Department of Employment and Workplace Relations (2004). *Small Area Labour Markets*. DEWR, Canberra.
- Department of Transport and Regional Services (2005). *Jervis Bay*. <http://www.dotars.gov.au/terr/jervis/envIRON.aspx>
- Hamilton-Smith, E. (2001). *The Social Benefits of Public Open Space: A Review*. Sydney Urban Parks Education and Research (SUPER) Group, Sydney.
- Kiama City Council (2004). *State of the Environment Report 2003/04*. <http://www.kiama.nsw.gov.au/>
- Marine Parks Authority (2005). *Jervis Bay Marine Park*. <http://www.mpa.nsw.gov.au/jbmp/jbmp-overview-plan5.htm>
- National Association of State Park Directors (2001). *Personal/individual values and benefits of state parks*. <http://naspd.indstate.edu/values>.
- National Parks and Wildlife Service (2003). *The Economic Impact of Fitzroy Falls Visitor Centre*. NSW National Parks and Wildlife Service, Hurstville.
- National Park Service (2002). *President Bush highlights Rivers and Trails Program in the Healthier U.S. Initiative*. Press release, 21 June, Washington, D.C.

NSW Department of Infrastructure, Planning and Natural Resources (2004), *New South Wales State and Regional Population Projections 2001-2051*, Sydney.

Sagoff M. (2002). *On the Value of Natural Ecosystems: The Catskill Parable*. *Philosophy and Public Policy Quarterly*, Vol 22 1/2. pp. 10-16

Shellharbour City Council (2004). *State of the Environment Report 2003/04*.  
<http://www.shellharbour.nsw.gov.au/YourCouncil-AnnualReport2003-2004.asp>

Shoalhaven City Council (2004). *State of the Environment Report 2003/04*.  
<http://www.shoalhaven.nsw.gov.au/council/pubdocs/soe/Default.htm>

Stroud Water Research Center (2000). *Water for Gotham: Stroud Center tackles New York City's internationally envied system*. *Stroud Center Newsletter*, Fall 2000.  
<http://www.stroudcenter.org/newsletters>

## **7 APPENDIX 1: DATA SOURCES AND ASSUMPTIONS USED IN CALCULATING THE IMPACTS OF PROTECTED AREAS**

### **7.1 Park Management Expenditure**

The first category of expenditure of interest to the study is expenditure made by park agencies on park management. This consists of on-going maintenance expenditure on goods and services and salaries paid to staff living and working in the region. One-off capital expenditure is not included in this analysis, although such expenditure will of course contribute to economic activity in the region should park managers purchase such items from local firms.

#### Goods and Services

The expenditure of interest here is expenditure on goods and services purchased by park agencies from local firms, as distinct from firms outside the region. Purchases made outside the region will not contribute to economic activity in the local economy.

#### Categories of park management expenditure on goods and services

Common expenditure items used in DEC, DEH and Jervis Bay Marine Park management are shown in Table A1.

*Table A1: Generalised expenditure items related to park management*

Salaries and Wages (Planning Only)	Books/Periodicals/Newspapers	Miscellaneous Expenses
Salaries & Wages Normal Time (Perm staff)	Catering Fees	Miscellaneous Fees
Recreation Leave Provision Expenses	Cleaning	Routine Maint - Mat - Utilities & Inf. A
Allowances - Taxable	Computer Hardware < \$5000	Routine Maint - Mat - Motor Vehicles
Field Allowance	Computer Software < \$5000	Routine Maint - Cont - Motor Vehicles
Standby	Courier & Freight	Routine Maint - Cont - Plant & Equipment
Temp Assistance - Non Established Positions	Electricity - Other Buildings	Fees - Commercial Tour Operators
Salaries & Wages - Overtime	Fees For Services - General	Fees - Bus Entry
Allowances - O/T Meal Allowance	Fuel Oil & Gas - Offices & Workshops	Fees - Day Entry General
Penalty Rates	Insurance (CTP) - Motor Vehicles/Plant &	Fees - Annual Entry Permit
Fringe Benefits Tax	Managed Fund - Property	Fees-Annual Entry Pass-Single Country Pa
Salary Oncost - Recurrent	Postal Expenses	Fees - Camping
Contractors Fees (Working Expenses)	Printing	Fees - Cabin Lettings by NPWS
Motor Vehicles/P&E - Registration Costs	Radio License Fees	Fees - Miscellaneous
Motor Vehicles/P&E - Fuel and Oil	Rates - Council	Fees - Guided Tours & Walks
Motor Vehicle - Lease Costs - Other	Rates - Water/Sewerage	Growers Licence
Travel & Subsistence - Domestic ACTUALS	Rent - Property Services Group & Manag.	Pickers Licence
Travel & Subsistence (Domestic)	Rent - Other	Aviary Registration Certificate
Other Operating Costs (Planning Only)	Stores & Stationery - Consumables	Apiary Licence
Advertising Discretionary	Stores & Stationery - Computers	Reptile & Amphibian Licence
Advertising Recruitment	Stores - Uniforms and Protective Clothing	Sale of Publications & Stock - Internal
Advertising Non-Statutory - Other	Telephone Expenses - Calls	Commercial Leases & Concessions
Asset Purch < \$5000-Plant & Equipment	Telephone Expenses - Service & Equipment	Staffing Rentals
Asset Purch < \$5000-Furniture & Fittings	Telephone Expenses - Mobile Phones	Recovery Phone/Utility Costs - Staff
Credit Card/EFTPOS Charges	Training Fees	Sale of Assets (original cost < \$5000)

