



Little Penguin (*Eudyptula minor*) Photograph by Raelee Turner, Cradle Coast, NRM.

# **Good Practice Guidelines for Little Penguin Tourism in Tasmania**

by

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## **Declaration**

A thesis submitted in partial fulfilment of the requirements for a Masters Degree at the School of Geography and Environmental Studies, University of Tasmania.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signed

Wendy Mitchell

28 May 2010

This thesis is an uncorrected text as submitted for examination.

## **Abstract**

This paper seeks to analyse the current management practices of Little Penguins, (*Eudyptula minor*.) in Tasmania with a view to determining if these are sufficient to adequately protect the Little Penguins from interaction with humans. It seeks to identify and document the current applicable legislation and management plans with a view to analysing the adequacy or otherwise of that legislation

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## Chapter 1 Introduction

In the 2005 Tasmanian Wildlife Tourism Strategy, Tasmanian wildlife is described as a living asset, where access to *a biologically rich landscape of diverse species and habitats is easy and convenient* Ellis (2005: 2). The document highlights the State's desire to grow the wildlife tourism industry, also pointing out that; *Tasmania has untapped opportunities to connect and convert visitors to wildlife tourism experience to the benefit of the tourism industry* Ellis (2005: 2). The document acknowledges Tasmania's unique island status, *where whales, dolphins, seals and penguins have the capacity to delight visitors from all over the world* (Ellis 2005: 3). In 2004 26% of visitors to Tasmania reported to engage in wildlife tourism. Finally the Wildlife Tourism Strategy 2005 highlights a series of action plans to facilitate an expansion of wildlife tourism in Tasmania - worthy of note are the strategies to:

- *encourage and support the development of sustainable and high quality product to enhance the visitor experience and increase yield to operators;*
- *facilitate ongoing development within the State's protected areas to deliver outstanding wildlife viewing opportunities;*
- *assess the need for a Tasmanian wildlife philanthropy program, with the deliverables and perceived benefits to be: enhances capacity to achieve; and*
- *a vision of sustainability, extends an opportunity for visitors and community to contribute to the vision of sustainability, and increases a sense of ownership and involvement amongst community and visitors – connection with place* (Ellis, 2005: 15).

In the Tasmanian Wildlife Tourism Inventory (TWTI), under the heading, Wildlife Viewing Opportunities the document suggests penguin viewing as one of the key wildlife tourism opportunities. The TWTI also identifies that: *To enhance Tasmanian's goal to become a world leader in wildlife tourism, national and international models of best practice in wildlife tourism need to be modified for Tasmania's sites and species and then understood and applied by both tourist and operator. Recognizing the impact tourism can have on specific animals, plants and ecosystems and establishing codes to help minimize this* (Kriwoken *et al.*, 2002: 20).

With this statement Kriwoken is highlighting that with a desire for an increase in Tasmanian wildlife tourism, the sustainability and welfare of that wildlife is of critical importance, and is interlocked with the ecosystem of fauna and flora co-dependency. Therefore two points are crucial to this thesis:

- the promotion of best practice models for wildlife tourism; and

- better management of the sector (Kriwoken *et al.*, 2002: 22).

Addressing these two items will largely form the backbone of this thesis following on from recommendations of the TWTI; suggesting that further work is recommended to: *Develop codes of minimum impact viewing guidelines for both specific sites and species*, and to, *implement minimum impact viewing guidelines for their sites*, to, *develop good working models of best practice in wildlife viewing*, and to *rapidly establish means to monitor/audit key sites for visitor impacts* (Kriwoken *et al.*, 2002: 38).

Sustainable development is the framework used for this thesis. Sustainable development is the goal espoused in all major works when the use of natural resources is discussed for example in documents such as the *United Nations Conference on Environment and Development, 1992*; the *National Strategy for the Conservation of Australia's Biological Diversity*; as well as *Tasmania's Nature Conservation Strategy 2002*. Sustainable development is the most important factor for consideration in the modern world. The Organization for Economic Co-operation and Development (OECD) identifies the critical question as: *How can we meet today's needs without diminishing the capacity of future generations to meet their own?* (OECD, 2001: 1).

Sustainable development is the key guiding principle of the Tasmanian Planning Commission (TPC) and one that must be embodied by all Tasmanian land use planning instruments:

- managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, while:
- sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations;
- safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
- avoiding, remedying or mitigating any adverse effects of activities on the environment.

My research will focus on the sustainability of the Tasmanian colonies of Little Penguin (*Eudyptula minor*) which are used for commercial wildlife tourism experiences. Little Penguins are unique to Southern Australian states and therefore Australia has a duty of care to ensure that colonies are sustainable. The literature suggests that some colonies of penguins are declining, as an example Schwitzer *et al.*, (2008), says the African Penguin (*Spheniscus demersus*) population decreased substantially in the 20th century and is declining rapidly in South Africa and Namibia, with an estimated loss of 50% of the total population over the last four years. Schwitzer suggests that unless drastic action is taken there is a substantial risk that

the species will become extinct. A further example suggests that the estimated 1.45 million birds in adult plumage at Dassen Island in 1910, but in 1990 the population on the island had declined to about 30,000 – a loss of 98% (Shannon and Crawford, 1999). Hockey *et al.*, (2005) suggest that the population on Dyer Island also decreased catastrophically by 94%, from around 25,000 breeding pairs in the 1970s to just 1513 pairs in 2007. This decline leading to the species being classified as ‘vulnerable’ by the IUCN (Barnes, 2000).

In Tasmania, while Little Penguins are not listed as an endangered species, they still must rely on the mechanisms of State legislation for environmental protection and management plans. The alternative is for ecotourism operators to self regulate and self manage. As the desire for ecotourism increases it is likely to increasingly threaten other values such as biodiversity and habitat protection (Harris *et al.*, 2002), self management and self regulation are not appropriate or acceptable measures. Although Dudley (2008) suggests that in some situations land trusts have been established and can be effective, however usually, Dudley argues, they need government intervention and supervision to ensure their areas are protected and measures are effective (Dudley, 2008:32). It can be argued that some sites in Tasmania, colonies of Little Penguins have already declined significantly or collapsed due to developments pressures (Stevenson & Woehler, 2007 and Hodgson, 1975). Therefore the argument supports Dudley’s argument of increased measures of responsive management through legislation and governance is required (Dudley, 2008).

## **1.1 Purpose**

The research aims to contribute to the development of good practice guidelines for minimizing human disturbance to Little Penguins at commercial penguin viewing operations in Tasmania. This research will identify the impacts on colonies of Little Penguins, through activities including tourism. It is anticipated that the work will assist the good management of Little Penguin viewing activities and help maintain the health and well being of Little Penguin colonies in Tasmania. This thesis will review Little Penguin colonies which are used for commercial tourism purposes to determine if tourism to these colonies is being conducted in a sustainable manner. The objectives of the research are:

- to identify and describe the characteristics and potential impacts of commercial Little Penguin tourism in Tasmania;
- to identify the policies, legislation and management plans and management interventions that influences the management and status of Little Penguins in Tasmania;

- to identify criteria for good-practice commercial Little Penguin tourism;
- to describe current practice commercial Little Penguin tourism for three case studies in Tasmania;
- to assess the adequacy of, and identify any deficiencies in, current policies, legislation, plans and guidelines and management interventions, with respect to addressing the impacts of commercial tourism on Little Penguins in Tasmania;
- to identify and assess options for addressing any deficiencies identified in Objective 5;
- to make recommendations for good practice commercial Little Penguin tourism in Tasmania.

## **1.2 Introduction to Approach and Methodology**

To achieve the objectives mentioned above, three case study sites in Tasmania; Bruny Island, Low Head and Bicheno will be analysed. These three study sites represent three commercially viewed Little Penguin colonies in Tasmania; each study site has been operating commercially for a period longer than ten years.

For this thesis both qualitative and quantitative research methods will be used: including a literature review, site observations, key informant interviews, and visitor surveys. These data sources will be integrated into a detailed consideration of current practice at the three study sites. Finally recommendations on improvements that are required to ensure Little Penguin colonies remain sustainable into the future will be made. The specific deployment of the methods included:

- a literature review, undertaken at an early stage in the research in order to gain thorough background knowledge and understanding of the existing research relating to Little Penguins;
- an legislative analysis which gave enabled me to interpret the legal framework that had the ability to impact on Little Penguins;
- questionnaires that allowed me to gather data on a range of visitor attitudes, which were subsequently be used to support recommendations;
- semi structured interviews which were utilised as a means of obtaining data from operators and Parks and Wildlife staff; and
- field observations that allowed me to observe firsthand the sites utilised for the commercial wildlife experience, provided an opportunity to observe the penguins, habitat and infrastructure, as well as note impacts and allow an interaction with operators, visitors and Parks and Wildlife staff.

The analysis considered data from all these methods in order to develop the findings and subsequent recommendations that have been provided in Chapters 7 and 8. Figure 1 shows the relationship between these methods and the above objectives

	Objective	Methods	Description
1	To identify and describe the range of potential sustainability issues associated with those Little Penguin colonies in Tasmania that are used for commercial tourism.	<ul style="list-style-type: none"> <li>Review of the academic literature on Little Penguins and penguin tourism</li> </ul>	Available was sourced literature from sources available, e.g. University libraries, internet sources, supervisor's personal libraries, Government and departmental websites and published and unpublished work from other wildlife tourism enterprise.
2	To identify the policies, legislation and management plans and management interventions that influences the management and status of Little Penguins in Tasmania.	<ul style="list-style-type: none"> <li>Review of the 'grey literature</li> <li>Interviews with key informants from relevant management authorities</li> </ul>	Information was obtained from key respondents and informants and relevant management authorities, as examples, Phillip Island Management literature, Derwent Estuary Program literature and other sources as relevant
3	To identify criteria for good-practice sustainable management of Little Penguin colonies, with particular reference to commercial tourism.	<ul style="list-style-type: none"> <li>Review of the literature on Little Penguins and penguin tourism</li> <li>Interviews with key informants from relevant management authorities</li> <li>Interviews with representatives from the tourism industry</li> </ul>	Available information from libraries and management authorities such as Phillip Island, Granite Island, Manly, and the Derwent Estuary program were obtained and reviewed and documented as appropriate. Interviews were sought with operators, Parks and Wildlife teams, NRM North and Tamar NRM and with Tourism Tasmania.
4	To describe current management practice for three case studies in Tasmania used for commercial Little Penguin tourism.	<ul style="list-style-type: none"> <li>Field observations</li> <li>Interviews with key informants from relevant management authorities</li> <li>Review of relevant documentation and literature relevant to the case study site</li> <li>Surveys of Little Penguin tourism clients</li> </ul>	<p>Onsite inspections were conducted for each case study as appropriate in some cases two or three visits were required to obtain the necessary information.</p> <p>Interviews were conducted with the relevant Parks and Wildlife Staff, the appropriate regional NRM body and the operators at each case study site.</p> <p>Surveys were conducted at two of the three case study sites with visitors to the case study</p>
5	To assess the adequacy of, and identify any deficiencies in, current policies, legislation, plans and guidelines and management interventions, with respect to the sustainability of Little Penguin colonies in Tasmania, with particular reference to the impacts of commercial tourism.	<ul style="list-style-type: none"> <li>Compare current practice with good practice using the criteria developed under Objective 4</li> </ul>	All legislation which had the ability to impact on the thesis objectives were sourced and analysed and documented in this thesis as appropriate
6	To identify and assess options for addressing any deficiencies identified in Objective 5.	<ul style="list-style-type: none"> <li>Review of the literature on Little Penguins and penguin tourism</li> <li>Field observations</li> <li>Interviews with key informants from relevant management authorities</li> <li>Interviews with representatives from the tourism industry</li> <li>Assess options using the criteria developed under Objective 4</li> </ul>	The legislation which had the ability to impact on the case study sites were analysed and considered in conjunction with reality on the ground at the case study sites
7	To make recommendations for good practice management of Little Penguin colonies in Tasmania, with particular reference to commercial tourism.	<ul style="list-style-type: none"> <li>Qualitative integration of all the above data sources.</li> </ul>	Information was scrutinised to find the appropriate sustainability measures and any shortfalls in legislation or practice were noted and have been discussed within this thesis

Figure 1 Relationships between objectives and methods within this thesis

### 1.3 Scope and Limitations

The research project was limited to the study of three case studies of Little Penguin colonies used for commercial tourism purposes in Tasmanian. It is acknowledged that other colonies of

Little Penguins are also utilised for tourism purposes in Tasmanian and interstate. The research was also limited by my ability to interview key respondents in geographically diverse locations around Tasmania and the depth of support offered by respondents. The implications of these limitations will be considered in development of the findings and recommendations in Chapters 7 and 8.

## **1.4 Thesis structure**

The thesis consists of eight chapters. Each chapter has been developed with a view to its contribution to the overall objectives outlined in Chapter 1 and culminating in subsequent recommendations in Chapter 8. A summary of each of the chapters is provided below:

### **1.4.1 Chapter 1**

Chapter 1 sets the scene for this research, it introduces the subject and definition of sustainability and outlines why the research project is important and relevant to Tasmania. It identifies and connects the stakeholders and the impacting factors that are going to be considered in the thesis. It outlines why the research is required and connects that research to objectives outlined by Tourism Tasmania and their desire for higher tourism numbers and the further opportunity for wildlife tourism in Tasmanian.

### **1.4.2 Chapter 2**

Chapter 2 provides the outline of the methods used to develop the research; outlines the requirements for the literature review. Details the case studies and describes why they were chosen, discusses the interview process. Additionally the chapter discusses the survey development and subsequent process and analysis as well as provides an outline of the field observations and details why this is important to the research process.

### **1.4.3 Chapter 3**

In this chapter the literature available on the impacts of commercial tourism will be reviewed in order to detail the research of others relating to the impacts of Tourism. In particular research that discussed the impacts on Little Penguins from developments was investigated. The chapter will commence with the discussion within the framework of the Convention of Biological Diversity 2004, and complete with the research of Stevenson and Woehler who undertook surveys of a number of Little Penguin colonies in Tasmania.

#### **1.4.4 Chapter 4**

In this chapter I will make reference to several the Little Penguin tourism sites which appear to espouse sustainable tourism practices. It is anticipated that this analysis will identify the key success factors important to sustainable penguin tourism.

#### **1.4.5 Chapter 5**

This chapter will review the policies and legislation which have the potential to impact on any of the three case study sites, the subject of this research. Australia has a tiered approach to legislation and governance, commencing with the Australian Government, followed by state and territory governments, and lastly, local governments. Both the national and state legislation relevant to the case study sites, international, national and state policies are also of importance and are discussed in this chapter.

#### **1.4.6 Chapter 6**

Chapter 6 provides the opportunity to analyse in depth the three case study sites, Low Head, Bicheno and Bruny Island and compare the relevant factors including governance and legislation, which impact on all or some of the case study sites.

#### **1.4.7 Chapter 7**

It is intended that this chapter will allow a personal analysis of the research, drawing from the information portrayed in each of the preceding Chapters 1 through to 6. In this chapter I will draw the reader's attention to the specific issues that the research has highlighted as important considerations for sustainability. Sustainability of Little Penguin colonies that are used for commercial purposes is important as without the colony there can be no commercial activity. The connection between sustainability, commercialism and wildlife has been documented by a number of writers including Lindsay, *et al.*, 2007; Shaughnessy and Briggs, 2008; Patterson *et al.*, 2003 and Ballantyne *et al.*, 2008, these writers note that reducing negative impacts through the implementation of appropriate strategies, planning and management strategies is essential to the development of a sustainable wildlife tourism industry

#### **1.4.8 Chapter 8**

Chapter 8 is the culmination of all of the preceding chapters. The chapter briefly revisits the question of sustainability for Little Penguin colonies used for commercial tourism purposes; the legislation that impacts, and the relevant stakeholders such as Parks and Wildlife and the operators. It is the conclusion to the research project and provides the recommendations

which have evolved from the research process. Also within this chapter are provided the Recommendations and the Operators Code of Practice.

