

Social and Economic Studies in the Angahook-Otway Study Area

Stage 3

Prepared for

Victorian Environmental Assessment Council

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URS

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People who made submissions to the VEAC assisted the consultants' work but are too numerous to mention individually in this report. We were able to interview only a small proportion of those who thought that they may be impacted by VEAC's proposals and recommendations.

We apologise to anyone that we have missed, and take responsibility for any remaining errors and omissions in the report.

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1 Stages and Tasks of the Socio-Economic Studies

There were three stages to the Angahook-Otway socio-economic studies.

Stage 1: Baseline study – assembled and synthesised baseline data on the Angahook-Otway economy and social setting.

Stage 2: Assessment of VEAC Draft Proposals – assessed the effects of proposals in VEAC’s Draft Proposals Paper on economic and social components of the Angahook-Otway study area

Stage 3: Assessment of VEAC Final Report Recommendations – assess draft recommendations under consideration for the Final Report.

The study tasks for Stage 3 ‘Assessment of VEAC draft Final Recommendations’ included:

1. Identify and, as far as possible, evaluate the social benefits and costs that could arise as a result of implementation of Council's draft recommendations. These benefits and costs are to include non-market values, and are to be distinguished from anticipated changes that are unrelated to the recommendations, in particular the Government’s decision to phase out timber harvesting by 2008.
2. Allocate the estimated social and economic benefits and costs of the draft recommendations to each industry or land use sector, and outline any assumptions made.
3. Estimate the likely social effects in terms of employment gain or loss, at the regional and State levels, and other community effects, and outline possible measures to mitigate negative effects.

2 Approach

Areas proposed to be subject to draft recommendations were identified by VEAC, to enable the Stage 3 social and economic assessment, building on the baseline information collected in Stage 1, and the Stage 2 social and economic assessment of the draft proposals. VEAC papers detailed the structure and basis for the draft recommendations, and indicated the range of implications expected.

VEAC also provided advice as to the practical implications of the draft recommendations, for economic appraisal by the consultants.

Social benefit-cost analysis was used for the economic analysis. Only those benefits and costs attributable to changes to existing uses and activities which result from the Council’s draft recommendations were assessed and included.

Some of the benefits and costs were not readily assessed in monetary terms, but every effort was made to do so. Where this was not possible, non-monetary or intangible benefits and costs were quantified where possible, or are at least scaled, ranked or described.

In the social effects assessment, the consultants built on the baseline study (Stage 1) to predict and describe likely effects; to identify communities or social groups who may benefit, or for whom there may be particular employment or ‘quality of life’ effects arising from the draft recommendations; to highlight locations or communities that would be substantially affected; and to advise on relevant measures that could be applied to mitigate any adverse effects.

The 1800 submissions received in the four public consultation periods, and VEAC’s analysis of them, were available to assist with Stage 3 of the project.

2.1 Estimating the economic contribution of parks

Change in net economic value

Benefit Cost-Analysis (or Social Benefit-Cost Analysis) is the methodology most commonly used for estimating the net public benefits of investing in community assets such as parks.

The appropriate measure of the benefit of parks to the Victorian community is termed the *net economic value* and represents the satisfaction people derive from visiting parks, expressed as a money value over and above what they actually pay to visit parks.

The net economic value of tourism and recreation is a prime focus of the study because the value of tourism and recreation is what brings visitors to parks where they contribute to the local and regional economies.

Contingent valuation and choice modelling surveys, and travel cost methods are applicable for estimating the net economic contribution of parks, and these methods are described in our main report.

Regional economic activity

The economic activity generated by the spending of visitors in the local area and in the region is the other main focus of the study. From the viewpoint of the State such spending is not regarded as a benefit of parks (in the context of benefit-cost analysis) because it could occur if the investment was made elsewhere in the State. From the viewpoint of the local area, however, the economic activity created by parks is an important consideration.

Recreational use of parks provides direct economic benefits to the region from recreational and tourism expenditure, and flow on or multiplier effects as that expenditure works its way back through the suppliers of the goods and services that the tourists consume. As a general rule, the greater the local content of goods and services sold, or alternatively the larger the region within which economic effects are studied, the bigger the multiplier effects will be for a given amount of direct expenditure.

Changes in the level of economic activity of one sector or region of the economy will affect activity levels in other sectors and regions. Multipliers are a means of relating the effects of direct changes in one sector, to the indirect and induced effects felt elsewhere in the economy. 'Input-output analysis' is the analytical technique that is commonly used to derive those multipliers.

Deriving input-output multipliers specifically for the Otway Ranges parks would require detailed regional modelling which was outside the scope of this study and was not justified due to the relatively small negative impacts on local industries. Instead we approximated the multipliers that might apply at the regional level by adapting the results of other work.

3 Biodiversity Values

Biodiversity values in economic terms are the dollar values that well-informed respondents to surveys would be willing to pay in order to achieve additional protection of biodiversity. In the case of the Otway Ranges National Park respondents to a willingness to pay survey would be informed, as follows.

- A. That the parks and reserves will protect a large range of values encompassing almost all significant values; that they are of adequate size to actually protect the values they are intended to protect, and across the range of environments in which the values are found. That is, essentially, that they meet the nationally-agreed criteria for a Comprehensive, Adequate and Representative (CAR) reserve system for biodiversity conservation.

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- B. That the parks and reserves are genuine parks and reserves, especially that the national park has large contiguous, essentially natural areas, covering and linking a range of landscapes and land and habitat types; that it is well managed and provides adequate, long term protection of these attributes; and that it is not compromised or threatened by over-development or large degraded areas.
- C. That the parks and reserves have many of the best examples of the features that people associate with national parks and the Otways – wet forests, rainforests, waterfalls, historic sites, Aboriginal heritage, wild places and beaches, landscape-scale scenery (eg. the whole coastal fall, whole catchments, the main Otways ridge and the Otways coastline).

The extent and scale of these improvements to biodiversity protection would of course affect the amounts that respondents would be willing to pay to gain access to them – whether through use or non-use attributes. In practice, the changes from the existing situation would need to be significant in order to elicit significant payments.

It is not likely that responses would be very sensitive to the differences in biodiversity protection recommended by VEAC between the Stage 2 (Draft Proposals Paper) and Stage 3 (Final Report) studies. While this does not imply that they have no value, we have not attempted to quantify them.

Willingness to pay for biodiversity restoration and protection in forests in the studies listed in our main report has ranged from \$5 (for revegetation of farmland) to \$100 per household per year, with a ‘modal’ value of approximately \$35. The response rate for surveys used to elicit these values are up to 60 percent. If we take the conservative view that the 40 percent who didn’t respond attached zero value to conserving biodiversity, the modal value becomes \$20 per household per year.

In the case of expanding the area of national park in the Otway Ranges, the *increase* in value will be some proportion of the assumed total value. The VEAC recommendations increase the area of national park in the study area approximately eight-fold, with a doubling in the area of Ecological Vegetation Classes (EVCs) protected in CAR reserves.

If people are willing to pay \$20 per household per year for a CAR system of permanent reserves, and the VEAC recommendations are responsible for half of that system (that is, through doubling the existing extent of protected EVCs), then the added non-use value that can be attributed to the expansion of the permanent reserve system is \$10 per Victorian household per year. The ABS 2001 Census shows 1.73 million households in the State. Total annual value is therefore \$17.3 m.

Given the level of uncertainty that surrounds estimates of biodiversity values, in the benefit-cost analysis we adopt a range of assumptions corresponding to pessimistic, conservative and optimistic scenarios.

For the purposes of the benefit-cost analysis, non-use values for biodiversity protection in the expanded national park are assumed to be \$5m per annum for the pessimistic case, \$15m per annum for the conservative case, and \$25m per annum for the optimistic case. These figures correspond to annual per household figures of about \$3, \$9, and \$15, respectively. They are higher than the values assumed in the assessment of the Environment Conservation Council's Box-Ironbark recommendations (\$0.75, \$1.50, \$3,) but can be justified by the nature of the two study areas concerned. People appear to be more willing to pay to protect mountain ash forests and rainforests than forests in low rainfall areas.

We make the additional assumption that there will be no increase in the value associated with biodiversity protection in the proposed new forest park as a result of VEAC recommendations, compared with those that applied to state forests. There may be some increase associated with the

forest park compared to state forest, but primarily this will result from the cessation of timber harvesting in 2008 by Government decision, not as a result of VEAC recommendations.

3.1 Additional park management costs

DSE will have administrative responsibility for managing recreation on public land recommended to be included in the new parks. Although the total area of public land to be managed will not increase at all under VEAC's recommendations, national parks in particular generally have higher management costs with respect to visitors because of the higher level of facilities and promotion associated with national parks compared with state forest. Also, it was evident from submissions that there is widespread community support for the view that public land management is currently poorly resourced and should be improved. As a package, VEAC's recommendations should make a substantial commitment to realising this improvement.

In the most recent example of management cost estimates (for the ECC Box-Ironbark recommendations), Parks Victoria supplied an estimate of the unit costs of their role in managing additional areas of parks and NRE (now DPI/DSE) provided an estimate of its unit costs for management of recreation in state forests.

- NRE estimated that it expended annually, on average, \$0.50 per visitor.
- Parks Victoria estimated that it expended annually, on average, \$0.61 per additional visitor and \$0.83 per additional hectare of park.

In this example, the results of the benefit cost analysis were additional park management costs of \$400,000 per year. This was over and above the costs of the NRE employees that were involved in managing, regulating and administering these public land areas for timber harvesting, roading, fire protection, pest plant and animal control, recreation, and various other uses. Responsibilities for fire protection, management of pest plants and animals, and researching ecological management, are standard costs of managing public land, regardless of who is the managing authority, hence those costs should not be affected.

In the end, the government invested considerably more than this amount in implementing and managing the Box-Ironbark public lands (see below). In addition, our review of submissions and discussions with stakeholders since the Stage 2 project has identified several additional aspects to improving public land management (and especially park management), particularly in relation to improving tourism yield and attracting visitors to the Otways hinterland.

Accordingly, in the case of the Otways recommendations we assume that the net additional management costs will be in the order of \$2m per year (double our Stage 2 estimate, in response to the factors cited in the previous paragraph). The new national park will also require a capital injection in order to raise the standards of services in the park to those required by its new status. The level of funding required will depend on the level of services the Government wishes to provide, but our overall analysis (as summarised below) assumes sufficient investment to adequately protect the parks values and to attract more tourists, particularly to the hinterland. Up to a point at least, additional investment in visitor services and infrastructure is likely to be recouped in additional visitor expenditure.

Several people submitted the view to VEAC that the existing parks in the Otways were already under-resourced and that adding to the area of parks would only exacerbate this problem. The most recent example of park implementation contradicts this assertion, as funding allocated to implementing the Box-Ironbark parks and reserves (and other recommendations) was \$20.8m over four years. This amount included financial assistance to those that were directly disadvantaged by the establishment of the parks, and a range of other programs for park management, recreation and firewood supply. Our

main report provides further details on this example, and also details expenditure on park management by DSE/NRE and PV over the past eight years. Expenditure on park management has trended upwards over this period, even in real terms (ie. net of inflationary increases), showing an increase of about 75 percent over the period. These figures include a component of the \$20.8m referred to above.

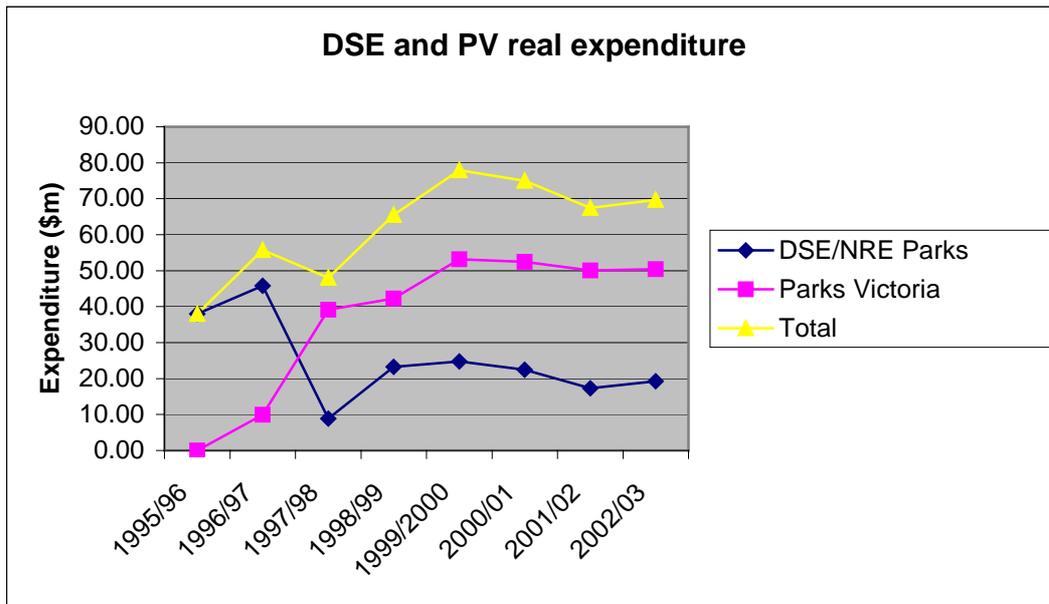


Figure 1 DSE and PV real expenditure on park management

(Source: National Parks Act Annual Reports)

- Notes:
1. National Parks Act funding varies from year to year according to whether it includes capital asset charges or one-off funding (for example for fire fighting or roading), and whether any funds have been carried over from the previous year. The parks estate also grew during this period, primarily with the addition of the Marine National Parks and sanctuaries, and Box-Ironbark parks.
 2. Parks Victoria expenditure above excludes all metropolitan park costs, but includes expenditure on numerous other areas managed by Parks Victoria.

4 Tourism and Recreation

The study area is located in the *Great Ocean Road Tourism Product Region (GOR)* as defined by Tourism Victoria. This is an extensive region which covers ten municipalities and extends from Geelong to Nelson on the South Australian border. This region has experienced considerable growth in tourism in the past few years. Significantly, the GOR region attracts the highest share of visitors outside metropolitan Melbourne according to Tourism Victoria, and the region has become an icon in the marketing of Victoria as a tourism destination.

In 2000, the GOR region attracted an estimated nine million visitors and this comprised 66% domestic day trip visits, 30% domestic overnight stays, and 4% international visitors.

4.1 Tourism and recreation activities on public land

The study area offers a combination of natural and developed tourism attractions for visitors. Public land in the region provides the basis for a diverse range of recreation activities including bushwalking, picnicking, fishing, surfing, diving, forest drives, camping and four-wheel driving. The coastal environment includes shipwreck sites and high sea cliffs.

Visiting national parks and state forests, along with bushwalking, were included among the ten most popular visitor activities in the West RFA region.

The Otway Ranges are the setting for many visits by tourists:

- many of the cultural heritage attractions of the area are located in forest reserves;
- people visiting friends and relatives may use the local forests for recreational activities;
- tourist drives travel through Otway Ranges landscapes; and
- forest scenery provides the setting for historic towns.

Most recreation and tourism activities will continue to be permitted activities in the national and forest parks recommended by VEAC, although it should be noted some have been or will be subject to conditions or restrictions such as some activities not currently permitted in closed catchments. Some activities will be only allowed in certain areas or under defined circumstances.

The contribution of the proposed parks to tourism in the region is likely to be significant. Parks Victoria is currently undertaking a 'Levels of Service Program' which inventories and compares the services offered by parks in the state. With appropriate government support, the existing Otways National Park could rise from a Level C or D park, to Level A (as the Otway Ranges National Park) – giving it the same ranking as the Grampians and Wilsons Promontory National Parks. This elevated status would clearly have significant implications for the added value of tourism, subject to the caveats that we discuss elsewhere with respect to possible congestion problems and the attractiveness of hinterland sections of the parks.

4.2 Estimated numbers of visitors to parks in the study area

There is some evidence that visitation has been increasing for the Angahook-Lorne State Park but decreasing for the Otway National Park. Visitor numbers are dependent on weather and the activities permitted in parks, among other things. However, there is a perception among some Parks Victoria staff that people are shifting their interests from outdoor activities in parks to other sources of recreation.

There were approximately one million visitors each year to parks in the study area during the period 1997/98 to 2000/2001.

These visitors comprise:

- **visitors** from the local area who use the public lands for recreation — estimated at approximately 350,000 visit days per year; and
- **tourists** — estimated at approximately 650,000 visit days per year.

These estimates are based on the proportion of local visitors (35 percent) versus tourists (65 percent) in the most recent comparable study.

We have adopted a definition used by Tourism Victoria which describes a tourist as someone who has travelled more than 50 km for a day-trip or overnight stay.

The visitor figures from Parks Victoria may be based on vehicle counts at the entry to parks, or sample head counts by staff at irregular intervals, and are therefore not rigorously based.

4.3 Economic valuation of recreation and tourism

The unit values for the net economic contribution for visitors to parks and reserves are based mainly on another consultancy undertaken for NRE (Read Sturgess & Associates 1999). That consultancy developed a generalised travel-cost model for the repeatable measurement of the economic value of recreation in parks. Valuations of recreational use were undertaken for approximately 30 metropolitan parks in Melbourne and 35 national parks in rural Victoria.

It included consideration of the following parks of relevance to VEAC's recommendations: the Otway National Park; the Angahook-Lorne State Park; the Melba Gully State Park; and the Carlisle State Park.

Three of the parks in the study area are in the top twelve parks in the State in terms of their economic contribution, measured as 'consumer surplus' (refer to the main report). Carlisle State Park is the only park in the study area that has relatively little economic impact – largely due to low visitor numbers.

In the period since the Read Sturgess & Associates study was completed (1997/98), visitor numbers for Angahook-Lorne State Park appear to have increased, while those for Carlisle State Park, Melba Gully State Park and Otway National Park appear to have decreased.

The existing Otway National Park attracts consumer surpluses of approximately \$36 per visitor day while the state parks range from \$10 to \$20 per visitor day.

Based on the figures from the Read Sturgess & Associates study, we assume unit values of \$30 per visitor day for national parks in the area; and \$15 per day for state parks, state forests, and forest parks.

There appear to be few reliable visitor data for state forests in the study area. A 1995 Read Sturgess & Associates study estimated that there were approximately 55,000 visitors to state forests in the Otway Forest Management Area in 1994-95, consisting of 24,000 day visitors, 15,000 campers and 16,000 'disperse' uses. However, these figures may be underestimates.

We assume no change in the visitation to the state forest areas that VEAC proposes to be included in Forest Park.

By applying the above unit values to the estimates of present visitation at each park, it was estimated that the net economic surplus due to the *existing* level of recreation and tourism at sites affected by VEAC's recommendations would be approximately \$25m per year.

A change in status from state forest to forest park, or from state park to national park, is likely to increase visitation in most instances. The precise scale of change cannot be predicted with certainty, since this depends on a variety of factors including:

- accessibility to major markets
- nature of the scenic resource

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- presence of key attractors (including well-known natural or cultural heritage attractions)
 - potential activities available for visitors
 - existing level of investment in surrounding tourist facilities
 - expenditure by park managers on facilities and promotion

The likely increase in visitation, based on two previous cases where land has changed designation from state forest to national park, is an increase of 30 percent in visitation following designation as a national park. This assumption is important to the benefit-cost analysis and to the analysis of regional economic activity.

From a State-wide perspective, increasing visitor numbers for expanded Otway Ranges parks may be at the expense of visitation to other parks in the State. It is also debatable whether all of the increases noted should be attributed to the nature of the parks. For example, it may not be necessary to increase the area of the national park to the extent proposed as many of the additional tourists may go no further than the existing boundaries of the Angahook-Lorne State Park (this is not to suggest that reducing the proposed size of the national park would be desirable as the biodiversity benefits would be diminished). For these reasons we discount the increases to 10 percent for the pessimistic case, and 20 percent for the conservative case, while setting the optimistic case at 30 percent.

We make the conservative assumption that the above increases apply to visitors to the expanded national park and not to the establishment of forest parks.

As a result of these analyses, (10, 20 or 30 percent increases in current visitor numbers multiplied by \$30 per day for every extra visitor) the increases in net economic values for tourism that potentially arise as a result of VEAC's recommendations for the national park are estimated to be approximately \$2.4m per year in the pessimistic case, \$4.8m per year in the conservative case, and \$7.2m per year in the optimistic case. These figures are unchanged from the Stage 2 report as they are unlikely to be sensitive to the changes made by VEAC between the Draft Proposals Paper and the Final Report.

4.4 Regional economic activity: expenditure and employment

Tourism expenditure represents income for the study area. Direct expenditure on tourism to the public lands of the study area generates upstream and downstream jobs in other parts of the local and Victorian economy. In this case, a significant proportion of these indirect jobs is likely to be in the main towns of the study area — for example in retailing, wholesaling and distribution.

It is assumed that the average expenditure by *local visitors* on their recreation on public land is spent mainly on food and transport, and is equivalent to the food expenditure of tourists in the Victorian Regional Travel and Tourism Survey (approximately \$10 per person). We earlier estimated that there were approximately 350,000 local visit days to existing parks in the study area. Local expenditure on recreation in public lands in the study area is therefore approximately \$3.5 million per year (not including visits to state forests).

The expenditure by visitors to public land is estimated as follows:

- Nearby residents account for 35 percent of all visitors to public land, with an average expenditure of approximately \$10 per person per day.
- Tourists (ie., those travelling more than 50 km) account for 65 percent of all visitors to public land, with an average expenditure of \$36 per person per day.

The contribution of the existing 650,000 *tourists* to the regional economy is estimated to be approximately \$23.4 million. It is estimated that each \$100,000 in expenditure on tourism and recreation would support one full-time job equivalent. The expenditure by tourists would therefore lead to the employment of about 234 people. The expenditure by local visitors would support an additional 35 jobs.

The balance of visitation between local visitors and tourists will vary depending on the park in question.

The total contribution of tourism and recreation, in terms of expenditure, is therefore currently about \$27 million per year, employing approximately 270 people.

In the *optimistic* case (30 percent increase in visitation), *additional* expenditure is estimated to be approximately \$6.5 million per year. The additional total expenditure would therefore support approximately 65 additional jobs, located mainly throughout the study area, but also at service outlets along the highway between Melbourne and the study area.

In the *conservative* case, additional expenditure is estimated to be approximately \$4.3m, supporting an additional 43 jobs.

In the *pessimistic* case, additional expenditure is estimated to be approximately \$2.1m, supporting an additional 21 jobs.

The additional expenditure from tourism would be expended mainly in the towns where commercial facilities are able to cater for visitors. The towns likely to benefit most from the increase in visitation are the coastal towns of Anglesea, Aireys Inlet, Lorne, and Apollo Bay. The inland city of Colac should also benefit.

Smaller inland and coastal towns would only benefit significantly if additional attractions and visitor facilities were located near them. The DSE Otway hinterland proposal to establish tourist nodes and zones in inland areas is consistent with attracting a greater share of visitor expenditure to these areas.

There is a strong case for upgrading infrastructure in the hinterland of the study area in order to ameliorate the adverse congestion effects of increased tourism along the coastal fringe. This would also have the effect of redistributing benefits to inland towns.

Various regional strategies point to the need to increase the number of overnight visitors while decreasing the number of day trips to ease congestion, particularly on the Great Ocean Road.