An example of park management expenditure, by expenditure category, is given in Table A2. For the purposes of the current study, it was also necessary to identify the proportion of this expenditure that was made in the region, and thus had a direct (and possibly a subsequently indirect) impact on local economic activity. Expenditure on items that were sourced from outside the region would not contribute to the regional economy, and thus has not been included in the analysis of the regional economic impact of park management expenditure. Table A2 refers to park management expenditure the Greater Shoalhaven region (DEC, Booderee NP and Jervis Bay MP).

Table A2: Park Management expenditure: Greater Shoalhaven region

TOTAL	
Operations	%spent in Gtr Shoalhaven economy
Advertising	17
Agents Commission	100
Architects Fees	100
Audit Fees - External	0
Equipment purchase <\$5000	99
Furniture & Fittings < \$5000	80
Motor Vehicles <\$5000	100
Bank Fees	0
Books/Periodicals/Newspapers	69
Catering	96
Cleaning	97
Computer related	9
Conference Fees	74
Consultant/Contractor Fees	78
Courier & Freight	47
Electricity	1
Fees for Services	77
Fuel & Oil	74
Hire Motor Vehicles & Equipment	44
Insurance - MV & plant	0
Motor Vehicle	30
Postage & Telephone	6
Printing	95
Publicity & Educations	96
Purchase for resale	100
Radio License Fees	0
Council Rates	100
Rates Water Sewerage	100
Rent	95
Stores & Stationery	49
Stores & Stationery - Computer	41
Uniforms	8
Training Fees	46
Travel	4
Miscellaneous Expenses	67
Miscellaneous Fees	80
Maintenance comprising:	
<i>Routine Maint - Bulk Stores</i>	60
<i>Routine Maintenance Utilities &amp; Inf</i>	80
<i>Routine Maint Furniture &amp; Fittings</i>	80
<i>Routine Maint Aircraft</i>	0
<i>Routine Maintenance vehicles</i>	100
<i>Routine Maintenance Plant &amp; Equip</i>	100
<i>Routine Maintenance Buildings</i>	100
<i>Routine Maintenance Roads</i>	100
<i>Computer Hardware Maintenance</i>	0
Aircraft Hire	0
Bad Debts written off	0
<b>Sub Total Operations</b>	
<b>Salaries</b>	<b>100</b>
<b>Grand Total</b>	

### Salaries and wages

It has been assumed that all salaries paid to park management staff are spent within the regional economy, e.g. park management staff employed in managing reserves in the Greater Shoalhaven region would spend their incomes within the region. This assumption can be justified given the size of the region and the reasonably central location of the main park offices in each region where the majority of staff would work (i.e. Nowra, Jervis Bay and Huskisson in the Greater Shoalhaven region,). Whilst not every staff member working in the region would necessarily live in Nowra, staff would travel from surrounding areas, which would be likely to be within the boundaries of the region.

It has been assumed that part-time staff constitute 0.5 FTEs.

*Table A3: Park management Salaries and wages in the Greater Shoalhaven region*

<b>Location</b>	<b>No. FTEs*</b>	<b>% Salaries spent in region</b>
P&WD	66	100%
Booderee NP	36.5	100%
Jervis Bay MP	5.5	100%
TOTAL	108	100%

\*Subject to rounding



## 7.2 Tourism and Visitation

Information on PA visitation and associated visitor expenditure in the region has been obtained from DEC P&WD regional offices, DEH Jervis Bay office and unpublished research carried out by DEC/DPI on behalf of the NSW Marine Parks Authority for Jervis Bay Marine Park and the Batemans Bay Bioregion.

Various assumptions have been made in compiling data and estimating impacts. Conservative estimates have been used throughout.

### The Greater Shoalhaven Region

Only data relating to those PAs which fall within the boundaries of the Greater Shoalhaven region have been used in calculations, i.e. Shellharbour, Kiama, and Shoalhaven LGAs and the Commonwealth Jervis Bay Territory. The NSW part of this region generally corresponds to the P&WD Ulladulla and Nowra Areas with a few exceptions (notably parts of Morton NP) as described below.

#### *Morton National Park*

Morton National Park mostly falls within the Greater Shoalhaven region, but also contains areas which fall in the DEC P&WD Highlands Area and areas which are just outside the South Coast study area in Wingecarribee Shire. The inclusion of Morton NP (and associated visitor numbers) in the study can be justified on the basis that the expenditure made by visitors to the park, and park management expenditure, will have an impact on towns in the study area, rather than outside the area, and can thus be included in calculations.