## **Chapter 2 Methods**

### **2.1 Introduction**

A number of methods and associated processes were employed during the process of writing this thesis in order to meet the objectives outlined in Chapter 1.4:

- literature and legislative review;
- three case studies analysed;
- key informant interviews;
- visitor surveys; and
- field observations.

This chapter describes each of these elements and how they have been organising to deliver on the objectives of this thesis.

The methodology used is a mixed qualitative/quantitative approach. The literature review provided an initial understanding of the primary concerns likely to be relevant for the research, as well as case examples from elsewhere that provided useful sources of comparison. The key informant interviews conducted for the three case studies provided a qualitative in-depth understanding of the issues and potential solutions. These data were complemented by field observations and quantitative visitor surveys.

In order for the interviews and visitor surveys to be conducted, ethics approval from the University of Tasmania and Parks and Wildlife approvals were required. It was also important to enlist support for the research project of stakeholders, the operators, Parks and Wildlife, the Regional NRM bodies and Birds Tasmania. This was achieved by initially seeking to develop a rapport with the stakeholders, by providing clear dialogue about the research process, methods and desired outcomes. It also included providing additional information when requested to clarify issues. As Hay (2005) points out, seeking to maintain that rapport is important and as I was to learn, not an easy task at times.

### **2.2 Literature and Legislative Reviews**

The thesis commenced with a review of academic literature on Little Penguins (*Eudyptula minor*), wildlife tourism; nature based tourism and Tasmanian tourism which was available through the University of Tasmania's libraries, private library sources, and the World Wide Web. Of particular interest were research papers of academics in the field of wildlife tourism and penguin tourism. The examination of relevant literature has demonstrated that I

have considered relevant literature and considered this within the scope of the research (Hay, 2005).

Literature reviews provided key information relating to wildlife tourism, Little Penguin tourism and Little Penguin biology. The reviews also identified key research papers in the above areas, especially in wildlife tourism experiences in Tasmanian and interstate. The commercial facilities at Granite Island, in South Australia, and Phillip Island, in Victoria, provided information of particular relevance as these sites were all utilising Little Penguin colonies for commercial wildlife tourism. The biology need of Little Penguins was important to this research as this would form the backdrop of recommendations. These were subsequently explored in Chapter 7, with recommendations being developed in Chapter 8, focusing on sustainability of colonies used for commercial tourism purposes. Research papers and literature were sourced from interested researchers and management authorities. Of particular relevance were the research papers of Peter Dann, the principal researcher at the Phillip Island Nature Park. Birds Tasmania was also able to supply research papers relevant to the thesis topic. Additionally, literature pertaining to coastal management, habitat, natural values and the management of parks and reserves were reviewed. Strategic and management plans of other Little Penguin colonies were an important component of the literature review and yielded information that could be helpful in determining sustainable outcomes.

The literature review also considered relevant policy and legislation. The international, Australian and Tasmanian Acts relevant to the topic and thesis purpose as outlined in Chapter 1.3, was considered important to the thesis, additionally international agreements such as Conservation of Biological Diversity and Agenda 21 were also considered important and relevant to the research topic. It was critical that this research thesis understood and considered the legislative framework which defined the management objectives for the case study sites and legislation which provided the governance for the land reserves and governance over licensed operators. Chapter 5 has been devoted to the review of relevant legislation and policy which is of particular importance to the three case study sites. Of particular importance was the governing legislation for reserves, and the instruments and licenses imposed on operators via that legislation.

### **2.3 Case Study Selection**

Bradshaw and Stratford (2005) suggest that sometimes we as researchers select a case study and sometimes the case study selects us. The selection of the case studies for this research

thesis initially arose from conversations with a Parks and Wildlife. Interest was ignited and so a nucleus of an idea was born at that time, the concept quickly developed and ultimately formed the basis for this thesis, and subsequently grew with assistance from supervisors from the University of Tasmania, Parks and Wildlife Ranges, Birds Tasmania and Regional NRM bodies.

To achieve the objectives outlined in Chapter 1, an analysis of three case study sites in Tasmania was undertaken. The three case study sites were anticipated to be indicative of wildlife tourism operators where Little Penguin colonies are exploited for commercial gain. It was anticipated that the analysis of these three case study sites would provide sufficient research material to support the development of recommendations, meeting the thesis purpose and objectives as set out in Chapters 1.3 and 1.4.

The three case studies that were ultimately chosen reflected three very different opportunities to observe the operations of commercial Little Penguin Wildlife tourism. The three case study sites are in geographically diverse areas of Tasmania and varied considerably in size. The operations ranged from a small private operator who takes perhaps two to eight visitors on a Little Penguin wildlife viewing experience, to a large scale tourism operation, who has perhaps sixty visitors on a tour. Additionally, the operators conducted their wildlife tourism operations using different methodologies, providing the opportunity to observe different methods of operation and to compare the parameters of those operations. The sites have been chosen for the following reasons:

- each of the Little Penguin tourism businesses have each been operating in excess of ten years on their site. This has given the opportunity to view their activities which have settled into their established and traditional methods of operation;
- they represent a commercial operation that is, they receive a financial return for their efforts;
- the three sites are all legislatively managed by Parks and Wildlife Services;
- they are geographically diverse;
- they are located in Tasmania;
- they use Little Penguins as the wildlife attraction for their commercial operation;
- they offer different sized operations to analyse;
- they conduct their tourism business in different ways;
- they have differing lease arrangements, imposed on them by the State Government;
- they are based on coastal areas which differ in historical use; and
- they have different flora and Little Penguin habitat.

This method of research will have some inherent difficulties. As each case study is a private commercial operation it will be necessary to work within the parameters imposed by the operators. Cooperation from the operators was required in order to conduct a comprehensive appraisal of tourism management in the penguin colonies.

The operators needed to participate in interviews, as well as allow the researcher to approach and interview visitors on their site. Additionally access to the colony would be required on more than one occasion in order to undertake the field observations. Approvals were sought from the three proposed operators at each of the case study sites. Initially contacted by telephone, the operator was given an outline of the research project and the proposed outcomes. The discussion outlined the methods that would be used during the research and a time to meet on site arranged.

The operators were informed that the research project would commence, provided they were agreeable, when the necessary approvals from the University and Parks and Wildlife had been provided. The operators were informed that before the interview processes could commence their formal approval was required by signing an declaration of consent. At the initial meeting on site the operator was again briefed on the objectives and methods of the research project, and given a contact at the University of Tasmania. The operators were informed that they could withdraw their consent to the research project at any time. The operators at the three case study sites verbally agreed to participate in the research.

However before the formal interviews and surveys had commenced at Low Head and after an onsite inspection at the Low Head site with the operator, a tour, and two conversations with a Low Head staff member; the Low Head operator withdrew support for the thesis. Subsequently, visitor surveys and operator interviews, two components of the research were therefore not able to be conducted at the Low Head site. As Hay (2005) suggests, there will be challenges in research work and a researcher has to be realistic and to manage challenging situations, and to understand and accept what is possible and what can be achieved in the available time frames.

## **2.4 Key Informant Interviews**

This thesis utilised a qualitative approach to the interviews. Semi structured interviews (Hay 2005: 80) were conducted with the following groups:

- commercial Little Penguin tourism operators; and
- Parks and Wildlife Rangers.

Informal conversations were also held with a Natural Resource Management (NRM) North officer on several occasions in regard to the Low Head case study site. Additionally a staff member from both NRM North and Tamar NRM met directly for onsite inspections at the Low Head case study site.

A series of two semi structured interview questions were prepared after consultation with staff at the University of Tasmania and Birds Tasmania. Interviews and discussions were conducted on location at Bicheno, Bruny Island and Low Head. Further interviews also took place over a period of weeks with relevant Parks and Wildlife Rangers by direct consultation or through electronic means.

Interviews were conducted with those staff of the Parks and Wildlife Service who held responsibility for a research case study area. In total six Parks and Wildlife Rangers took part in the formal interview process encompassing the three case study locations: Bruny Island, Bicheno and Low Head. Three further Hobart based Parks and Wildlife officers were able to provide some additional information, such as details of the case study sites lease agreements and clarification on key points. This semi structured and informal conversations were developed to help fill in knowledge gaps and to investigate behaviours and motivations and further to understand the opinions of the interviewees (Denzin, 2005). The questions were developed in a manner to facilitate an open response; therefore face to face interviews were desirable so prompts or clarification could be introduced as necessary (Hay, 2005). Figure 2 provides the details of the interviews.

Case Study Site	Interviewee	Location	Number of Interviewees
Low Head	Parks and Wildlife Manager and Officers	Launceston	Two
Low Head	Tourism Operator and a key staff member	Low Head	Two
Bruny Island	Parks and Wildlife Manager and Officers	Bruny Island	Two
Bruny Island	Tourism Operator	Bruny Island	One
Bicheno	Parks and Wildlife Manager and Officers	Freycinet	Three
Bicheno	The two tourism operators	Bicheno	Two

**Figure 2 Interview Schedule Commercial Tourism Operators, Key Staff and Parks and Wildlife Rangers**

The interviews were conducted in the following manner:

- after approval from Parks and Wildlife was received contact was established with the interviewees by phone;

- a pre-arranged meeting time was confirmed at a location and time most suitable for the interviewees; with a follow up email confirming the arrangements;
- at the prescribed on location meeting, the interviewees were provided with both an introductory dialogue and a written explanation - this explanation detailed the research project, time lines, methods, and outcomes.
- following this, the interviewees were asked to provide written evidence that they understood the research project and that they gave their consent to the researcher to proceed with the interviews' through signing a declaration to be interviewed.

The data captured during the interview process and was subsequently formatted and used as a source of raw data information for this thesis. After transcribing the data the information was edited and represented selectively (Hall, 2005). The data was coded and organised into themes. To protect privacy, throughout the thesis the transcript material has been referenced to indicate the type of interviewee, without revealing their specific identity.

## **2.5 Visitor Surveys**

Following approval from two of the three case study operators to conduct visitor surveys, surveys were attempted at these case study sites. One of the attempts was successful in the fact that a substantial sample was able to be collected and subsequently analysed and used in the research. This survey data facilitated the establishment of trends and themes of behaviours and levels of understanding (Hay, 2005).

The visitor survey was developed over a period of several months, and enlisted the assistance of supervisors, from the University of Tasmania and Eric Woehler of Birds Tasmania. The objective of these surveys was to gather information about the visitors, their motivations, expectations, knowledge, behaviours, and satisfaction with their wildlife tourism experience. A key component of the survey was to ascertain the visitor's willingness to modify their behaviour if they considered such changes in behaviours would assist the sustainability of the Little Penguin colony. The survey data also sought to capture demographic and other personal information. It was also anticipated that the surveys would support the other information collection methods and facilitate the development of the important emerging issues and key themes. These themes were subsequently developed and supported by the other qualitative research methods.

The survey predominantly deployed closed-ended questions, which nonetheless offered sufficient scope for the respondents to offer their views, while limiting the topics to those that served the needs of the research (Denzin, 2005). The questions were presented in a logical

order, commencing with the simple questions first and leaving the more complex questions to later (Hay, 2005).

The design phase took some time, as it required careful consideration and dialogue with stakeholders in order that the survey was appropriate to the research task at hand, ensuring the survey was relatively quick to complete, (did not impose excessively on respondents), was unambiguous, coherent and had a logical sequence; and ultimately would provide respondents, beliefs, attitudes and behaviour patterns (Hay, 2005). The decoding and analysis required was also considered in the design phase, ensuring that the information would be easily transformed into quantifiable data sets that could be subsequently analysed.

A pre-testing phase (Hay, 2005) was also used to test the questionnaire before implementation in the field, resulting in some minor modifications which appear to give rigour to the questionnaire.

The survey was broken into logically flowing sections as follows:

- motivation for taking the tour;
- satisfaction levels after completing the tour;
- the method by which information was disseminated to visitors *before* their tour;
- the method by which information was disseminated to visitors *during* their tour;
- the respondents response/reaction and subsequent behaviour following the provision of this information;
- the respondents' view on some of the activities which may occur at the Little Penguin colony sites;
- The respondents' view on the level of protection provided by the Little Penguin tourism operator on their tour;
- personal information regarding the visitor, such as:
  - nationality and postcode;
  - gender;
  - affiliation with land care or other similar organisation; and
  - education and qualifications.

After arrangements had been made with the operators, I approached each visitor prior to the commencement of the tour, offering them a brief verbal introduction, followed by a Visitor Survey Background Information Sheet. If the respondents were receptive they were asked to respond to a pen and paper survey at the completion of the tour. The respondents were informed that the surveys would be collected at the completion of their tour.

This was successful for the Bicheno case study site, where large numbers of visitors were available prior to their bus trip out to the colony, but was not successful for Bruny Island, where only small numbers of visitors were available on the several nights I was on site. The sample therefore obtained at Bruny Island was insufficient for a meaningful analysis. Subsequently I sought the support of the operator, however this also proved unsuccessful due to a range of factors.

On the first night of surveying at Bicheno around a third of the total number of completed surveys were collected. The difficulties involved the darkness and coldness of the night after the tour; visitors had difficulty seeing the survey form to complete and were anxious to go home. The level of completed return surveys at Bicheno was enhanced on the second night of surveying when the operator provided the respondents with time after the tour in the safety, warmth and lighting of the interior of the transporting bus to complete the surveys.

The resulting set of data was entered into excel spreadsheets and analysed. The subsequent analysis is provided in Section 6.4.2. This analysis has provided the opportunity to mesh the respondent's information from the surveys to the information obtained via the other methods of research and has assisted in the development of the commonalities and themes (Hay, 2005).

## **2.6 Field Observations**

In order to provide complimentary evidence (Hay, 2005), field observations were also utilised in this research. This provided the opportunity to gather additional descriptive information, before and during the research process. It also provided me with an opportunity to interpret the contextual setting of each of the case study field sites, and provided a real, firsthand experience. This was achieved through being actively involved in a penguin tour, as an observing participant, and visiting with key stakeholders, such as NRM staff members and talking with Parks and Wildlife staff on site, observing in an uncontrolled manner (Hay, 2005).

An important part of this thesis is the understanding obtained from direct observation of the case study sites. While a considerable amount of important information can be obtained from online research, interviews and surveys, the other components of this thesis, direct field observations provided an opportunity to observe what is happening first hand, and participate as a visitor at the case study sites. Observations provide the researcher with an opportunity to observe first-hand the relationship between the important interconnecting components. Through the field observation component of the research it was possible to:

- observe the site in relation to its locality, natural values, site usages, relationship and proximity to developments or other influencing factors;
- observe Little Penguin habitation and to form an opinion about the relationship between the Little Penguins and their environment;
- observe the infrastructure at each case study site and to form an opinion as to the effectiveness of fulfilling its original and intended purpose(s);
- note the signage at the case study sites; intended to provide visitors with information, instructions or restrictions;
- to meet the operators and observe their tourism operation and note their interest in Little Penguin sustainability, and ability to impact on colony sustainability;
- participate in a Little Penguin tour, observe the manner in which the tour was conducted, and note the instructions given to visitors by the operators before and during the tour;
- observe the vegetation at each case study site and observe the relationship between the vegetative cover and the Little Penguins;
- describe the site by observing the layout of the case study site, noting tracks both formally constructed such as board walks, gravel paths, formed paths, and informal tracks made by haphazard wanderings by people or animals or both (such as sheep) and their relationship to the site and to Little Penguins;
- observe and form an opinion about the perceived risk factors at each case study site;
- observe the relationship between the Little Penguin site and;
  - the operator;
  - the Parks and Wildlife staff;
  - the community;
  - the regional NRM bodies;
- observe any pressures that may or may not be impacting on the Little Penguins at each case study site; and
- observe weed infestation and note its impact or potential impact on the Little Penguins, (noting that the impact may be positive).