Geelong Otway Tourism in its submission to the VEAC Draft Proposals Paper claims that these strategies are already working and provides the following data for the region:

- the number of *day trips* to the Geelong Otway Tourism region is *declining*. The number of day trips has decreased from 4.68 million in 1998 to 3.38 million in 2002 – an average decrease of 4.5 percent per year;
- the number of *domestic overnight trips* to the region is *increasing*. The number of domestic overnight trips has increased from 1.97 million in 1998 to 2.15 million in 2002, almost a 2 percent increase per year; and
- the number of *international visitors* to the region is *increasing*. The number of international visitors has increased from 73,000 visitors in 1998 to 83,000 in 2002, an average annual increase of 2.7 percent.

Our estimates of additional tourism values provided by the expanded parks do not distinguish between coastal and hinterland effects, or allow for the costs of congestion. Rather, we assume that the VEAC recommendations for the new parks should be seen in the light of other strategies being developed for the region – such as that for the Great Ocean Road Region (DSE 2004). These strategies point to the need to attract tourists to hinterland areas through improved infrastructure – including roads, accommodation and dining facilities, and through additional attractions such as the Otway Fly. The development of appropriate visitor facilities within parks which include information and dining services should also be investigated – at least for the hinterland sections of the forest park.

4.5 Industry trends

Tourism as a whole is an industry which is forecast to grow strongly throughout Australia. In 1997, growth in the number of international visitors to Victoria was forecast by Tourism Victoria to be 9 percent per year, although these forecasts were revised downwards following the economic downturn in Asia, and more recent terrorism-related events. The Tourism Forecasting Council forecasts that total domestic nights are expected to grow at an annual rate of about 2 percent during the period 2001-2012. Day visitors to the Great Ocean Road Region increased by about 5 percent per annum over the period 1998-2000.

An Arup (2002) study estimated that over the next 8 years, growth rates in traffic (including industry and tourism) in the study area are likely to be:

- Great Ocean Road – 4 percent per annum
- Princes Highway West (Geelong to Colac) – 3.5 percent per annum
- Princes Highway West (Colac to Warrnambool) – 2.5 percent per annum

Small towns that are highly reliant on broadacre farming for their economic survival are most likely to be in decline. An ABARE (2000) report shows that the demand for farm services has not kept pace with the growth in other services such as tourism and hospitality and in remote areas, employment in agriculture, forestry and fishing fell by 15 percent between 1986 and 1996. In contrast, employment in accommodation, cafes and restaurants rose by 40 percent and by 56 percent in cultural and recreational services over the same period.

Real growth in visitor numbers to the study area will depend on the development of new attractions and better marketing of existing tourism products. The various tourism development plans for the regions comprising the study area suggest the development of a variety of new tourism attractions.

While it is important to avoid over-estimating potential visitor numbers and tourism benefits from VEAC recommendations, it is also important not to under-estimate them. Tourism numbers will be subject to fluctuations from year to year but the underlying forces leading to increased tourism include shifts in consumer preferences from consumption of primary commodities to participation in nature-based activities as disposable incomes rise.

5 Timber Harvesting and Related Activities

It is Government policy to phase out logging and woodchipping in the Otways by 2008 and the implications of this policy are outside the scope of this study. Our role is to assess the effects of the VEAC recommendations with the impacts of existing government policy appearing in the base case for the benefit-cost and social impact analysis.

Several submissions to the Draft Proposals Paper maintained the criticisms of earlier submission periods, namely that our study should include assessments of all the economic, environmental and social impacts of both the government's decision to phase out logging in the Otways, and the impacts of VEAC's recommendations. Some also suggested that we should have undertaken a regional input/output analysis to quantify the income and employment effects of the phasing out of logging.

We agree in principle that it is normally preferable for public policy proposals to be assessed against economic, environmental and social criteria before being implemented by government. In practice it is frequently the case that other considerations override this course of action. To our knowledge there has been no such assessment of the phasing out of logging and woodchipping. The brief and budget for the present study did not cover this issue. Therefore our study does not assess all the economic, environmental or social impacts resulting from the land use changes that may take place as a consequence of both the government's decision *and* VEAC's subsequent recommendations. We deal only with the latter.

One aspect of the VEAC recommendations relates to the possibility of immediate cessation of logging in the areas recommended for national park. One remaining sawlog licensee is affected by the recommendations – with entitlements amounting to approximately 20,000 cubic metres of sawlogs per year until 30 June 2008. The entitlements under the licence conditions include access to Mountain Ash and Mixed Species sawlogs.

Based on information provided by DSE, the potential to harvest sufficient quantities of Mountain Ash in the recommended forest park area is limited and may not be sufficient to meet fully the entitlements to 2008.

The outcome for Mixed Species harvesting as a consequence of the recommendations is such that commitments for these sawlogs could probably be met outside the new area of national park. However further field work would be necessary to confirm the availability of Mixed Species outside the national park area.

In our view there are *at least* three and potentially many more options:

- allow harvesting to continue for the next four years within the new national park areas in order to meet commitments (that is, delay implementation of the relevant areas of the national park). This option would represent a significant compromise to the integrity of the national park concept and the resultant controversy is likely to lead to associated added costs in terms of management, legal proceedings, enforcement and so on.
- buy out the rights for the sawlog committed. Because it is likely that the Mixed Species can be sourced from the forest park areas, the buy out could be restricted to the remaining Mountain Ash component of the entitlement.
- investigate the possibility of providing Mountain Ash logs from east of Melbourne, including the possibility of salvage logs from the areas damaged by the 2002/03 fires or from the Central Highlands. Transport costs may be a constraint. This option would need to be adopted soon in the case of fire salvage material, due to degradation of log quality over time.

In the absence of detailed information on benefits and costs, we favour some combination of the second and third options.

We are assuming in all this that there would be no constraints on harvesting within the forest park areas for the next four years, other than those which currently exist in state forest. However, we note that due to their 'park' status, there may be opposition to continued harvesting from these areas.

6 Other Forest-Based Products

In preparing its recommendations, VEAC has endeavoured to minimise the negative effects on industries operating on public land in the Otways. In our main report we include consideration of the impacts of VEAC recommendations on all industries in the study area.

Minor Wood Products - In addition to the production of eucalypt sawlogs and woodchips, the public land forests are a source of specialty timber, firewood, timber for fencing, poles and spars, hobby wood, logs for competitive wood chopping, and tea-tree stakes. Minor wood products are not included in the Government policy to phase out logging and woodchip production in the Otways.

Firewood is harvested by commercial firewood cutters as well as by individuals – and mostly supplies local markets including Geelong and Colac. Specialty timbers, predominantly blackwood, are mostly sourced during eucalypt logging programs, with the other forms of forest product mostly harvested from the foothill forests on the northern flank of the Otways.

An Otways timber cutter sells blocks of fiddleback Blackwood to the Maton Guitars factory in Melbourne. Maton produces Australian Blackwood Guitars, which are mostly exported – they are a prized item and sell for up to several thousand dollars each. The harvesting of fiddleback Blackwood is selective – involving the identification and cutting of about one in 300 trees. This is clearly a high value-added activity but there are no data on the extent of available fiddleback Blackwood. URS foresters doubt that the activity is sustainable in the medium to long term. Despite the high value-added nature of the activity, its net economic contribution is likely to be small relative to other values in the parks.

The most economically significant minor product from the state forests is firewood. For 2002/03 it is estimated that a total of about 4,000 cubic metres was harvested for commercial and domestic uses. The gross value of this output at \$80 per cubic metre is \$320,000.

The net economic contribution of firewood is calculated to be about \$7 per cubic metre, this gives a net economic contribution from firewood for the study area of \$28,000 per year. The economic importance of the firewood industry in the Otways is small compared with other areas of the State.

Our conclusion is that the net economic contribution of minor wood products for the Otways is unlikely to be significant and we exclude it from the benefit-cost analysis. However, some producers may be adversely affected by the impacts of the VEAC recommendations and we recommend that their cases be considered individually. Some local consumers of firewood may also be adversely affected but the reductions in volumes available as a consequence of the VEAC recommendations are likely to have little impact on prices in the State's market for firewood.

Apiculture - Much of the public lands of the study area are available for apiculture. In the past, beekeepers have used sites in the Otway National Park, throughout the state forests, and on other public land. Most of the sites previously used have fallen into disuse. Beekeeping is no longer permitted in the Otway National Park. Currently there are three designated apiary sites, of which two are currently unoccupied and have been unlicensed for a number of years. The currently licensed (but, in recent years, unoccupied) public land apiary right is in the Eumeralla Flora Reserve. Bees

from hives located on private land may make use of honey flows and nectar resources located within adjoining public land. The eucalypt species of the foothill forests are an important source of honey.

ABS provides estimates of the annual production of honey in each State, but those estimates exclude beekeeping operations with less than 320 hives. Gibbs and Muirhead (1998) have taken the ABS estimates and added an allowance for the likely level of production from bee keeping operations with less than 320 hives, and concluded that the total annual production from all hives registered in Victoria would be about 5,000 tonnes from Victoria in an average season.

The apiary industry is of growing importance to the Victorian economy, partly because of the growing need for pollination services in the state's northern irrigation districts – particularly for almond production. We estimate the *gross economic value* of apiculture in Victoria to be approximately \$20-30m per year, based on data contained in Essential Economics and Read Sturgess & Associates (1998). These figures include returns to beekeepers and processors. The *net economic contribution* of Victorian beekeepers (above basic wages) is in the range \$1-2m per year.

Available bee sites in Victoria are largely all allocated – both on private and public land. It is therefore difficult to find alternative sites if some are lost due to VEAC's recommendations. The return on capital for beekeepers is high relative to that for most other industries so there is active competition for sites. Net economic contribution per site is of the order of \$1,000-1,500 per year, but from the perspective of beekeepers faced with losing a site, the net losses may be of the order of \$5,000-15,000 per site per year, partly because they would factor in their lost return on labour, assuming that no other sites became available and that they were reluctant to take up some other form of part-time employment. However, there appears to be little demand for sites in the Otways and there is considerable potential to find alternative sites for that recommended to be incorporated in the national park and closed – notably in the 40,000 ha recommended forest park.

As in the case of minor wood products, we have excluded honey production from the benefit-cost analysis while recommending special consideration for the sole producer if a disadvantage as a result of the VEAC recommendations can be demonstrated.

Extraction of Sand, Gravel and Stone - The Otways public lands are an important source for many extractive industry products, and no current operations will be affected by the recommendations – they will continue either outside the proposed national park, or under provisions of the *National Parks Act 1975* that allow existing operations to continue. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the proposed national park.

Mining and Exploration - There are no operating mines on public land in the Angahook-Otway study area, although some public land is subject to exploration licences. It is proposed that these licences be allowed to continue until they expire when they may be renewed. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the proposed national park.

Although there is very little history of mining, and little current mining or exploration activity in the Angahook-Otway study area, the mining industry raised several issues in the submission period following the Draft Proposals Paper – including claims that the establishment of new or expanded national parks delayed, prohibited or in other ways led to Victoria missing out on potentially profitable mining operations.

In industry submissions it was estimated that the cost to mining of designating 15 percent of Victoria in state and national parks could amount to as much as \$100m per year. This is a gross figure and would approximate a net economic contribution of about \$10m per year. The expanded Otway

Ranges National Park represents about a 3 percent increase in the total area of parks in Victoria, so on this basis the claimed reduction in net economic contribution could be about \$0.3m per year.

However, the Otways do not have a history of significant exploration expenditure or mining – other than for gravel and stone. It is our view that it is unlikely that the future expected returns from mining in the Otways would approach the estimates for gold mining in the Box-Ironbark parks (about \$0.05-0.15m per year for an area which *does* have a history of mining). In other words, they would be likely to be small relative to the other values in the recommended national park.

Industry submissions also referred to two other matters – costly delays in processing Section 40 consents for exploration licences that existed before a national park was established; and loss of knowledge acquisition through prohibiting any drilling in national parks. The second matter involves an argument that environmentally benign drilling in national parks might allow the acquisition of new knowledge that may facilitate successful mining operations *outside* parks. It was claimed that exploration on public land is more easily undertaken than in farmland where geological features are masked by various forms of land use. This argument may reinforce the case for improving the administration of existing exploration licences that fall within the new national park but there would be strong opposition outside the industry to drilling in other areas of the park.

In summary, we agree that the opportunity costs of discouraging or prohibiting mining in the Otways are not zero, but it is likely that they are small relative to other values in the park. The Section 40 issues should be investigated and reviewed from operational and policy points of view – as was recommended by the ECC in the case of the Box-Ironbark parks.

Agricultural Use of Public Land - There have been some changes since the Stage 2 report in terms of the number of licences and the areas affected – mainly due to improved mapping and data rather than new areas added to parks.

There are around 602 current licences, covering about 2138 ha, for grazing domestic stock on public land in the Otways. Nearly all of these licences (94 percent by number, 92 percent by area) will remain unaffected. The proposals will result in cancellation of all or part of 39 licences, covering about 314 ha, although only around 196 ha is actually grazed. Also, implementation of the proposals may require fencing of some of the currently licensed areas, particularly public land along river and stream frontages.

The net economic impact of VEAC proposals on grazing licences is likely to be small (approximately \$20,000 per year) but special consideration should be given in the implementation phase to those licensees who may be adversely affected – the costs to them will appear to be greater than the loss of net economic contribution to the economy. The loss of the licences may have a greater impact in some cases than is apparent from simply considering the size of the area affected as they may play a strategic role in grazing systems. However, it is unlikely that farm viability will be at risk due to the licence cancellations.

Eel Production – The eel fishery is a relatively small but important export fishery for Victoria. While greatly affected by seasonal factors, including drought, state-wide production averages around 280 tonnes per year with a gross value of \$1.4-4.7m. The catching and processing sectors of the fishery employ up to 70 people across Victoria in a good season (DNRE 1999).

If we assume a 10 percent return on capital invested in the industry, the net economic contribution for Victoria is about \$140,000 to \$470,000 per year.

Under VEAC recommendations, eel fishing would be phased out within ten years from sections of the lower Gellibrand and lower Aire Rivers, and prohibited immediately from Lake Elizabeth. In

consultation with the industry, VEAC staff have estimated that the existing eel harvest in the study area employs about three full time equivalents and has a gross value of around \$100,000 per year, representing two to seven percent of the total for Victoria. The net economic contribution of the local fishery is about \$10,000 per year – small by comparison with other values in the parks. Nevertheless, there are likely to be claims for assistance if these sections of the fishery are ultimately closed.

Horse-riding – A number of submissions to the Draft Proposals Paper suggested that horse-riding in general, and commercial horse-riding activities in particular, would be adversely affected by VEAC's recommendations. The submitters felt that there would be restrictions placed on where horses could be taken and that because dogs were to be excluded from the national park, many of their customers would go elsewhere.

VEAC has responded to these concerns, at least in part, by removing some areas, such as parts of Barongarook forest and areas near Barwon Downs, from the national park and placing them in forest park. VEAC has also provided for horse-riding in the former state forest area of the Jancourt Nature Conservation Reserve and made specific reference to continuing access to currently used tracks in key areas such as around Aireys Inlet, Anglesea and Cape Otway.

Despite these adjustments, it is likely that there will still be some restriction on recreational and commercial activities involving horses and accompanying dogs. However, for the commercial activities there should be expanded opportunities arising out of the increased numbers of visitors to the region that are expected as a result of the significant upgrading of parks. Individual cases of genuine disadvantage that might remain should be dealt with on a case by case basis.

7 Benefits and Costs of VEAC's recommendations

As stated earlier, it is Government policy to phase out logging and woodchip production in the Otways and the implications of this policy are outside the scope of this study. Our role is to assess the effects of the VEAC recommendations with the impacts of existing Government policy appearing in the base case for the benefit-cost and social impact analysis. In other words, we do not include the net loss of timber value from the phasing out of logging in what follows.

We have concluded that a number of industrial and commercial economic impacts of the VEAC recommendations are relatively small and, most particularly, are too small to be included in the comparison of benefits and costs.

The main economic impacts of the VEAC recommendations are to be found in the broad category of biodiversity conservation; and in recreation and tourism. Because of lack of visitor data we were not able to quantify net changes in the recreational impacts in moving from state forest to forest park or national park.

The estimates of the additional costs of park management (\$2m per year) are provisional and may be subject to change – partly depending on whether all of VEAC's recommendations are accepted by government.

Non-use economic values for biodiversity protection in the expanded national park are assumed to be \$5m per annum for the pessimistic case, \$15m per annum for the conservative case, and \$25m per annum for the optimistic case.

The increases in net economic values for tourism that potentially arise as a result of VEAC's recommendations for the national park are estimated to be approximately \$2.4m per year in the pessimistic case, \$4.8m per year in the conservative case, and \$7.2m per year in the optimistic case.

In summary, we estimate that the net increase in economic value that may arise as a consequence of adopting VEAC's recommendations lies in the range \$5.4-30.2m per year, with the 'conservative case' yielding net benefits to Victorians of about \$18m per year, including the 'non-use' value obtained from increased biodiversity protection, and after deducting the additional costs of public land management.

Regional impacts

In the optimistic case (30 percent increase in visitation), *additional* expenditure is estimated to be approximately \$6.5 million per year (excluding the additional expenditure of \$2m per year associated with managing the new parks). The additional total expenditure would therefore support approximately 65 additional jobs, located mainly throughout the study area, but also at service outlets along the highway between Melbourne and the study area.

In the conservative case, additional expenditure is estimated to be approximately \$4.3m, supporting an additional 43 jobs.

In the pessimistic case, additional expenditure is estimated to be approximately \$2.1m, supporting an additional 21 jobs.

The towns likely to benefit most from the increase in visitation are the coastal towns of Anglesea, Aireys Inlet, Lorne, and Apollo Bay and the inland city of Colac.

Smaller inland and coastal towns would only benefit significantly if additional attractions and visitor facilities were located near them. The DSE draft hinterland tourism development plan to establish tourist nodes and zones in inland areas is consistent with attracting a greater share of visitor expenditure to these areas.

There is a strong case for upgrading infrastructure in the hinterland of the study area in order to ameliorate the adverse effects of increased tourism along the coastal fringe. This would also have the effect of redistributing benefits to inland towns.

We have suggested that the individual businesses that actually are adversely affected by VEAC's recommendations should be assisted on a case by case basis in the implementation phase of establishing the parks – should VEAC's recommendations ultimately be adopted by Government.

This report has been prepared for the Victorian Environmental Assessment Council (VEAC) by URS Sustainable Development (URS). The report provides an assessment of the potential social and economic impacts which may arise from implementation of VEAC's final recommendations

The Government of Victoria has requested VEAC to investigate and make recommendations on public land use in the Otways, and specifically to determine:

- the boundaries of a single national park in the Otway Ranges including public land extending from Anglesea to Cape Otway, specifying whether or not the Great Ocean Road should be included in the park; and
- any other public land currently managed as state forest which would be suitable for addition to existing state parks or nature conservation reserves, or for inclusion in new conservation reserves once native forest logging ceases in the Otways.

The following matters are outside VEAC's Terms of Reference:

- whether or not native forest timber harvesting should or should not continue – the Government has decided and announced that it will phase-out native forest timber harvesting by 2008;
- details of the timber harvesting phase-out (the Department of Sustainability and Environment is managing this issue);
- whether or not there will be a national park – the Terms of Reference specify that there will be “single National Park in the Otways including public land extending from Anglesea to Cape Otway”; and
- the Alcoa lease area, excluded by the Terms of Reference.

While the Council will not make recommendations related to the above matters it does not mean that they are irrelevant to the Council's consideration of issues and (for example) the Terms of Reference specifically require the Council to take into account the Anglesea Heathland Agreement between the Government and Alcoa. Similarly the impact of any recommendations on private land would be taken into account by the Council.

2.1 Objectives and tasks of the social and economic studies

The *objectives* of the socio-economic studies are:

- to provide baseline information on the Angahook – Otway economy and community;
- to identify and, as far as possible, assess the social benefits and costs, including environmental benefits and costs, that could arise from VEAC's draft proposals; and
- to assess the social benefits and costs that could arise from revised recommendations in VEAC's Final Report.

Stages and Tasks of the Socio-Economic Studies

There were three stages to the Angahook-Otway socio-economic studies.

Stage 1: Baseline study – assembled and synthesised baseline data on the Angahook-Otway economy and social setting.

Stage 2: Assessment of VEAC Draft Proposals – assessed the effects of proposals in VEAC’s Draft Proposals Paper on economic and social components of the Angahook-Otway study area

Stage 3: Assessment of VEAC Final Report Recommendations – assess draft recommendations under consideration for the Final Report.

The study tasks for Stage 3 ‘Assessment of VEAC draft Final Recommendations’ included:

1. Identify and, as far as possible, evaluate the social benefits and costs that could arise as a result of implementation of Council's draft recommendations. These benefits and costs are to include non-market values, and are to be distinguished from anticipated changes that are unrelated to the recommendations, in particular the Government’s decision to phase out timber harvesting by 2008.
2. Allocate the estimated social and economic benefits and costs of the draft recommendations to each industry or land use sector, and outline any assumptions made.
3. Estimate the likely social effects in terms of employment gain or loss, at the regional and State levels, and other community effects, and outline possible measures to mitigate negative effects.

The Study Area extends from Anglesea to Princetown along the coast, and north to the Princes Highway and Cape Otway Road. About half of the land in the Otways region is public land consisting of a small national park (Otway National Park), three state parks (Angahook-Lorne, Carlisle, and Melba Gully), large areas of state forest, and public land in a variety of other categories. There are also two marine national parks off the Otway coast.

The following areas are not included in the investigation:

- private land (the *VEAC Act* specifies that VEAC can only consider public land);
- public land leased or licensed for plantations, specifically excluded by the Terms of Reference; and
- that part of the Anglesea Heathland covered by the Alcoa lease area, outside the study area, as specified in the Terms of Reference.

The Australian Bureau of Statistics (ABS) does not collect data in a manner that is consistent with the study area boundaries. In this report data analysis is largely confined to the ABS Statistical Local Areas (SLAs) of Colac-Otway – Colac, Colac-Otway – North, Colac-Otway South, and Surf Coast – West. The VEAC study area extends into eastern parts of Corangamite – North and Corangamite – South but most of these SLAs lie outside the study area.

Using the ABS SLA data in this way includes a higher proportion of private agricultural land, particularly in the Colac-Otway – North SLA, but this should not unduly bias the conclusions drawn here.

We will also refer to other studies that have been done, in particular by the Commonwealth of Australia (1999) and the Corangamite Catchment Management Authority (2002). These studies each use boundaries that extend over much wider areas than the VEAC study area but provide information that is useful on a regional scale. It is not reasonable to assume that all adjustment to VEAC recommendations should take place within the VEAC study area so taking a broader regional view on some issues is useful.

The Commonwealth of Australia study of the West Victoria Regional Forest Agreement will be referred to as the ‘West RFA study’ or the ‘West RFA Region’. The boundaries for this study extend from Macedon in the East to Horsham in the North and Edenhope in the West. Within this area, the Otway Town Resource Cluster (TRC) has the same boundary as the Otway Forest Management Area (FMA) and approximates the VEAC study area.

The Corangamite Catchment Management Authority’s (CCMA) Regional Catchment Strategy will be referred to as the ‘Corangamite RCS study’, or the ‘Corangamite Region’. The boundaries for this study extend from Geelong in the East to Ballarat in the North to Peterborough in the West. It includes the Colac Otway Shire and the Surf Coast Shire.

Shire boundaries are not consistent with the VEAC boundaries. However, the Colac Otway Shire and the Surf Coast Shire account for most of the study area, with some of the study area extending into the

Corangamite Shire. The Colac Otway Shire includes the three Colac-Otway SLAs referred to above, while the Surf Coast Shire includes Surf Coast East and West SLAs.

Finally, some forest industry data is available for an area referred to as 'Central Victoria'. The Central Victoria region includes, but is larger than, the VEAC study area and extends from Melbourne in the East, to Avoca and Kyneton in the North, to Terang in the West.