An estimated 1,000,000 people visit Morton NP per year. However this visitation includes visitors to the Fitzroy Falls Visitor Centre (FFVC), which lies at the northern top of Morton NP. The Visitor Centre receives an estimated 411,000 visitors p.a., with an average of 350,000 visitors p.a. over the last 10 years (pers. comm. FFVC Centre Manager).

A recent study of FFVC (National Parks and Wildlife Service, 2003) showed that visitors to the Centre contributed to economic activity in the economies of the Kiama and Shoalhaven LGAs (part of the Greater Shoalhaven region) but also to the Wingecarribee regional economy, which lies outside the region.

In order to avoid overestimating the impact on regional expenditure associated with FFVC visitors, some proportion of the expenditure made by the 350,000 average visitors to the Centre should be allocated to the area outside the study area (i.e. the economy of Wingecarribee Shire).

Therefore, for the purposes of the study, it has been assumed that:

- all the visitors to Morton NP excluding visitors to the FFVC (i.e. 1,000,000 - 350,000 = 650,000) can be counted as visitors to the study area.
- Of the 350,000 visitors to the FFVC, 50 percent can be included in the region (i.e. 175,000 visitors), as it has been assumed that half of all visitors to the region will have come from the coast to the Visitor Centre, or will be travelling to the coast after their visit.

This information is shown in Table 2.1 in Section 2 of the report.

### *Booderee National Park*

Booderee National Park is located in the Commonwealth Jervis Bay Territory and is managed by the Commonwealth Department of Environment and Heritage. Park management is funded by the Commonwealth Government.

The Park receives approximately 450,000 visitors a year, 65,000 (14.5%) of whom are people who camp in the park (pers. comm. Park Manager, Booderee NP). No other accommodation is available in the Park. A survey of park visitors was carried over 9 days in Easter 2004 to obtain information on visitor expenditure patterns. Information on visitor numbers, visitor expenditure and park management expenditure has been incorporated in the present study.

### *Jervis Bay Marine Park*

Jervis Bay Marine Park is managed by the NSW Marine Parks Authority from offices in Huskisson. A number of surveys of users of the marine park have been carried out since the creation of the park in 1998. However, these surveys were not designed to provide information on the total number of visitors to the MP, but rather to provide information on the activities of visitors to the park.

Data obtained from commercial tour operators shows that some 58,000 visitors went on commercial tours in the waters of the marine park in 2003. This figure is in addition to those visitors who use the terrestrial areas (e.g. beaches) around the waters of the marine park. (Those areas form part of the NSW Jervis Bay National Park and have been counted separately).

Since there is no other readily available information on the number of people using the marine park for other recreational purposes, the figure of 58,000 visitors p.a. to the marine park has been used in this study, although this will underestimate actual numbers of users.

A survey of visitors to JBMP was carried out in Easter 2004 to identify patterns of visitor expenditure in the regional economy. As in the case of Booderee NP, information on visitor numbers and expenditure, and park management expenditure, has been used in calculating the economic impacts of PAs in the study area.

As shown in Table 2.1 in Section 2 above, visitation to PAs in the Greater Shoalhaven region was 1,950,100 for DEC reserves, and 2,458,170 when including JBMP and Booderee NP. It has been assumed that nature reserves receive a nominal 50 visitors a year unless actual visitation data has been collected.

A nominal figure of 50 visitors per year has been attributed to Joadja NR for visitor expenditure purposes. However as the nature reserve is managed by the P&WD Sydney South Area (which is outside the study area) Joadja has not been included in analysis of the impacts of park management expenditure (see Section 5 above).

It should be noted that there is some ambiguity in the interpretation of data on visitation to PAs. For the purposes of this study, it has been assumed that visitor numbers represent a single visit to a PA by an individual. Thus visitor numbers represent visits.

This definition does not take account of the length of time that a visitor may stay in a park (e.g. number of nights at a camping site), or that the same visitor may make a

number of visits to the same park over the period the visitation data relates to (data is usually specified as visitation per year). One example of this would be where visitors made multiple visits to a beach within a national park, but each visit was counted as if made by a different individual.

This interpretation of visitor numbers has been adopted as a result of the design of the visitor survey instrument used to collect data on park visitor expenditure. This survey seeks information on total expenditure made by visitors on a range of different goods and services during their trip to and from the PA in question.

### **7.3 Greater Shoalhaven Visitor expenditure - data sources and assumptions**

The approach taken in the study to estimate visitor expenditure has been to combine data from a number of sources as follows.

- Visitor expenditure surveys carried out in 2004 for Booderee NP and Jervis Bay MP.
- Previous NPWS studies carried out for PAs in the study area (Minnamurra Rainforest Visitor Centre, Fitzroy Falls Visitor Centre, Batemans Bay Bioregion, Montague Island Nature reserve).
- Other visitor expenditure surveys carried out under the auspices of the NSW Marine Park Authority (e.g. information derived from a survey of bait fishing activity in Jervis Bay).

#### *Day visitors and locals*

As noted above, the visitor expenditure data collected through the above surveys focused on local expenditure made by visitors to particular PAs. The focus of the survey was to obtain information on expenditure associated with the visitors' trip to the PA in question. Thus the survey was less concerned with daily expenditure, and did not obtain information on the length of stay of those visitors who came to the region.