Several field inspections were conducted at each of the three case study sites, with a view of determining the factors mentioned above. At Low Head the site inspections were conducted jointly with staff from NRM North and NRM Tamar. The staff were able to provide background information relating to on ground works, as well as efforts such as school based education programs; community engagement programs and onsite programs such as fencing and re-vegetation activities. At Bruny Island one onsite inspection of the case study side was conducted with the Bruny Island Park and Wildlife Ranger, while several others were conducted alone. At Bicheno three field inspections were completed by the researcher

(Denzin *et al.*, 2005). The information provided from these visits is summarised in the Figure 3.

Topic	Question
Presence of Little Penguins	Can Little Penguins be observed as habituating this site?
Habitat description	Describe the Vegetative state as adopted from Baker (2007); <ul style="list-style-type: none"> <li>• was the vegetation structurally and floristically intact, (weed invasion less than 10%);</li> <li>• was the vegetation structurally or floristically altered and weed invasion less than &gt;10% and &lt; 50% cover;</li> <li>• was the vegetation structurally or floristically altered and weed invasion less than &gt;50% and &lt; 90% cover;</li> <li>• was the vegetation in a grossly altered structure in otherwise weed infested vegetation &gt;90% weeds, Coastal Values (2007).</li> </ul>
Evidence of tourism pressures	are there pressures on the colony from tourism and visitations?
Development pressures	is there evidence of developmental pressures on the colony?
Case study size and description	where is the case study site and how would it be described?
Tourism or other infrastructure	what infrastructure is on the site and what is its purpose?
Evidence of other activities	is there evidence of other activities at the colony?
Signage and information	what information is available to the public at the colony?
Risk analysis	what are the perceived risks to the ecology?
Evidence of Involvement of community, Parks and Wildlife, operator or others	what evidence and/or level of interest on the sustainability of Little Penguin at the site is there; <ol style="list-style-type: none"> <li>1. from the operator;</li> <li>2. from the Parks and Wildlife officer;</li> <li>3. from the regional NRM representative.</li> </ol>
Little Penguin tours	how does the operator conduct Little Penguin Tours?

**Figure 3 Observations during Field Studies**

It is timely to remember the words of Denzin *et al.*, (2000: 49): *All observations involve the observer’s participation in the world being studied. There is no pure, objective, detached observations. The effects of the observer can never be erased.*

The requirement for vigilance is noted, as even the act of observing has an impacts on the data obtained (Denzin *et al.*, 2000). Mindful that even the activity of visiting the Little Penguin case study sites and asking questions has ramifications. A consideration made real when the operator at the Low Head site withdrew support for the thesis. Because the goal of semi structured interviews is to generate understanding, it is paramount, according to Denzin *et al.*,

(2000) to establish rapport - however such rapport can be fragile, and can be lost. Subjects become stakeholders, thus the relationship changes (Denzin *et al.*, 2000). Such a relationship change appeared to take place at Low Head; the operator there considered that the research may have negative consequences on their business. Hay (2005) suggests in such situations seeking support from networks and colleagues in order to understand and to learn from such experiences is helpful, in maintaining the researchers focus and effort.

At Low Head discussions did take place on two occasions before support was withdrawn, it was also possible to participate in a wildlife tour (Hay 2005), and to have a dialogue with a key employee. However there were still knowledge gaps and it was at this point that I sought support and guidance from a number of people including the University of Tasmania thesis supervisors and Birds Tasmania, to help retain the focus that Hay discussed. The gaps in knowledge (Hay 2005) were largely filled by seeking support from Parks and Wildlife Rangers, and two regional NRM bodies, NRM North and NRM Tamar, and several field trips.

## **2.7 Ethics and Parks and Wildlife Service Approvals**

Formal approvals to conduct the research thesis on the sustainable use of the Little Penguin colonies were received from the University of Tasmania Human Research Ethics Committee and the Parks and Wildlife Service Tasmania.

The University of Tasmania approval process required the justification of the research project, confirming the research project would; increase the knowledge base of the sustainability issues for Little Penguin colonies used for commercial tourism purposes and contribute research which may support improvements in practices at commercial Little Penguin wildlife viewing operations. A further requirement was to confirm that the research would not negatively impact on Little Penguins, or any person or creature. Additionally detailed safety procedures ensuring safety of a participant was required. The requirements of the ethics approval included:

- an obligation to conduct the research in accordance with the approved researcher process;
- a commitment to conduct the research, honestly, ethically and impartially;
- a commitment to do no harm;
- occupational health and safety issues such as informed the supervisor when field work was being conducted;
- informing the interviewees of the research focus, and obtaining their written permission to proceed;

- informing the respondents that their participation was voluntarily, and they could withdraw from the process at any time;
- to make available the research to interested stakeholders; and
- to provide a summary document to interested parties on request at the conclusion of the research.

In order to receive Parks and Wildlife Service Tasmania approval much the same process was required. A detailed letter outlined the proposal, the method of research, the case study sites chosen for the research and the rationale behind those choices was submitted. The letter also detailed the time frame and lastly detailed the outcomes with a promise to supply a summary document should it be required. Additionally making available through the University of Tasmania the final thesis should they choose to access it. Following this letter the Parks and Wildlife Service required further clarification on a few points; this was achieved through email correspondence and finally by telephone before the approval to proceed was given provided by email.

As the researcher I acknowledge that research methods do have their limitations, a factor acknowledge by Kvale, however I consider that the approach and methods which have been developed adequately will deliver the objectives defined in Chapter 4. Kvale, defines qualitative research interviews as; *attempts to understand the world from the subjects' point of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations* Kvale (1996:59). Hay also values the interview process in qualitative search by commenting; *people's own words do tell us a great deal about their experiences and attitudes but they may also reveal key underlying social structures* Hay (2000:10). This last point is most relevant to this thesis, as Hays (2000) reminds; *to think global, act local with the statement; geographic enquiry has shifted from the global, to regional to local, but have then re-engaged with theoretical and global (best practice and understanding). The interview process, gives voice, to those previously silent, or anonymous, they embody and acknowledge* (Hay 2000:11). Figure 4 below outlines the scope and limitations which impacted on the ability to fully explore the methods which was outlined in Chapter 1.4.2.

	Low Head	Bicheno	Bruny Island
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Interview Parks and Wildlife	Yes	Yes	Yes
Interview regional NRM Body	Yes	No	No
Interview Operators	Partly completed	Yes	Yes
Surveys conducted of visitors	No	Yes	Not successful
Onsite inspections	Yes	Yes	Yes
Wildlife Tour	Yes	Yes	Yes

**Figure 4 Analysis matrix of case study sites**

In conclusion the methods chosen provided the opportunity to ensure the methodology was rigorous and thorough, ensuring its dependability as a research thesis (Hay 2005). Importantly a code of ethics has been followed, through obtaining informed consent (Denzin 2005) ensuring privacy and confidentiality of interviewees and respondents and that accuracy, a cardinal principle in social science codes has been maintained (Denzin 2005). The principles of collaboration and participation have been important considerations in the methodology developed for this research, ensuring that those important to the research have been included in the journey (Denzin 2005).

## **Chapter 3      Characteristics and Potential Impacts of Commercial Wildlife Tourism**

### **3.1 Introduction**

In this chapter I will review the literature on the impacts that commercial wildlife tourism has on the natural environment. Particular attention will be given to the Little Penguins, and the threats to their sustainability. It will be important in this chapter to refer to the Convention of Biological Diversity as a subsequent strategy was developed by the Australian Government provides national guidance on the conservation of Australia's biological diversity. Additionally other important research and documents will be explored within this chapter with a view to identifying the potential impacts on wildlife tourism, and the particular focus of this research, Little Penguins. As indicated in Chapter 2, it is important to consider the writings and research of others on this topic in order to understand what is currently understood of the impacts of tourism on wildlife.

### **3.2 Characteristics of Ecotourism and Wildlife Tourism**

The Convention of Biological Diversity 1992 is the most widely adopted and supported tool for the preservation of the natural biodiversity in the world. Subsequent to this convention Australia adopted a Biological Diversity Strategy. The strategy is therefore an important discussion point within this chapter. In 2004 the Secretariat of the Convention on Biological Diversity said: *Tourism is a source of increasing stress on fragile ecosystems. Its social, economic and environmental impacts are immense and complex, not least because tourism concentrates on vulnerable natural and cultural sites. Short-term gains may take precedence over long-term environmental considerations, such as the conservation and sustainable use of biological diversity. However, natural ecosystems and biological resources that may be threatened by tourism development provide the very goods and services that underpin the tourism industry. The subsequent challenge appears therefore to ensure that ecotourism and nature based tourism is developed in harmony with environmental wellbeing. If tourism adheres to strong sustainable guidelines it has the capacity to generate employment and income, while enhancing the very base on which it evolves, nature. Therefore there should be a strong incentive for conservation. Sustainable, responsible tourism has the potential to meld*

*economic and environmental concerns and give a practical meaning to sustainable development (Zedan, 2004:1).*

Ecotourism or nature based tourism has been described as low impact travel to endangered and often undisturbed locations (Cochrane 1998). It is different from other forms of tourism because it provides the tourist with an opportunity to learn about the area, in terms of the physical landscape, cultural characteristics and natural flora and fauna.

There is also an important 'sub sector' which is comprised of those ecotourism ventures which concentrate on wildlife tourism, additionally some wildlife tourism do not meet the definition of ecotourism. Page *et al.*, (2002, as cited in Higginbottom, 2004), introduces the topic of environmental tourism by with the following statement: *If we accept the underlying premise that the earth's resources and environments are finite resources and that global environmental problems exist as a result of man's actions (including tourism) then one valuable approach within the egocentric paradigm is to understand how individuals can minimise their environmental impacts (Page et al., 2002; as cited in Higginbottom, 2004:10).*

Page discusses tourism as being a *smokeless* industry which nevertheless impacts on employment and revenue. As an example, Granite Island at Victor Harbour advertises Penguin Eco-tours of two hours duration; *The tour is a comprehensive and enjoyable nature experience. Participants meander through the penguin colony on Granite Island with a guide to view the Little Penguins as they come ashore after a day's fishing. The penguins make their way to their burrows where they can be seen displaying various behaviours, depending on the season. These behaviours may include, feeding chicks, nest building, courting, or mating (Granite Island, 2009).*

The international Ecotourism Society state that Ecotourism is about uniting conservation; meaning that those who implement and participate in ecotourism activities should follow the following ecotourism principles: minimize impact, build environmental and cultural awareness and respect, provide positive experiences for both visitors and hosts, provide direct financial benefits for conservation, provide financial benefits and empowerment for local people, and raise sensitivity to host countries' political, environmental, and social climate.

It would appear that Capoor is in agreement with this basic philosophy as she says in her delivery to the Second International Conference on Ecotourism in India; *The edifice of responsible tourism is based on the following objectives; To protect the environment – its flora, fauna and landscapes, to respect local cultures – traditions, religions and built*

*heritage, to benefit local communities – both economically and socially, to conserve natural resources – from source to destination, to minimise pollution – through noise, waste disposal and congestion (Capoor, 2008:4). Goodwin supports Capoor, but takes the discussion one step further: Responsible tourism should make positive contributions to the conservation of natural and cultural heritage, and to the maintenance of the world's diversity (Goodwin, 1998, as cited in Higginbottom, 2004:9).*

The International Ecotourism Society states that ecotourism is the largest business sector in the world's economy, and that the travel and tourism industry is responsible for over 230 million jobs and over 10% of the gross domestic product worldwide. Tourism is a principle export, a foreign exchange earner for 83% of developing countries, and the leading export for one third of the world's poorest countries. For the world's forty poorest countries, tourism is the second most important source of foreign exchange, after oil (International Ecotourism Society 2008).

Goodwin, in his speech: 'Taking Responsibility for Tourism' reminded the listeners that the Association of Independent Tour Operators (AITO) is committed to developing a responsible tourism policy. In 2000, the policy stated; *that wherever a tour operator does business or sends clients it has a potential to do both good and harm (Goodwin 2009:9). Goodwin further suggested that, all too often in the past the harm has outweighed the good Goodwin (2009:9). He reminds us that all forms of tourism can be more responsible, and says that, all stakeholders must take responsibility for creating better forms of tourism and realising these aspirations (Goodwin, 2009:9). Importantly, responsible tourism relishes the diversity of our world's cultures, habitats and species and the wealth of our cultural and natural heritage and therefore accepts that responsible and sustainable tourism will be achieved in different ways (Goodwin, 2009:9). Goodwin does not argue that one set of criteria applies universally, however he does argue that; it is only at the local level, where tourists and locals interact, that tourism can be sustainably managed (Goodwin, 2009:10). Goodwin continues this argument with the suggestion that planning authorities, tourism businesses, tourists and local communities take responsibility for achieving sustainable tourism. He also reminds us that individuals in tourism operations can make a difference, but there is also a major role that the government must play. He emphasises the need for transparency, measurable outcomes, benchmarking and continual monitoring by the government in order to achieve successful outcomes. Finally, Goodwin reminds us of some the core values expressed by the Association of Independent Tour operators of England; which are that responsible tourism must; protect*

the Environment – its flora, fauna and landscapes, respect local cultures – traditions, religions and built heritage, benefit local communities – both economically and socially, conserve natural resources – from office to destination, minimise pollution – through noise, waste disposal and congestion (Goodwin 2009).

Hvenegaard describes a range of possible environmental issues caused by eco or nature based tourism. They include overcrowding, over development, unregulated access to recreation, pollution, wildlife disturbance and vehicle use (Hvenegaard, 1994, as cited in Page *et al.*, 2002). Hvenegaard writes that in a fragile environment this can be much more damaging than at other sites, because it is more *dependent on relatively pristine natural environments than the later* (Page, 1994, as cited in Page *et al.*, 2002). Most importantly, Page argues that as ecotourism or nature based tourism is concentrated in ecologically sensitive areas, they must be controlled, as tourists often go to environmentally fragile areas, and important to note, do so in sensitive seasons (Hvenegaard, 1994, as cited in Page *et al.*, 2002).

McLaren makes the comment that ecotourism is often at odds with both the ecological preservation and local use of the site, suggesting that the large numbers of tourists visiting sensitive sites are often above the carrying capacity of the site. Most sites are energy consumers; car parks, roads, water, power resources, toilets, accommodation, and as such have environmental consequences including discharge of waste water, removal of vegetation, trampling of vegetation, road kill, heavy use of chemicals, cleaning products, fertilisers, petroleum products, rubbish and rubbish removal, even hiking and camping has a list of related impacts on the environment (McLaren 1998, as cited in Page *et al.*, 2002). Honey (2008, as cited in Conroy 2008) says that a large proportion of those organisations reporting to be ecotourism ventures do not fit this description accurately as they do not place enough emphasize on conservation and education during tours.

Figure 5 lists a number of primary and consequential effects of ecotourism, suggesting that the impact of ecotourism is felt within an economic, social, cultural and environmental context. This reminds us that while a focus is frequently placed on the benefits, there are also many negative consequences related to ecotourism. Both the primary and the consequential effect of these organisations should be considered in the development of management plans (Page *et al.*, 2002).