3.1 Local government areas

Local government in Victoria has changed significantly over the last decade, with major rationalisation and amalgamation of local authorities. The Corangamite Catchment is included within the boundaries of nine local governments (URS Australia and AgInsight 2002). Three of those fall within the VEAC study area.

Colac-Otway Shire.

This shire is wholly within the Corangamite catchment and was formed by amalgamating the Shires of Colac and Otway. South of Colac, it includes coastal communities, the forested Otway ranges and the foothills and slopes of the Otways, used principally for grazing and dairying. The northern third of the shire is open farming land on the basaltic plains. The shire's population is approximately 20,000 and has grown by 1 percent in the period 1996 to 2001. The diversity in the shire is reflected in varying population trends across the shire over the same period. The population of Colac itself has grown by 0.9 percent, while the population in the northern broad acre areas has declined by 0.7 percent. In contrast the Otway and coastal population has grown by 8.8 percent, with significant development pressures in Apollo Bay and adjacent coastal settlements.

Corangamite Shire.

The eastern three-quarters of this shire are within the Corangamite catchment. It was formed by amalgamating three shires. It is characterised by the tourist attractions on the coast – principally the 'Twelve Apostles' – and by the Heytesbury dairy district. The shire's population is 16,700 and did not change significantly over the period 1996 to 2001. This statistic obscures within-shire trends, which show that while the southern part has grown marginally over this period (0.8 percent growth), the population in the northern broad acre areas have declined significantly – by 3.7 percent. Pressures for further coastal development and industrial development (gas extraction and processing) will encourage further population growth.

Surf Coast Shire.

This shire is wholly within the Corangamite catchment, and was formed through an amalgamation of two shires – one coastal and one inland. The inland broad acre farming areas, centred on the town of Winchelsea support grazing and cropping enterprises. The eastern third of the Otway ranges lies in the shire, flanked to the north by well established farming communities centred on Deans Marsh. These farming communities have traditional links with the holiday coastal towns, although these relationships are being diluted by strong migration into coastal communities from outside the shire. The coastal area, with the world-famous Great Ocean Road and major population centres at Torquay,

Anglesea, Aireys Inlet and Lorne are experiencing very large population growth and strong demands for residential land to support part-time or full time residence. In the period between 1996 and 2001, the population in the Surf Coast shire grew from 16,700 to 19,600, a 17 percent increase. Approximately half of the residences in the coastal towns are not permanently occupied.

Areas proposed to be subject to draft recommendations were identified by VEAC, to enable the Stage 3 social and economic assessment, building on the baseline information collected in Stage 1, and the Stage 2 social and economic assessment of the draft proposals. VEAC papers detailed the structure and basis for the draft recommendations, and indicated the range of implications expected.

VEAC also provided advice as to the practical implications of the draft recommendations, for economic appraisal by the consultants.

Social benefit-cost analysis was used for the economic analysis. Only those benefits and costs attributable to changes to existing uses and activities which result from the Council's draft recommendations were assessed and included.

Some of the benefits and costs were not readily assessed in monetary terms, but every effort was made to do so. Where this was not possible, non-monetary or intangible benefits and costs were quantified where possible, or are at least scaled, ranked or described.

In the social effects assessment, the consultants built on the baseline study (Stage 1) to predict and describe likely effects; to identify communities or social groups who may benefit, or for whom there may be particular employment or 'quality of life' effects arising from the draft recommendations; to highlight locations or communities that would be substantially affected; and to advise on relevant measures that could be applied to mitigate any adverse effects.

The 1800 submissions received in the four public consultation periods, and VEAC's analysis of them, were available to assist with Stage 3 of the project.

4.1 Methodology

4.1.1 Estimating the economic contribution of parks

Gain in net economic value

Benefit-Cost-Analysis (or Social Benefit-Cost Analysis) is the methodology most commonly used for estimating the public benefits of investing in community assets such as parks.

The appropriate measure of the benefit of parks to the Victorian community is termed the *net economic value* and represents the satisfaction people derive from visiting parks, expressed as a money value over and above what they actually pay to visit parks.

The net economic value of tourism and recreation is a prime focus of the study because the value of tourism and recreation is what brings visitors to parks where they contribute to the local and regional economies.

Contingent valuation and choice modelling surveys, and travel cost methods are applicable for estimating the net economic contribution of parks, and are described in Attachments 13.1 and 13.2.

Regional economic activity

The economic activity generated by the spending of visitors in the local area and in the region is the other main focus of the study. From the viewpoint of the State such spending is not regarded as a benefit of parks (in the context of benefit-cost analysis) because it could occur if the investment was made elsewhere in the State. From the viewpoint of the local area, however, the economic activity created by parks is an important consideration.

Recreational use of parks provides direct economic benefits to the region from recreational and tourism expenditure, and flow on or multiplier effects as that expenditure works its way back through the suppliers of the goods and services that the tourists consume. As a general rule, the greater the local content of goods and services sold, or alternatively the larger the region within which economic effects are studied, the bigger the multiplier effects will be for a given amount of direct expenditure.

Changes in the level of economic activity of one sector or region of the economy will affect activity levels in other sectors and regions. Multipliers are a means of relating the effects of direct changes in one sector, to the indirect and induced effects felt elsewhere in the economy. 'Input-output analysis' is the analytical technique that is commonly used to derive those multipliers.

Deriving input-output multipliers specifically for the Otway Ranges parks would require detailed regional modelling which was outside the scope of this study and was not justified due to the relatively small negative impacts on local industries. Instead we approximated the multipliers that might apply at the regional level by adapting the results of other work.

4.1.2 Technical background to economic analysis

The conceptual and theoretical foundations of Benefit-Cost Analysis (BCA) provide a sound basis for the evaluation of public investments in National Parks and Forest Parks.

- BCA provides a rigorous conceptual framework for the assessment of public sector investments.
- However, its use to provide 'triple bottom line' assessments is limited unless non-market value estimates are incorporated. In contrast to direct economic impacts, the environmental and social impacts of alternative investment strategies often involve benefits and costs that are not bought and sold in markets.
- Parks have 'public good' characteristics such as 'jointness in consumption' and 'non-excludability' that preclude market allocation.:
 - *jointness in consumption* - consumption by one person does not reduce the amount of the good available for the next person. For example, scenic views are not changed by the number of individuals who have previously looked at the view.
 - *non-excludability* - users cannot be prevented from consuming the good. For example, it is often difficult to charge visitors to national parks because of the large number of entry points to the area.

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- Hence, markets cannot be used as a direct source of information regarding the strength of peoples' preferences for environmental and social impacts of projects such as establishing or expanding parks.
 - To integrate environmental and social impacts along with economic benefits and costs, valuation techniques must yield estimates that are conceptually consistent and preferably measured in the same unit – usually money.
 - Non-market valuation (NMV) techniques are designed to yield value estimates in monetary units that are consistent with the principles of welfare economics that underpin BCA.

We can further classify non-market values into two types: use values and non-use values:

- *use values* correspond to the benefits obtained from actually visiting an area and taking part in walking, driving or other activities;
- *non-use values* reflect the satisfaction that people derive from knowing that some environmental attribute or species is to be protected or preserved — even though they may never visit the area.

The cost of applying non-market valuation techniques – because of the need to collect primary data – is likely to ensure that only very substantial public investments will warrant their use in a BCA. The availability of sufficient non-market value estimates across a range of circumstances is important in determining the viability of 'benefit transfer' as a means of reducing the costs of performing BCA's which incorporate non-market values. 'Benefit Transfer' is a term used to describe the process of inferring environmental values from other locations. It was beyond the scope of this study to collect original survey data for estimation of non-market benefits..

The most commonly used methods for estimating non-market values, including benefit transfer, are summarised in Attachment 13.1.

The Victorian Department of Sustainability and Environment (DSE), has made extensive use of benefit transfer methods in river management (eg. see URS Sustainable Development 2003a), floodplain management, and nutrient management. The Rapid Appraisal Method (RAM) described in these studies was developed by Read Sturgess and Associates, now part of URS.

URS and Read Sturgess & Associates have also applied the methods in several studies for DSE and Parks Victoria (PV) to provide economic assessment of the values offered by national and state Parks (Read Sturgess & Associates 1999, Midas Consulting 2001), and the environmental values offered by farm forestry programs (URS Australia 2003). Other URS studies employing non-market valuation methods include URS Sustainable Development (2003b, 2004a,b).

This section draws on information and views provided by VEAC.

5.1 The Otways Park

VEAC’s major recommendation for the Angahook-Otway Investigation is the establishment of the ‘Otways Park’. There are two components to the Otways Park – the Otway Ranges National Park, and Otway Forest Park.

The Otway Ranges National Park consists of approximately 102,500 ha linking the existing Otway National Park, and Angahook-Lorne, Carlisle and Melba Gully State Parks and many state forest areas and smaller reserves. The recommended national park will provide a range of opportunities for visitors to the region and encompasses a range of environments including dense coastal forests with many scenic views along the Great Ocean Road and inland waterfalls.

Table 1 summarises the recommended changes in areas of public land use. The recommendations constitute an eight-fold increase in the area of national park – representing a more than doubling of the area that is currently in national and state park.

Table 1 Summary of VEAC recommendations for each public land category

| Category | Existing Area (ha) | Recommended Area (ha) |
|------------------------------------------------------------------------------------|--------------------|-----------------------|
| Otway Park | | |
| National Park | 11,755 | 102,470 |
| Forest Park | - | 39,265 |
| Other Public Land (main categories only) | | |
| State Park | 26,935 | 0 |
| Regional Park | 665 | 0 |
| Nature Conservation Reserve | 6,555 | 5,040 |
| Natural Features Reserve | 7,170 | 2,970 |
| State Forest | 92,030 | 0 |
| Total Extent of Public Land included in the Investigation | 157,125 | 157,1255 |
| Public Land Leased or Licensed for Plantations – not included in the Investigation | 5,850 | 5,850 |
| Freehold | 174,505 | 174,505 |
| Total Extent of Study Area | 337,480 | 337,480 |

Note: The areas in this table are rounded-off to the nearest five hectares. The areas are mostly derived from GIS mapping and, for the existing areas, may differ from (generally less precise) area statements published elsewhere (in association with the listing of areas on various Acts of Parliament, for example).

VEAC has recognised the desire for a diverse range of recreation activities in the natural environment of the Otways and has recommended the new land use category of forest park to meet this demand. The Otway Forest Park encompasses some 39,000 ha and provides for recreation, nature conservation and minor resource utilisation. This new category complements the national park values throughout

the Otways and provides the potential for developments associated with the national park without threatening the core natural and aesthetic values of the region.

5.2 Conservation Reserve System

VEAC is recommending to double the total area of the existing system of dedicated (permanent) conservation reserves from about 50,000 ha to approximately 100,000 ha. The total extent of areas with the highest level of protection – national and state parks – is recommended to increase from 38,690 ha to 102,470 ha.

The recommended reserve system has been designed to maximise protection of natural values, especially those for which adequate protection in reserves is a key conservation requirement. Accordingly for example, threatened plant and animal species that are sensitive to major habitat disturbance and require large contiguous areas of suitable habitat – the spot-tailed quoll and masked owl, for example – are much better represented in the recommended dedicated reserves than is currently the case.

The recommended dedicated reserve system significantly increases the adequacy of representation of a number of key vegetation types that are currently not well represented in dedicated reserves: lowland forest, herb-rich foothill forest, riparian forest and cool temperate rainforest, for example.

In addition to the recommendations for dedicated reserves, the Otway Forest Park will offer significant benefits for nature conservation. Management planning will protect significant values at particular sites in the forest park – such as waterfalls, historic places, threatened species and poorly represented vegetation types – while reduced emphasis on commercial resource utilisation (particularly after the phase-out of logging and woodchipping by 2008) will reduce pressure on natural values.

5.3 Recreational access

The Otways are an important and popular location for a diverse range of recreational pursuits from fishing and prospecting, to walking and birdwatching. VEAC appreciates the need to ensure that opportunities to undertake nature based recreation activities are maintained, if not enhanced by the recommendations.

The recommended national park, while protecting conservation values, also offers facilities and access to key natural assets such as waterfalls and rainforest. Provision of access for many popular recreational pursuits like horse riding and four wheel driving will continue on many of the roads that explore the forested Otways landscape. Zones established within the recommended national park can accommodate activities that may otherwise not be compatible with national park values, such as dog walking.

A key objective of the recommended forest park is the provision of opportunities for recreational pursuits in enjoyable natural settings. Dog walking, dispersed camping and hunting are some of the

activities that are specifically catered for within the recommended forest park, along with other active pursuits such as trail and mountain bike riding. Of course it is expected that more passive undertakings like nature study, walking and sightseeing will also take advantage of the considerable natural assets of the forest park.

5.4 Industrial and commercial uses

In preparing its recommendations, VEAC has endeavoured to minimise the negative effects on industries operating on public land in the Otways. Establishment of the Otways Park will offer benefits to many industries operating on public land through improved management of that land, and simpler administrative and planning arrangements. In summary, the implications for each industry are as follows:

Tourism: Tourism is the largest industry in the Otways, and VEAC's recommendations will allow this industry to continue its rapid expansion while ensuring that the natural values on which it depends are protected.

Sawlog and Woodchip Harvesting: Sawlogging and woodchipping will be allowed in the recommended forest park until 2008 when the Government's phase-out of these industries from public land in the Otways will come into effect.

Other Forest Produce: Large areas of forest park are recommended to continue to remain available for firewood and other minor forest produce such as tea tree stakes. Some areas close to Colac – the area of main demand for firewood – are recommended for inclusion in the national park or nature conservation reserves, which will not be available for minor forest produce, so some firewood production may be required from more distant areas.

Extraction of Sand, Gravel and Stone: The Otways public lands are an important source for many extractive industry products, and no current operations will be affected by the recommendations – they will continue either outside the recommended national park, or under provisions of the *National Parks Act 1975* that allow existing operations to continue. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the recommended national park.

Mining and Exploration: There are no operating mines on public land in the Otways, although some public land is subject to exploration licences. VEAC recommends that these licences be allowed to continue until they expire when they may be renewed. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the recommended national park.

Agriculture: There are around 602 current licences, covering about 2138 ha, for grazing domestic stock on public land in the Otways. Nearly all of these licences (94 percent by number, 92 percent by area) will continue unaffected. In short, the recommendations will result in cancellation of all or part of 39 licences, covering about 314 ha, although only around 196 ha is actually grazed. Also,

implementation of the recommendations may require fencing of some of the currently-licensed areas, particularly public land along certain river and stream frontages.

Eel production: Apart from small sections of the lower Gellibrand and lower Aire rivers and Lake Elizabeth recommended for inclusion in the Otway Ranges National Park, all areas where eels are commercially harvested will continue to be available.

Apiculture: Beekeeping is a relatively minor industry on public land in the Otways, with only three licensed sites. While large areas near these sites – in the recommended forest park, in the Alcoa lease area and on freehold land – will be available for apiculture, the sites themselves are recommended for inclusion in the Otway Ranges National Park and, consequently, closure.

5.5 The Great Ocean Road

The Great Ocean Road and the towns, countryside and spectacular natural environment that it traverses is an important asset to the local and broader communities. The attractiveness of this asset, however, is placing great pressure on the asset itself – traffic frequently exceeds the road's capacity. Poorly planned development of the road and the region would constitute a significant threat to the region's character and natural environment. It is VEAC's view that the general character of the road and the region it traverses should be maintained and, in particular, that protection of the natural environment is paramount.

To this end VEAC is proposing that the Great Ocean Road be restricted to a defined road reserve, that roadside vegetation be managed cooperatively between the managers of the road and of adjoining public land, and that any works outside that road reserve require the consent of the adjoining public land manager. It is recommended that the Great Ocean Road continue to be managed primarily by VicRoads and not be included in the Otway Ranges National Park.

This profile of the region is intended to provide information on the economic health of the various communities in the study area. This assists in the assessment of any socio-economic impacts (positive or negative) of recommendations made by VEAC for changes in the management of public land. The profile examines:

- population levels and trends
- employment and labour force characteristics
- income levels
- stakeholder views
- community views

6.1 Population

Table 2 shows the number of males and females in the VEAC study area for the last three ABS censuses. There has been a 4.5 percent increase in the population of the VEAC study area between 1996 and 2001. However, the changes have varied substantially between SLAs in the study area, ranging from a *decrease* of 0.71 percent in the Colac-Otway – North SLA to an increase of 11.87 percent in the Surf Coast West SLA.

Less than 1 percent of people in the VEAC study area are Aborigines or Torres Strait Islanders.

Table 2 Population in the study area 1991-2001

| | 1991 | 1996 | 2001 | Increase |
|---------------|-------|-------|-------|----------|
| Males | 13938 | 13656 | 14270 | 4.5% |
| Females | 14049 | 13757 | 14376 | 4.5% |
| Total Persons | 27987 | 27413 | 28646 | 4.5% |

Source: ABS Census data

Population predictions for the three Shires within the Corangamite Catchment for the years 2006 to 2021 in five year intervals are shown in Table 3. Surf Coast figures include Surf Coast East SLA which lies outside the VEAC study area and inflates the results. Most of Corangamite lies outside the study area.

Table 3 Population predictions 2006-2021

| Shire/City | 2006 | 2011 | 2016 | 2021 | 15 yr Change | % Change |
|---------------------------------|-----------|-----------|-----------|-----------|--------------|----------|
| Colac-Otway | 20,631 | 20,643 | 20,794 | 20,836 | 205 | +1.0 |
| Corangamite | 13,218 | 12,594 | 12,043 | 11,578 | -1,640 | -12.4 |
| Surf Coast | 20,879 | 22,210 | 23,446 | 24,947 | 4,068 | +19.5 |
| Total for Corangamite Catchment | 362,546 | 371,442 | 379,807 | 387,947 | 25,401 | +7.1 |
| Victoria Total | 4,946,688 | 5,099,070 | 5,235,983 | 5,359,116 | 412,428 | +8.3 |
| Regional Victoria | 1,342,141 | 1,367,751 | 1,394,933 | 1,424,238 | 82,097 | +6.1 |

Source: URS and AgInsight (2002, page 6)

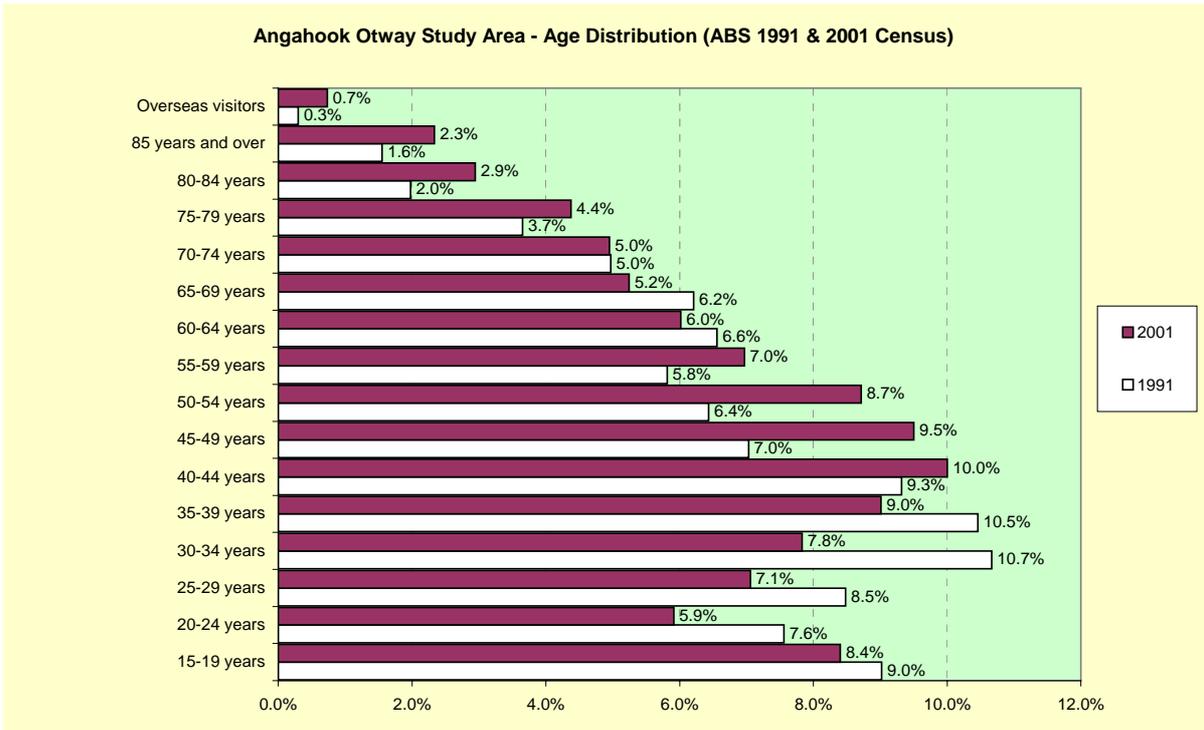


Figure 1 Angahook-Otway age distribution

From Figure 1 it can be seen that the age distribution has shifted into older age groups, with a substantial increase in the proportion of those people in the 50-54 years age bracket, and substantial decreases in younger age brackets.

6.2 Employment

Table 4 shows that employment in the VEAC study area has increased steadily between 1996 and 2001, despite increases in the number of people in the workforce.

Table 4 Employment 1991-2001

| Category | 1991 | 1996 | 2001 |
|-------------------------|-------|-------|-------|
| Unemployed | 1325 | 983 | 731 |
| Employed | 10860 | 10812 | 12385 |
| In the labour force | 12185 | 11795 | 13116 |
| Not in the labour force | 8349 | 8407 | 8203 |
| Total | 20534 | 20202 | 21319 |
| Unemployment rate (%) | 10.87 | 8.33 | 5.57 |

Source: ABS Census data

Note: includes persons 15 years and over

Table 5 shows the unemployment rates for each of the SLA's in the Corangamite Catchment from December 1997 to March 2002.

Table 5 Unemployment rates by SLA

| Statistical Local Area (SLA) | Unemployment Rate (%) | | | | | |
|------------------------------|-----------------------|--------|--------|--------|--------|--------|
| | Dec 97 | Dec 98 | Dec 99 | Dec 00 | Dec 01 | Mar 02 |
| Colac-Otway Colac | 10.5 | 8.3 | 9.6 | 8.2 | 5.4 | 5.8 |
| Colac-Otway North | 4.8 | 3.0 | 3.5 | 3.1 | 1.9 | 1.6 |
| Colac-Otway South | 8.9 | 6.8 | 8.7 | 8.5 | 5.5 | 6.1 |
| Corangamite North | 7.2 | 6.1 | 6.5 | 5.5 | 4.1 | 3.8 |
| Corangamite South | 4.3 | 3.7 | 4.0 | 3.6 | 2.3 | 2.3 |
| Surf Coast East | 9.0 | 7.1 | 8.0 | 6.6 | 4.2 | 4.5 |
| Surf Coast West | 8.9 | 7.9 | 7.8 | 6.9 | 4.7 | 4.8 |
| Victoria | 7.9 | 7.1 | 6.6 | 5.8 | 6.4 | 6.2 |

Source: URS and AgInsight (2002, page 10)

There has been a decline in unemployment across all of the SLA's within the Corangamite catchment from December 1997 to March 2002.

Rural SLA's showing comparatively high levels of unemployment include Colac-Otway South (6.1 percent), and Colac-Otway Colac (5.8 percent). The SLA's recording the lowest levels of unemployment are Colac-Otway North (1.6 percent) and Corangamite South (2.3 percent).