(In fact, TourismNSW surveys of the South Coast have indicated that the standard length of stay in the region is 2.8 days [information provided by Ian Smith, DEC South Coast region]. Limited data obtained from visitor survey results carried out at Booderee NP and Jervis Bay MP in Easter 2004 suggests that a number of survey respondents stayed for periods of around a week; presumably because the survey was carried out during the Easter school holidays, and respondents were holidaying in the area over the whole period. This limited data was not used in the present study).

The lack of sufficient information to calculate daily expenditure becomes an issue in the case of the expected difference in expenditure between visitors who already live in the region surrounding the PA in question and make short/day trips to the PA, and those visitors to the PA who come from outside the region. One question of interest here is as follows. If the local/day visitors to the PAs in the region had not spent money on their trip to the PA, would they have spent the money on other things in the region, and thus still contributed to the overall economic activity of the region? (although this expenditure would accrue to different sectors of the regional economy from those associated with PAs).

This question has been addressed by examining information provided by visitor survey respondents about the importance of their trip to the PA. If survey

respondents stated that they had travelled to the region solely to visit the PA in question, 100 percent of their expenditure was attributed to the presence of the PA. In contrast, if the visit to the PA was stated to be 'not very important' as part of their overall trip, only 20 percent of their expenditure was attributed to the presence of the PA. Expenditure has been allocated according to the categories shown in Table A8 below.

*Table A8: Allocation of expenditure for all types of visitors Booderee and Jervis Bay*

<b>Purpose of trip to PA</b>	<b>Expenditure Allocation (%)</b>	<b>No. visitors Booderee</b>	<b>No. Visitors Jervis Bay</b>
Sole purpose	100	128,250	21,340
Very important	80	90,000	8,990
Fairly important	60	150,300	20,470
A little important	40	62,100	5,100
Not very important	20	19,350	2140
Total	-	450,000	58,000

For the purposes of this study it has been assumed that it is appropriate to calculate a figure for average visitor expenditure (disaggregated by expenditure category), and attributed according to the percentages shown in Table A8, which can then be applied to all visitors across the whole study area. This is shown for Booderee NP and Jervis Bay Marine Park in Table A9 and A10 below.

*Table A9: Allocation of total Booderee National Park visitors by purpose of trip*

<b>Purpose of trip</b>	<b>Allocation</b>	<b>% of sample</b>	<b>Actual number</b>
Sole purpose	100%	28.5	128,250
Very important	80%	20	90,000
Fairly important	60%	33	148,500
A little important	40%	13.8	62,100
Not very important	20%	4.2	18,900
Total	-	100%	450,000

*Table A10: Allocation of total Jervis Bay Marine Park visitors by purpose of trip*

<b>Purpose of trip</b>	<b>Allocation</b>	<b>% of sample</b>	<b>Actual number</b>
Sole purpose	100%	36.8	21,340
Very important	80%	15.5	8,990
Fairly important	60%	35.3	20,474
A little important	40%	8.8	5,104
Not very important	20%	3.7	2,146
Total	-	100%	58,000

The number of visitors in each category has then been used to calculate spending under different expenditure categories as shown in Table A11 and A12.

*Table A11: Sectoral allocation of expenditure Booderee (actual \$ rates)*

<b>% Allocation</b>	100% (\$)	80%(\$)	60%(\$)	40%(\$)	20%(\$)
Accommodation - motels, caravan park site and non-Marine Park camping fees etc.	63.2	50.5	37.9	25.3	12.6
Prepared meals and drinks - in restaurants, cafes, pubs, clubs etc.	21.1	17.0	12.6	8.4	4.2
Other Shopping - e.g. souvenirs, other food and groceries, films/processing, camping gear, sunscreen etc.	25.2	20.2	15.1	10.1	5.0
Own vehicle costs - e.g. Petrol/diesel, oil, repairs, etc.	11.3	9.0	6.8	4.5	2.3
Transport fares, car rentals.	0.5	0.4	0.3	0.3	0.2
Guided tour costs - (excluding Dept of Environment & Heritage or NSW PAWD tours)	1.2	1.0	0.7	0.5	.2
Entertainment – e.g. Cinema, theatre, shows, fun parks, museums, other venues.	4.6	3.7	2.8	1.8	0.9
Other (please specify).	1.5	1.2	1.0	0.6	0.3

*Table A12: Sectoral allocation of expenditure Jervis Bay (actual \$ rates)*

<b>% Allocation</b>	100% (\$)	80%(\$)	60%(\$)	40%(\$)	20%(\$)
Accommodation - motels, caravan park site and non-Marine Park camping fees etc.	72.0	57.6	43.2	28.8	14.4
Prepared meals and drinks - in restaurants, cafes, pubs, clubs etc.	40.4	32.3	24.2	16.2	8.1
Other Shopping - e.g. souvenirs, other food & groceries, films/processing, camping gear, sunscreen etc.	25.2	20.2	15.1	10.1	5.0
Own vehicle costs - e.g. Petrol/diesel, oil, repairs, etc.	14.0	11.2	8.4	5.6	2.8
Transport fares, car rentals.	1.4	1.1	0.8	0.6	0.3
Guided tour costs - (excluding Dept of Environment & Heritage or NSW PAWD tours)	8.7	7.0	5.2	3.5	1.8
Entertainment – e.g. Cinema, theatre, shows, fun parks, museums, other venues.	5.1	4.1	3.1	2.0	1.0
Other (please specify).	2.9	2.3	1.8	1.2	0.6



The information in Tables A9 and A10 above is then multiplied by the data in Tables A11 and A12 to provide total and average expenditure by sector.