Primary Effects – Biophysical -negative	Consequent conditions
Decrease in the abundance and diversity of fauna	Change in structure/composition of fauna
Displacement of fauna	Fauna occupying less desirable habitats
Change in fauna behaviour	Fauna becomes distressed
Decrease in the aesthetics of the area	Impairment of the natural scene
Decrease in water quality	Increase in contamination
Decrease in air quality	Aesthetics of the area decrease
Conservation awareness	Reduction in environmental effects
Primary Effects – Biophysical -positive	Consequent conditions
Conservation awareness	Reduction in environmental effects
Primary Effects – Socio-cultural – negative	Consequent conditions
Overcrowding of the site	Host community and eco-tourists are in conflict causing dissatisfaction
Demonstration effect (alien ideas, behaviour and lifestyle)	Alteration of the host community
Effect on social pathology	Increase in crime and associated activities
Lack of sufficient infrastructure	Increased pressure on existing infrastructure and demand for new facilities
Co-modification of local culture	Loss of traditional knowledge
Degradation of archaeological sites	Loss of cultural value and heritage
Diversion of resources	Resources diverted
Conflict of uses	Altered uses
Primary Effects – Socio-cultural – positive	Consequent conditions
Improvements in infrastructure	Diversification of facilities and services
Better services	Increase in diversification of services
Cultural appreciation	Encourages host community and eco-tourists to value cultural assets
Improved environmental education	A more environmentally informed community

**Figure 5 Ecotourism effects (Page *et al.*, 2002: 186)**

### 3.3 Potential Impacts of Wildlife Tourism on Little Penguins

When assessing the impact of ecotourism on the Little Penguins, a distinction should be made between commercial, non commercial and unregulated or impromptu tourism (Weaver, 2001). Weaver also suggests that while some operators might claim to have eco-tourism operations,

in principle their operations may not meet the eco-tourism criteria. In this case, their operations may have a negative impact on successful breeding and maintenance of the Little Penguins (Weaver, 2001). Weaver reminds us that all forms of tourism have the potential to impact negatively on the Little Penguins, some of which include hiking, camping, boating and fishing (Weaver, 2001). Gales makes mention of a four year study by Anne Hodgson on the Little Penguins in Bruny Island, Tasmania; the area around the colony was declared a game reserve largely from her work, however Gales reminds us of the sad facts emerging from Hodgson's study. The first of these is include the high mortality rate of the Bruny island penguins compared to rates recorded in studies at Phillip Island (Reilly & Cullen as cited in Gales, 1987). Hodgson's study revealed a mortality rate as high as 43 percent, three times higher than the Victorian study. He put this largely down to the current disturbances and the impacts of humans to the Bruny island colonies (Gales 1991). Gales makes the following statement regarding these figures: *it is unfortunately a good illustration of the effect of human interference on little penguin survival* (Gales 1991:99).

According to Weaver, visitors to Phillip Island to view the Little Penguins in 1995 were in the vicinity of 500,000 people, with arguably a smaller impact on the Little Penguin colonies than the Tasmanian example. This suggests that the principles of ecotourism are being applied to a greater extent within Phillip Island, resulting in fewer disturbances to the breeding colonies (Weaver 2001).

Peripheral areas where Little Penguins colonise, argues Hall, are largely away from settled areas and tend to lack the effective political and economic control, which the main areas enjoy; this further impacts on their wellbeing. Activities such as providing access to peripheral areas, unless accompanied by improved control can facilitate greater ad hoc visitations, and can have a negative impact on the colonies (Hall *et al.*, 2005).

The desire for coastal settlements and the Tasmanian shack culture has increased the number of developments on the shorelines of the Tasmanian coast, which is taking up valuable nesting sites for the Little Penguins (Lindberg *et al.*, 1997 as cited in Page 2002:177). These coastal settlements according to Lindberg have various effects on the coast line including:

- *unregulated recreation;*
- *increased erosion;*
- *loss of habitat cover;*
- *facilitate introduced species;*

- *increased wastage and environmental damage;*
- *more uncontrolled dog activities;*
- *decreased breeding success, more disruption to birds through disturbance, lights and noise;*
- *loss of habitat by trampling, removal by councils, illegal disturbances;*
- *increased discharges , approved and accidental spills, including oil;*
- *increased impact of fishing, including loss or decrease in food sources and availability;*
- *net tangles and loss of life;*
- *climate change, higher tides destroying eggs and chicks, reducing habitat options;*
- *have unsustainable practices;*
- *have insufficient regulation;*
- *have commercial exploitation,*
- *are un-accountable or unmonitored council shore works;*
- *individuals residing on the coast may initiate permanent or occasionally remodelling and or removal of vegetation;*
- *impacts from developments of all types; approved and illegal;*
- *vehicle activities on the beach or dunes;*
- *visitations exceed carrying capacity of locations;*
- *visitors not abiding by rules; and*
- *inappropriate visitations during the sensitive breeding season.*

According to Hobart's Derwent Estuary Program Coordinator, the Little Penguins once thrived along the Derwent Estuary near Hobart, but numbers have declined as a result of habitat loss and attacks from roaming cats and dogs. However after three years of collaborative efforts from the government, industry and community, the plight of the Little Penguins in the Derwent has improved dramatically. Monitoring has shown that Little Penguin numbers have increased in the Derwent from 98 breeding pairs in 2005 to more than 190 breeding pairs in 2008: *That's really encouraging news and steps such as installing new burrows, improving vegetation and educating dog owners have all made a big difference* (Wells, 2009:22).

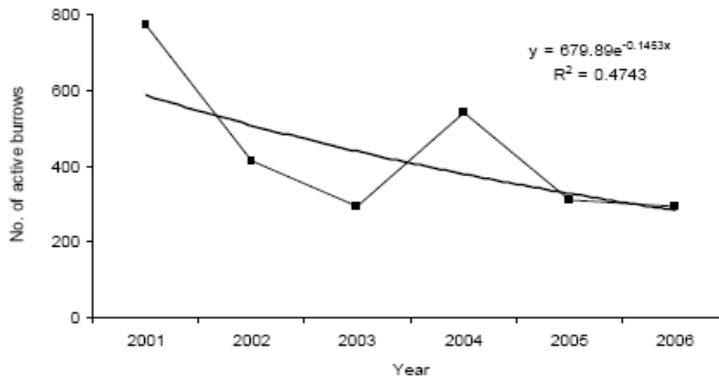
Analysis from the Derwent Estuary Program shows that the Little Penguin populations have faced a variety of threats over recent years, both direct and indirect. Urban populations such as those found in the Derwent are exposed to far greater threats than their offshore island counterparts (Lee & Booth, 2006).

Threats that appear to be most relevant to Derwent estuary penguins include habitat modification and degradation; this can be from individuals, councils or developers. Human disturbance, predation and gill netting are also significant hazards for the Little Penguins. Additionally, removal of vegetation, even weeds, old logs and refuse, can destroy the burrow habitat and nesting material. Throughout the evening penguins are often active outside their burrows and are especially vulnerable when traversing between the landing zone and the nest site. Removing protective cover or ‘refuges’ within the colony exposes penguins to greater risk. Also important to note is that the vegetation around the nest site acts as a form of insulation and protects the birds from heat stress throughout the night. Even alteration to the upper canopy can increase temperatures inside the nest, which can have a negative effect on breeding success (Ropert-Coudert *et al.*, 2004, as cited in Pryor & Wells, 2009). The dumping of garden wastes along the foreshore can also block burrow entrances and disturb the breeding cycle (Pryor & Wells, 2009). Lee and Booth (2006:4) observed and studied the threats against the Little Penguin colonies living at Hobart’s Derwent Estuary; and concluded: *The desire of people to live and recreate in coastal locations, improvements in house-building technology (allowing increased access to steep, rocky sites) and the difficulty of planning mechanisms to adapt to new environmental knowledge and trends have resulted in houses and other infrastructure, such as sea walls, impinging on the Little Penguin colonies inhabiting the Derwent Estuary.* There are a number of threats to the Little Penguin’s survival including (Lee and Booth 2006:8);

- *direct disturbance to the Little Penguin colonies;*
- *disturbance and/or removal of habitat vegetation;*
- *changes to the natural coastal and marine systems;*
- *increased siltation of adjacent waters;*
- *disturbance and death from domestic pets;*
- *increased activity, noise and light disturbance;*
- *inappropriate penguin-viewing activities;*
- *increased road kill;*
- *increased disturbance from boating activity;*
- *increased recreational fishing, including the use of gill nets; and*
- *increased stormwater and sewage.*

The research by Page measures and documents the effect of a variety of elements on the sustainability of penguin colonies and the decline in number of active burrows (Figure 6). These elements include: tourism, predators, such as rats and seals weather fluctuations and

food shortages, including competition for food with other wildlife. A combination of these elements is believed to be responsible for the delays observed in the penguins' natural breeding cycle, the slower growth rates of penguin chicks, and the abandonment of the chicks as the adults prepare for their annual moult. *A small increase in the impacts of any of these factors on Little Penguins may ultimately be sufficient to progress these Little Penguins subpopulations to extinction* (Page *et al.*, 2002; as cited in Higginbottom, 2004:10)



**Figure 6** The number of active Little Penguins burrows at Granite Island 2001-2006, (Page *et al.*, 2002, as cited in Higginbottom, 2004:10).

### 3.4 Potential Impacts of Commercial Little Penguin Tourism

Eco-tourism or wildlife tourism, as it sometime called, is said to be on the increase. In 2002, the Department of Environment and Heritage's (DEH) official statistics indicated that there were approximately 135,000 visitors to Kangaroo Island in the year 2000. According to the statistics 77% of visitors to Kangaroo Island also visited Kingscote Township and 81% took part in wildlife observation activities as part of their main tourist activity. Less than 12% of visitors to Kingscote actually attended a penguin tour, suggesting that the majority of visitors are participating in unofficial viewing of the wildlife. There are reportedly three penguin tour operations on Kangaroo Island, two of which are based on the same penguin colony on the seafront bordering the central town area. Another private operator runs tours in Penneshaw, about 60km from Kingscote (unknown, Kangaroo Island, 2006).

There are many cases of unregulated viewing of the Little Penguins. McClung reports that on the Otago Peninsula, which is on the South Island of New Zealand, tourists have unregulated access to breeding sites of the Yellow-Eyed Penguin (*Megadyptes antipodes*) (McClung *et al.*, 2003). The presence of people on beaches delays post-foraging landing by penguins, which in turn may affect the amount of food delivered by parents to their chicks. This has significant consequences for chick growth and fledging mass (McClung *et al.*, 2003). A study conducted

in 2002 on the chicks at Sandfly Bay, an area with high numbers of tourists, were shown to have significantly lower fledging weights compared to the chicks studied at Highcliff, an area with no tourist activity (McClung *et al.*, 2003). Lower fledging weights may result in long-term consequences for those penguin populations concerned. Although fledging weight is influenced by a number of different factors, the results suggest that tourism has a large impact on this phenomenon. This is important to this discussion, especially when acknowledging that eco-tourism and wildlife tourism is on the increase globally (McClung *et al.*, 2003; Dowling 2002; Hall *et al.*, 2005).

Wright conducted research on eco-tourism practices in reference to the Little Penguin colonies at Sandfly Bay, on Otago Peninsula, New Zealand. The research has shown that presence of humans has a measurable effect on penguin landing behaviour. It has been shown that the penguins are less likely to come ashore if people are present in the areas close to their burrows than when people are on other areas of the beach or hide (Wright, 1998).

A study conducted by Giese found that hatching success in Adelie Penguin colonies was significantly lower in smaller areas, where penguin nest checks/counts were performed on a regular basis. Rates of hatching success were found to be even lower in areas exposed to recreational visits (Giese, 1996).

The Port Phillip Eco-Centre suggests that a range of activities, besides commercial and non-commercial viewing of Little Penguins, which has an effect on the colony's breeding success; activities such as recreational fishing and boating, water sports, such as boating, jet skis, yachting, and walking the dog all present a threat to the penguins. Other threats include tangles in fishing line, accidents involving fishing hooks and other tackle, litter, especially plastic bags, oil spills, and harassment by humans or dogs, cats and other predators. The foraging range of the Little Penguins is restricted to the coastal waters of Bass Strait, and the recreational fishing catch today is thought to be almost equal the commercial catch. This means there is a lot of pressure on the fish supply within this area.

Green believes that wildlife tourism can have a negative impact on the wildlife. The impact on wildlife can be in the form of short-term physiology changes, changes in the behaviour of individual animals, through to wider ranging impacts, such as increased mortality or reduced breeding success within the colony, and impacts to the ecosystem (Green *et al.*, 2004). Short-term issues can cumulatively develop into long-term problems. Similarly, issues experienced within one species of wildlife can affect other populations and ecosystems. The effect of

wildlife tourism on animals varies considerably by species, age, sex, physical condition, cycle of breeding, habitat cover or lack thereof proximately to other animals, and previous interaction with people (Green *et al.*, 2004). The impact that tourism has on the animal in question will also vary according to the type of tourist activity taking place, the frequency of this activity, the distance kept between a person (or vehicle) and the animal, and the level of other disturbance from things such as, sound, light or sudden movement. Additionally, threats and disruption caused by dogs, cats, horses, vehicles, development and even council works can also affect the health and sustainability of the colony (Green *et al.*, 2004). The mere presence of people is a stimulus that affects different animals in different ways (Green *et al.*, 2004). When an animal becomes aware of humans, it can respond in a number of ways, it may fly away, freeze, or hide or defend its nest or position (Green, 2004). In the Little Penguins' case, they do not emerge or they delay emerging from the safety of the sea when threatened by the presence of humans. Some animals become accustomed to some types of stimuli such as the use of soft artificial lighting. Even if a disturbed animal does not flee, or show other behavioural signs of disturbance, it may still experience an increase in heart rate, body temperature as well as other endocrine responses in response to human presence (Green *et al.*, 2004). These reactions are considered synonymous with a stress response, and can result in stress on relationships, weight loss and ultimately reduced breeding success (Green *et al.*, 2004).

Habitat clearance is perhaps the most serious conservation threat to the world's wildlife; habitat may be cleared or modified for wildlife tourism, during the construction of accommodation, camping grounds, roads, parking spaces or picnic areas. Removal of understorey shrubs or large trees with hollows destroys resources used by many animals. Habitat fragmentation has created what is known as the edge effect (Green & Catterall, 1998, as cited in Green *et al.* 2004). The edge effect can be defined as the reduction of an animal's territory and home range. This allows access by feral animals, including competitors or predators. Some habitats may appear to receive little use by wildlife, yet in reality they provide critical resources during lean periods such as drought or times when food sources are low (Green & Catterall 1998, as cited in Green *et al.*, 2004).

Wildlife tourism has the potential to increase road kill of terrestrial species by (a) bringing more traffic into a wildlife-rich area; (b) habituating animals to traffic and parked cars and thus making them less wary; and (c) making vehicles a positive attraction to the animals because they learn to associate them as a source of food (Green *et al.*, 2004).

When breeding animals are killed or maimed, this can have serious consequences on the offspring and dependent mates. Similarly when a particular age or sex classes of a species is removed this can lead to serious consequences for that species' population (Green *et al.*, 2004).

Dann (1996) acknowledges the impacts on Little Penguins at the site on Philip Island, stating that mitigation of these threats is called for: *There is no known way of artificially increasing the survival of birds in the period between fledging and breeding, apart from those which reduce the impact of existing threats. What is required is to evaluate the risks/threats and implement appropriate response measures; research is required* (Dann, 1996:57). Dann and others have determined that the threats against the Little Penguins residing at the Phillip Island site are numerous. They include the following;

- *encroachment from development;*
- *tourism pressure;*
- *predators: cats, dogs and foxes;*
- *road fatalities;*
- *marine pollution, entanglements and oiling;*
- *inappropriate plantings and weed infestations; and*
- *stress on the birds from inappropriate viewing techniques during tourist visits and research projects* (Dakin, 2006:58).

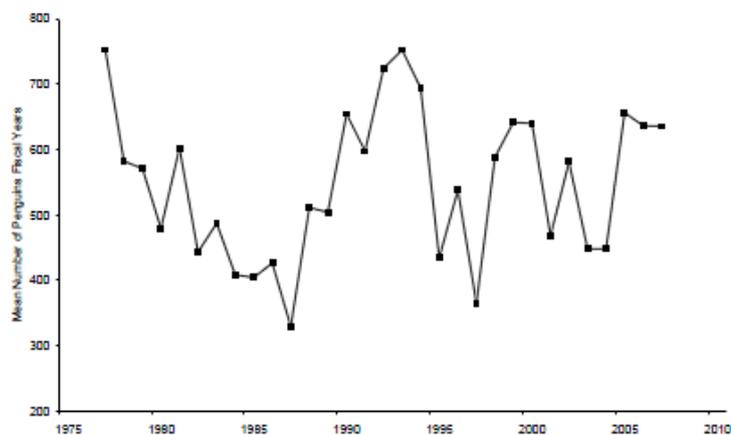
To mitigate the effect of the threats and impacts mentioned above, Philip Island embarked on a dedicated program involving, among other things, the development of a management plan.