6.3 Industries

The bulk of employment in the VEAC study area is in health and community services; retail trade; manufacturing; and agriculture, forestry and fishing – see Figure 2. However, while employment has increased slightly in the first two categories, it has decreased substantially in manufacturing and agriculture, forestry and fishing over the past decade.

Agriculture, forestry and fishing are the main industries of employment in only the Corangamite and Colac-Otway Shires. This comes as no surprise considering the high proportion of land allocated to agricultural activity in these two shires; Corangamite – 82 percent, Colac-Otway – 50 percent.

In Figure 2 employment includes full-time and part-time employment in various industries.

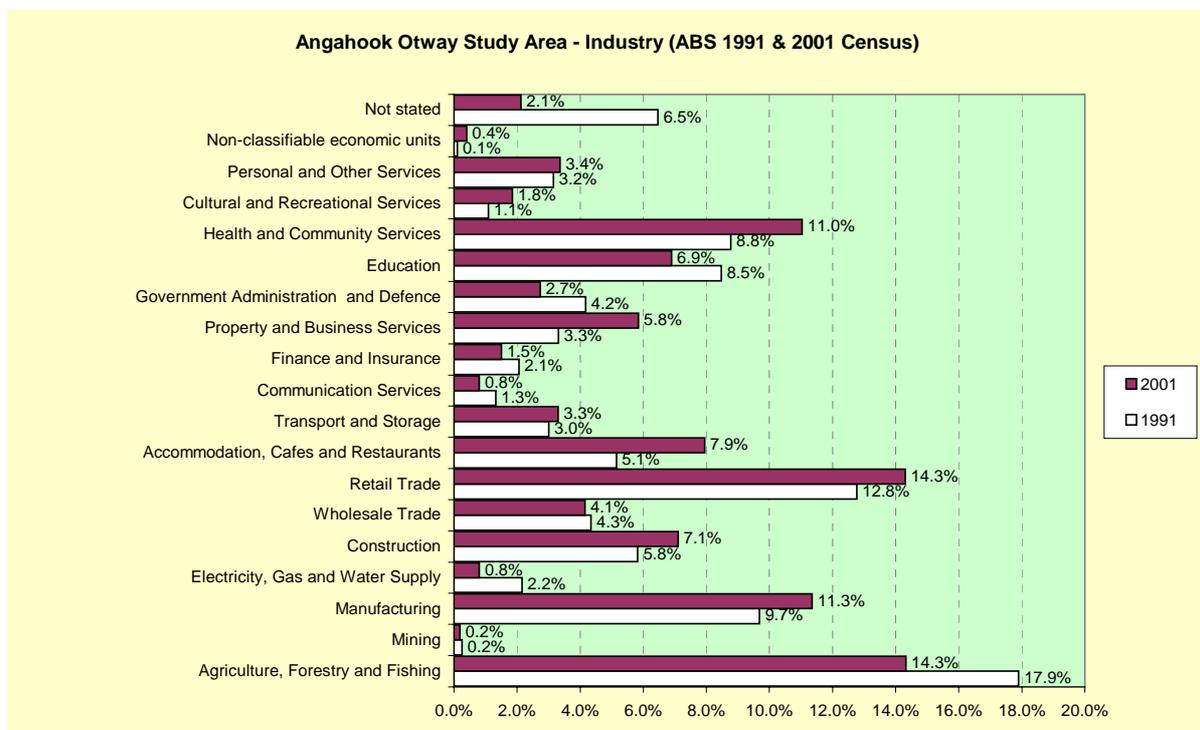


Figure 2 Angahook-Otway industry

6.4 Household income

As shown in Figure 3, weekly household income in the VEAC study area has seen a substantial shift into higher income brackets between 1996 and 2001. There has been a large fall in the proportion of households with income of less than \$300 and a large increase in the proportion earning \$1,000 to \$1,499 per week. Even if we allow for the effects of inflation over the period, these changes are likely to be significant.

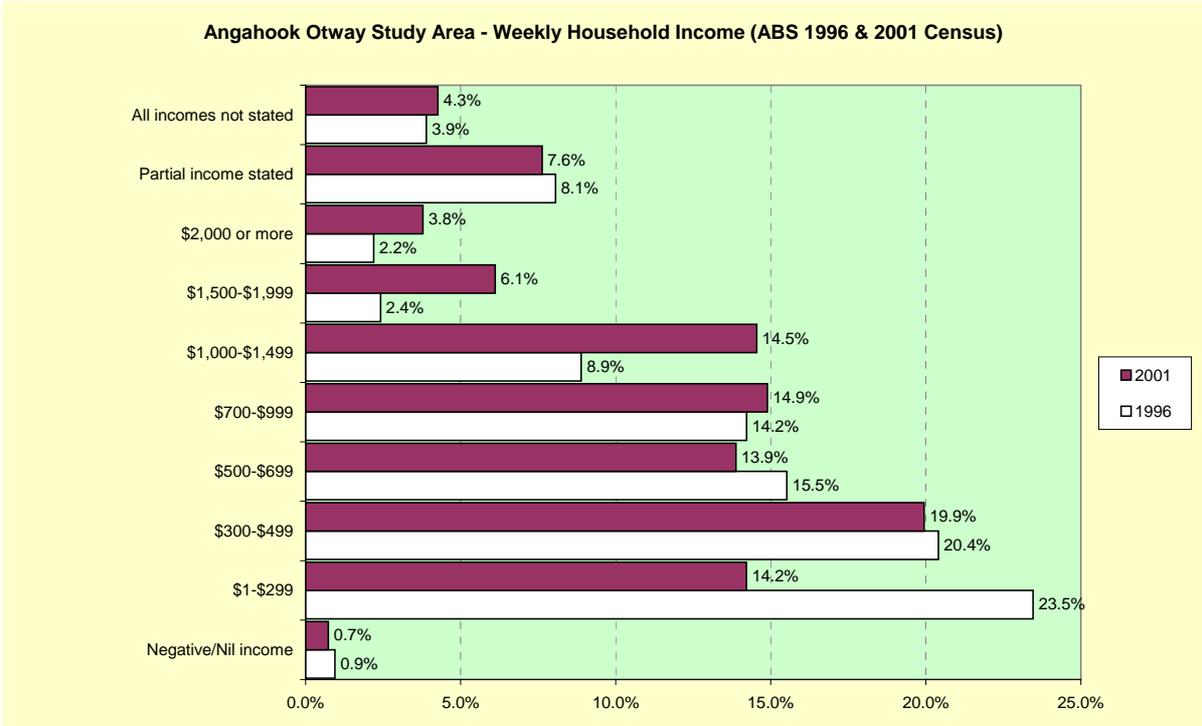


Figure 3 Angahook-Otway weekly household income

The four main reasons for preserving biodiversity relate to: ecosystem processes and environmental health; ethical views with respect to species extinction; aesthetic and cultural values; and economics. Economic values include use values — such as recreation and tourism in areas of natural beauty, and non-use values — such as the value people get from simply knowing that a species or ecosystem is to be protected. Many Australians place high values on native plants and animals and are willing to pay for their preservation (eg. through income taxes), whether or not they actually visit the protected areas. Biodiversity also provides a genetic pool for use now and in the future in agriculture, forestry, medicine, and other industries. (Midas Consulting 2001).

7.1 Environmental values in the study area

This section draws on information provided by VEAC and is included for convenience in cross-referencing.

Vegetation Types

The recommended Otway Ranges National Park lies across four bioregions - Otway Ranges, Otway Plain, Victorian Volcanic Plain, and Warrnambool Plain Bioregions.

The recommended national park contains several unbroken sequences spanning the range of vegetation types from dark, damp cool temperate rainforest, through wet and dry eucalypt forests to the botanically diverse coastal and inland heaths. The understoreys of these forests vary greatly, from open and grassy or mossy, herb- or sedge-rich, to dense low or tall heaths and shrubs.

The park's heathlands and heathy woodlands are of particular importance – for example the Anglesea heath alone contains seventy-nine orchid species, presenting a colourful wildflower display in spring.

Protection of ecosystems – in the form of Ecological Vegetation Classes (EVCs) – is the backbone of biodiversity conservation. In particular, the recommended national park includes significant areas of several widespread EVCs that are currently poorly represented in the dedicated reserve system – Lowland Forest, Herb-rich Foothill Forest/Shrubby Foothill Forest Complex, Shrubby Wet Forest, and Herb-rich Foothill Forest.

There are 39 EVCs represented in the park, including 11 forest-based EVCs which make up about 80 percent of the total park area. The VEAC recommendations double the area of EVCs protected in dedicated reserves and more than double the area of protected forest EVCs.

As well as being poorly represented in existing dedicated reserves, Cool Temperate Rainforest is highly valued for its rarity and beauty. The recommended park contains over two thirds of Cool Temperate Rainforest and all rainforest sites of national and state significance in the Otways. The area of Cool Temperate Rainforest protected in dedicated reserves is recommended to increase from 1,460 ha to 6,185 ha.

Threatened Flora

Many of the threatened flora species found in the study area occur in the wetter vegetation communities for which the Otways are recognised. The Otway Ranges are a stronghold for tall astelia and slender tree fern in particular, and other threatened flora species such as the small ferns and fern allies including beech finger-fern and slender fork-fern.

Wrinkled buttons, found primarily in the vegetation communities between Lorne and Aireys Inlet, depends upon periodic fire to maintain sufficient individuals in a significant number of populations. The recommended park includes the vast majority of locations where wrinkled buttons have been recorded.

Heathlands in the recommended park contain many orchids, with a number listed as rare or threatened including the endemic Angahook Pink-fingers. The wine-lipped and heart-lip spider-orchids are key populations in their distribution in coastal and Western Victoria. The Otways population of the rare Otway bush-pea is a Victorian stronghold. The inclusion of the Devondale Heaths in the recommended park encompasses the vast majority of known records in the study area.

The recommended park includes a significant portion of the known records of the rare dwarf silver wattle, as well as their only coastal representations in the State.

Many of the known records for Anglesea grevillea, found only in the heathy woodlands north and north-west of Anglesea, are in the recommended park. The rare Brooker's gum has reasonably wide distribution across the main Otway Range. The majority of the known records of several other species demonstrating close evolutionary links between the Otways and Tasmania – starry daisy-bush, beech finger-fern and slender tree-fern – are within the recommended park.

Fauna

The recommended park will provide permanent, high-level protection over extensive contiguous areas for the fauna of the Otway ranges and foothills.

Substantial areas of contiguous habitat are essential for species such as the powerful owl and spot-tailed quoll. The Otways is a key area for the quoll, being by far the larger of the two areas in western Victoria where it remains.

Four species of land snails that are thought to be endemic to the study area. The Otway black snail is widespread in the damp environs of the cool temperate rainforests and wet forests of the park. Other endemic or threatened invertebrates known from the park include the Otway burrowing cray, Otway stonefly, Glenelg freshwater mussel, and three caddisfly species.

Two vertebrates endemic to the study area - the Anglesea form of the mountain dragon and the Otways subspecies of the rufous bristlebird - will be protected in the park. Powerful and masked owls, Australian king-parrots, and gang-gang and yellow-tailed black-cockatoos breed in large tree hollows that take many decades to develop, and the high representation of old-growth forest and tall trees in the park will ensure long-term protection for these birds. On the other hand, the park's substantially

increased area of heathlands will provide essential habitat for species such as the endangered ground parrot.

Lake Elizabeth, in the recommended park, is a well-known and popular location to view the unique platypus. Waterways of the park are also home to 14 native freshwater fish, notably the vulnerable Australian grayling and critically endangered Australian mudfish.

7.2 Valuation of biodiversity

Native animals, plants and other natural resources can have economic value because either:

- humans use them (ie. they have ‘*use values*’ such as those associated with harvest of honey, minerals, timber, and recreation) or
- humans value their existence, even if they do not use them (ie. they have ‘*non-use values*’).

Each of these classes of value is a legitimate component of the economic welfare derived from the preservation and use of natural resources. However, the non-use values are sometimes referred to as *non-market values* because they are not traded in markets in the same way as other goods and services and therefore do not attract market prices. Some of the use values, such as recreation, may also fall into the non-market category.

People are *willing to pay* to conserve natural resources. This principle of willingness to pay (WTP) underlies the idea of the demand for environmental goods and services and forms the basis of several widely-used methods to value unpriced benefits, the best-known of which are the *travel cost method (TCM)*, the *contingent valuation method (CVM)*,² and *choice modelling (CM)*. Choice modelling is a more recent method which is rapidly gaining in popularity among environmental economists (eg. see Bennett, 1999a). Attachments 13.1 and 13.2 contain brief accounts of the TCM, CVM and CM methods used to estimate non-market values.

One of the important reasons for people placing value on the conservation of biodiversity is that there are often no substitutes for the environmental values in question. There may be substitutes for the recreation values offered by Otway Ranges parks, or for the timber and other products that they yield. But the ecosystems themselves are unique and if they were to disappear the choices open to present and future generations would be seriously constrained. So it is to be expected that as the extent of unique ecosystems declines, public demand for their conservation increases.

There have been no comprehensive economic valuation studies of the natural values associated with the Otway Ranges forests of the study area, using such methods. This means that we can gain some understanding of the size of those values only by either:

1. *transferring values* estimated at another site (say, by the travel cost or contingent valuation methods) to the site in question; or
2. *undertaking a detailed study specifically targeted at the Otway Ranges*. This option is beyond the scope of the study.

7.3 Transferring results from other studies

The validity of values obtained in this way has been scrutinised by Smith (1992) and Desvougues, Naughton and Parsons (1992), among others. Smith summarises the two contrasting views to deriving values. Some analysts insist on waiting until the ideal data are available before conclusions can be drawn and decisions made. Others argue that any information is better than none. When time and resources are limited, it may be necessary to strike a balance between these viewpoints by adapting and transferring existing information with care, but only when adaptation meets a set of professional criteria. In the years since these studies were done, progress on methodologies has been rapid, accompanied by their more widespread acceptance (eg. see van Bueren and Bennett 2004).

Desvougues, Naughton and Parsons suggest four criteria that must be satisfied before values are transferred from an original study to the site of interest:

- The original study should be based on adequate data;
- The original and new locations should offer similar types of values to a similar spectrum of households;
- The benefits to be valued at the new site should be similar to those valued at the original site; and
- The original study should contain statistical analysis of value (measured by willingness to pay), as a function of socio-economic and environmental variables.

We would add that, in the case of transferring results from contingent valuation studies, it is also important that the original study must include testing of scope sensitivity — to ensure that respondents were nominating their willingness to pay for preservation of the specific resource being studied, and not their willingness to pay for all examples of preserving a particular class of environmental resource.

The essence of these criteria is that the sites satisfy the common-sense requirement of being "comparable" and that there is sufficient information to allow systematic adjustment for differences between the sites. Transferring use values from one site to another is likely to have greater validity than transferring non-use values. Not only is the determination of non-use values in a site-specific exercise more controversial than for use values, but the non-use values may be heavily dependent on the uniqueness of the site.

Although to date there have not been any comprehensive valuation studies of the Otway Ranges forests themselves, several studies that consider the values associated with forest restoration and preservation have been undertaken in Australia and overseas:

- The Nadgee Nature Reserve on the south coast of New South Wales has some characteristics in common with parts of the Otways. The Reserve contains a number of endangered species of birds and a diverse set of habitats in a natural setting. Using the contingent valuation method, Bennett (1984) estimated that the average existence benefit (measured as a once-only lump sum) of this preserved natural area to the residents of Canberra over the age of 18 years was about \$27 per person in 1979 dollars.

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- In 1989 the Resource Assessment Commission (1992) used a contingent valuation study to assess the community's willingness to pay for those areas currently used for timber production in south-east NSW and East Gippsland to be converted to conservation zones of the National Estate. This revealed that the median willingness to pay for total preservation of the National Estate was about \$43.50 per household per year or \$22 per person per year.
 - Lockwood et al (1992) used contingent valuation procedures to estimate the Victorian Community's willingness to pay to reserve unprotected National Estate forests in East Gippsland from timber harvesting. The median value of the willingness to pay was \$25 per household per year.
 - A contingent valuation study of the preservation values of East Gippsland forests, undertaken by Lockwood and Loomis (1993) estimated that 50 percent of Victorian households were willing to make an annual contribution of \$52.
 - Macmillan et al. (2001) used contingent valuation procedures to assess the values that people attached to the restoration of two large areas (80,000 ha each) of native forest in Scotland. The values ranged from UK£ 24-53 per household per year.

Nunes et al. (2001) reviewed a total of 61 representative biodiversity valuation studies published between 1983 and 1999 from various countries, but mainly the United States. The valuation studies were categorized into: 1) genetic and species diversity (21 studies); 2) ecosystems and natural habitat diversity (27); and 3) ecosystem functions and ecological services protection (13). Contingent valuation and choice modelling were the preferred methods used since the other methods are unable to identify and measure passive or non-use values. The other methods used included travel cost and tourism revenues – particularly for biodiversity values related to recreational values.

Values ranged from US\$5-126 per household per annum for protection of single species; US\$18-194 per household per annum for protection of multiple species; and US\$27-101 for protection of ecosystems and natural habitat diversity.

The range of monetary estimates of the value of changes of biodiversity depended on the level of diversity, the biodiversity value type, and the valuation method used. The article noted that most studies lack a uniform, clear perspective on biodiversity and that in fact the empirical literature failed to apply economic valuation to the entire range of biodiversity benefits. The estimates, therefore should be critically regarded and at best considered as lower bounds to unknown values of biodiversity. Nunes et al. concluded that monetary valuation of changes of biodiversity can make sense.

A study by Lockwood et al. (2000) and Lockwood and Walpole (2000) included market and non-market valuations of conserving remnant native vegetation (RNV) on private land in north-east Victoria and southern NSW. The Victorian study area covered 1,880,056 ha, including 113,313 ha of RNV; 1,205,498 ha of forested public land; 8,000 ha of private pine plantations; and 553,245 ha of predominantly cleared private land.

Lockwood et al. (2000) used two stated preference methods, contingent valuation (CVM) and choice modelling (CM), to assess the non-market economic values of remnant native vegetation (RNV) in the two study areas. Both of these methods involved the use of mail surveys to determine community

willingness to pay (WTP) for RNV conservation. The economic estimates from the two methods were not significantly different, providing evidence for the convergent validity of the results. The CM data were used in subsequent analyses, because they allowed calculation of WTP for a range of different scenarios.

Average household WTP for RNV conservation in north-east Victoria was about \$73, as a one-off payment. If we assume a discount rate of 7 percent in perpetuity, this value translates into \$5 per household per year, or \$6.90m per year for all Victorian households (adopting the ABS 1996 Census figure of 1.35 m households in Victoria). It is likely that Victorians would be willing to pay more for biodiversity conservation in national and state parks than in remnant native vegetation areas on private land so these values are likely to be conservative.

Participants in the WTP survey were recruited from random samples of 2,000 Victorian and 2,000 NSW voters obtained from the state electoral rolls. Each of the four survey instruments (CVM and CM for each State) was mailed to 1,000 potential participants. The return rate for Victoria was about 60 percent, relatively high for this type of survey.

7.3.1 Values captured by the recommended parks

Biodiversity values in economic terms are the dollar values that well-informed respondents to surveys would be willing to pay in order to achieve additional protection of biodiversity. In the case of the Otway Ranges National Park respondents to a willingness to pay survey would be informed, as follows.

- A. That the parks and reserves will protect a large range of values encompassing almost all significant values; that they are of adequate size to actually protect the values they are intended to protect, and across the range of environments in which the values are found. That is, essentially, that they meet the nationally-agreed criteria for a Comprehensive, Adequate and Representative (CAR) reserve system for biodiversity conservation.
- B. That the parks and reserves are genuine parks and reserves, especially that the national park has large contiguous, essentially natural areas, covering and linking a range of landscapes and land and habitat types; that it is well managed and provides adequate, long term protection of these attributes; and that it is not compromised or threatened by over-development or large degraded areas.
- C. That the parks and reserves have many of the best examples of the features that people associate with national parks and the Otways – wet forests, rainforests, waterfalls, historic sites, Aboriginal heritage, wild places and beaches, landscape-scale scenery (eg. the whole coastal fall, whole catchments, the main Otways ridge and the Otways coastline).

The extent and scale of these improvements to biodiversity protection would of course affect the amounts that respondents would be willing to pay to gain access to them – whether through use or

non-use attributes. In practice, the changes from the existing situation would need to be significant in order to elicit significant payments.

It is not likely that responses would be very sensitive to the differences in biodiversity protection recommended by VEAC between the Stage 2 (Draft Proposals Paper) and Stage 3 (Final Report) studies. While this does not imply that they have no value, we have not attempted to quantify them.

7.3.2 Summary of economic values for biodiversity protection

In summary, WTP for biodiversity restoration and protection in forests in the studies listed has ranged from \$5 (for revegetation of farmland) to \$100 per household per year, with a 'modal' value of approximately \$35. As noted earlier, surveys used to elicit these values have response rates of up to 60 percent. If we take the conservative view that the 40 percent who didn't respond attached zero value to conserving biodiversity, the modal value becomes \$20 per household per year.

In the case of expanding the area of national park in the Otway Ranges, the *increase* in value will be some proportion of the assumed total value (ie. \$20 per household per year). The VEAC proposal is to increase the area of national park in the study area by approximately eight-fold, with a doubling in the area of Ecological Vegetation Classes (EVCs) protected in permanent reserves. We assume that the *incremental* value attaching to the *expansion* of the park will be \$10 per household per year. The ABS 2001 Census shows 1.73 m households in Victoria. Total annual value is therefore \$17.3 m.

Given the level of uncertainty that surrounds estimates of biodiversity values, in the benefit-cost analysis we adopt a range of assumptions corresponding to pessimistic, conservative and optimistic scenarios.

For the purposes of the benefit-cost analysis, non-use values for biodiversity protection in the expanded national park are assumed to be \$5m per annum for the pessimistic case, \$15m per annum for the conservative case (an approximation to the above estimate of \$17.3m per annum), and \$25m per annum for the optimistic case. These figures correspond to annual per household figures for Victoria of about \$3, \$9, and \$15, respectively. They are higher than the assumed values assumed for the case of the Box-Ironbark study (\$0.75, \$1.50, \$3, Midas Consulting 2001) but can be justified by the nature of the two parks concerned. People appear to be more willing to pay to protect Mountain Ash forests and rainforests than Box-Ironbark ecosystems in low rainfall areas¹.

We make the additional assumption that there will be no increase in the value associated with biodiversity protection in the forest park as a result of VEAC recommendations, compared with those that applied to state forests. There may be some increase associated with the recommended forest

¹ This view is supported by the Victorian National Parks Visitor Segmentation Study which was completed by NRE in March 1996 (DNRE 1999). The main findings relating to the total population of park visitors included the observation that visitors had a high interest in rainforests and a moderate interest in forests, rivers, beaches and mountains.

park compared with state forest, but primarily this will result from the cessation of timber harvesting in 2008 by government decision, not as a result of VEAC recommendations.

Non-use values, by definition, do not directly create jobs. Also, willingness to pay for the values does not mean that people actually pay. It is relatively common in the USA for conservationists to directly pay for the preservation of ecosystems but it is less common in Australia. In the case of the VEAC recommendations some people currently working in the forests (in addition to those timber workers already displaced by government policy) may lose their livelihoods if government ultimately accepts the recommendations. Conservationists (and others) on the other hand gain, probably at little direct expense to themselves. In our view there is a strong case for financially assisting those who lose and we return to this issue later in the report.