The final stage in deriving an average figure of per capita visitor expenditure by sector for the Greater Shoalhaven region is to take data obtained from the above process and combine it with data obtained from other NPWS studies of the economic impact of visitor expenditure in the study area.

These other economic impact studies are for the Minnamurra Rainforest Centre, Fitzroy Falls Visitor Centre (located at the northern end of Morton NP), Bateman's Bay Bioregion (data collected under the auspices of the NSW MPA), and Montague Island NR. The visitor expenditure data obtained from these studies was available for the visitor expenditure categories shown in Tables A11 and A12. This visitor expenditure data was combined with the data from Booderee and Jervis Bay and is shown in Table A13 below.

This expenditure has been broken down in to a number of expenditure categories such as accommodation, food etc. and allocated to various sectors in the regional economy in the input-output tables as described in Section 4 above (see also Appendix 4 - Sectoral Allocation of Visitor Expenditure) It has also been assumed that children (who could in effect range from infants to teenagers) spend the same amount as adults.

As can be seen in Table A13, survey results for Booderee and Jervis Bay MP are consistent with figures for other survey locations.

The figure used for Minnamurra is particularly low in comparison to the other studies, reflecting the age of the study, conservative assumptions made in the original study, and the proximity and accessibility of the site to day visitors from the Sydney and Wollongong metropolitan areas. The figure has been included here to take account of the popularity of the northern part of the study area for day visits.

Table A13: Expenditure by visitors to PAs in region per person per trip, by sector

AV. ANNUAL VISITOR EXPENDITURE BY EXPENDITURE CATEGORY

<b>GREATER SHOALHAVEN</b>									
Visitor Nos. p.a. 2,458,170	<b>Booderee NP</b>	<b>Jervis Bay MP</b>	<b>Fitzroy Falls VC</b>	<b>Minnamurra RFC</b>	<b>Montague Island NR.</b>	<b>Batemans Bay</b>	<b>Total expenditure</b>	<b>Av. per cap. expenditure</b>	<b>Total expenditure</b>
Accommodation - motels, caravan park site and non-Marine Park camping fees etc.	44.85	53.80	33.00	8.20	67.10	41.86	248.80	41.47	101,933,607.66
Prepared meals and drinks - in restaurants, cafes, pubs, clubs etc.	14.97	30.19	24.00	7.00	31.70	24.23	132.08	22.01	54,114,367.58
Other Shopping - e.g. souvenirs, other food and groceries, films/processing, camping gear, sunscreen etc.	17.88	18.83	19.00	4.10	28.40	15.36	103.57	17.26	42,431,403.61
Own vehicle costs - e.g. Petrol/diesel, oil, repairs, etc.	8.02	10.46	9.00	4.20	4.00	9.94	45.62	7.60	18,690,810.31
Transport fares, car rentals.	0.35	1.05	2.00	1.00	8.00	22.70	35.10	5.85	14,382,293.81
Guided tour costs - (excluding Department of Environment & Heritage or NSW Parks & Wildlife Service tours)	0.85	6.50	1.00	-	36.00	11.68	56.03	9.34	22,955,440.28
Entertainment – e.g. Cinema, theatre, shows, fun parks, museums, other entertainment venues.	3.26	3.81	3.00	-	9.70	11.70	31.48	5.25	12,896,813.49
Other (please specify).	1.06	2.17	-	0.60	5.10	-	8.93	1.49	3,659,100.76
<b>TOTAL</b>	<b>91.25</b>	<b>126.80</b>	<b>91.00</b>	<b>25.10</b>	<b>190.00</b>	<b>137.47</b>	<b>661.62</b>	<b>110.27</b>	<b>271,063,837.49</b>