Within that management plan are a number of important working strategies including:

- *research and monitoring;*
- *lobbying and enlistment of government support;*
- *analysis of the monetary return of tourism practises to the Victorian economy, in order to determine accurate data;*
- *initiation of habitat restoration programs;*
- *development of a pest and weed eradication plan;*
- *development of a responsible tourism plan, with the implementation of appropriate infrastructure at the site, such as car parks, raised boardwalks, platforms and seating arrangements; and*
- *restricted viewing, only allowing viewing within a confined area, (to allow birds to recover and breed in peace)* (Dakin, 2006).

Phillip Island Nature Park has a commitment to research and the studies done thus far have provided Phillip Island with important information about the health of their penguin colony over time. Phillip Island Nature Park has been collecting data on penguins crossing the Summerland Beach since 1977, which is depicted in Figure 7. These data provide them with clear evidence that there has been a significant decline in penguin numbers and that intervention currently required to mitigate this phenomenon (Darin, 2006).

This data provides them with clear evidence that there has been a significant decline in penguin numbers and that intervention currently required to mitigate this phenomenon (Dakin, 2006).



**Figure 7 Mean numbers of penguins crossing at Summerland Beach at Phillip Island 1977 – 2009 (Dakin 2006:12).**

Phillip Island Nature Park is currently in the process of completing a research study which is looking into the foraging route and distance that the Little Penguins take from Phillip (Dakin, 2006). As Dann (2009) suggests, such information will provide governing bodies with important data, which may be utilised in determining things such as fishing licenses and perhaps implementation of new marine reserves. A recent research project has determined that the act of banding Little Penguins affects their diving ability, and their subsequent breeding success (Dakin, 2006). I suggest that many of the factors threatening the Little Penguins at Phillip Island are also relevant to the three case study sites explored in this thesis. This thesis will, through the research methods outlined in Chapter 2, will determine what these are and make recommendations in the final chapter for mitigation strategies.

When Stevenson and Woehler undertook survey work of Little Penguins in Southern Tasmania they discovered that several sites that had previously been successful colonies for the birds were either no longer occupied, or had significantly low numbers compared to

before. Their work highlights the importance continual monitoring and collection of data over time. Their ongoing research meant that they were able to make clear comparisons on the colony's numbers and how they had shifted over time. The former colony at Marion Bay, which covered approximately five hectares (extending one km from the mouth of Bream Creek), had a population of between 400 and 600 pairs of Little Penguins present between 1986 and 1987 (Stevenson & Woehler 2007). The 2002 study showed revealed that there were no longer any birds present in the area, and that the last breeding recorded was in 1998. Cape Direction, Pigeon Holes, and North Clifton all report similar stories, Stevenson and Woehler suggest that the decline may be due to introduced predators, habitat modification and destruction, and accidental drowning of penguins in recreational gill nets (Stevenson & Woehler 2007).

There is an absence of previous empirical data for the three case study sites the subject of this research. Without such information it is difficult to determine the true effect that commercial tourism has on the Little Penguin colonies Stevenson and Woehler (2007) believe this data is vital for the Little Penguins' future sustainability: *The lack of empirical data for Little Penguin colonies prevents a detailed analyses of the rates of decrease* (Stevenson & Woehler, 2007:72). What we can understand from Stevenson and Woehler's, research is that fairly significant colonies of Little Penguins have disappeared in several previously occupied colonies in Southern Tasmania.

It appears obvious that there is commercial gain to be made from exploiting Tasmanian wildlife, and if the colony collapses or shifts from that location, the commercial operation no longer an attraction to make revenue from the wildlife. Therefore it appears fundamental that all possible factors affecting the Little Penguins' health and wellbeing are investigated thoroughly.

### 3.4 Conclusion

This chapter has discussed the characteristics and potential impacts of commercial wildlife tourism. It had a particular emphasis on the impacts of commercial tourism on Little Penguins. The writings as discussed in the chapter have outlined the potential impacts of wildlife tourism, stating that these impacts should be understood and adaptive management techniques used to militate against these potentially damaging impacts. Responsible tourism protects the environment, the habitat and the species being viewed, seeking as Goodwin says, to make positive contributions to the biodiversity rather than make negative contributions

(Goodwin 1998). Page (2002) argued that ecotourism or nature based tourism concentrates on sensitive fragile environments, and Hvenegaard (1994) argued they go in sensitive seasons further impacting on fragile biological communities. The consequences of these pressures were explored in a local context on Little Penguins by a review of the writings of Stephenson and Woehler (2007) and Dann (1996) both in a Victorian and Tasmanian context. These two examples discussed the types of development pressures and the consequences of these pressures on Little Penguins. The need for mitigation measures was discussed; this included the need for research and government involvement through governance and legislative powers. Lastly examples were provided through the exploration of the success of intervention measures at Phillip Island where migration measures have slowed the rate of decline of the Little Penguins at Phillip Island Nature Park. There are pressures of ecotourism or nature based tourism, a fact established by the writers reviewed in this chapter. It has also been established that various measures are available to eliminate or reduce these pressures. These factors will be further explored in Chapter 7 and recommendations delivered in Chapter 8.

Little research appears to have been undertaken on the Little Penguin colonies which are used for commercial tourism in Tasmania. This research thesis is arguably the first review which has looked at the three case study sites in question. Discussions in this chapter have clearly established that the colonies of Little Penguins in Tasmania have experienced significant decline over recent years. Declining numbers of wildlife can also lead to declining numbers of tourist visits to a site, which would render a tourism venture unsustainable. Extinction of a colony would of course mean loss of a tourism attraction, which results in lost revenues for the tourism operations involved. This thesis identifies the current threats to the Little Penguin colonies if efforts are made to mitigate these threats and ensure the survival of the penguin colonies and ongoing benefits to tourism in Tasmania.

## **Chapter 4 - Good Practice Commercial Little Penguin Tourism**

### **4.1 Introduction**

This chapter will allow me to explore other Australian sites where commercial tourism activity takes place utilising Little Penguins (*Eudyptula minor*) as the primary draw card. The sites I have chosen are Granite Island, Phillip Island, Manly Point. Additionally I will draw on the activities of the Derwent Estuary Little Penguin program in Tasmania. Although this is not a commercial tourism operation, it does appear to offer an example of an effort in Tasmania where research and ground work has been undertaken. The objectives of the Derwent Estuary Little Penguin program are to improve the sustainability of the Little Penguins which colonise there (Lee and Booth, 2008).

The purpose of this chapter to acknowledge the activities that other commercial Little Penguin tourism operations have adopted in Australia to help stop the decline of Little Penguin colonies used for commercial tourism. It is anticipated that this will provide ideas that have been tried and proven over a period of time at our sites, ideas which have subsequently become standard management practices.

Within the structure of the chapter initially an exploration of relevant literature will explain to the reader some of the pressures that Little Penguin colonies experience as a result of development which include of course, tourism. I will then introduce the three case study examples along with discussions on the Derwent Estuary Program. Lastly the summary will provide an analysis of the main points that I have picked up from that literature, with a view to utilising those points in subsequent chapters, especially Chapters 7 and 8.

In this chapter the main activity will be to make reference to several the Little Penguin tourism sites which appear to espouse sustainable tourism practices. I use this analysis to identify the key success factors important to sustainable penguin tourism. This analysis has relevance to the Little Penguin sites within Tasmania. The three case study sites discussed in Chapter 6 operate on a commercial level and it is important that initiatives are taken to improve the sustainability of such practices, this chapter provides the opportunity.

Additionally in this chapter I will explore Little Penguin biology and in particular some early research conducted at Bruny Island which I consider relevant by way of introduction to the Little Penguins, and their biological needs.

## 4.2 Penguin Biology

The smallest of the penguin species, the Little Penguin generally weighs between 1000 and 1200 grams and standing about 30 cm tall. Upper body is slate-blue coloured whilst the underside is white, flippers are blue-black, with a white trailing edge and white below, the bill is black, feet are pale with black soles, and the eye is silvery grey. Little Penguins generally live for an average of six years, although one bird of 21 years has been recorded according to DPIW (2009). There is a single Australian subspecies; Little Penguins can only be found in Australia, in the temperate Australasian waters found in the zone between summer isotherms of approximately 20 degrees Celsius to the north and 12 degrees in the south. In Australia the breeding range extends from Fremantle in Western Australia around the coast to Tasmania and up to and around Sydney in New South Wales (Stahel *et al.*, 1987)

While the Little Penguin was named by Captain Cooks expedition by J. R. Forster in 1780, according to (Stahel *et al.*, 1987) the species would have been well known to the Aboriginal tribes and perhaps their original name included, *martidekker* and *tomeranaray*. The Australian Little Penguin is distinctive from the five New Zealand subspecies by a margin of white feathers on the tail and on the rear edge of each flipper (Stahel *et al.*, 1987).

Little Penguins hunt at sea and are well prepared for marine life with their dense waterproof plumage, dark blue on the upper parts and white on the underside. Their body shape and short wings, modified as paddles give them a streamline diving advantage, feeding on small schooling fish, krill and squid, occasionally crabs from the sea bed, using short shallow dives of between 10 and 30 metres, sometimes extending to 60 metres. Little Penguins swallow their prey whole (DPIW 2009). The Little Penguins are not migratory and stay relatively close to land and their burrows, for most of the year, although most stay out at sea throughout the autumn to winter period. The birds live for an average of seven years, with some birds retaining the same mate for life. They can be found in coastal zones where they rest and nest under cover in burrows in sand dunes, among rocks, in sea caves and on headlands. Burrows are usually spaced around 2 metres apart. The size of the colonies can vary enormously, from a few pairs to many hundreds. Penguins always come ashore after dark and return to the sea on first light, this habit is not clearly understood, but could be based according to Stahel *et al.*, (1987) on the need to ensure the landing zone is free from predators, and tend to linger in the shallows and come onto dry land in numbers when the coast is clear. The Little Penguins have limited mobility once on land and can fall prey to a number of predators. Stahel *et al.*,

(1987) suggests that their habit of returning to the sea before light suggests a further link to the hypothesis of predator avoidance behaviour is in evidence.

The Tasmanian population is estimated to range between 110,000 and 190,000 breeding pairs, of which 5% are found on mainland Tasmania (Department Primary Industries, Parks, Water and the Environment, 2009). The Department also say that on the mainland of Tasmanian due to: *The ever increasing human pressure will probably result in extinction* (DPIW, 2009:1).

During the breeding season, between May and December the male penguins return to either renovate their old burrow or to dig or find a new one. Noisy male displays greet arriving female penguins, when the mate is chosen it is usually for life. The pair will breed annually, usually laying a clutch of two eggs, the pair share incubation shifts of one to two days and hatching takes place within 33 – 37 days, the non guarding parent returns to the sea to build up its own body weight again, about 60% of eggs are successfully hatched (DPIW, 2009:1).

The suggestion that the species is vulnerable is supported in part by Hodgson (1975). In 1975 Anne Hodgson, a PHD student of UTAS, initiated investigations of the Little Penguins at several breeding grounds in Southern Tasmania; these sites included two sites on Bruny Island, at the Neck at Cape Queen Elizabeth, as well as two in the Derwent Estuary south of Hobart, at Boronia Bay and Taronga. She observed small groups of separate east and west populations occupied different localities on the east and west sides of the Neck study area, with some overlapping and a few east-west mating. The total population gradually declined, due to natural losses, mainly from the pod-chick to the pre-egg period and losses of breeding and non-breeding birds attributable to human agency. The resulting disturbances affected breeding in subsequent seasons and few young west side birds became established, so that by 1972 the west population was nearly non-existent (Hodgson 1975).

Due in part to Hodgson (1975) analysis, it is possible to conclude that the annual cycle of the Little Penguin consists of a series of events which occur in an orderly sequence and are repeated year by year as depicted in Figure 8.

Stage	Maximum observed extent of each stage
Winter period	May – July
Pre-egg period	July – September
Egg Laying Period	September – December
Hatching	October – January
Post Breeding (prior to moult)	October – April
Moult	January – May

**Figure 8 Little Penguin annual cycle as adopted from Hodgson (1975:217)**

Stahel (*et al.*, 1987) says Little Penguins usually nest in burrows, they are often associated with sand dunes, may be among rocks or caves and on headlands. The burrows usually consist of a tunnel with a nest at the end, which is large enough for the penguin to stand up in although the entrance may be just large enough to allow the penguin access. The nest inside the burrow is made from local vegetation and available plant material; they can vary from just a few blades of grass to a substantial covering of material. Burrows are usually 60 to 80 centimetres long, or longer if penguins are trying to avoid disturbances perhaps from an outstretched hand suggest Stahel. Burrows are not found in barren sand dunes as they may collapse, they are rather set back in rocks and tussock grasses and shrubs which help to stabilise the soil structure. Rocky areas and sea caves are also used for nesting by some birds. Little Penguins can also take advantage of other spaces, such as boatshed or houses which are close to the sea to nest. Deeper burrows Stahel says, provides protection from predators such as man, dogs, cats, rats, foxes and sea birds. The Little Penguins are after shelter and security for their offspring. According to Stahel (*et al.*, 1987) Little Penguins defend a small space around their burrow with several aggressive calls, the first of these being a warning growl from within the burrow, which is made when a penguin intrudes on space, further aggressive intent is shown by sharp kak kak kak sound delivered with the body stretched up and the flippers help out to give an impression of greater size. If more defence is required locked beaks can follow and blows are delivered to the intruder with the flippers.

Hodgson (1975) noted that fresh burrow nesting material, such as grass, sags, pigface, rhagodia or bracken was collected by some birds in preparation for subsequent courting ceremonies and preliminary nesting rituals for mating, with the male penguins putting on a display to entice their mate or to find a new partner, Hodgson observed that male penguins would use the same favoured burrow with new partners in a season if they lose a mate. Kinsky: *The time new nesting material is brought into burrows varies from pair to pair and*

*depends on the time at which pair formation is definitely established* Kinsky (1960 as cited in Hodgson 1975:285).

Kinsky suggests a noteworthy feature is disputes over favoured burrows and rivalry between females, accentuated by the promiscuous behaviour of the males, sometimes continuing even after the females commenced laying. Successful breeding for young penguins Hodgson observed during her field studies was problematic, young birds had to learn to find partners and successfully produce a clutch of eggs, and then take parental turns to incubate and later guard the young chicks: *It is clear that young birds behave very differently from mature and established breeders. Whereas mature birds are systematic and efficient in preparing their nests, laying and incubating their eggs and rearing their chicks, in contrast young ones birds are inconstant and inefficient and often relinquish their breeding responsibilities for no apparent reason. It is therefore possible to distinguish young birds from older ones by watching their behaviour and comparing it with that of known mature and established birds* (Hodgson 1975:202).

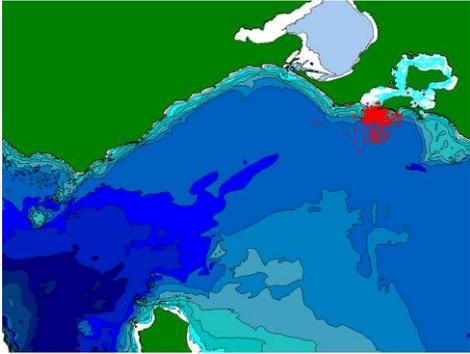
Hodgson also observed that two-year-olds and three-year-olds, both male and female may commence breeding and may successfully hatch eggs, but chicks are not likely to be reared to the stage of successful departure by birds under four years old.