7.4 Additional park management costs

DSE will have administrative responsibility for managing recreation on public land recommended to be included in the new parks. Although the total area of public land to be managed will not increase at all under VEAC's recommendations, national parks in particular generally have higher management costs with respect to visitors because of the higher level of facilities and promotion associated with national parks compared with state forest. Also, it was evident from submissions that there is widespread community support for the view that public land management is currently poorly resourced and should be improved. As a package, VEAC's recommendations should make a substantial commitment to realising this improvement.

In the most recent example of management cost estimates (for the ECC Box-Ironbark recommendations), Parks Victoria supplied an estimate of the unit costs of their role in managing additional areas of parks and NRE (now DPI/DSE) provided an estimate of its unit costs for management of recreation in state forests.

- NRE estimated that it expended annually, on average, \$0.50 per visitor.
- Parks Victoria estimated that it expended annually, on average, \$0.61 per additional visitor and \$0.83 per additional hectare of park.

In this example, the results of the benefit cost analysis assumed additional park management costs of \$400,000 per year. This was over and above the costs of the NRE employees that were involved in managing, regulating and administering these public land areas for timber harvesting, roading, fire protection, pest plant and animal control, recreation, and various other uses. Responsibilities for fire protection, management of pest plants and animals, and researching ecological management, are standard costs of managing public land, regardless of who is the managing authority, hence those costs should not be affected.

In the end, the government invested considerably more than this amount in implementing and managing the Box-Ironbark public lands (see below). In addition, our review of submissions and discussions with stakeholders since the Stage 2 project has identified several additional aspects to improving public land management (and especially park management), particularly in relation to improving tourism yield and attracting visitors to the Otways hinterland.

Accordingly, in the case of the Otways recommendations we assume that the net additional management costs will be in the order of \$2m per year (double our Stage 2 estimate, in response to the factors cited in the previous paragraph). The new national park will also require a capital injection in order to raise the standards of services in the park to those required by its new status. The level of funding required will depend on the level of services the Government wishes to provide, but our overall analysis (as summarised below) assumes sufficient investment to adequately protect the parks values and to attract more tourists, particularly to the hinterland. Up to a point at least, additional investment in visitor services and infrastructure is likely to be recouped in additional visitor expenditure.

Several people submitted the view to VEAC that the existing parks in the Otways were already under-resourced and that adding to the area of parks would only exacerbate this problem. The most recent example of park implementation contradicts this assertion, as funding allocated to implementing the Box-Ironbark parks and reserves (and other recommendations) was \$20.8m over four years. This amount included financial assistance to those that were directly disadvantaged by the establishment of the parks, and a range of other programs for park management, recreation and firewood supply. Attachment 13.5 describes the implementation of the Box-Ironbark recommendations. Figure 4 and Attachment 13.6 show that expenditure on park management has trended upwards over this period, even in real terms (ie. net of inflationary increases), showing an increase of about 75 percent over the period. These figures include a component of the \$20.8m referred to above.

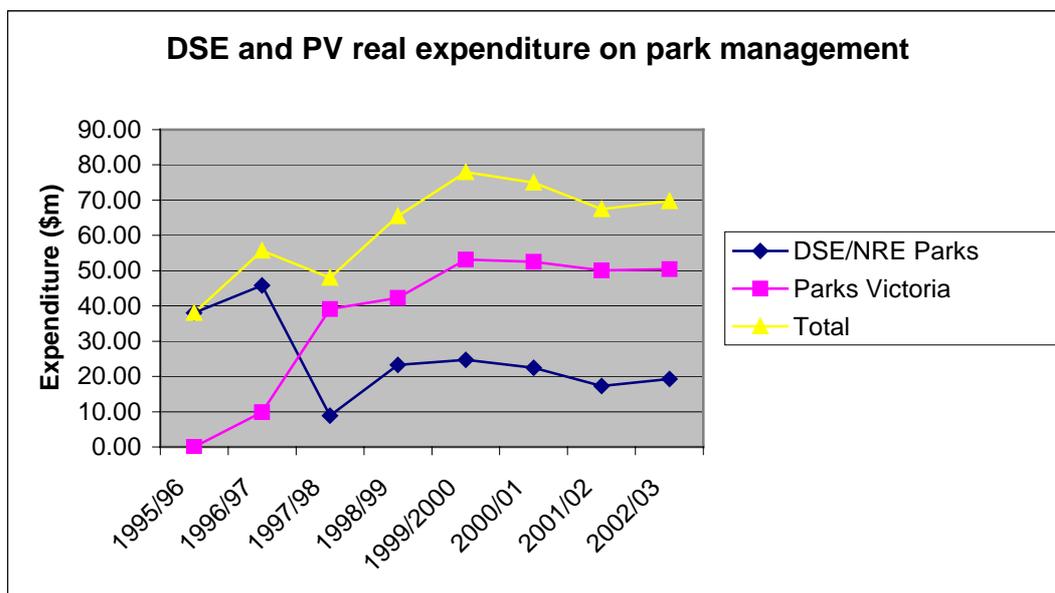


Figure 4 DSE and PV real expenditure on park management

(Source: National Parks Act Annual Reports)

- Notes:
1. National Parks Act funding varies from year to year according to whether it includes capital asset charges or one-off funding (for example for fire fighting or ‘roading’), and whether any funds have been carried over from the previous year. The parks estate also grew during this period, primarily with the addition of the Marine National Parks and sanctuaries, and Box-Ironbark parks.
 2. Parks Victoria expenditure above excludes all metropolitan park costs, but includes expenditure on numerous other areas managed by Parks Victoria (such as nature conservation reserves).

The study area is located in the *Great Ocean Road Tourism Product Region* (GOR) as defined by Tourism Victoria. This is an extensive region which covers ten municipalities and extends from Geelong to Nelson on the South Australian border. This region has experienced considerable growth in tourism in the past few years. (Essential Economics 2002).

Significantly, the GOR region attracts the highest share of visitors outside metropolitan Melbourne according to Tourism Victoria, and the region has become an icon in the marketing of Victoria as a tourism destination.

In 2000, the GOR region attracted an estimated nine million visitors and this comprised 66 percent domestic day trip visits, 30 percent domestic overnight stays, and 4 percent international visitors. These visitor patterns are shown in Table 6. The row headed ‘domestic overnight’ gives the number of overnight visitors per year while the row headed ‘visitor nights’ indicates the total number of nights that they stayed. There has been little change in these figures over the three years.

Table 6 Visitor activity in the Great Ocean Road Region, 1998-2000

| Visitor Type | 1998 | 1999 | 2000 | Average annual growth rate 1998-2000 | Share in 2000 |
|-------------------------------------|---------------|---------------|---------------|--------------------------------------|---------------|
| | (‘000s) | (‘000s) | (‘000s) | (%) | (%) |
| Domestic Overnight (visitor nights) | 2,730 (7,370) | 2,500 (7,750) | 2,680 (7,500) | -0.9 (+0.9) | 30 |
| Domestic Day Trip | 5,420 | 6,160 | 5,995 | +5.2 | 66 |
| Sub-total | 8,150 | 8,660 | 8,675 | +3.2 | 96 |
| International Overnight | 115 | 125 | 130 | +6.3 | 1 |
| International Day Trip | 152 | 220 | 229 | +22.7 | 3 |
| Sub-total | 267 | 345 | 359 | +16.0 | 4 |
| Total | 8,417 | 9,005 | 9,034 | +3.6 | 100 |

Source: Essential Economics (2002) drawing on National Visitor Survey 1998-2000; and International Visitor Survey 1998-2000.

Note: International day trip data for 2000 are not available. Estimate derived by applying 4.1 percent growth based on Tourism Forecasting Council’s average growth for the period 1999-2010.

8.1 Tourism and recreation activities on public land

The region offers a combination of natural and developed tourism attractions for visitors. Public land in the region provides the basis for a diverse range of recreation activities including bushwalking, picnicking, fishing, surfing, diving, forest drives, camping and four-wheel driving. The coastal environment includes the Twelve Apostles, shipwreck sites and high cliffs.

Tourism plays an important part in the economies of the Shires within the Corangamite Region and is a viable and fast growing industry. The Surf Coast Shire is the gateway to the Great Ocean Road, a favourite destination for families (28 percent) and younger singles (23 percent). Approximately

2.2 million people visit the Great Ocean Road annually and the 12 Apostles is the most popular Victorian tourist attraction outside Melbourne. Apart from being a significant destination for international and domestic visitors, Surf Coast also accommodates a regional influx of weekend visitors who regularly stay in their holiday houses. (URS and AgInsight 2002, page 48).

In 2000 Geelong received the most visitor overnight trips at 773,000, followed closely by Surf Coast, receiving 685,000. Seventy five percent of overnight trips in the Surf Coast Shire were made in the Surf Coast West SLA. Other regions showing a high volume of tourists visiting include Ballarat (608,000 overnight trips) and Colac-Otway (355,000 overnight trips). (URS and AgInsight 2002, page 49).

In 1995 over 3.5 million visitors spent a total of 10.5 million visitor nights in the West RFA region. The majority of these, 2.42 million visitors, visited attractions along the Great Ocean Road. Visitors to the West RFA region in 1995 spent around \$412 million, mostly on accommodation, food and transport.

Only 45 percent of tourism businesses operating in public forests in the West RFA region are based within that region (CCMA 2002). Of those based outside the region, 27 percent are from the Melbourne Metropolitan area and 28 percent are from other towns outside the region.

Fifteen commercial tour operators with permits to operate in public forests are based in the Otway Town Resource Cluster (TRC), representing 7.2 percent of all permit holders in the West RFA region. TRCs are aggregations of ABS census collector districts. Four were defined for the West RFA, one of which is the Otways TRC (Commonwealth of Australia 1999).

There are approximately 176 tourist accommodation businesses in the Otway TRC representing 18 percent of similar businesses in the Corangamite Region. They are mainly located in Apollo Bay (38), Lorne (27), Colac (13), Terang (10) and Port Campbell (10). Anglesea is not located within the Otway TRC.

The ten most popular visitor activities in the West RFA region are shown in Table 7. Visiting national parks and state forests are included, along with bushwalking.

The principal tourism attractions of the Angahook-Otway Study Area are:

- The Great Ocean Road; beaches and the ocean
- Angahook-Lorne State Park
- Otway National Park
- Marine national parks
- Erskine and other falls
- The Otway Fly
- Historic places

Table 7 Most popular visitor activities in the West Region

| Activity | Visitors participating (%) |
|-----------------------------------|----------------------------|
| Drive to sightsee/pleasure | 53 |
| Shopping | 49 |
| Restaurants/dining out | 46 |
| Visiting friends and relatives | 42 |
| Visiting national park/forest | 31 |
| Bushwalking | 29 |
| Visit a museum or historic site | 22 |
| Visit an art gallery/craft centre | 21 |
| Swimming/diving/surfing | 18 |
| Visit a park or garden | 17 |

Source: Commonwealth of Australia (1999).

Note: percentages do not add to 100 percent as visitors may have participated in more than one activity.

The Otway Ranges are the setting for many visits by tourists:

- many of the cultural heritage attractions of the area are located in forest reserves;
- people visiting friends and relatives may use the local forests for recreational activities;
- tourist drives travel through Otway Ranges landscapes; and
- forest scenery provides the setting for historic towns.

The following tourism and recreational activities take place on public land in the study area, including the Otway National Park, state parks, state forests and reserves:

| | | |
|-------------------------|-----------------------------------|----------------------------|
| bushwalking (overnight) | four-wheel driving | orienteering and rogaining |
| camping | gemstone fossicking & prospecting | picnics and barbecues |
| car rallies | guided tours | trail bike riding |
| car touring | horse riding | visiting historic features |
| cycling | hunting | walking and running |
| fishing | nature observation | walking dogs |

Most of these activities will continue to be permitted activities in the national and forest parks recommended by VEAC, although it should be noted some have been or will be subject to conditions or restrictions – for example some activities are not currently permitted in closed catchments; camping may be confined to designated sites within parts of the recommended national park. Some activities will be only allowed in certain areas or under defined circumstances.

The contribution of the recommended Otway Ranges parks on public land to tourism in the region is likely to be significant. Parks Victoria is currently undertaking a ‘Levels of Service Program’ which inventories and compares the services offered by parks in the state. *With appropriate government support, the existing Otways National Park could rise from a Level C or D park, to Level A (as the Otway Ranges National Park) – giving it the same ranking as the Grampians and Wilsons*

Promontory National Parks. This elevated status would clearly have significant implications for the added value of tourism, subject to the caveats that we discuss elsewhere with respect to possible congestion problems and the attractiveness of hinterland sections of the parks.

A description of tourism and recreation features for the recommended parks is included in Attachment 13.4.

8.2 Estimated numbers of visitors to parks in the study area

The number of visits to state and national parks in the study area are shown in Table 8. Reliable visitor statistics for public land are difficult to collect, particularly in areas such as the Otways where there are many access points and major through roads, so these data need to be interpreted cautiously. They may be based on vehicle counts at the entry to parks. They are frequently based on sample head counts by staff at irregular intervals.

That said, the data in Table 8 provide evidence that visitation has been increasing for the Angahook-Lorne State Park but decreasing for the Otway National Park. Visitor numbers are dependent on weather and the activities permitted in parks, among other things. However, there is a perception among some Parks Victoria staff that people are shifting their interests from outdoor activities in parks to other sources of recreation.

Table 8 Parks Victoria visitor statistics

| Name of Venue | 1997/1998 | 1998/1999 | 1999/2000 | 2000/2001 | Average* |
|---------------------------|------------------|------------------|------------------|------------------|------------|
| | Visit days | Visit days | Visit days | Visit days | Visit days |
| Angahook-Lorne State Park | 539,520 | 614,690 | 514,870 | 696,670 | 591,438 |
| Cape Otway Lighthouse | 51,380 | na | na | na | |
| Carlisle State Park | 1,780 | na | 1,600 | 1,500 | 1,595 |
| Melba Gully State Park | 245,420 | na | 196,010 | 183,370 | 206,200 |
| Otway National Park | 432,730 | 325,450 | 292,930 | 219,200 | 317,578 |
| Total* | 1,219,450 | 1,141,640 | 1,005,410 | 1,100,740 | |

Source: Parks Victoria

* Excluding Cape Otway Lighthouse, and assuming that Melba Gully SP attracted 200,000 visitors and Carlisle SP 1,500 visitors in 1998/99.

Table 8 shows that there were approximately one million visitors each year to parks in the study area during the period 1997/98 to 2000/2001.

Figure 5 is based on DNRE (1999) and data provided by Parks Victoria for the Otway National Park and Angahook-Lorne State Park. Over the period 1989/90 to 2000/01 the total visitor days for these parks increased by approximately 600,000, representing an average annual increase of 13 percent per year. For the Angahook-Lorne State Park the increase was an average of 35 percent per year.

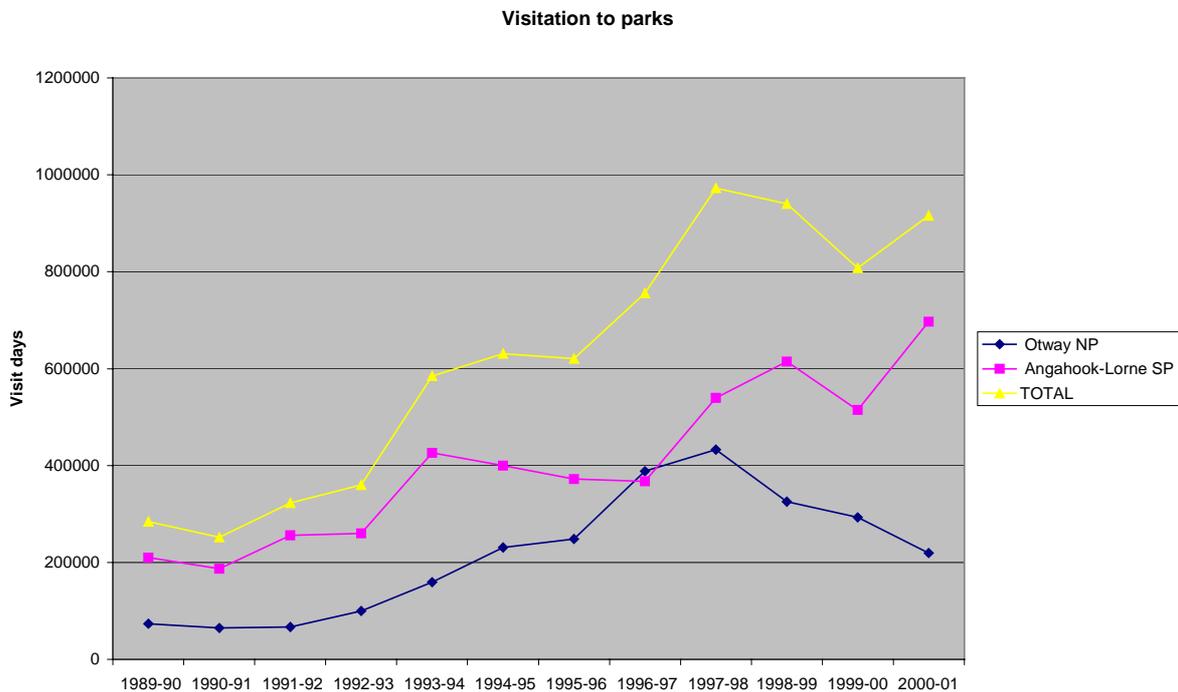


Figure 5 Visitation to the Otway NP and Angahook-Lorne SP

No data are available to determine what proportion of the visitors to parks are tourists as opposed to locals (Tourism Victoria defines a tourist as someone who has travelled more than 50 km for a day trip or overnight stay). However, in 1998 it was estimated that 35 percent of visitors to Box-Ironbark parks and reserves were locals and 65 percent were tourists (Midas Consulting 2001).

Applying the Box-Ironbark proportions would suggest that the one million visitors per year to the Otways comprise:

- *visitors* from the local area who use the public lands for recreation — estimated at approximately 350,000 visit days per year; and
- *tourists* —estimated at approximately 650,000 visit days per year.

8.3 Economic valuation of recreation and tourism

The unit values for the net economic contribution for visitors to parks/reserves are based mainly on another consultancy undertaken for NRE (Read Sturgess & Associates 1999). That consultancy developed a generalised travel-cost model for the repeatable measurement of the economic value of recreation in Parks. Valuations of recreational use were undertaken for approximately 30 metropolitan parks in Melbourne and 35 national parks in rural Victoria.

It included consideration of the following parks of relevance to VEAC’s recommendations: the Otway National Park; the Angahook-Lorne State Park; the Melba Gully State Park; and the Carlisle State Park.

In Table 9 it is significant that four of the parks in the Great Ocean Road Region fall in the top twelve parks in the State in terms of their economic contribution, measured as consumer surplus². Three of the parks fall within the study area. Carlisle State Park is the only park in the study area that has relatively little economic impact – largely due to apparently small visitor numbers.

Table 9 Estimates of consumer surplus for non-Melbourne parks

| Non-Melbourne Parks | Consumer surplus | Visitor days 1997/98 | Total consumer surplus |
|-----------------------------|-------------------------|-----------------------------|-------------------------------|
| | (\$ per visitor day) | | (\$ p.a.) |
| Port Campbell NP | 40.21 | 1,533,018 | 61,644,312 |
| Grampians NP | 18.85 | 1,228,268 | 23,157,233 |
| Mornington Peninsula NP | 7.94 | 2,239,079 | 17,787,171 |
| Otway NP | 35.82 | 432,733 | 15,498,946 |
| Bay of Islands Coastal Park | 27.60 | 511,006 | 14,106,150 |
| Wilson’s Promontory NP | 25.15 | 394,139 | 9,913,095 |
| Mt Buffalo NP | 30.79 | 196,227 | 6,041,664 |
| Alpine NP | 16.21 | 368,621 | 5,975,706 |
| Bunurong MP | 23.19 | 250,000 | 5,797,558 |
| Angahook-Lorne SP | 10.73 | 539,518 | 5,786,489 |
| Croajingolong NP | 45.75 | 108,326 | 4,955,701 |
| Melba Gully SP | 20.06 | 245,417 | 4,921,887 |
| Carlisle SP | 10.51 | 1,783 | 18,744 |

Source: Adapted from Read Sturgess and Associates (1999)

From Table 9 it can be seen that the Otway National Park attracts consumer surpluses of approximately \$36 per visitor day while the state parks range from \$10 to \$20 per visitor day. As noted above, these figures are based on the travel cost method for assessing value and reflect in part the distances that people have been willing to travel to visit the parks. The total consumer surplus for parks in the study area is approximately \$26.2m.

Based on these figures we assume unit values of \$30 per visitor day for national parks in the area; and \$15 per day for state parks, state forests, and forest parks.

² See Attachment 13.2 for explanation of this measure, and for description of the Travel Cost Method which was used to estimate the values.

There appear to be few reliable visitor data for state forests in the study area so their omission is a possible source of bias³. A 1995 Read Sturgess & Associates study estimated that there were approximately 55,000 visitors to state forests in the Otway Forest Management Area in 1994-95, consisting of 24,000 day visitors, 15,000 campers and 16,000 'disperse' uses. However, these figures may be underestimates.

We assume no change in the visitation to the state forest areas that VEAC proposes to be included in the Forest Park.

By applying the above unit values (\$30 per visitor day for national parks in the area; and \$15 per day for state parks, state forests, and forest parks) to the estimates of average visitation at each park (see Table 8), it was estimated that the net economic surplus due to the base level of recreation and tourism at sites affected by VEAC's recommendations is approximately \$21.5m per year (see Attachment 13.7 for detailed calculations). This compares with the Read Sturgess & Associates (1999) figure of approximately \$26.2m – using higher per day values for national parks (see Table 9). The net economic surplus due to the *existing* level of recreation and tourism based on the parks in the study area is likely to be in the vicinity of \$25m per year.

Based on past experience (see below for some examples), a change in status from state forest or state park to national park, is likely to increase visitation in most instances. The precise scale of change cannot be predicted with certainty, since this depends on a variety of factors including:

- accessibility to major markets
- nature of the scenic resource
- presence of key attractors (including well-known natural or cultural heritage attractions)
- potential activities available for visitors
- existing level of investment in surrounding tourist facilities
- expenditure by park managers on facilities and promotion

The Midas Consulting (2001) study of Box-Ironbark parks estimated the likely increase in visitation, based on two previous cases where land has changed designation from state forest to national park — the Grampians National Park and Murray-Sunset National Park.

The Grampians was declared a National Park in 1985. Visitor numbers prior to declaration (2 years' figures) averaged 1.12 million visitor days. Visitor numbers following the park declaration (figures

³ The VEAC recommendation to convert State Forests into Forest Park *may* lead to increases in visitation to these areas - in addition to that for the areas of State Parks and State Forests that are recommended to be converted into national park. Any increase in visitation would be partly dependent on whether the new Forest Parks receive resources additional to those currently available to the management of State Forest. However, as discussed earlier, there will be some restrictions placed on current recreational activities, at least in the state forest areas that are intended for national park. These restrictions will tend to restrict visitor numbers for these activities to some extent.

for 11 years) have averaged 1.50 million. That is, the increase in visitors following Park designation was approximately 30 percent.

Murray-Sunset National Park was declared in 1991. Visitor numbers post designation have averaged 2.3 times those pre designation (27,200 average compared with 12,000). Statistical analysis revealed that visitation following declaration as a park increased by 32 percent for the Grampians and 62 percent for the Murray-Sunset National Park. Both these increases were net of increase due to population increase and were significant at the 1 percent level.

On the basis of these analyses, the Midas Consulting study assumed an increase of 30 percent in visitation following designation as a national park. This assumption is important to the benefit-cost analysis and to the analysis of regional economic activity.