## 8 APPENDIX 2 INDUSTRY CLASSIFICATION USED IN REGIONAL INPUT-OUTPUT TABLES (SEE SECTION 3 OF THE REPORT)

### 106 Sector Classification

Sector Aggregation	106 IO Sectors
Sheep	Sheep for meat and wool
Grains	Grains inc. cereals, oilseeds, legumes
Beef Cattle	Beef cattle
Dairy Cattle	Dairy cattle
Pigs	Pigs
Poultry	Poultry for meat and eggs
Other Agriculture	Other agriculture, inc. nurseries, vegetables, fruit, cotton, tobacco, sugar cane, herbs, hay, goats, horses, deer, beekeeping, pet breeding.
Services to agriculture	Cotton ginning, shearing and wool classing, aerial ag services, contract harvesting, seed grading, land clearing; hunting
Forestry	Forestry and logging
Fishing	Commercial fishing and aquaculture
Mining	Coal; oil and gas
	Iron ores
	Non-ferrous metal ores
	Other mining inc. construction materials
	Services to mining inc. exploration
Food Mfg	Meat and meat products
	Dairy products
	Fruit and vegetable products
	Oils and fats
	Flour and cereal foods
	Bakery products
	Confectionery
	Other food products inc sugar, seafood, animal/bird feed, spices, herbs, savoury snacks, tea, honey - blended etc.
	Soft drinks, cordials, syrups
	Beer and malt
	Wine and spirits
	Tobacco products
	Textile Mfg
Textile products inc. blinds, awnings, curtains, sails, tents, carpets, rugs, ropes, nets, string, cord, bags, sacks etc.	
Knitting mill products	
Clothing	
Footwear	
Leather and leather products	
Wood Mfg	Sawmill products inc sawn timber, woodchips, dressed timber, plywood, veneer, fabricated boards
	Other wood products inc. structural components - windows, doors, trusses, frames, containers, pallets, cases, log preservation.
Printing/Publishing	Pulp, paper and paper-board
	Paper bags and products
	Printing; services to printing
	Publishing; recorded media etc
Chemical Mfg	Petroleum and coal products
	Basic chemicals inc. fertilisers, industrial gas/chemicals, synthetic resins, dyes, acid, salt, urea, fluoride, chlorine etc.
	Paints
	Pharmaceuticals etc inc. drugs, medicines, medicinal preparations
	Soap and detergents
	Cosmetics and toiletries

<b>Sector Aggregation</b>	<b>106 IO Sectors</b>
	Other chemical products inc. explosives, ink, glue, polish, cleaners
	Rubber products
	Plastic products
Mineral Mfg	Glass and glass products
	Ceramic products
	Cement, lime and concrete slurry
	Plaster; other concrete products
	Non-metallic mineral. products nec inc. abrasives, chalk, stone products, insulation materials, ag/hydrated/quick lime,
Metal Mfg	Iron and steel rolling, galvanising, casting, forging, pipes and tubes
	Basic non-ferrous metals inc alumina, aluminium, copper, silver, lead, zinc, gold, bronze, nickel, tin – smelting, refining, rolling, drawing, extruding, casting, forging
	Structural metal products inc girders, reo-mesh, architectural products, doors, gates, windows etc
	Sheet metal products inc. containers, guttering, downpipes, tanks
	Fabricated metal products inc. tools, general hardware, springs, wire, nails, nuts, bolts, screws, rivets, metal coating, non-ferrous pipe fittings, miscellaneous metal products
Mach/Equip Mfg	Motor vehicles and parts etc
	Ships and boats
	Railway equipment
	Aircraft
	Scientific etc equipment inc photographic, optical, medical, surgical
	Electronic equipment inc. computer, telecommunication, radio, TV
	Household appliances
	Other electrical equipment inc. cable, wire, batteries, lights, signs, fuses, electric motors, generators, welding equip. etc
	Agricultural, mining, construction machinery inc lifting/handling
	Other machinery and equipment inc. food processing, machine tool/part, pumps/compressors, commercial heating/cooling equip.
Other Mfg	Prefabricated buildings
	Sheet metal, wooden and upholstered furniture, mattresses, pillows, cushions (not rubber)
	Other manufacturing inc jewellery, toy, sporting goods, brushes, miscellaneous goods
Utilities	Electricity generation, distribution and supply
	Gas distribution and town gas mfg/dist. Via mains
	Water supply, sewerage and drainage services
Residential Building	Residential building
Other Construction	Non-residential building, Non-building construction inc. road/bridge, earthmoving, irrigation, mitigation
Wholesale Trade	Resale of new or used goods to business or institutional users.
Retail Trade	Resale of new or used goods to final consumers for personal or household consumption eg main-street establishments
Mechanical Repairs	Mechanical repairs
Other Repairs	Other repairs in. household equipment repairs etc
Accommodation Restaurants	Accommodation inc. hotels, motels, guest houses, youth hostels, student residences, camping grounds, caravan parks; cafes & restaurants; hospitality clubs, pubs, taverns and bars
Road Transport	Road freight and passenger transport
Rail Transport	Rail; pipeline; other inc. cable car, chair lift etc
Water Transport	International, coastal, inland water transport inc sea freight, cruise operation, boat charter, ferry.
Air Transport	Scheduled domestic and international air transport and non-scheduled air & space transport.
Transport Services	Services to road, water and air transport; travel agency, freight forwarding, customs agency; storage
Communication	Postal, courier, telecommunications
Banking	Reserve Bank; development, savings and trading banks