Hodgson observed that it frequently transpired that a mate was lost during the breeding season; often a female would seek to find a new mate to produce a new clutch of eggs. Additionally it was observed that it was possible for penguins to incubate another female's egg and on occasion it was observed that penguins did feed an abandoned chick Hodgson (1975): *After the collapse of its own burrow, a 19-day-old chick entered a nearby nest on the night of December 1-2, 1961. The male parent N178, had been seen in attendance at this nest while his own single chick was hatching, between 06.55 and 17.20 hours on December 1. On the following day the female M77, was found brooding her own tiny chick with the large alien chick lying beside her. This chick (NClb) was adopted by M77 and N178 and successfully reared with their own chick* (Hodgson 1975:263).

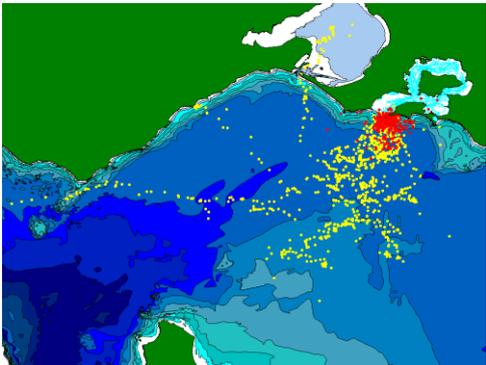
When a partnership was established the female lays a clutch of two eggs, after laying a successful clutch, Hodgson observed that the females returned to the sea to feed and the males were temporarily in charge of the clutch. She observed that the stronger of the hatched chick is fed first, ensuring survival of at least one chick (Hodgson 1975). The egg incubation is a joint affair, each parent taking turns to stay with the eggs while the other parent returns to

the sea to feed. Hodgson also observed that one female remained incubating her eggs for 18 consecutive days alone until she was forced to abandon her clutch for fear of starvation (1975).

The research conducted in 2007 by Dann (2007) scientifically supports this concept; this can be observed in Figure 9 and Figure 10 which shows the distances Little Penguins travel during the guard phase and subsequent guard and post guard stages.



**Figure 9** Satellite Tracking of Little Penguins at Phillip Island showing penguins during guard stage, (Dann: 2007, unpublished data)



**Figure 10** Satellite Tracking of Little Penguins at Phillip Island showing penguins during guard and post guard stage (Dann: 2007, unpublished data)

The duration of the incubation period varied between 31.5 and 38 days for eggs which hatched. If eggs or chicks are lost, the penguins will attempt to produce a second clutch, however during the years of intensive study at the Neck, by Hodgson) no successful breeders were ever found re-nesting, and there was no evidence that chicks were successfully reared from *any* second clutches laid following the loss of either eggs or chicks (Hodgson 1975) .

Incubation of the eggs is not commenced until both eggs have been laid, the female standing over the eggs, but the eggs remaining cool. Hodgson observed that it the maximum period observed for one of the penguins was 12 consecutive days for a female and 11 for a male. The relieving bird normally took charge of the eggs shortly after returning at night, but the

relieved partner rarely departed immediately. The hatching of the two eggs can occur some hours apart, Hodgson observed that the minimum incubation period of 31.5 days occurred for the first egg, while the second egg could hatch as much as 60 or even 72 hours later than the first, although usually it was 33.42 days and for the second 34.71 (Hodgson 1975).

When the Little Penguins finally manage to peck through their protective shell with their beak tooth one to three days may have passed. When hatched the chicks are very weak and cannot raise their head says Stahel (*et al.*, 1987), their eyes are shut and they are covered in a fine down. Their downy covering is important to the maintenance of their temperature; sheathed feathers emerge when the penguin is about four weeks old.

After hatching the chick is constantly guarded by one of the parents; with the returning parent regurgitating semi digested food to feed the chick upon its return to the nest. This period is called the guard stage; the chicks are not left unattended for the first 16 to 21 days. Hodgson observed, unless there was a loss of a mate, in which case the chick could be abandoned and slowly died of starvation. Throughout the guard stage chicks normally remained within their own burrows and were fed each night by the incoming parent, alternately the male and the female. During the early post-guard stage, at five to six weeks after hatching, many began to venture forth at night to meet the returning adults. Younger chicks were normally fed within their nests and older ones outside, after feeding, the older chicks usually retired into their nests to sleep, while the parents remained on guard outside, within a further two to three weeks, when their weight is around 900 grams they are ready to move to the sea, where they grow to maturity. But before they take to the sea they must shed their protective downy covering in favour of their dense, water tight feathers.

These feathers have a density of around 12 feathers per square centimetre; to further water proof their feathers the Little Penguins secrete from their oil gland (uropygial gland) located at the base of their tail (Stahel *et al.*, 1987)

Hodgson emphasised that adequate feeding by both parents throughout the chick period was essential for the rearing of healthy chicks. The chief cause of chick mortality was starvation. The failure rates of chicks varied in different seasons between 70.9% and 78.9% of the total eggs hatched (Hodgson 1975).

After fledging the young penguins disperse widely and do not return to the natal colony for about a year, according to Stahel (*et al.*, 1987) young birds from Tasmania tend to head North and they can travel great distances, a bird banded from Five Islands off the coast of New

South Wales was seen to spend a week ashore 1000 kilometres from its natal colony. In about one year they will return to moult at their natal colony.

Moulting happens usually once per year for the penguins, and is a natural process to take care of the wear and tear on their feathers, producing a completely new set annually. The penguins need a completely waterproof covering or they will not survive at sea. They must prepare for this time (by adding additionally body weight to their frame) of moulting when they are land based, unable to feed, unable to return to the sea until they have a new covering of waterproof feathers. Breeding pairs usually return to their burrows for their annual moult. Their old feathers are entirely lost over a two week period, before new feathers grow in replacement, and this loss is through preening and abrasion, this period can be detected by piles of moulted feathers at burrow entrances. At the conclusion of the moulting process the birds are emaciated, having used their fat stores (Stahel *et al.*, 1987) and need to return to the sea immediately to replenish energy reserves before starvation.

According to Hodgson there is a high correlation between death of a female who due to insufficient time to complete the moult was forced back into the sea to feed and replenish her body weight; Hodgson believed this was due in part to females who had exhausted themselves during long periods of feeding their chicks unaided by their mates. The adult birds return to the nesting sites to moult shortly after the chicks depart (O'Brien 1940 cited in Hodgson 1975). Hodgson noted that the behaviour of penguins at favourable colony sites differs from the behaviour of penguins in places where civilisation is beginning to encroach on their breeding grounds; here birds become very wary of lingering in exposed areas she commented, although she goes on to say, penguins which have not been conditioned to fear man or his domestic animals are bold and venturesome and show little fear (Hodgson 1975). Those that breed in dense colonies are therefore particularly vulnerable. It is now recognised that it is not safe to assume that a species is in no danger because it is still common (Hodgson 1975). She concludes by saying: *The Little Penguin is so vulnerable that it may eventually become one of the many endangered species unless the public becomes more aware of the need for a stricter enforcement of the existing laws of conservation* (Hodgson 1975:332)

## 4.2 Overview of pressures and responses



Figure 11 Pressures on Little Penguin Colonies (Wendy Mitchell - adapted from Dann 1996)

Dann (1996) identified a number of development pressures which may have an impact on the Little Penguins. I have adapted this work to indicate the pressures relevant to good practice commercial Little Penguin tourism, Figure 11. Nonetheless, it appears that there are several commercial tourism enterprises which happily co-exist with the Little Penguin colonies. Phillip Island in Victoria is one of the most prominent Little Penguin enterprises within Australia, followed by Granite Island in South Australia. These two sites will be discussed at length in this chapter.

I will also consider the experience in Manly New South Wales. While it cannot be said that this is a thriving colony of Little Penguins it appears from the literature that efforts have been made to analyse and address problems associated with the Little Penguin decline experienced there. I therefore consider it to be worthy of analysis in this chapter.

There are several colonies of Little Penguins in the southern waters of Australia including South Australia, Victoria, and Tasmania. Little Penguin colonies are also present in New South Wales, and Montague and Bowen Island. Sydney Harbour also penguins are occasionally found in Sydney Harbour. In Victoria, there are Little Penguin colonies living in Phillip Island and St Kilda. Tasmania has many colonies of Little Penguins, including those of Binalong Bay, the Derwent Estuary, Lillico Beach, Bicheno, Low Head, King Island, Flinders

Island and Bruny Island. There are also a couple of smaller offshore islands which have significant colonies living on them, such as Little Christmas Island and Diamond Island (Stevenson & Woehler, 2007). Some colonies have suffered collapse in Tasmania. Stevenson and Woehler's research (2007) suggests that there also used to be colonies living at Cape Direction, Pigeon Holes, Marion Bay, North Clifton and the town of Penguin, but they have since died out.

Of the sites mentioned only a few have commercial Little Penguin tourism operations, these include: Phillip Island, Granite Island, Bruny Island, Bicheno and Low Head. Phillip Island in Victoria is the largest commercial enterprise, it has been in operation since 1920, and has up to 500,000 visitors per night. In South Australia both Granite Island and Kangaroo Islands have commercial Little Penguin tourism operations. In Western Australia, Penguin Island has a small colony, but visitors are restricted to viewing wildlife at a special facility containing captive birds.

When commercial enterprises are established, which utilise a wildlife experience, they increase the pressure on that wildlife (Shaughnessy *et al.*, 2008). Legislation is a means by which that pressure is managed, and as Patterson (2003) writes, the potential effects that tourism may have on wildlife populations has become an important conservation issue. Repeat visits to a site over the course of a season can amount to hundreds of people. The challenge then is minimise impacts that human activity has on the wildlife populations in question: *One concern is the intense human activity associated with these sites will negatively impact wildlife populations* (Patterson *et al.*, 2003: 301).

Patterson *et al.*, (2003) acknowledge that further research is required in order to understand the relationship between humans and the wildlife they impact. Woehler's 1993 research project identified that human visits to the penguin colonies may be adversely affecting the recruitment of pre-breeding birds to the colonies. This suggests that young breeding birds are more disturbed by human visitation, which leads to subsequent consequences on the breeding success of the colony. While it is not appropriate to research that phenomena within this thesis, it is suggested that further research on human visitation and its effect on young birds regarding the subsequent breeding success is worthy of future consideration. Woehler's research appears to support the writings of a further research project by de Villiers (2008), who writes about the negative problems associated with human visitations, particularly the impact on hatching success rates. He suggests they can have a serious impact on hatching success rates: *Human approaches may lead to direct or indirect consequences. For example a*

*bird may exhibit behavioural and physiological changes in accord with a stress response, which in turn, if sustained, could have a negative impact on reproduction and survival. Visitors could disrupt a penguin colony; disturbed parents may abandon their eggs or young making them vulnerable to predators* (de Villiers, 2008 in Tin *et al.*, 2008:10).

Tin *et al.*, (2008) suggests that environmental monitoring and targeted research is urgently required to assist in the management decision process. Tin's suggestion highlights the importance of research, monitoring and a continual management process which drives a process of improvements with a clear strategy to obtain goals and desired environmental outcomes. Research and monitoring appear to be attributes that the following case study examples have in common. Commonalities which can be identified at commercial Little Penguin tourism sites, espousing sustainable development include Granite Island and Phillip Island. Those commonalities appear to acknowledge the importance of the information that research and monitoring provide, remembering that environmental monitoring is seen as integral part of the *Environment Protection and Biodiversity Conservation Act 1999*.

The two case study examples used in this chapter, Granite Island and Philip Island; both appear to appreciate the need for legislation and governance, management and strategic planning. The apparent need for planning is a viewed shared by a number of writers including Claridge (1997) and Dann (1996).

Baseline data, says Tin *et al.*, (2008); Dakin (2006) and Zedan (2004) is required before research is meaningful, as is the need for ongoing training of staff, visitors and volunteers. These two examples are just two of the common elements that connect Philip Island Nature Park and Granite Island. Granite Island and Philip Island two commercial tourism operations which utilise Little Penguins as their primary draw card appear to undertake these activities and others on a continual basis and appear also to have a number of management and research plans in place. Regular monitoring and auditing processes and the ability to enforce legislation or to impose penalties or other measures for non compliance, all appear important components of a proactive management and environmental plan (Zedan 2004).

At Granite Island management recognised that visitor interest in Little Penguins held inherent dangers, and on their website they publicise these problems in the hope that visitors will take a guided tour which has reduced stress implications on the little birds. They suggest: *Problems caused by unguided visitors include the use of white torches and camera flashes which interfere with the penguins' vision and cause disorientation. Coming within 5 metres of*

*the penguins, and touching the penguins and or their eggs and burrows places stress on the birds, As this behaviour obstructs the penguins nightly pathway and prevents them from returning to their burrows. In breeding season it also delays and or prevents the penguin chicks from being fed. On occasion penguins have been beaten to death or left wounded by vandals (Gisland, 2009:3).*

Involvement by the community appears an important component of successful Little Penguin tourism as this helps improve personal responsibility and thus environmental sustainability, while also encouraging tourism, which is of great importance (Dawson, 2008). These groups are generally called volunteers or friends groups. Community groups, when active, provide assistance in a variety of ways: monitoring, seed collection, propagation and habitat regeneration, fencing as well as ongoing care and pest control. In projects that have a strong sustainability element groups appear to be a key contributing success factor. The need for community participation is documented within a number of publications including: the *Convention of Biodiversity 1988*, the *Tasmanian State Planning Acts*, the *Guidelines on Biodiversity and Tourism 2004* and the *Convention on Biodiversity 2004*. The need for management plans appears important, it is the means by which consideration is given to a range of issues; it can also provide a mechanism for setting goals, timelines and the monitoring of performance. Babu describes the process in the following quote: *In the process of development, the issues confronting today are achieving desired development for economic or social reasons on one hand and safe guarding the environment ... on the other Babu (2002:1). The major challenge is not just finding a site for a developmental activity but is finding a solution for achieving sustainable development. It is being increasingly realised that the developmental activities are to be planned in such a way that the socio-economic objectives are fulfilled without causing adverse impacts on the environment (Babu, 2002:1).*

The management plan should include a description of the park or reserve, explaining its location using map references and explain the unique features of the landscape, heritage, aboriginal values, historic values, vegetation, alien species, threatened species, native fauna (there may be special plants or animals that live there). Any scientific research and monitoring, rehabilitation, Fire management (a plan to minimise risk or danger to nearby land, homes, people, wildlife and plants) should also be detailed (South Australian Parks and Wildlife, (SPP&WS) 2009). Current uses as well as zone provisions, any emergency management procedures, such as search and rescue, and responses to events such as oil spills

should be documented (SPP&WS 2009). Additionally such a plan should include an impact assessment, and detail what impacts are occurring, and what are likely to occur (Zedan 2004).

In commercial enterprises, strategic plans are used to set a forward thinking, futuristic vision for a project (Zedan 2004). Such documents also outline the intent of a business venture and portray its values, ethics and overall vision. They also provide both short and long term goals and the steps that need to be undertaken in order to reach them.

Management plans at some of the commercial Little Penguin tourism facilities have documented the key risks to the Little Penguin populations. These risks are regarded by Dann (1997) regarded as critical and it is integral that they are recognised and responded to with an appropriate course of action as soon as possible (Dann, 1997). Such management plans may provide the framework for the recognition of improvements which are required to halt the decline and destruction of the Little Penguin habitat and the subsequent demise of colonies inhabiting them (Stevenson & Woehler, 2007).