From a State-wide perspective, increasing visitor numbers for expanded Otway Ranges parks may be at the expense of visitation to other parks in the State. It is also debatable whether all of the increases noted should be attributed to the nature of the parks. For example, it may not be necessary to increase the area of the national park to the extent recommended as many of the additional tourists may go no further than the existing boundaries of the Angahook-Lorne State Park. (This is not to suggest that reducing the recommended size of the national park would be desirable on the basis of its biodiversity benefits.) For these reasons we discount the increases to 10 percent for the pessimistic case, and 20 percent for the conservative case, while setting the optimistic case at 30 percent.

We make the conservative assumption that the above increases apply to visitors to the expanded national park and not to the establishment of the forest park.

As a result of these analyses, (10, 20 or 30 percent increases in current visitor numbers multiplied by \$30 per day for every extra visitor) the increases in net economic values for tourism that potentially arise as a result of VEAC's recommendations for the national park are estimated to be approximately \$2.4m per year in the pessimistic case, \$4.8m per year in the conservative case, and \$7.2m per year in the optimistic case. These figures are unchanged from the Stage 2 report as they are unlikely to be sensitive to the changes made by VEAC between the Draft Proposals Paper and the Final Report. The detailed calculations are shown in Attachment 13.7.

8.4 Regional economic activity: expenditure and employment

Tourism expenditure represents income for the study area. Direct expenditure on tourism to the public lands of the study area generates upstream and downstream jobs in other parts of the local and Victorian economy. In this case, a significant proportion of these indirect jobs is likely to be in the main towns of the study area — for example in retailing, wholesaling and distribution.

It is assumed that the average expenditure by *local visitors* on their recreation on public land is spent mainly on food and transport, and is equivalent to the food expenditure of tourists in the Victorian Regional Travel and Tourism Survey (approximately \$10 per person). We earlier estimated that there were approximately 350,000 local visit days to existing parks in the study area. Local expenditure on

recreation in public lands in the study area is therefore approximately \$3.5 million per year (not including visits to state forests).

The expenditure by visitors to public land is estimated as follows:

- Nearby residents account for 35 percent of all visitors to public land, with an average expenditure of approximately \$10 per person per day.
- Tourists (ie, those travelling more than 50 km) account for 65 percent of all visitors to public land, with an average expenditure of \$36 per person per day.

The contribution of the existing 650,000 *tourists* to the regional economy is estimated to be approximately \$23.4 million. It is estimated that each \$100,000 in expenditure would support one full-time job equivalent. The expenditure would therefore support about 230 people.

The balance of visitation between local visitors and tourists will vary depending on the park in question.

The total contribution of tourism and recreation, in terms of expenditure, is therefore currently about \$27 million per year, employing 270 people.

In the *optimistic* case (30 percent increase in visitation), *additional* expenditure is estimated to be approximately \$6.5 million per year. The additional total expenditure would therefore support approximately 65 additional jobs, located mainly throughout the Study Area, but also at service outlets along the highway between Melbourne and the Study Area.

In the *conservative* case, additional expenditure is estimated to be approximately \$4.3m, supporting an additional 43 jobs.

In the *pessimistic* case, additional expenditure is estimated to be approximately \$2.1m, supporting an additional 21 jobs.

The detailed calculations for these results are shown in Attachment 13.7.

The additional expenditure from tourism would be expended mainly in the towns where commercial facilities are able to cater for visitors. The towns likely to benefit most from the increase in visitation are the coastal towns of Anglesea, Aireys Inlet, Lorne, and Apollo Bay. The inland city of Colac should also benefit.

Smaller inland and coastal towns would only benefit significantly if additional attractions and visitor facilities were located near them. The DSE Otway hinterland proposal to establish tourist nodes and zones in inland areas (DSE 2003) is consistent with attracting a greater share of visitor expenditure to these areas.

VEAC's recommended national park will highlight the hinterland attractions and encourage people to go there and enjoy the wide range of activities for which national parks are well suited – many of which will lead to increased stays: camping, visiting rainforests, bushwalking, etc. This assumes that the park and reserves will be widely promoted – which seems a reasonable assumption given the

likely economic benefits. Many in the tourism sector see it as giving tangible encouragement to operators who might be considering setting up in the area or expanding their activities.

The gypsy wagon tour operator is an example of an activity which has the potential to attract more people to the hinterland areas of the national and forest parks.

We emphasise that we have not explicitly modelled the case where visitor numbers to the study area are held more or less constant while the proportion of overnight visitors is increased. Several of the tourism strategies referred to in the Bibliography point to this as a desirable policy – partly to avoid congestion in, and damage to, natural areas and the Great Ocean Road. There is a strong case for upgrading infrastructure in the hinterland of the study area in order to ameliorate the adverse effects of increased tourism along the coastal fringe. This would also have the effect of redistributing benefits to inland towns.

Because overnight visitors tend to spend more than day visitors (Essential Economics 2002) the way we have modelled the increased tourism may underestimate both net economic benefits and regional impacts. But this will depend on whether or not the strategies to redistribute visitor numbers succeed – the figures in Table 6 suggest that the proportion of day visitors has *increased* on average over the period 1998-2000 while that for overnight visitors has decreased.

Geelong Otway Tourism in its submission to the VEAC Draft Proposals Paper claims that these strategies are already succeeding in reversing this trend and provides the following more recent data for the region:

- the number of *day trips* to the Geelong Otway Tourism region is *declining*. The number of day trips has decreased from 4.68 million in 1998 to 3.38 million in 2002 – an average decrease of 4.5 percent per year;
- the number of *domestic overnight trips* to the region is *increasing*. The number of domestic overnight trips has increased from 1.97 million in 1998 to 2.15 million in 2002, almost a 2 percent increase per year; and
- the number of *international visitors* to the region is *increasing*. The number of international visitors has increased from 73,000 visitors in 1998 to 83,000 in 2002, an average annual increase of 2.7 percent.

Our estimates of additional tourism values provided by the expanded parks do not distinguish between coastal and hinterland effects, or allow for the costs of congestion. Rather, we assume that the VEAC recommendations for the new parks should be seen in the light of other strategies being developed for the region – such as that for the Great Ocean Road Region (DSE 2004). These strategies point to the need to attract tourists to hinterland areas through improved infrastructure – including roads, accommodation and dining facilities, and through additional attractions such as the Otway Fly. The development of appropriate visitor facilities within parks which include information and dining services should also be investigated – at least for the hinterland sections of the forest park.

8.5 Industry trends

Tourism as a whole is an industry which is forecast to grow strongly throughout Australia. The Tourism Forecasting Council (cited in Essential Economics 2002) forecasts that total domestic nights are expected to grow at an annual rate of about 2 percent during the period 2001-2012. Day visitors to the Great Ocean Road Region have increased by about 5 percent per annum over the period 1998-2000 (Table 6).

Several submissions referred to the likely congestion problems faced by the Great Ocean Road and other infrastructure in the region – even in the absence of any stimulus to tourism provided by the expanded parks. These views are supported by the Arup (2002) study and other reports prepared as part of the DSE (2004) Great Ocean Road Region Strategy.

The Arup (2002) study estimated that over the next 8 years, growth rates in traffic (including industry and tourism) in the study area are likely to be:

- Great Ocean Road – 4 percent per annum
- Princes Highway West (Geelong to Colac) – 3.5 percent per annum
- Princes Highway West (Colac to Warrnambool) – 2.5 percent per annum

Arup also undertook sensitivity analysis which assumed a doubling of these rates and assessed the carrying capacity of roads for both ‘natural’ and accelerated rates of growth. Arup concluded that under both rates, hinterland routes would have sufficient capacity to handle traffic diverted from the Great Ocean Road. The assumptions made in the Arup report, with respect to growth in domestic overnight and international tourists, and industrial and residential growth, are contained in Attachment 13.8.

Small towns that are highly reliant on broadacre farming for their economic survival are most likely to be in decline. The demand for farm services has not kept pace with the growth in other services like tourism and hospitality (ABARE 2000). In remote areas, employment in agriculture, forestry and fishing fell by 15 percent between 1986 and 1996. In contrast, employment in accommodation, cafes and restaurants rose by 40 percent and by 56 percent in cultural and recreational services over the same period. (ABARE 2000).

Real growth in visitor numbers to the study area will depend on the development of new attractions and better marketing of existing tourism products. The various tourism development plans for the regions comprising the study area suggest the development of a variety of new tourism attractions.

While it is important to avoid grossly over-estimating potential visitor numbers and tourism benefits from VEAC recommendations, it is also important not to grossly under-estimate them. Tourism numbers will be subject to fluctuations from year to year but the underlying forces include shifts in consumer preferences from consumption of primary commodities to participation in nature-based activities as disposable incomes rise.

It is Government policy to phase out logging and woodchipping in the Otways by 2008 and the implications of this policy are outside the scope of this study. Our role is to assess the effects of the VEAC recommendations with the impacts of existing government policy appearing in the base case for the benefit-cost and social impact analysis.

Several submissions to the Draft Proposals Paper maintained the criticisms of earlier submission periods, namely that our study should include assessments of all the economic, environmental and social impacts of both the government's decision to phase out logging in the Otways, and the impacts of VEAC's recommendations. Some also suggested that we should have undertaken a regional input/output analysis to quantify the income and employment effects of the phasing out of logging.

We agree in principle that it is normally preferable for public policy proposals to be assessed against economic, environmental and social criteria before being implemented by government. In practice it is frequently the case that other considerations override this course of action. To our knowledge there has been no such assessment of the phasing out of logging and woodchipping. The brief and budget for the present study did not cover this issue. Therefore our study does not assess all the economic, environmental or social impacts resulting from the land use changes that may take place as a consequence of both the government's decision *and* VEAC's subsequent recommendations. We deal only with the latter.

One aspect of the VEAC recommendations relates to the possibility of immediate cessation of logging in the areas recommended for national park. One remaining sawlog licensee is affected by the recommendations – with entitlements amounting to approximately 20,000 cubic metres of sawlogs per year until 30 June 2008. The entitlements under the licence conditions include access to Mountain Ash and Mixed Species sawlogs.

Based on information provided by DSE (Attachment 13.9), the potential to harvest sufficient quantities of Mountain Ash in the recommended forest park area is limited and may not be sufficient to meet fully the entitlements to 2008.

The outcome for Mixed Species harvesting as a consequence of the recommendations is such that commitments for these sawlogs could probably be met outside the new area of national park. However further field work would be necessary to confirm the availability of Mixed Species outside the national park area.

In our view there are *at least* three, and potentially many more, options to deal with any shortfall:

- allow harvesting to continue for the next four years within the new national park areas in order to meet commitments (that is, delay implementation of the relevant areas of the national park). This option would represent a significant compromise to the integrity of the national park and the resultant controversy is likely to lead to associated added costs in terms of management, legal proceedings, enforcement and so on.
- buy out the rights for the sawlog committed. Because it is likely that the Mixed Species can be sourced from the forest park areas, the buy out could be restricted to the remaining Mountain Ash component of the entitlement.

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- investigate the possibility of providing Mountain Ash logs from east of Melbourne, including the possibility of salvage logs from the areas damaged by the 2002/03 fires or from the Central Highlands. Transport costs may be a constraint. This option would need to be adopted soon in the case of fire salvage material, due to degradation of log quality over time.

In the absence of detailed information on benefits and costs, we favour some combination of the second and third options.

We assume that there would be no constraints on harvesting within the forest park areas for the next four years, other than those which currently exist in state forest. However, we note that due to their 'park' status, there may be opposition to continued harvesting from these areas.

10.1 Minor wood products

In addition to the production of eucalypt sawlogs and woodchips, the public land forests are a source of specialty timber, firewood, timber for fencing, poles and spars, hobby wood, logs for competitive wood chopping, and tea-tree stakes. Firewood is harvested by commercial firewood cutters as well as by individuals – and mostly supplies local markets including Geelong and Colac. Specialty timbers, predominantly blackwood, are mostly sourced during eucalypt logging programs, with the other forms of forest product mostly harvested from the foothill forests on the northern flank of the Otways. (VEAC 2003).

Recent production figures for wood products other than sawlogs and woodchips are presented in Table 10.

Table 10 Production figures for wood products other than sawlogs and woodchips

| PRODUCT | UNIT | QUANTITY | | | |
|---------------------------|----------------|---------------|---------------|---------------|---------------|
| | | 1999/2000 | 2000/01 | 2001/02 | 2002/03 |
| Bush sawn/split timbers | pieces | 340 | 125 | 0 | 0 |
| Round timbers | pieces | 151 | 15 | 110 | not available |
| Craftwood | cubic metres | 12.75 | 6.5 | not available | 6.14 |
| Chopping logs | cubic metres | 0 | 0 | 0 | 50 |
| Firewood commercial | – cubic metres | 2239 | 2392 | | |
| Firewood domestic | – cubic metres | 1425.5 | 819.5 | 2359 | 3986 |
| Poles | lineal metre | 20 | 0 | 0 | 36 |
| Posts | lineal metre | not available | not available | not available | 345 |
| Tea-tree | lineal metre | 39,692 | 25,509 | not available | 23,790 |
| Xanthorrhoea fronds/heads | bunches/number | 1100 | not available | 700 | 400 |

Source: Department of Sustainability and Environment, cited in VEAC (2003)

Note that the last row in the VEAC (2003) version of Table 10 refers to royalty income, not net economic contribution.

10.1.1 Firewood

The most economically significant minor product from the state forests is firewood. For 2002/03 it is estimated that a total of about 4,000 cubic metres was harvested for commercial and domestic uses. The gross value of this output at \$80 per cubic metre is \$320,000.

The net economic contribution of firewood was calculated by Midas Consulting (2001) to be about \$7 per cubic metre. This gives a net economic contribution from firewood for the study area of \$28,000 per year. In contrast, the harvest of firewood from Box Ironbark forests (Midas Consulting 2001)

revealed a net economic contribution of \$295,000 per year for harvesting 42,000 cubic metres. In other words, the economic importance of the firewood industry on public land in the Otways is small compared with other areas of the State.

Our conclusion is that the net economic contribution of minor wood products for the Otways is unlikely to be significant in comparison with other sources of economic contribution and we exclude it from the benefit-cost analysis. However, some individual producers may be adversely affected by the impacts of the VEAC recommendations and we recommend that their cases be considered individually. Some local consumers of firewood may also be adversely affected but the reductions in volumes available as a consequence of the VEAC recommendations are likely to have little impact on prices in the State's market for firewood.

10.1.2 Fiddleback Blackwood

An Otways timber cutter sells blocks of fiddleback Blackwood to the Maton Guitars factory in Melbourne. Maton produces Australian Blackwood Guitars, which are mostly exported – they are a prized item and sell for up to several thousand dollars each. The harvesting of fiddleback Blackwood is selective – involving the identification and cutting of about one in 300 trees. This is clearly a high value-added activity but there are no data on the extent of available fiddleback Blackwood. URS foresters doubt that the activity is sustainable in the medium to long term. Despite the high value-added nature of the activity, its net economic contribution is likely to be small relative to other values in the parks. Nevertheless, subject to environmental considerations, it is our view that the activity should be permitted to continue in the recommended forest park.

10.2 Apiculture

Much of the public lands of the study area are available for apiculture. In the past, beekeepers have used sites in the Otway National Park, throughout the state forests, and on other public land. Most of the sites previously used have fallen into disuse. Beekeeping is no longer permitted in the Otway National Park. Currently there are three designated apiary sites, of which two are currently unoccupied and have been unlicensed for a number of years. The currently licensed (but, in recent years, unoccupied) public land apiary right is in the Eumeralla Flora Reserve. Bees from hives located on private land may make use of honey flows and nectar resources located within adjoining public land. The eucalypt species of the foothill forests are an important source of honey.

ABS provides estimates of the annual production of honey in each State, but those estimates exclude beekeeping operations with less than 320 hives. Gibbs and Muirhead (1998) have taken the ABS estimates and added an allowance for the likely level of production from bee keeping operations with less than 320 hives, and concluded that the total annual production from all hives registered in Victoria would be about 5,000 tonnes from Victoria in an average season.

The apiary industry is of growing importance to the Victorian economy, partly because of the growing need for pollination services in the state's northern irrigation districts – particularly for almond

production. We estimate the *gross economic value* of apiculture in Victoria to be approximately \$20-30m per year, based on data contained in Essential Economics and Read Sturgess & Associates (1998). These figures include returns to beekeepers and processors. The *net economic contribution* of Victorian beekeepers (above basic wages) is in the range \$1-2m per year.

Available bee sites in Victoria are largely all allocated – both on private and public land. It is therefore difficult to find alternative sites if some are lost due to VEAC's recommendations. The return on capital for beekeepers is high relative to that for most other industries so there is active competition for sites. Net economic contribution per site is of the order of \$1,000-1,500 per year, but from the perspective of beekeepers faced with losing a site, the net losses may be of the order of \$5,000-15,000 per site per year, partly because they would factor in their lost return on labour, assuming that no other sites became available and that they were reluctant to take up some other form of part-time employment. However, there appears to be little demand for sites in the Otways and there is considerable potential to find alternative sites for that recommended to be incorporated in the national park and closed – notably in the 40,000 ha recommended forest park.

As in the case of minor wood products, we have excluded honey production from the benefit-cost analysis while recommending special consideration for the sole producer if a disadvantage as a result of the VEAC recommendations can be demonstrated.

10.3 Eel production

The eel fishery is a relatively small but important export fishery for Victoria. While greatly affected by seasonal factors, including drought, state-wide production averages around 280 tonnes per year with a gross value of \$1.4-4.7m. The catching and processing sectors of the fishery employ up to 70 people across Victoria in a good season (DNRE 2002).

If we assume a 10 percent return on capital invested in the industry, the net economic contribution for Victoria is about \$140,000 to \$470,000 per year.

Under VEAC recommendations, eel fishing would be phased out within ten years from sections (but by no means all) of the lower Gellibrand and lower Aire Rivers, and prohibited immediately from Lake Elizabeth. In consultation with the industry, VEAC staff have estimated that the existing eel harvest in the study area employs about three full time equivalents and has a gross value of around \$100,000 per year, representing two to seven percent of the total for Victoria. The net economic contribution of the local fishery is about \$10,000 per year – small by comparison with other values in the parks. Nevertheless, there are likely to be claims for assistance if these sections of the fishery are ultimately closed.

10.4 Agricultural use of public land

There have been some changes in the number of licences and the areas affected from the Stage 2 report – mainly due to improved mapping and data rather than new areas added to parks.

There are around 602 current licences, covering about 2,138 ha, for grazing domestic stock on public land in the Otways. Nearly all of these licences (94 percent by number, 92 percent by area) will remain unaffected. The recommendations will result in cancellation of all or part of 39 licences, covering about 314 ha, although only around 196 ha is actually grazed. Also, implementation of the recommendations may require fencing of some of the currently-licensed areas, particularly public land along river and stream frontages.

The net economic impact of VEAC recommendations on grazing licences is likely to be small (approximately \$20,000 per year) but special consideration should be given in the implementation phase to those licensees who may be adversely affected – the costs to them will appear to be greater than the loss of net economic contribution to the economy. The loss of the licences may have a greater impact in some cases than is apparent from consideration of areas affected as they may play a strategic role in grazing systems. However, it is unlikely that farm viability will be at risk due to the cancellations.

10.5 Extraction of Sand, Gravel and Stone

The Otways public lands are an important source for many extractive industry products, and no current operations will be affected by the recommendations – they will continue either outside the recommended national park, or under provisions of the *National Parks Act 1975* that allow existing operations to continue. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the recommended national park.

10.6 Mining and Exploration

There are no operating mines on public land in the Angahook-Otway study area, although some public land is subject to exploration licences. It is proposed that these licences be allowed to continue until they expire when they may be renewed. New licences can be issued in all public land categories (generally subject to approval by the Minister for the Environment) except the proposed national park.

Although there is very little history of mining, and little current mining or exploration activity in the Angahook-Otway study area, the mining industry raised several issues in the submission period following the Draft Proposals Paper – including claims that the establishment of new or expanded national parks delayed, prohibited or in other ways led to Victoria missing out on potentially profitable mining operations.

In industry submissions it was estimated that the cost to mining of designating 15 percent of Victoria in state and national parks could amount to as much as \$100m per year. This is a gross figure and would approximate a net economic contribution of about \$10m per year. The expanded Otway

Ranges National Park represents about a 3 percent increase in the total area of parks in Victoria, so on this basis the claimed reduction in net economic contribution could be about \$0.3m per year.

However, the Otways do not have a history of significant exploration expenditure or mining – as opposed to gravel and stone. It is our view that it is unlikely that the future expected returns from mining in the Otways would approach the estimates for gold mining in the Box-Ironbark parks (about \$0.05-0.15m per year for an area which *does* have a history of mining). In other words, they would be likely to be small relative to the other values in the recommended national park.

Industry submissions also referred to two other matters – costly delays in processing Section 40 consents for exploration licences that existed before a national park was established; and loss of knowledge acquisition through prohibiting any drilling in national parks. The second matter involves an argument that environmentally benign drilling in national parks might allow the acquisition of new knowledge that may facilitate successful mining operations *outside* parks. It was claimed that exploration on public land is more easily undertaken than in farmland where geological features are masked by various forms of land use. This argument may reinforce the case for improving the administration of existing exploration licences that fall within the new national park but there would be strong opposition outside the industry to drilling in other areas of the park.

In summary, we agree that the opportunity costs of discouraging or prohibiting mining in the Otways are not zero, but it is likely that they are small relative to other values in the park. The Section 40 issues should be investigated and reviewed from operational and policy points of view – as was recommended by the ECC in the case of the Box-Ironbark parks (ECC 2001, page 61, R20).

10.7 Horse-riding

A number of submissions to the Draft Proposals Paper suggested that horse-riding in general, and commercial horse-riding activities in particular, would be adversely affected by VEAC's recommendations. The submitters felt that there would be restrictions placed on where horses could be taken and that because dogs were to be excluded from the national park, many of their customers would go elsewhere.

VEAC has responded to these concerns, at least in part, by removing some areas, such as parts of Barongarook forest and areas near Barwon Downs, from the national park and placing them in forest park. VEAC has also provided for horse-riding in the former state forest area of the Jancourt Nature Conservation Reserve and made specific reference to continuing access to currently used tracks in key areas such as around Aireys Inlet, Anglesea and Cape Otway.

Despite these adjustments, it is likely that there will still be some restriction on recreational and commercial activities involving horses and accompanying dogs. However, for the commercial activities there should be expanded opportunities arising out of the increased numbers of visitors to the region that are expected as a result of the significant upgrading of parks. Individual cases of genuine disadvantage that might remain should be dealt with on a case by case basis.

11.1 Benefit-cost analysis

As stated earlier, it is Government policy to phase out logging and woodchip production in the Otways and the implications of this policy are outside the scope of this study. Our role is to assess the effects of the VEAC recommendations with the impacts of existing Government policy appearing in the base case for the benefit-cost and social impact analysis. In other words, we do not include the net loss of timber value from the phasing out of logging in what follows.

We have concluded that a number of industrial and commercial economic impacts of the VEAC recommendations are relatively small and, most particularly, are too small to be included in the comparison of benefits and costs.

The main economic impacts of the VEAC recommendations are to be found in the broad category of biodiversity conservation; and in recreation and tourism. Because of lack of visitor data we were not able to quantify net changes in the recreational impacts in moving from state forest to forest park or national park.

The estimates of the additional costs of park management (\$2m per year) are provisional and may be subject to change – partly depending on whether all of VEAC’s recommendations are accepted by government.