<b>Sector Aggregation</b>	<b>106 IO Sectors</b>
Non-bank Finance	Building societies, credit unions, money market dealers, deposit taking financiers, financial asset investors etc
Insurance	Insurance and services
	Services to finance and investment inc. brokers
Ownership of dwellings	Residential Property Operators
Property Services	Commercial property operators and developers, real estate agents, non-financial asset investors, machinery and equipment hiring and leasing
Technical, Computer Services	Scientific research, architectural, surveying, consultant engineering, other technical services, data processing, information storage and retrieval, computer maintenance and consultancy services.
Legal/Account/Mgt/Mkt'g	Legal, accounting, advertising, commercial art and display, market research, business administration and management services
Other business services	Employment placement, contract staff, secretarial, pest control, cleaning, packing, etc.
Public Administration	Federal, state, local government administration; justice
	Defence
Education	Education
Health	Hospitals, nursing homes, medical and health services; veterinary services
Community Care Services	Child care, accommodation for the aged, residential care services
Entertainment/Media	Motion picture, film and video, radio and television
Cultural	Libraries, museums, parks and gardens, arts
Sport, Gambling	Sport, gambling and other recreation services
Personal Services	Personal and household goods hiring; laundries, drycleaners; photographic studios and processing, funeral directors etc, gardening, hairdressing etc; private households employing staff
Other Services	Religious organisations; Interest groups - business and professional associations; Public order and safety

## 9 APPENDIX 3 SUMMARY INPUT-OUTPUT TABLES

### Summary data - Greater Shoalhaven region

SECTOR	Gross O/P (\$'000)	Value-added (\$'000)	Income (\$'000)	Employment (no.)	Exports (\$'000)	Imports (\$'000)
Sheep	99	54	50	3	44	5
Grains	69	40	40	2	39	8
Beef cattle	8,991	4,753	4,524	245	3,901	1,801
Dairy cattle	32,899	13,123	12,360	402	531	11,300
Pigs	172	78	69	6	0	21
Poultry	-	-	-	-	-	-
Other agriculture	7,143	3,897	3,828	206	725	1,517
Services to agric.; hunting	5,911	2,605	2,074	69	3,116	2,352
Forestry and logging	5,126	1,965	1,469	39	-	1,455
Commercial fishing	26,770	9,957	6,567	174	13,036	10,161
Coal; oil and gas	-	-	-	-	-	-
Iron ores	-	-	-	-	-	-
Non-ferrous metal ores	4,806	2,053	1,084	22	4,425	826
Other mining	5,807	2,830	2,472	83	1,047	1,568
Services to mining	4,261	1,749	568	11	1,179	200
Meat and meat products	6,206	1,218	443	22	2,088	1,209
Dairy products	82,444	17,933	3,761	136	37,048	16,038
Fruit and vegetable products	1,353	341	102	4	176	509
Oils and fats	-	-	-	-	-	-
Flour and cereal foods	138,512	37,876	4,437	200	106,389	62,732
Bakery products	10,217	3,728	1,607	71	629	2,544
Confectionery	5,095	1,449	392	17	975	1,871
Other food products	13,793	2,992	1,025	39	3,612	5,905
Soft drinks, cordials, syrups	-	-	-	-	-	-
Beer and malt	5,114	1,821	248	7	718	1,679
Wine and spirits	7,661	2,203	271	13	2,298	3,571
Tobacco products	-	-	-	-	-	-
Textile fibres, yarns etc	3,921	715	343	9	1,733	2,297
Textile products	9,652	2,192	1,923	59	1,109	5,008
Knitting mill products	-	-	-	-	-	-
Clothing	8,249	1,620	1,541	58	967	4,350
Footwear	-	-	-	-	-	-
Leather and leather products	1,473	164	61	7	1,095	797
Sawmill products	29,174	10,635	3,387	95	5,765	9,132
Other wood products	61,914	20,234	8,381	307	27,944	16,784
Pulp, paper and paperboard	234,567	47,185	15,279	267	226,325	146,886
Paper bags and products	-	-	-	-	-	-
Printing; services to printing	18,830	7,121	4,672	151	420	3,346
Publishing; recorded media etc	46,464	19,250	7,395	220	3,363	11,094
Petroleum and coal products	22,324	2,484	305	7	9,712	17,154
Basic chemicals	20,564	3,169	1,365	32	4,257	11,482
Paints	2,316	825	478	15	118	673
Pharmaceuticals etc	7,571	1,321	344	9	2,612	2,929
Soap and detergents	5,330	1,162	-	17	492	2,799
Cosmetics and toiletries	-	-	-	-	-	-
Other chemical products	40,727	8,943	2,426	67	25,586	21,520
Rubber products	66,222	13,777	4,119	156	45,964	40,979
Plastic products	10,873	3,039	1,452	53	595	3,835
Glass and glass products	10,538	3,235	2,311	45	4,971	4,411
Ceramic products	15,605	5,234	2,705	60	1,080	7,203
Cement, lime and concrete slurry	32,145	9,081	3,282	75	8,557	8,947
Plaster; other concrete products	13,045	5,198	1,754	39	2,663	1,695
Non-metallic min. products nec	5,273	1,596	708	16	591	1,767
Iron and steel	60,056	16,146	6,136	122	28,535	19,930
Basic non-ferrous metals etc	27,612	6,224	2,243	43	16,976	9,945

Greater Shoalhaven region (contd.)