There are many kinds of human disturbance, but a major challenge for the management of penguin colonies is the pressure to allow public viewing (Dann, 2009). One of the places where public viewing has been conducted for many years is Phillip Island. People have been watching the Little Penguins come ashore at Summerland Beach on Phillip Island since 1928. This nightly event is known as the “Penguin Parade” and currently attracts almost 500,000 tourists each year. Although most of the visitors come from within Australia, it is also the most important attraction for international tourists in the region. Phillip Island has not been without its problems, mean numbers of penguins coming ashore at the Parade declined significantly from 1978 until 1988 and potential causes, including tourism, were examined (Dann, 1979). Today only approximately 10% of the penguin population on Phillip Island are exposed to tourism; this is recognised as important, as it effectively ensures that the rest of the population can breed largely naturally undisturbed by visitor interest (Dann, 1979). Penguin viewing has obvious cultural and financial benefits to local and regional communities. The generation of revenue and public interest in the penguins are persuasive factors in ensuring that management systems are applied to mitigate the risks associated with this activity.

Some of the commercial enterprises mentioned above have management plans; one of those is at Granite Island. The management plan for Granite Island’s estimated 700 penguins is important for the sustainability of the Little Penguins; the plan also recognises that the Little Penguins are an important tourism drawcard for the region. Their plans emulate the South

Australian, Department of Environment and Heritage plans, and follow the principles espoused by the *Wilderness Protection Act, 1992* (Gisland, 2009).

In Tasmania there are no specific management plans relating to the commercial Little Penguin tourism sites. However, it could be argued that the North East Small Island Management Plan of 2002 is the attempt at espousing conservation values to protect the birds.

Within Tasmanian Legislation there is a comprehensive system which deals with many of the places which have conservation values in Tasmania. Legislation relevant to the conservation of the Little Penguin sites include; *Crown Lands Act 1976*, *Nature Conservation Strategy*; *National Parks and Reserves Management Act 2002*, *Nature Conservation Act 2002*, and the *Environment Protection and Biodiversity Conservation Act 1999*, the Tasmanian State Coastal Policy. The Parks and Wildlife Service (PWS) are responsible for enforcing the legislative acts listed above.

According to PWS, two key documents support the management evaluation system: the Management Plan and a linked State of the Park Report, which effectively evaluates the effectiveness the management plan. Management plans should include topics such as:

- *management objectives;*
- *clear statements of key desired outcomes from each objective (that is, statements of the on-ground results that would be expected if the objective was fully realised);*
- *prescriptions for management strategies and actions to achieve the objectives;*
- *requirements for performance monitoring, evaluation and reporting requirements for review of the management plan* (Jones, 2005:2).

An example of such a management plan is the Waterhouse Conservation Area Management Plan of 2003, which states their management initiatives as:

- *protection of the internationally significant wetland will be enhanced by many measures, including appropriate zoning, regulation of eel and trout bait fishing, the discontinuation of duck hunting and regulation of the use of outboard engines;*
- *improved protection of aboriginal heritage will result from the introduction of a number of measures associated with vehicular tracks and camping;*
- *improved protection of fauna and flora, particularly in coastal habitats, will occur through the implementation of changes to camping and vehicular access;*
- *a basis is provided for improving the provision of recreational opportunities and facilities of the reserve;*
- *a basis is provided for the development of a fire management plan to improve fire management; and*

- *a basis is provided for assessing future proposals for land rehabilitation and stabilisation works* (Parks and Wildlife, 2003:1).

Again, according to Jones (2005) management plans are required in order to coordinate the management of a park so that agencies and operators are working towards the same objectives. These objects should include the following: to clarify what activities are permitted on the land, and militate against any risk associated with those activities, to protect the conservation values of the area, to protect the threatened species and generally to manage all associated visitor impacts. The process should allow the community to have input into the management plan, an argument supported by Zedan (2004). According to the Parks and Wildlife Service management plans should include statements relating to the management objectives, the key desired outcomes and a summary of values: including World Heritage Values, National Estate Values, and Nature Reserve Values. They should also make connections to international, national, state and local legislative matters which affect the region. Finally and probably most importantly, they should espouse a vision for the future (Jones 2005).

Comprehensive documentation on the conservation of Little Penguins and habitat rehabilitation is described effectively for the program; the Derwent Estuary Penguin Project in Southern Tasmania. This project has support from a number of organisations including NRM South, Parks and Wildlife, volunteers and friends. It appears a good example of a group effort's pursuit of sustainability at a specific site. Its success, is based on a multifaceted approach, and measured by the increase in numbers of Little Penguins colonising there (Lee, 2009). This has been largely achieved by reducing impacts for predators, regeneration of native plants, weed control, visitor control protocols, improved nesting site provision, habitat protection, fencing and methods to control accidental vehicle deaths of Little Penguins (Booth, 2009).

### **4.3 Commercial Little Penguin Tourism examples**

In the following section, I provide a short study of two commercially operated Little Penguin sites, Philip Island and Granite Island in South Australia. These two sites have a few things in common; arguably the most influential is the development of management plans for their tourism sites.

#### **4.3.1. Granite Island Commercial Little Penguin Tourism**

Granite Island is situated off Victor Harbor in South Australia and connects to the mainland by a causeway. The entire island is controlled by National Parks and Wildlife Service of South Australia with the northern shore leased for development. Granite Island is home to a colony of approximately 700 Little Penguins and guided tours operate each evening at dusk. The main issues at Granite Island is the declining penguin population, a fact confirmed during a 2009 census conducted by 30 volunteers who checked every burrow on the island, weighing and tagging Little Penguins, with a total of 354 Penguins sited. There were 2000 Little Penguins on Granite Island ten years ago. A significant investment of resources followed in order to understand and halt the decline in penguin numbers, including the instigation of research and management plans, and the establishment friends groups. One of the management outcomes was to restrict visitors from going within five metres from Little Penguins (SAP&WS, 2009).

One of the management outcomes was to establish a website; subsequently the web site for Granite Island has been comprehensive developed. The web site includes the following information: a It includes the following information: the history of the island, a description of the land tenure, a fact sheet on the penguins, some photographs and general information about Little Penguins and their biology and details of a breeding monitoring program. It also includes details on how they propose to protect and enhance the colony. One such method is to restrict visitor access to sections of the colony, installing penguin security guards, boardwalks and fenced human trails, habitat re-construction, and lastly a penguin rehabilitation centre for injured birds. The island has a dedicated Penguin, Marine and Environmental Centre designed as an unobtrusive structure built at the face of the granite cliff on the northern edge of Granite Island. Tours of the centre include an interactive penguin display and interpretation of the behaviours and adaptations of the island's penguin colony. The centre also contains numerous artificial burrows where penguins can be viewed through viewing windows. In the centre the building, a penguin rehabilitation area is located, for sick and injured birds. Continual research will aid in the understanding of environmental impacts affecting the Granite Island program (SAP&WS, 2009). At the island, management is aware of a number of problems caused by unguided visitors to the region. This includes the use of white torches and camera flashes which interfere with the penguins' vision and cause disorientation. Other problems included the habit of visitors in approaching the penguins closer than five metres, as well as touching penguins, their eggs and their burrows, which has

been identified as putting stress on the birds. It also obstructs the penguins' nightly pathway, preventing them from returning to their burrows and in breeding season delaying or preventing chicks from being fed. These issues were all identified as stress factors and have been found to result in lower colony breeding success rates. Additionally, there have been a few cases, in which penguins have been beaten to death or left wounded by vandals at Granite Island (SAP&WS, 2009).

Due to the direct and indirect interference placed on the colony by visitors, it became necessary to insist that visitors only view the penguins on guided tours. Access was restricted to a tour of the northern shore with a professional tour guide, who provided information and an interpretation on the penguins' biology and behaviour. During such tours minimum approach distances were enforced (SAP&WS, 2009). The development of restrictions, such as a minimum distance of 5 metres, is a factor which appears to be lessening the stress on birds (SAP&WS, 2009).

A penguin management plan was formulated to protect the penguin colony and their habitat. Long term improvements include the construction of a boardwalk and viewing platforms to separate people from penguins. Attempts to increase habitat through nesting box placement and the planting of 'penguin friendly' indigenous vegetation has also occurred at Granite Island (SAP&WS, 2009).

Research is seen to be important by SAP&WS and is conducted on Granite Island to monitor the health of the colony. The impact of humans and problems caused by construction and development are monitored through the study of breeding success and chick survival rates. Research is also conducted to assess changes and trends in the number of penguins in this population through ongoing active burrow counts. Research opportunities for post graduate university students have been encouraged and supported, by the South Australian Parks and Wildlife service (SAP&WS, 2009).

Research shows that if adequate infrastructure is not established then it is likely to have a serious and significant impact on penguin populations and their habitat over the coming years. Pollution continues to be a problem, as is the erosion of the sand dunes. The lack of boardwalks and signage are key elements that need to be addressed in order to prevent further destruction of the penguins' habitat.

The SAP&WS has committed to a management plan; this plan identifies the key areas of difficulty, some of which are listed below:

- *protection of penguins during peak times on granite island is difficult;*
- *the cost of maintaining or upgrading some infrastructure is problematic;*
- *damage to the ecological area due to pollution, from rubbish, and/or inadequate sewerage systems;*
- *damage to sensitive sand dune areas due to visitors ignoring signage and entering into fenced off areas;*
- *small family businesses find it hard to keep trained staff on payroll during low season and can only employ extra staff during peak seasons. This means they have to train them when they can least afford time (SAP&WS 2009:1).*

To make improvements at the site, several policies have been implemented for on-ground works, these include:

- *the availability of coast care brochures in the visitor centre;*
- *information on the park's conservation efforts, with guidelines on how visitors should behave while in the area;*
- *restrictions on public movement during the time penguins are returning to their burrows – visitors are now required to be on a guided tour during this time;*
- *signs on granite island advising visitors not to touch penguins, or to use flashes on their cameras or normal torch light;*
- *to maintain a minimum viewing distances to penguins of 5 metres;*
- *the public are warned not to restrict the Little Penguins access to their burrows or delay their return to feeding their young (SAP&WS 2009:2).*

Granite Island Managers recognise that public and local awareness plays a big part in the protection of penguin colonies. Continual education and public participation is viewed as critical to their survival. A feature of the park management system is the development of a National Parks Code of Conduct; this is an attempt to solicit visitors in more environmentally friendly behaviours. The code includes the following guidance:

Help protect your national parks by following these guidelines:

- *leave your pets at home;*
- *take your rubbish with you;*
- *observe fire restrictions. This is usually from 1st November to 30th April). During these periods only gas fires are allowed and during days declared a total fire ban all forms of fire are prohibited;*
- *conserve native habitat by using liquid fuel or gas stoves;*
- *respect geological and heritage sites;*
- *keep our wildlife wild. Do not feed or disturb animals, or remove native plants;*

- *keep to defined vehicle tracks and walking trails and comply with all management signs.*
- *be considerate of other park users (SAP&WS 2009:1).*

Granite Island have also developed tourism guidelines reminding visitors that Little Penguins are vulnerable to attacks by dogs and stress due to disturbance from people, and subsequently visitors are urged to adhere to the following guidelines:

- *five metres is as close as you should approach, to limit the disturbance that you cause;*
- *camera flashes are very disturbing to penguins. A camera flash will blind a penguin for up to five minutes making them vulnerable to predators;*
- *use torches indirectly- shine the bright spot past the penguin. It is preferable that you place your hand over the torch or use a red filter;*
- *many penguin deaths have been caused by dog attacks, so keep dogs away at all times. Even the smell of dogs within the colony will disturb penguins and may stop them from breeding;*
- *the penguins always have the “right of way”. They are usually returning to their burrow or chicks. don’t get between chicks and adult penguins or obstruct a penguin from getting to its burrow;*
- *moulting penguins may be easy to see in their burrows but they are most vulnerable at this time. Their new feathers are not yet waterproof so they cannot leave the burrow if disturbed;*
- *do not touch any penguins, chicks, eggs or burrows as the human scent may cause the penguins to abandon their breeding activities (Gisland, 2006:1)*

An important feature for the sustainable management of the penguin colony at Granite Island appears to be the partnership which exists between the South Australian Government, and its agencies, the park’s lease holder and concerned members of the public. The Friends of Granite Island Recreation Park (FOGI) is a volunteer community group which provides assistance to the Department for Environment and Heritage by maintaining the Granite Island site and increasing public awareness of its unique value. The volunteers take part in a number of initiatives to help protect the area and its wildlife, including: conducting organised penguin tours, carrying out penguin surveys, collecting native seed, propagating native plants, conducting plantings, and maintaining and monitoring revegetation sites on the island. The group is supported by the South Australia Department of Environment; there is a link to the volunteers group on their website. The ultimate goal of the Friends of Granite Island Recreation Park is to restore the Island’s native vegetation species, which were likely to have existed on Granite Island prior to European settlement (FOGI, 2009).

The revegetation work undertaken by FOGI aims to restore native vegetation to Granite Island for its own sake, but also for the broader ecological restoration of the island. It is hoped that replanting areas of native vascular plants on Granite Island will encourage the establishment of other species of flora and fauna. Revegetation activities, in some areas, also aim to address soil loss through wind and water erosion. Due to the high visitation levels to Granite Island revegetation activities on the island have the potential to raise public awareness of, and participation in, environmental restoration. This is viewed very positively by the volunteers involved in the group (FOGI, 2009).

Legislation which provides the underlying structure for Granite Island Little Penguin tourism venture is espoused in the South Australian *Wilderness Protection Act of 1992*. This legislation seeks to protect, and where practicable enhance wilderness quality. The key areas of legislation relevant to this thesis are:

- *protect wildlife and ecological processes;*
- *control and, where practicable, eradicate non-indigenous plants and animals;*
- *protect geographical features;*
- *provide for public use and enjoyment where compatible with maximising wilderness quality; and*
- *promote public awareness of, and education in, the natural features of and proper use of wilderness protection areas and wilderness protection zones.*

In summary, Granite Island is aware of the commercial gains available by supporting a structured Little Penguin commercial enterprise. They also appear aware that there are inherent risks associated with wildlife viewing, and have taken the steps necessary to mitigate these risks, hoping to move towards greater sustainability of the Little Penguins inhabiting the Island. These measures include activities such as:

- development of a commercial operation, were visitors pay for a tour;
- facilitation and support for appropriate monitoring and research programs;
- the development of management plans;
- investment in appropriate infrastructure;
- training and employment guides;
- placement of mechanisms and infrastructure that support injured wildlife;
- public education;
- development and promotion of a code of visitor conduct;
- enforced restrictions;
- habitat regeneration programs, and;
- support to community groups who are interested in undertaking work on the island.

The activities portrayed by the South Australian Government in respect to the conservation work at Granite Island provide good examples of the successful management of inherent problems associated with commercial penguin activity.

#### **4.3.2 The Phillip Island Penguin Parade, Victoria**

The Little Penguin tourism facility at Philip Island is arguably the largest commercial Little Penguin tourism venture in the southern hemisphere. The success of this venture can be measured in a number of ways. For this thesis, the success measure is ultimately the health of the colony and its continued growth, through successful breeding habits and efforts to insure of colony sustainability, as espoused in Chapter 1. Philip Island has not been without its problems, like Granite Island penguin numbers have been declining in recent years (Dann, 2007). Although the penguins are not listed as an endangered species, their numbers have been significantly affected. Breeding areas have reduced in size by 80 per cent since the early 1900s, resulting from human related impacts including tourism, including uncontrolled vehicle and pedestrian access as well as habitat loss due to developments. By the 1980, penguin numbers had declined by 45 per cent at Philip Island, concerning the Victorian government (Resource Assessment Commission, 1993).

In response to this decline, the Victorian Government developed the Penguin Protection Plan in 1985, which outlined a program to protect and improve the situation. The program included a land buyback program to increase the size of the reserve, and the preparation of a management plan to mitigate the decline of the penguin colony. Implementation of both the buyback program and management plan have *proved to be very successful, with penguin number reportedly on the increase* (Resource Assessment Commission, 1993): *Part of Philip Island's strategy is to recognize critical times in the breeding cycle. Research has shown that fledging is a critical time in a young penguin's life. During the moult from down to adult plumage, the chick puts on a serious amount of weight; they can weigh approximately 2kg compared to the normal adult weight of 1 to 1.5 kg. This makes them extremely sluggish and an easy prey for both predators and humans. If they lose too much weight during this period, due to stress, they will not survive once they leave the burrow for good* (Norman et al., 1992:403).