Non-use economic values for biodiversity protection in the expanded national park are assumed to be \$5m per annum for the pessimistic case, \$15m per annum for the conservative case, and \$25m per annum for the optimistic case.

The increases in net economic values for tourism that potentially arise as a result of VEAC’s recommendations for the national park are estimated to be approximately \$2.4m per year in the pessimistic case, \$4.8m per year in the conservative case, and \$7.2m per year in the optimistic case.

In summary, we estimate that the net increase in economic value that may arise as a consequence of adopting VEAC’s recommendations lies in the range \$5.4-30.2m per year, with the ‘conservative case’ yielding net benefits to Victorians of about \$18m per year, including the ‘non-use’ value obtained from increased biodiversity protection, and after deducting the additional costs of public land management.

11.2 Regional impacts

In the optimistic case (30 percent increase in visitation), *additional* expenditure is estimated to be approximately \$6.5 million per year. The additional total expenditure would therefore support approximately 65 additional jobs, located mainly throughout the study area, but also at service outlets along the highway between Melbourne and the study area.

In the conservative case, additional expenditure is estimated to be approximately \$4.3m, supporting an additional 43 jobs.

Comparing Benefits and Costs of VEAC Recommendations

SECTION 11

In the pessimistic case, additional expenditure is estimated to be approximately \$2.1m, supporting an additional 21 jobs.

The towns likely to benefit most from the increase in visitation are the coastal towns of Anglesea, Aireys Inlet, Lorne, and Apollo Bay and the inland city of Colac.

Smaller inland and coastal towns would only benefit significantly if additional attractions and visitor facilities were located near them. The DSE's draft hinterland tourism development plan, to establish tourist nodes and zones in inland areas, is consistent with attracting a greater share of visitor expenditure to these areas. VEAC's recommendations for expanded parks in the hinterland areas should also attract more visitors to these areas.

There is a strong case for upgrading infrastructure in the hinterland of the study area in order to ameliorate the adverse effects of increased tourism along the coastal fringe. This would also have the effect of redistributing benefits to inland towns.

We have recommended that the individual businesses that may be adversely affected by VEAC's recommendations should be assisted on a case by case basis in the implementation phase of establishing the parks – should VEAC's recommendations ultimately be adopted by Government.

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13.1 Economic Value

The economic value of a good is determined by the amount that an individual is willing to pay. Demand for a good is normally described by the use of a demand function which shows how much an individual is willing to pay to obtain various amounts of the good in question. Normally the interaction of supply and demand in the market place determines the price and quantity of a good bought and sold. However, the environmental benefits provided, for example by establishing or expanding national parks, are not all priced in markets.

It might be considered that it is not possible to place an economic value upon certain goods such as scenic quality or preservation of flora and fauna. However, in recent years economists have developed a set of tools and techniques which allow us to do this. There have been substantial developments in the valuation of non-market goods and the techniques available allow us to provide a more balanced policy perspective on the use of the environment.

Values are normally expressed in monetary terms in economic analysis. The justification for monetary evaluation is that it allows us to have a common measure for comparing benefits and costs. Money is a useful measure by which to express value as it is used every day when we buy and sell goods and thus exhibit our preferences. The usefulness of providing a monetary measure is that it can be easily interpreted and employed by decision makers, providing a simple check of the economic rationality of decisions.

The basic idea behind evaluation of non-market goods is that preferences (expressed in monetary terms) are the basis of benefit measurement. The simplest way to discover an individual's preferences is by direct asking — essentially providing them with choices between various options and asking them what their decisions would be. If an individual expresses positive preferences toward a particular good this should be reflected in a positive measure of willingness-to-pay (WTP) for that particular good. If we can establish a sample of WTP values these can be used to extrapolate the value which society places upon a good.

Expenditures on goods might not actually capture the entire benefit of a good to an individual or society. This is because many individuals might have been willing to pay more than the market price for a good, reflecting the fact that they obtain more satisfaction from consumption of the good than they are being asked to pay for — this excess is known as consumer surplus (CS). Thus, total WTP is equal to actual expenditure on the good (market price times quantity demanded) plus CS. In other words, direct expenditure on a good normally under-estimates the consumer's valuation or WTP for the good.

The concept of consumer surplus, together with a graphical representation of the principles involved, is revisited in a later section.

Identifying the Elements of Value

There are two main elements of value which need to be distinguished, 'use' and 'non-use' value. Use value accrues to those individuals who actually use an economic resource. However, there are also individuals who do not use an economic resource but still value the existence of that resource. Thus Total Economic Value (TEV) can be defined as follows:

TEV = Use Values (priced and unpriced) + Non-Use Values (unpriced)

In general, unpriced (or ‘non-market’) values for *use* value are more easily determined than those for *non-use* values. There has been much research into the various forms of environmental value and the following are the most generally accepted:

USE VALUES

- Productive uses where certain species are harvested for sale of their products.
- Consumptive uses such as recreational fishing, hunting and plant collecting.
- Non-consumptive uses such as bushwalking, camping, viewing of scenery or photography.

NON-USE (PRESERVATION OR INTRINSIC) VALUES

- Existence value — the value which arises from the knowledge that the environmental feature or species in question exists and will continue to exist.
- Option value — the value to the individual of knowing that the species will be available for use in the future.
- Quasi-option value — the value of preserving options, given uncertain outcomes from decisions and an expectation of gaining more information with time.

It should be noted that only one of the six sub-categories of value, namely productive uses, are priced in markets.

Types of Non-Market Valuation Techniques

- Non-Market Valuation (NMV) techniques can be classified into two types: revealed preference (RP) techniques and stated preference (SP) techniques.
- RP techniques rely on observations of peoples’ actions in buying and selling goods and services that are in some specific way related to the non-marketed impact under consideration. For instance, peoples’ preferences for farmland – as reflected by the prices paid for property – can be used to infer the values they hold for environmental and social factors that affect farm prices but which themselves are not marketed directly. Examples would include scenic views, neighbourhood social facilities etc. – which are considered in conjunction with the agricultural value of the land.
- SP techniques involve people being asked questions in the format of a survey regarding the strength of their preferences for specified environmental or social changes. The questions are designed to focus on the trade-offs people are willing to make between the environmental and social improvements and their personal wealth and well-being.

Revealed preference techniques

- The Travel Cost Method (TCM) uses the relationship between peoples’ preferences for recreational experiences – for instance natural areas or cultural sites – and their willingness to pay the costs of travelling to the site of that experience. Hence, where an investment in eg. riparian management improves the recreational potential of a resource (say through an enhancement of the water quality in a river that is used for swimming or fishing) the TCM could be used to estimate the value of the benefit that is so derived.

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- The Hedonic Pricing (HP) technique requires the estimation of the price of a marketed good as a function of its determining factors, including non-marketed elements that are of interest. Hence, if rural land prices reflect both an agricultural production component and an environmental component (eg. as assessed by the extent of tree clearing) land price data could be related to these components using statistical procedures in order to determine the contribution of each component to land value. Land markets can also be analysed to estimate the value of improved aesthetics and air and water quality.

Stated preference techniques

- The Contingent Valuation Method (CVM) is perhaps the most widely known SP technique. In a CVM application, respondents are asked to reveal their willingness to pay in a structured questionnaire. The CVM is extremely flexible in its application and has thus been applied in a wide variety of non-market valuation contexts. It can be used to estimate the value associated with moving from the 'status quo' situation to one in which a range of social and environmental features are improved.
- The Choice Modelling (CM) approach to non-market valuation is a development of the CVM where respondents to a questionnaire are asked to select between an array of alternative future resource allocation scenarios. Each scenario is described in terms of a set of non-marketed 'attributes' or characteristics and a monetary cost. For example, a CM application may provide estimates of the value of increased stream side vegetation, enhanced biodiversity, improved water quality, more recreational opportunities, etc. By combining these individual estimates, the values associated with changing from the 'status quo' situation to many different alternative situations can be estimated.

Benefit Transfer

- Benefit transfer (BT) has been developed as a way to limit the costs of estimating non-market values.
- BT involves values estimated in an already completed study (called the source study) being transferred for use in the case of interest (called the target study).
- For the BT process to be valid, a number of conditions should be satisfied:
 - ◆ First, the source study should be valid – ie the non-market valuation process should have been performed in a rigorous fashion.
 - ◆ Second, the bio-physical and or social conditions pertaining in the target study should be similar to those occurring in the source study.
 - ◆ Third, the demographic and economic characteristics of the population sampled in the source study should parallel those in the target study.
 - ◆ Finally, the extent of the changes being values in the target study should approximate those investigated in the source study.
- This list of requirements is difficult to satisfy when there is only a limited number of source studies. As the number of non-market valuation exercises performed increases, the database of source studies increases and hence the chances of a relevant source study being available increases.

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- BT may employ the use of statistical procedures to transfer values, or less rigorous ‘impressions of value’ may be transferred from other studies where the cost of performing a full survey or detailed statistical modelling are not justified.

A more comprehensive discussion of the issues canvassed in this Attachment may be found in: URS (2003), *Non-Market Valuation and Holistic Assessment: Part 1: Non-Market Benefits of Research and Development*, Final Report prepared for Land and Water Australia, Canberra.

13.2 The Travel Cost Method and Consumer Surplus

The Travel Cost Method has been widely used to estimate the value of parks. For example, Read Sturgess & Associates (1999) used this method to value all Victorian Parks managed by Parks Victoria, including those in the study area.

In its simplest form, the TCM uses data collected from site users as to their place of residence and their costs of travelling to the site to estimate the function:

$$V_i/N_i = f(TC_i) \quad (1)$$

where:

V_i is the number of visits made to the site by people from a region i ;

N_i is the population of region i ;

f denotes the functional form of the relationship; and,

TC_i is the average costs of travelling to the site from region i .

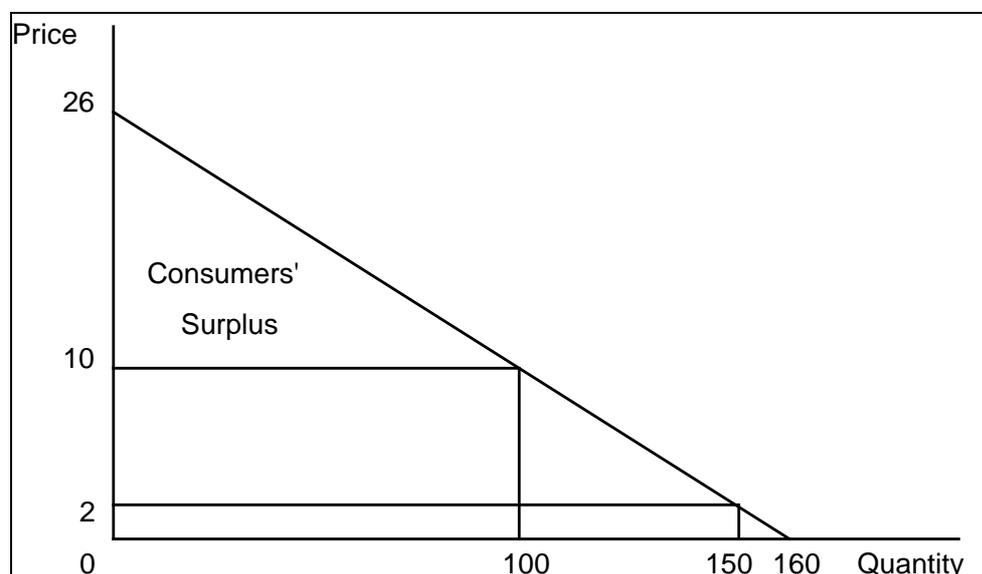
From this equation, it can be observed how the visitation ratio (V_i/N_i) would change if a hypothetical fee of varying magnitude was to be charged for entry to the site. To do this it is necessary to assume that site visitors would respond to an entrance fee in the same way as they respond to higher travel costs. Thus for a particular region where the current average travel cost was \$15, the visitation ratio predicted given a \$5 entrance fee would be the visitation ratio predicted by the estimate of Equation 1 for a region where the current travel costs are \$20.

By performing these extrapolations and summing total visitation numbers from across all regions at a range of different hypothetical entrance fees, a demand curve for the use of the site can be constructed. The area under this demand curve and above the price line is an estimate of the total consumer surplus enjoyed as a result of people's use of the site. The consumer surplus measures the difference between what consumers are willing to pay for a service and the price that they are required to pay. It thus reflects the improvement in well-being that they experience through the consumption of the service. A simple division of this total by the number of people currently using the park gives an estimate of the average per person benefit. This figure can then be extrapolated to cover the population of users that is relevant to the valuation exercise.

In the diagram below the demand schedule is the line joining a price of \$26 with a quantity of 160 units. It shows the quantity of the good or service that will be demanded at a given price. In this hypothetical case, at a price of \$10 per unit, the quantity demanded equals 100 units.

The diagram shows that at a price level of \$10 per unit the consumer surplus enjoyed totals \$800 ($16 \times 100 \div 2$). The revenue earned at this price totals \$1,000 (10×100). At a price of \$2 per unit, consumer surplus totals \$1,800, a *net gain* of \$1000 in value. For the same fall in price, revenue has *decreased* by \$700. This example illustrates that the use of revenue/expenditure data can lead to grossly mistaken conclusions about the economic worth of an asset or proposal. At the price of \$2 per unit, the *value in use* (consumers' surplus) equals \$1,800 but the *value in trade* (revenue) is only \$300. So the total economic value is \$2,100, not \$300.

Demand Schedule Showing Consumer Surplus



In the context of parks, if the quantity axis in the above example was in thousands of visitors per annum, the total consumer surplus, net of the costs of travelling to the site, would potentially be \$2.08m per annum ($26 \times 160,000 \div 2$). In other words, the *value* of the park is equivalent to \$2.08m per annum. If entry fees are charged, they represent simply a transfer of funds from visitors to park management — park management gains revenue and visitors lose some consumer surplus. The value of the park doesn't change.

It is therefore appropriate to undertake the economic evaluation of parks in two stages:

- an economic appraisal which determines the social worth of the proposal based on considerations of the net consumer surpluses generated;
- followed by a financial appraisal which examines the revenue implications of the project.

We focus our attention on the first stage in this report as this is the crucial stage — particularly for parks which embrace a substantial 'public good' component and can be seen in part as meeting community service obligations.

The two situations depicted in the above diagram could be regarded as that applying to a private enterprise (at the higher entry price) and to a park (at the lower entry price). The private enterprise has higher revenue and lower consumer surplus than the park – a common result when comparing private with public goods. In the case of the Otway Ranges recommended parks, there are many possible entry points and the opportunity to charge entry fees is limited. But as the above analysis shows, this does not diminish the economic values of the parks (as opposed to their accounting or financial value) and it is possible to estimate what these values may be.

13.3 The 'Forest Park' Land Use Category

VEAC has recommended that the new land-use category 'forest park' be in accordance with the following outline:

1. the new land-use category be defined as "extensive areas of land supporting native forests and bushland, with a range of recreation, nature conservation and resource utilisation values";
2. the management objectives of the new land-use category be - that such areas be used to:
 - (i) provide opportunities for informal recreation associated with the enjoyment of natural surroundings;
 - (ii) protect and conserve biodiversity, natural and cultural features, and water supply catchments;
 - (iii) supply a limited range of natural resource products;
3. the following activities generally be permitted:
 - (i) bushwalking, car touring, four wheel driving, horse-carriage driving, horse riding, mountain-bike riding, trail-bike riding, dog walking, picnicking, camping (including dispersed camping), hunting, fishing, recreational prospecting and gem-stone seeking, nature observation, bird watching and visiting historic features, orienteering and rogaining, car rallying, defence force training;
 - (ii) water extraction;
 - (iii) exploration and extraction of earth resources, minerals and petroleum and other fossil fuel products where consistent with recreation and conservation management objectives, and subject to the approval of the Minister for the Environment [ie be restricted Crown land];
 - (iv) apiculture and low-intensity grazing of domestic stock where pre-existing and consistent with recreation and conservation management objectives; and
 - (v) low-intensity harvesting of minor forest products such as firewood, posts and poles, woodchop blocks and other plant products;
4. the following activities not be permitted:
 - (i) timber harvesting for sawlog and pulpwood production after 2008; and
5. they be permanently protected under new legislation and be managed by the Department of Sustainability and Environment (management may be delegated by DSE to either the Forests Service or Parks Victoria).

VEAC's recommendations also list site-specific special values that are to be protected or accommodated in particular areas of the forest park.

13.4 Tourism and Recreation in Recommended Parks

Source: Provided by VEAC.

Bushwalking (overnight)

- **General:** high level activity in Angahook-Lorne State Park and Otway National Park; some designated walking tracks in state forest - most vehicle tracks are available for walking; long coastal walks established
- **Current:** allowed in all public land except closed catchments, reference areas and operating logging coupes; access limited practically by steep topography, high rainfall and tracks growing over
- **Submissions:** bushwalkers sought construction of new multi-day walking tracks and implementation of the Trans Otway Walk; prefer separate tracks from vehicle and horse tracks
- **Recommended:** will continue to be allowed as currently

Camping

- **General:** very popular activity, especially in camping grounds along the coast and in Angahook – Lorne State Park
- **Current:** large camp grounds at 8 coastal towns; 75 designated inland camping grounds, most in Angahook – Lorne State Park and nearly all vehicle-based; 5 in Otway National Park, 3 in state forest as well as dispersed camping permitted across all areas of state forest except operating logging coupes
- **Submissions:** a few called for maintenance of existing access, and for dispersed vehicle based camping to be allowed to continue
- **Recommended:** formal / designated campsites will continue to be allowed as currently, and dispersed camping will be permitted in the recommended forest park, and in parts of the recommended national park (at the land managers' discretion)

Car rallies

- **General:** minor activity in Angahook – Otway study area
- **Current:** allowed in state forest with approval from the land manager; generally not allowed in national or state parks
- **Submissions:** none specifically on car rallying; numerous submissions want roads and tracks generally to remain open
- **Recommended:** will be allowed in the forest park, and will not be allowed in the national park

Car touring

- **General:** major activity in Angahook – Otway study area
- **Current:** allowed on roads and open tracks that were formed for the passage of vehicles, in state forest, national park and state parks, and other public roads
- **Submissions:** several submissions called for more maintenance of roads and tracks
- **Recommended:** will continue to be allowed as currently

Cycling

- **General:** medium level activity in the study area, particularly bicycle touring along the Great Ocean Road, coastal areas and inland routes, and mountain bike riding at Kwarren and from Forrest to Lake Elizabeth
- **Current:** allowed on roads and open tracks that were formed for the passage of vehicles, in state forest, national park and state parks, and other public roads
- **Submissions:** a few called for maintenance of access for mountain bikes
- **Recommended:** will continue to be allowed as currently

Fishing

- **General:** medium level activity in Angahook - Otway study area
- **Current:** generally allowed in national and state parks, and state forest, subject to normal licensing and regulations
- **Submissions:** several submissions called for access for fishing to be maintained
- **Recommended:** will continue to be allowed as currently

Four-wheel driving

- **General:** major activity in the Otways
- **Current:** allowed on roads and open tracks that were formed for the passage of vehicles, in state forest, national park and state parks; no off-track driving is permitted on public land
- **Submissions:** several submissions called for access for four-wheel driving to be maintained, and roads and tracks not to be closed; others called for four-wheel driving to be banned from at least part of the area
- **Recommended:** will continue to be allowed as currently

Gemstone Fossicking, Prospecting, etc.

- **General:** very minor activity in Angahook – Otway study area
- **Current:** allowed in state forest (but little interest) and coastal reserve; not allowed in state or national parks (little interest), except in one area (Wreck Beach in existing Otway National Park, which is the key area for gemstone seekers)
- **Submissions:** several submissions want additional designated fossicking areas in parks
- **Recommended:** will be allowed in the forest park and coastal reserve, and will not be allowed in the national park, except at Wreck Beach where existing arrangements will continue

Guided tours

- **General:** minor activity in the study area; several horse-riding tour businesses for example at Winchelsea South, Aireys Inlet and Cape Otway, as well as mountain biking, and gypsy wagon tours, and nature tours generally along the eastern coastal strip
- **Current:** allowed on open tracks in most public land, with requirements according to specific activities in the national and state parks

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- **Submissions:** industry wants access to key areas maintained; some submitters were concerned over impacts of ‘too much’ tourism
 - **Recommended:** will generally continue to be allowed as currently; traditional access for horse-riding to parts of the national park will generally continue, subject to management

Horseriding

- **General:** medium level activity in the study area; popular around Aireys Inlet, Anglesea, Barongarook and Princetown.
- **Current:** generally allowed on open vehicle tracks in all inland public land (except as for bushwalking); also in most coastal reserves and some beaches in the Otway National Park
- **Submissions:** several want at least maintenance of present access, and zoning to permit riding in parks
- **Recommended:** will continue to be allowed as currently; traditional access to parts of the national park will generally continue, subject to management; some tracks may be closed seasonally or permanently because of unacceptable environmental impacts

Hunting

- **General:** minor activity in Angahook – Otway study area
- **Current:** allowed in state forest (primarily for deer) and Lower Aire Wildlife Reserve (for waterfowl), subject to normal licensing and regulations; not allowed in national or state parks, or nature conservation reserves
- **Submissions:** a few submissions want access for hunting maintained; a similar number want hunting banned
- **Recommended:** will be allowed in the forest park, and will not be allowed in the national park

Nature observation

- **General:** major activity in Angahook – Otway study area, with tall trees, rainforests, fern gullies, diverse heathlands and numerous bird species among other natural elements
- **Current:** allowed in state forest, national and state parks, nature conservation reserves and other reserves with natural habitat
- **Submissions:** many want more habitat protected in a larger national park
- **Recommended:** will continue to be allowed as currently

Orienteering and rogaining

- **General:** occasional organised events in the study area, rather than ongoing or frequent use
- **Current:** with the approval of the land manager, potentially allowed in all public land except closed catchments, reference areas and operating logging coupes
- **Submissions:** none specifically on these uses
- **Recommended:** will continue to be allowed as currently

Picnics and barbecues

- **General:** very high level in the study area
- **Current:** many locations along the coast, Great Ocean Road and at inland park and forest features (such as waterfalls, tall trees and fern gullies) have established picnic areas, some with barbecue facilities; elsewhere no limits on picnicking (except as for bushwalking); barbecues in designated fireplaces only, subject to fire restrictions
- **Submissions:** none specifically on picnics and barbecues
- **Recommended:** will continue to be allowed as currently

Trail bike riding

- **General:** medium level activity in the study area; more intensive use near some towns, particularly in the east of the study area
- **Current:** allowed on roads and open tracks that were formed for the passage of vehicles, in state forest, national park and state parks; no off-track riding is permitted on public land
- **Submissions:** several submissions want access for motorbikes to be maintained; several want trail bike riding banned
- **Recommended:** will continue to be allowed as currently

Visiting historic features

- **General:** generally minor activity in the study area
- **Current:** visitation to interpreted, robust sites is encouraged, in state forest, national and state parks; there are practical (rather than administrative) limits to visiting more remote sites; access to some sensitive sites may not be encouraged
- **Submissions:** several called for identification and protection of historic timber industry relics, and recognition for cultural heritage values
- **Recommended:** will continue as currently

Walking and running

- **General:** major activities in Angahook – Otway study area; many very popular short walks, half day and day walks, near towns and in the parks and state forests, particularly to scenic and historic features; near-continuous opportunities for coastal walks; many roads and tracks provide challenging running in attractive settings
- **Current:** allowed on walking and vehicle tracks in all public land except closed catchments, reference areas and operating logging coupes
- **Submissions:** a few called for maintenance of existing walking tracks; many want access maintained for a range of recreational activities
- **Recommended:** will continue to be allowed as currently

Walking dogs

- **General:** major activity within 2 km of towns; small amount of camping with dogs
- **Current:** allowed everywhere except national park where not allowed anywhere
- **Submissions:** several submissions called for maintenance of access to beaches and near towns for dog walking; a few wanted access to parks and forests
- **Recommended:** will be allowed in the forest park and coastal reserves, and will not be allowed in the national park, except in a zone near Aireys Inlet

13.5 Implementation of ECC Box-Ironbark Recommendations

Source: Provided by VEAC

ECC's Box-Ironbark Final Report was presented to Minister Garbutt on 30 June 2001. The Government released the report to the public on 23 August 2001. Soon afterwards, NRE established the Box-Ironbark Project Team to carry out key steps towards implementation of approved recommendations. On 22 November 2001, the Government announced 'in principle agreement' to the boundaries of the recommended Box-Ironbark parks and reserves.