## Greater Shoalhaven region (contd.)

SECTOR	Gross O/P (\$'000)	Value-added (\$'000)	Income (\$'000)	Employment (no.)	Exports (\$'000)	Imports (\$'000)
Structural metal products	44,077	14,705	7,519	196	9,159	11,433
Sheet metal products	2,477	816	461	14	103	297
Fabricated metal products	17,458	5,363	4,018	96	1,245	5,390
Motor vehicles and parts etc	36,546	6,603	3,356	91	4,650	17,404
Ships and boats	13,936	3,631	294	108	5,992	6,763
Railway equipment	-	-	-	-	-	-
Aircraft	33,871	8,010	6,712	142	24,456	20,602
Scientific etc equipment	3,280	445	408	21	1,567	2,439
Electronic equipment	15,949	1,900	927	28	3,658	12,103
Household appliances	7,097	1,053	696	19	354	3,296
Other electrical equipment	3,337	712	481	15	614	1,546
Agricultural, mining etc machin	19,284	3,233	2,782	62	5,363	10,173
Other machinery and equipmer	10,645	1,839	1,169	38	3,256	6,593
Prefabricated buildings	4,579	1,667	414	16	2,875	844
Furniture	11,934	3,820	3,056	169	293	2,886
Other manufacturing	7,364	1,169	1,142	85	2,459	5,508
Electricity	21,178	12,325	6,754	137	-	6,032
Gas	3,912	2,318	616	12	-	365
Water, sewerage and drainage	52,570	30,438	4,887	135	851	10,502
Residential building	308,275	133,760	95,879	3,586	-	48,655
Other construction	113,817	57,749	36,630	1,067	-	12,809
Wholesale trade	217,052	89,379	39,168	1,369	8,338	22,003
Retail trade	401,623	194,313	152,076	8,172	46,310	93,056
Mechanical repairs	59,395	40,579	23,245	963	1,933	11,373
Other repairs	13,664	9,056	2,931	142	-	1,642
Accommodation, cafes & resta	299,644	124,678	57,472	3,267	21,041	98,873
Road transport	126,198	58,697	32,605	1,064	2,028	24,240
Rail, pipeline, other transport	13,676	6,990	3,740	87	1,793	2,169
Water transport	7,270	1,668	1,539	36	1,869	2,088
Air and space transport	32,918	10,141	2,566	100	-	9,620
Services to transport; storage	46,627	30,811	5,732	181	4,574	3,310
Communication services	83,318	49,007	15,632	439	-	12,394
Banking	46,301	29,423	13,060	378	-	4,610
Non-bank finance	15,205	5,997	4,128	120	-	1,855
Insurance	31,483	19,135	6,522	173	-	4,928
Services to finance etc	18,197	16,056	5,089	149	-	288
Ownership of dwellings	532,090	456,428	-	-	0	24,413
Other property services	260,152	97,049	16,860	732	32,927	40,627
Scientific research etc	61,653	36,865	20,833	600	1,546	7,584
Legal, accounting etc services	140,780	78,224	29,339	1,025	2,195	18,019
Other business services	95,109	31,975	19,979	1,096	-	23,598
Government administration	183,355	102,425	65,585	1,624	-	30,636
Defence	206,672	104,010	58,285	1,529	2,318	55,889
Education	217,130	187,821	116,501	3,742	-	15,632
Health services	205,295	166,856	120,621	3,605	-	19,892
Community services	72,770	32,202	22,642	1,280	-	17,769
Motion picture, radio etc	14,040	6,305	2,665	92	933	3,273
Libraries, museums, arts	23,943	15,983	9,550	324	573	3,800
Sport, gambling etc	63,993	28,141	12,698	566	2,531	17,134
Personal services	52,889	30,203	21,629	1,070	728	11,673
Other services	61,561	46,863	23,598	684	-	6,053
Household Expenditure		478,340				1,030,052
Capital Expenditure		41,699				277,991
TOTAL	5,462,483	3,222,091	1,204,492	44,346	801,936	2,564,359

## **10 APPENDIX 4 STUDIES OF THE ECONOMIC IMPACT / VALUE OF PROTECTED AREAS ON THE NSW SOUTH COAST**

### Regional Economic Impact Assessments

- Minnamurra Rainforest Centre Buderoo National Park (NPWS - 1995)
- Fitzroy Falls Visitor Centre (Gillespie Economics - 2003)
- Murramarang National Park (Drozdzewski et al; [UNSW post graduate student thesis] - 1999)
- Montague Island Nature Reserve (NPWS - 1999)

### Travel cost studies

- Fitzroy Falls Visitor Centre (Laura Allen [UNE student thesis] - 2004)
- Minnamurra Rainforest Centre (NPWS - 1995)
- Booderee National Park (Shellie Davis [Economic Value of Recreation: a case study of Booderee National Park Jervis Bay Territory]. Thesis for B.Res. Economics Univ of Sydney - 2003)
- Jervis Bay Marine Park (NPWS Survey - 2004, unpublished)
- Eurobodalla National Park (Lockwood and Lindberg - 1996)
- Tourism and Recreation in the Eden CRA Region (Gillespie Economics - 1997)
- Montague Island Nature Reserve (NPWS - 2002)