With the Box-Ironbark recommendations, and ECC's Marine, Coastal and Estuarine Areas investigation recommendations, implementation was unusual in that substantial budgets were set aside specifically for those purposes. Minister Garbutt indicated that sufficient funding would be provided to implement the Box-Ironbark recommendations.

While ECC made the Box-Ironbark recommendations, the subsequent passage of the *VEAC Act* on 4 December 2001 applied a new approval process, requiring a formal response to each recommendation within 6 months – and a statutory commitment to “ensure that appropriate actions are taken to implement (each) recommendation to the extent that it has been accepted.”

Following the in principle agreement, the Box-Ironbark Project Team worked energetically to implement the approved recommendations. The following summary lists many of the tasks and sub-projects it has overseen.

Box-Ironbark Project Team has:

- acted as secretariat for the **Button Implementation Panel**, which among other things considered impacts on forest workers, and in its January 2002 report specified details of appropriate financial assistance
- consulted within NRE and with other relevant departments, and drafted the detailed **Government Response** to the recommendations, released on 26 February 2002
- held a **workshop** for NRE staff to plan steps necessary to implement the approved recommendations
- prepared an **ERC bid** for implementation funding; subsequently the 2002/2003 State Budget included an allocation of **\$20.8 million over 4 years** to implement the Box-Ironbark recommendations
- established a public **website** providing public access to the many reports produced during implementation, and displaying maps of each new park, fact sheets describing the rationale for the parks and the biodiversity being protected, and 'frequently asked questions and answers'
- published 10 editions of the **Box-Ironbark Newsletter**, explaining progress on various matters to the community, between July and December 2002
- assisted in developing **fire protection plans** for Box-Ironbark forests; a consultation process was started in October 2002
- set up **farm forestry schemes** in the 'North Central area' [September 2002] and 'North East area' [October 2002], each with a commitment of \$400 000 to support grants for woodlots for firewood on private land

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- established a **new firewood licensing scheme** that targets wood for local communities rather than sale in Melbourne
 - prepared **5-year firewood plans** for each of 13 community firewood supply areas, and produced a full research report on Box-Ironbark firewood, a summary of research findings, and a technical reference document [September/October 2002]
 - established a structure for a **grievance process** for public land users who object to land management decisions, and the office of the grievance registrar, who will hold hearings as required [consultation October 2002; grievance officer Brian Wright appointed late 2003]
 - initiated establishment of **conservation management networks**, at Wychitella and along the Broken, Boosey and Nine Mile Creeks; a consultation process was announced in October 2002, and a project officer appointed at Bendigo
 - developed the detailed Box-Ironbark **Recreation Framework** [completed October 2003] assisted by a 13 member community advisory group
 - initiated development of a **streamlined approvals process** for exploration and mining on public land within existing legal frameworks

As a cross-departmental initiative, a number of other divisions/regions were responsible for delivery of some elements of the Box-Ironbark implementation project, as follows:

- DSE's Parks, Flora and Fauna policy group (PFF) steered preparation of the *National Parks (Box-Ironbark and Other Parks) Bill* in August/September 2002, including provisions for the new category of National Heritage Park, and clauses to permit complex arrangements for mineral exploration, mining and prospecting in some parks (among other things); for the first time park plans were produced using 1:25 000 Crown parcel digital mapping, requiring numerous meetings between NRE Parks, Land Victoria, Parks Victoria, ECC/VEAC staff, and Land Victoria surveyors (who prepared comprehensive reports), to resolve the fine details of each park boundary. PFF supported passage of the Bill through Parliament, the amendment being assented to on 29 October 2002
- Forests Service's FISAP group oversaw implementation of the 'fair and equitable' Box-Ironbark **structural adjustment** scheme for affected businesses and sawlog, firewood and post cutters; this was very successful, with all 120 eligible cutters taking up assistance packages; these were facilitated by an independent 'service provider' who gave financial advice, training and advocacy
- Forests Service commenced **forest management planning** for Bendigo FMA, with establishment of Community Advisory Groups; community forest tours were held in October 2003; the aim is to complete the FMA plan by December 2004
- DSE's Box-Ironbark regional implementation officer (RIO) supported the **Firewood Taskforce**, established in May 2003 to consider longer term community energy solutions, comprising 4 local MPs who toured the Box-Ironbark area, spoke to local communities, received submissions and produced a Final Report in October 2003
- The RIO has also overseen transitional firewood licensing arrangements in 2003, new arrangements for firewood season 2004, and coordinated implementation of numerous Box-Ironbark tasks in the region, including setting up advisory groups, the grievance process, and provisions for recreation

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- Crown Land Management received funding to prepare detailed mapping of Box-Ironbark land use categories, based on the VicMap Digital parcel layer [October 2002 – June 2005]; CLM drafts are validated by VEAC staff; this project is now known as **VEAC25** development map layer, contributing to PLM25 mapping of Victoria
 - Crown Land Management scheduled a program of **detailed boundary surveys** of recommended reserves, with the aim of formal **reservation** of most such areas; PLM – Parks is validating draft survey reports
 - Parks Victoria’s **ecological thinning** research trials have commenced [as recommended by ECC], after establishing a scientific reference group to set treatment parameters; plots have been treated near Castlemaine; \$600 000 to employ displaced woodcutters to carry out thinning, and \$400 000 for monitoring have been committed
 - Parks Victoria has initiated a 3 year program of **park management plan** preparation, and has established advisory groups for the Greater Bendigo National Park, Castlemaine Diggings National Heritage Park and Broken – Boosey State Park
 - Parks Victoria has a comprehensive Box-Ironbark site on its website, with much background information and links to current processes
 - Department of Infrastructure, Energy and Security Division has initiated the development of a **Strategy for Sustainable Domestic Energy Use** in the Box-Ironbark Region. A number of recommendations relating to managing change in domestic energy supply and demand are investigated including:
 - Natural Gas Connection
 - Gas Infill Subsidy
 - Energy Efficiency Retrofit program
 - Wood Pellets
 - ECC and VEAC staff have provided on-going advice, clarifications, detailed information, and resolution of specific queries.

13.6 Summary of DSE and PV Expenditure on Park Management

Source: Provided by VEAC

National Parks Act Annual Reports data.

Total expenditure on park management [including staff] for National Parks Act areas.

Incorporates Parks Victoria expenditure [excluding PV's Parks & Reserves Trust income from metropolitan Melbourne ratepayers]

| Year | Total expenditure | Reference | Number of Rangers |
|-----------|--------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------|
| 2002/03 | DSE Parks \$19.3M Parks Victoria \$50.4M Total \$69.7M | Table 5, p.18 | 250 [plus 90 'field service' officers] |
| 2001/02 | NRE Parks \$16.8M Parks Victoria \$48.6M Total \$65.4M | Table 4, p.16 | 262 [plus 95 'field service' officers] |
| 2000/01 | NRE Parks \$21.2M Parks Victoria \$49.5M Total \$70.7M | Table 4, p.16 | 262 |
| 1999/2000 | NRE Parks \$22.0M Parks Victoria \$47.3M Total \$69.3M | Table 9, p.16 | 259 |
| 1998/99 | NRE Parks \$20.2M Parks Victoria \$36.7M Total \$56.8M | Table 9, p.18 | 237 |
| 1997/98 | NRE Parks \$7.6M Parks Victoria \$33.6M Total \$41.2M | Table 8, p.15 | 237 |
| 1996/97 | NRE Parks \$14.6M NRE Regional \$24.7M Parks Victoria \$8.5M Total \$47.8M | Table 7, p.14 PV report p.20* | 228 |
| 1995/96 | NRE Parks \$6.5M NRE Regional \$25.7M Total \$32.2M | Table 4, p.16 | 213 |

- For Parks Victoria's first year of operation, this estimate is derived from PV's total operating expenses less ratepayer revenue – it is only approximate.

13.7 Net Benefits and Expenditure for Tourism

Estimate of the value of visitation for the existing study area parks - *optimistic scenario*

| | Area (ha) | Total visitor days per year | Assumed increase in visitation (optimistic) | Increase in net benefit (\$) | Likely future level of visitation (visitor days per year) | Net increase (visitor days per year) |
|---------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|---------------------------------------------|------------------------------|-----------------------------------------------------------|--------------------------------------|
| Parks | | | | | | |
| Otway National Park (6% reference area, 79% conservation, 21% conservation and recreation, 0.2%recreation development) | 12,900 | 317,578 | 0% | - | 317,578 | 0 |
| Angahook-Lorne State Park (87% conservation, 13% conservation and recreation, nil recreation development) | 21,359 | 591,438 | 30% | 5,322,938 | 768,869 | 177,431 |
| Carlisle State Park (>99% conservation, <1% conservation and recreation, nil recreation development) | 5,600 | 1,595 | 30% | 14,355 | 2,074 | 479 |
| Melba Gully State Park (75% conservation, 22% conservation and recreation, 3% recreation development) | 73 | 206,200 | 30% | 1,855,800 | 268,060 | 61,860 |
| Kawarren Regional Park (no visitor data available) | 663 | 0 | 0% | - | - | 0 |
| Total | 40,595 | | | | | |
| State Forests | | | | | | |
| approximate total | 92,000 | 0 | 0% | | - | 0 |
| Grand Total | | 1,116,810 | | | 1,356,580 | 239,770 |
| NET BENEFIT (net economic contribution) (\$/year) | | \$ 21,515,813 | | \$ 7,193,093 | | |
| EXPENDITURE (\$/year) | | \$ 30,042,189 | | | \$ 36,491,995 | \$ 6,449,806 |
| JOBS | | 300 | | | 365 | 64 |
| Assumed consumer surplus \$ per visitor day - | | | | | | |
| national park | 30 | | | state park and forest park | 15 | |

Estimate of the value of visitation for the existing study area parks - conservative scenario

| | Area (ha) | Total visitor days per year | Assumed increase in visitation (conservative) | Increase in net benefit (\$) | Likely future level of visitation (visitor days per year) | Net increase (visitor days per year) |
|---------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|-----------------------------------------------|------------------------------|-----------------------------------------------------------|--------------------------------------|
| Parks | | | | | | |
| Otway National Park (6% reference area, 79% conservation, 21% conservation and recreation, 0.2%recreation development) | 12,900 | 317,578 | 0% | - | 317,578 | 0 |
| Angahook-Lorne State Park (87% conservation, 13% conservation and recreation, nil recreation development) | 21,359 | 591,438 | 20% | 3,548,625 | 709,725 | 118,288 |
| Carlisle State Park (>99% conservation, <1% conservation and recreation, nil recreation development) | 5,600 | 1,595 | 20% | 9,570 | 1,914 | 319 |
| Melba Gully State Park (75% conservation, 22% conservation and recreation, 3% recreation development) | 73 | 206,200 | 20% | 1,237,200 | 247,440 | 41,240 |
| Kawarren Regional Park (no visitor data available) | 663 | 0 | 0% | - | - | 0 |
| Total | 40,595 | | | | | |
| State Forests | | | | | | |
| approximate total | 92,000 | 0 | 0% | | - | 0 |
| Grand Total | | 1,116,810 | | | 1,276,657 | 159,847 |
| NET BENEFIT (net economic contribution) (\$/year) | | \$ 21,515,813 | | \$ 4,795,395 | | |
| EXPENDITURE (\$/year) | | \$ 30,042,189 | | | \$ 34,342,060 | \$ 4,299,871 |
| JOBS | | 300 | | | 343 | 43 |

Estimate of the value of visitation for the existing study area parks - pessimistic scenario

| | Area (ha) | Total visitor days per year | Assumed increase in visitation (pessimistic) | Increase in net benefit (\$) | Likely future level of visitation (visitor days per year) | Net increase (visitor days per year) |
|---------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|----------------------------------------------|------------------------------|-----------------------------------------------------------|--------------------------------------|
| Parks | | | | | | |
| Otway National Park (6% reference area, 79% conservation, 21% conservation and recreation, 0.2%recreation development) | 12,900 | 317,578 | 0% | - | 317,578 | 0 |
| Angahook-Lorne State Park (87% conservation, 13% conservation and recreation, nil recreation development) | 21,359 | 591,438 | 10% | 1,774,313 | 650,581 | 59,144 |
| Carlisle State Park (>99% conservation, <1% conservation and recreation, nil recreation development) | 5,600 | 1,595 | 10% | 4,785 | 1,755 | 160 |
| Melba Gully State Park (75% conservation, 22% conservation and recreation, 3% recreation development) | 73 | 206,200 | 10% | 618,600 | 226,820 | 20,620 |
| Kawarren Regional Park (no visitor data available) | 663 | 0 | 0% | - | - | 0 |
| Total | 40,595 | | | | | |
| State Forests | | | | | | |
| approximate total | 92,000 | 0 | 0% | | - | 0 |
| Grand Total | | 1,116,810 | | | 1,196,733 | 79,923 |
| NET BENEFIT (net economic contribution) (\$/year) | | \$ 21,515,813 | | \$ 2,397,698 | | |
| EXPENDITURE (\$/year) | | \$ 30,042,189 | | | \$ 32,192,124 | \$ 2,149,935 |
| JOBS | | 300 | | | 322 | 21 |

13.8 Arup's Traffic Growth Assessment

Source: Arup (2002)

Assumptions Concerning Anticipated Development Growth Rates

Tourism

Domestic Overnight

Current domestic overnight visitors in the region are approximately 2.7 million. The average length of stay is 2.8 nights. From year 2000 to 2010 these numbers are expected to increase by approximately 14 percent, accounting for an additional 370,000 visitors.

Surveys undertaken as part of this study indicate that for domestic visitors, 94 percent used car for access to the region of which 73 percent used the Great Ocean Road and 23 percent hinterland routes. Expected growth would account for approximately 174,000 additional two way vehicle movements per annum by 2010 or an estimated average 500 vehicles per day (vpd). This would be distributed to the Great Ocean Road and hinterland routes, using current patterns as a basis for distribution, as follows:

- Great Ocean Road – 365 vpd (300 vpd to Melbourne)
- Hinterland Routes – 135 vpd.

Approximately 80 percent of traffic movements would occur toward Melbourne/Geelong.

International Visitors

International visitors to the region currently account for approximately 130,000 people, which has been estimated to grow by 95 percent from year 2000 to 2010. This will increase visitor numbers by 123,000 to 253,000 by 2010. Limited information is available for the modes of travel used by international visitors to visit the region but a conservative estimate of 50 percent using private car is used here to assess impacts on private car travel. An assumed occupancy of two persons per car and 40 per coach has also been used.

By 2010, the 253,000 international visitors per day would translate to an estimated 700 visitors per day or approximately 175 vehicles and 10 tourist coaches per day.

A majority of the car trips, say 80 percent, would be expected to occur along the Great Ocean Road because of its scenic splendour and attraction, and approximately 50 percent of the coaches – geometric constraints prevent coaches longer than 12.5m in length from using the Great Ocean Road although some locations could cater for larger 14m coaches with widening in selected areas.

The estimated numbers discussed above could translate into the following traffic usage along the Great Ocean Road and hinterland routes:

- Great Ocean Road – 150 vpd
- Hinterland Routes – 50 vpd.

Industrial

Growth in industry and related traffic flows is difficult to assess because of the limited availability of traffic data, particularly for local roads. The Victorian Freight Task Report provides data on existing and forecast freight movement by commodity but this is focussed on movement along the main highway network.

The timber industry, however, has data available from the TIRES report which provides some estimates of timber vehicles on local roads over the next decade. The estimates, when broken down to daily truck volumes, indicate less than 50 trucks per day distributed over numerous “local” roads in the region. The local roads eventually link into one or more of the hinterland routes being considered for the Great Ocean Road Access Strategy and when distributed onto these routes, make up a fairly insignificant component of the total traffic volumes.

However, the safety issue associated with these large vehicles in the traffic stream is one that needs to be considered in the wider view of operational safety for users of the routes.

The hinterland routes provide linkages to timber processing plants at Apollo Bay, Lavers Hill, Forrest, Terang and Colac with the largest number of plants located at Colac. Proposed expenditure to upgrade local roads linking into hinterland routes, as identified in the TIRES report, is estimated at \$2.9m over the next decade.

The Victorian Freight Task Report identifies the Princes Highway West as being used to transport up to 70 kilotonnes of wood products annually between Colac and Warrnambool and between 351 and 650 kilotonnes of wood products between Colac and Geelong (2000). The report also indicates that it is anticipated that in future timber production will be concentrated in fewer sawmills. This centralisation will mean that logs are likely to be hauled further distances by bigger and more powerful vehicles but it may also allow opportunities for greater utilisation of rail facilities.

Forecasts for growth in the dairy and fishing industries are not available but it is anticipated that dairy growth could continue at recent levels of 7 percent per year. The Victorian Freight Task report indicates that the Princes Highway West between Terang and Warrnambool carries 51- 150 kilotonnes per annum and between Terang and Geelong 251-500 kilotonnes per annum (2000). The Princes Highway West is one of six primary routes for dairy transport in Victoria.

The gas industry continues to develop facilities in the areas between the Princes Highway and Great Ocean Road and west of Port Campbell. This traffic comprises construction traffic and service vehicles and is contained mainly along local roads leading to the Princes Highway West. Construction traffic is significant and ongoing and is incorporated in growth rates discussed previously.

Residential

Residential population within the region is expected to increase by 9 percent over the next 20 years to approximately 106,000 people. This reflects an increase of about 9,000 people and, given the same growth rates, by about 4,500 people (say 2250 households) by 2010.

The telephone surveys conducted as part of the Arup study confirmed that approximately 90 percent of residents have licences and are therefore highly mobile and for 75 percent of all households at least one adult member is employed. Car is the main mode of travel for both work travel and recreation (approx 90 percent) and on average 50 percent of travel involves the Great Ocean Road. The above

information can be translated into the following traffic usage on the Great Ocean Road, Surfcoast Highway and hinterland routes:

- Great Ocean Road -
 - 15 percent Apollo Bay to Warrnambool (460vpd)
 - 25 percent Apollo Bay to Torquay (760 vpd)
- Surfcoast Corridor – 10 percent Torquay to Geelong (300vpd)
- Hinterland Routes – 50 percent split along 4 routes (380 vpd each).

Total Growth

The total growth estimates in traffic on a normal day along key routes, namely the Great Ocean Road and hinterland routes, from a base of tourism and residential growth can be summarised as follows:

- Great Ocean Road – 700 to 1200vpd
- Hinterland Routes – 400 to 460 vpd
- Surfcoast Corridor – 300 vpd.

The above figures assume a continuation of current mode usage.

Future Seasonal Growth

The comparison of future seasonal traffic growth volumes for 2010 with the higher growth rate and tourism/residential growth assumptions:

- Confirms the previously identified need to widen the Princes Highway from Geelong to Winchelsea
- Confirms the previously identified capacity improvements of the Great Ocean Road from Torquay to Lorne
- Confirms the spare capacity along the hinterland routes
- Confirms the suggested need for capacity improvements along the Great Ocean Road from Lorne to Apollo Bay and from Peterborough to Allansford

The comparisons further reinforce the need to consider alternative access options to and within the Great Ocean Road Region during holiday seasons, particularly as widening along the Great Ocean Road is not feasible/viable.

Summary of Traffic Growth Assessment

The analysis generally confirms that the adoption of natural growth rates as experienced over recent years for traffic on roads in the region will account for future increases in traffic generated by tourism, industrial and residential growth. One important aspect to observe also is the significant level of spare capacity available along hinterland routes to cater for both normal and seasonal traffic levels. Should the current levels of traffic growth in seasonal periods continue over the next decade, the traffic carrying capacity along both the Great Ocean Road and hinterland routes will become severely stressed and unlikely to cope with demand. *(For instance the data indicate a seasonal volume on the Aireys Inlet/Lorne Section of the Great Ocean Road route of approximately 21,500 vehicles per day whereas the available road capacity (Level of Service D) by combining the Great Ocean Road and*

hinterland route capacities provides a supply of 12,000 vehicles per day only). During normal periods of the year however there will be sufficient capacity.

This reinforces the need for any future strategy to consider additional modes of travel to/from the region during peak activity periods as well as other initiatives to reduce travel demands by private car and spread demand away from the traditional peaks.

13.9 DSE Timber Analysis

During preparation of the final recommendations, VEAC staff sought information from DSE on the likely impacts of four options (in terms of the areas to be added to the national park) on the availability of timber to meet remaining licence commitments. The consultants met with DSE and VEAC staff in Colac as part of this process. The information below is confined to a close approximation of the final option adopted by VEAC in its recommendations – which gave consideration to the implications for timber availability.

Existing Licence Commitments

➤ Mountain Ash

- License volume 6,100m³ per year
- Minimum 80 percent Mountain Ash (4,880m³)
- Minimum 30 percent B grade
- Maximum 10 percent D grade.

➤ Mixed Species

Licensed volume 13,600m³ per year distributed over two licences:

1. 9,600m³ D grade and better; and
2. 4,000m³ C grade).

Up to 950m³ per year of licensed volume can be supplied as Mountain Ash depending on availability.

Analysis

Year 1 and Year 2 Mountain Ash commitment can be supplied, with a possible 50 percent of Year 3 commitment also being supplied. A shortfall of 50 percent in Year 3 and 100 percent in Year 4 is likely.

Years 1 – 3 Mixed Species commitment can be met with a reasonable level of confidence. The Year 4 commitment could possibly be met, in line with caveats listed below. Of particular importance in meeting the Year 4 commitment is access to all areas listed as Forest Park.

Caveats

1. Timber can be sourced from all areas identified as Forest Park.
2. In providing the timber analysis data, not all forest areas have undergone detailed field checking (for attributes including timber volume, quality, slope/stream and other prescribed exclusions). As a result, lower levels of confidence are attached to estimates for later years as identified in the attached table.
3. Unforeseen operational circumstances may preclude the planned volumes being obtained. Factors include prolonged adverse weather, unfavourable topography not identifiable prior to harvesting

commencing, and timber defects that are not identifiable prior to harvesting which may result in lower than planned volumes being obtained.

4. Community pressure against harvesting certain areas may result in forest protests leading to an inability to supply timber from certain areas. This issue should not be discounted in determining what resource is available versus what resource is obtainable.

Other Relevant Information

1. Some higher elevation Mixed species coupes may yield smaller volumes of Mountain Ash. Given that the Mountain Ash is not usually in pure stands in these cases, accurate estimates of such volumes are hard to identify, even after coupe assessments have been conducted.
2. The 'Motain' coupe, scheduled for harvesting in 2004/2005 may be unavailable depending on the exact location of the western boundary of the national park in the Arkins Creek catchment area. This is an important coupe for 2004/2005, with a planned yield of 3,500m³ sawlog.

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The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

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