The development of a volunteers group has been an important element in the protection measures needed to improve conditions for the Little Penguins at Phillip Island (Dann, 1996). Volunteers have assisted in developing protection measures. Funding has assisted volunteer

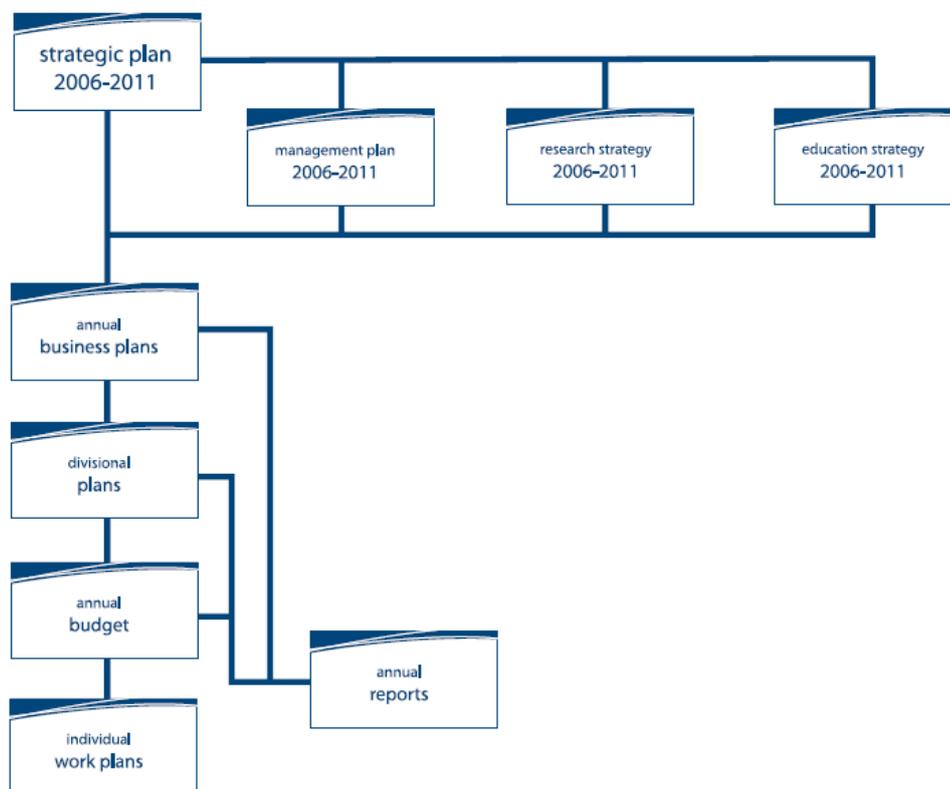
groups and government teams to establish wildlife corridors, create fencing to control stock access and to prevent erosion and improvements to and vegetation and habitat. Pest and weed eradication programs have been established and the development of important infrastructure, such as car parks, raised paths, boardwalks and seating platforms has helped improve sustainability.

The volunteers group found that site degradation was largely due to stock grazing. Sheep traverse paths of their own; these pathways are in turn used by visitors, in some cases leading to erosion, habitat destruction and disturbance to the Little Penguins. Volunteers use various protection measures such as tree guards to protect against the harsh wind, kangaroos and rabbits. Interestingly, these vegetation methods have proved problematic, as the use of tree guards creates wind vortices that erode the area around the seedling. An innovative solution was found to stabilise the sand inside the guards the group sowed oats between the tree guards: *The core philosophy says that it doesn't matter what grows initially as long as it stabilises the top soil and keeps things in place until the seedlings are old enough to establish themselves. Eighty-five different species of local plants, including: trees, shrubs, wildflowers and native grasses, are planted each year, to increase habitat and nesting sites. Boardwalks and interpretive signing was found to be important to educate and remind people of best practice behaviour* (Hall, 2001: 5).

The coastal ambassador program is a further example of one of the initiatives undertaken by the volunteers working with Parks and Wildlife. This program was developed to help motivate and teach young people about how to care for the environment. Students team up with National Park Rangers, Scientists and Marine Biologists to work on joint projects. During the program, students learn about the coastal environment, its wildlife, and issues affecting this region. They are also taught sea skills, such as surfing, snorkelling and kayaking, which enable their participation in monitoring programs. The program is supported by the Victorian Department of Education and Science Teachers Association and the Toyota Phillip Island Partnership, 2010.

A partnership and sponsorship arrangement with Toyota Australia has provided Phillip Island with an opportunity to engage with corporate Australia, source additional funds for ground works, and promote its volunteers program through a corporate identity. Phillip Island and Toyota Australia are committed to improving the nesting habitat of the Little Penguins. This project enabled Toyota employee volunteers to work alongside senior rangers and members of the research team to improve the homes and habitat of Phillip Island's Little Penguin colony.

It involves building penguin homes, or artificial burrows, from timber materials, installing them into selected penguin habitat and assisting in the re-vegetation of the area. The penguin burrows provide an improved environment for the penguins to breed, hatch and raise their chicks, adding a significant benefit to the overall health of the penguin colony. This project, which developed in 2003, in response to the penguins colonise the car park, penguins were being killed by cars and buses visiting the penguin parade. This project aims to encourage penguins away from traffic areas and into safe regions, previously occupied by guest houses and holiday homes.



**Figure 12 Philip Island Strategic Planning outline (Dakin, 2006:6)**

A key component to the success of the Phillip Island Project has been its commitment to strategic planning, as can be seen by Figure 12. The Philip Island Strategic Plan has a multi faceted approach its penguin protection program. The Strategic Plan has a management component, research strategy component, educational component, and a business plan amongst its chapters. The Strategic Plan espouses a set of principles which are to guide management. These include the following:

- *threats to populations from fire, feral and domestic animals, habitat destruction, and human activity should be minimised;*

- *regulations for wildlife protection should be enforced;*
- *contingency plans for responding to oil spills and fires should be in place;*
- *management plans should be adopted in all cases where public access is authorised (Dakin, 2006:80).*

It is important that this plan sets out clear and measurable objectives, so its effectiveness can be monitored over time.

- *The success of the Phillip Island Strategic Plan will be measured according to completion of the following objectives: key breeding sites for all species are adequately managed and protected from potential threats, in particular the accidental introduction of alien species;*
- *populations for those species with confirmed breeding sites in Australian waters shows a demonstrable, or at the very least, signs of stabilisation.*
- *in the event that future actual threats to populations are identified, appropriate measures to minimise or mitigate them are developed and implemented as a priority;*
- *the breeding population for those species breeding in Australia and are regarded as endangered or critically endangered has increased sufficiently so that they are reclassified as vulnerable; and,*
- *effective management programs to control alien species are in place for all sites where alien species threaten breeding colonies of the seabirds covered by this plan (Dakin, 2006:10).*

Also important in the conservation of interdependent flora and fauna is the *Victorian Flora and Fauna Guarantee Act 1988*. This Act provides the framework by which the objectives can be achieved. The flora and fauna conservation and management objectives are:

- *to guarantee that all of Victoria's flora and fauna can survive, flourish and retain their potential for evolutionary development in the wild;*
- *to conserve communities of flora and fauna;*
- *to manage potentially threatening processes;*
- *to ensure that any use of flora or fauna by humans is sustainable;*
- *to ensure that the genetic diversity of flora and fauna is maintained;*
- *to provide relevant programs;*
- *promote community education in the conservation of flora and fauna;*
- *to assist in providing incentives to people, including landholders, to enable flora and fauna to be conserved; and*
- *encourage the conservation of flora and fauna through cooperative community endeavours.*

Research is an important component of Philip Island's management plan for the site. Research projects have enabled the development of a tracking device to monitor the Little Penguins

forging habits, using a small tracking device attached to the bird's wing. According to Dann (2009) it will be the first time such a study has been undertaken. The project will focus on four separate penguin colonies living on the Islands off the east coast of Wilson's Promontory, Victoria.

Using satellite technology (Figure 9 & 10) researchers will track individual penguins in order to gain data into their foraging distances for food and determine what extent food zones and food sources is a limiting factor in the size of the penguin colony. Satellite devices were attached to twelve penguins across each of the four colonies and provided accurate tracking data to the researchers. Analysis from these 'test colonies' will then enable researchers to target the most influential factors affecting penguin colony health. This information may well influence government environmental policy on issues such as commercial fishing licences and the establishment of further marine parks and exclusion zones. The improved knowledge of the penguins' diet and behaviour will also allow for improved rehabilitation of sick and injured sea birds throughout Australia (Dann, 2009).

Pest and weed eradication is an important element of improved colony sustainability at Phillip Island. Foxes were introduced to Phillip Island around 1905 (Dann 1996). Foxes are the Little Penguins' number one predator on land. By 1980 nine of the Islands ten penguin colonies had become extinct and the remaining colony on the Summerland Peninsula was under threat (Dann, 1996).

In late 1994 farmers and rangers began coordinating with one another to control the fox population. Together, they have been able to destroy more than 1000 foxes over the past 20 years (Dann, 1996). Feral and roaming domestic cats are also a significant problem to wildlife at Phillip Island. They hunt small birds, reptiles and frogs and can cause the spread of toxoplasmosis (*Toxoplasma gondii*) which can infect humans and other mammals such as sheep, dolphins and whales. Weeds were identified as one of the greatest threats to flora and fauna on Phillip Island (Dann, 1996). Over 200 weeds have been recorded in the Park, including five 'Weeds of National Significance' and 26 state declared noxious weeds. To help combat weeds, a weed strategy has been developed that sets priorities, partnerships and resources for effective weed management (Dakin, 2006).

### **4.3.3 Manly Point**

Lessons can be learnt by the experience of others. For example, in 1997, the NSW Scientific Committee listed the Manly Point population of Little Penguins as endangered on the

*Threatened Species Conservation Act, 1995* (Department of Environment and Climate Change 2010). Several years earlier the Manly Point colony was extensive, with populations living throughout Manly Point, Spring Cove, Store Beach and Cabbage Tree Bay in Sydney. Today the population is restricted to Manly Point and may be a colony as small as 35 birds (Department of Environment and Climate Change 2010). According to the Department, the population is of significant conservation value given its disconnectedness from other populations and its occurrence in Sydney Harbour. The decline of Little Penguin populations in the Sydney has been attributed to habitat destruction and predation from domestic and introduced animals. There is evidence that predation by dogs has been a significant factor in the decline of the Manly population; and that the numbers of Little Penguins in the Manly Point population have been reduced to such a critical level that they are in immediate danger of extinction. . Most of the suitable nesting habitat around Manly's foreshore has been destroyed as a result of residential development. Other areas have become inaccessible or unsuitable, with the exception of the Sydney Harbour National Park area. In some areas, the construction of sea walls appears to have blocked direct access to several nests. This has resulted in penguins being diverted onto the street, where several have been killed by dogs and cars (Little Penguin Steering Committee, 1996).

The re-vegetation program at Manly Point helps to protect nest sites by stabilising topsoil, slowing and scattering surface water run-off and providing shade, which reduces heat on the rocky slopes utilised by penguins. This is particularly important in summer, during the height of the breeding period (Little Penguin Steering Committee, 1996). Vegetation also provides cover from predators and helps to hide nest sites from human disturbance, so its removal poses a threat to the colony. This vegetation includes introduced species such as lantana, which is classified as a noxious weed in the Manly local government area. Disturbance of Little Penguins and their habitat comes from a variety of sources, for example, in Sydney there have been reports of jet skis harassing the penguin colony (Klomp 2000). Disturbance around the nesting areas is another threat to the population: as is increases in noise and light from nearby buildings and waterway activities have the potential to impact penguin nesting activities. Lights shining onto nesting areas from boats or buildings may disorientate or even prevent birds from returning to shore. North Harbour is used for a variety of recreational purposes including windsurfing, jet skiing, power boating, kayaking, yachting, diving, swimming as well as commercial and recreational fishing. Marine users need to be aware of the marine regulations imposed by the Waterways Authority around Sydney's North Harbour.

There are also restrictions relating to anchoring; boats are prohibited from anchoring within 30 metres of the shore in the Spring Cove area (Waterways Authority, 2009). Although this restriction does not apply to Manly Cove disturbance from the public appears to place additional pressure on the penguin colony. Most of the foreshore along Manly Point is not readily accessible to the general public, although residents have observed tourists in the area and members of the public accessing the area to walk their dog (Little Penguin Steering Committee, 1996).

Predators such as dogs, cats, and foxes are known to take penguins from shallow burrows and as they move between the water and their nesting area. On one night in 1995 eight penguins were killed in a residential street and veterinary post-mortems indicated that a dog attack was responsible (Little Penguin Steering Committee, 1996). Domestic dog attacks seem to be predominantly responsible for the destruction of the Eagles Claw population at Eden in New South Wales. On occasion, local residents walk their dogs along the foreshore around Manly, and they often take their dogs off the leash (Little Penguin Steering Committee, 1996). As Stahel and Gales point out, the loss of only one adult in a breeding pair can result in the death of their young (Stahel and Gales, 1987). The colony at North Sydney Harbour is said to be extremely vulnerable to attack. Due to its small size, several predation events during a single breeding season could severely reduce the continual existence of this population (Little Penguin Steering Committee, 1996). Additionally, pollution may have a significantly adverse impact the colony; as stormwater runoff and rubbish dumping can destroy nesting habitat and expose penguins to pollutants (Little Penguin Steering Committee, 1996). Inputs into Sydney Harbour from storm water, sewerage overflows, watercourses and atmospheric fallout affect water quality and substrate composition and may be harmful to penguin health (Victorian Department of Conservation and Environment, 1992). Industrial and urban inputs of heavy metals and organochlorines into Sydney Harbour also have the potential to cause physiological effects on penguins by contaminating their food source (Cunningham *et al.*, 1993). Monitoring of these inputs and any changes in concentrations will assist in determining their effects and whether or not any conservation actions are required. Pollution of the harbour from deliberate or accidental marine oil or chemical spillage may impact the penguins' feeding or movement throughout the harbour (Little Penguin Steering Committee, 1996). Sydney Harbour is often used by cargo and military ships. Accidents involving large-scale spillages of oil, petrol or other toxic products from ships, boats, shore-based operations or trucks could have a major impact on the colony. Oil spills may have a direct effect on penguin

colonies covering the foreshore or an indirect effect on their habitat, both of which would have an adverse impact on the penguin populations inhabiting the area.

Even though environmental controls are currently in place, such as *Protection of the Environment Operations Act 1998*, it is essential that an integrated response between the various relevant organisations is implemented, in order to minimise the impact on the penguins and their habitat (Little Penguin Steering Committee, 1996).

There have been suggestions that the commercial fishing in Sydney Harbour may be having a detrimental impact on the food source of the Little Penguins. Little Penguins from the St Kilda colony in Victoria are heavier than those on Philip Island (Cullen *et al.*, 1996). This may be attributed to their close proximity to good fishing grounds and savings in energy expenditure by foraging close to nest sites (Cullen *et al.*, 1996). It also means that less food is digested by adults prior to feeding chicks as foraging trips are shorter. Although currently it appears there is no data available to support this claim. It is however, well known that lack of food resources is a common cause of mortality in seabirds (Harrigan, 1992 and Norman *et al.*, 1992), resulting in improved breeding success (Cullen *et al.*, 1996).

Fishermen may also have an impact on the Little Penguin populations through the hauling of nets outside the penguins' burrows. This obstructs the penguins from returning to their nests, which can have a particularly large impact during the breeding season, as the adult birds are forced to stay in the water for longer periods of time, and may digest a large portion of food that would have been available for the chicks. This was observed by researchers at Five Islands, New South Wales, where penguins were unwilling to return to their nests to feed their chicks whilst fishermen were hauling nets onto shore (Smith, 1998). The rehabilitation plan provides for various activities should which should reduce a number of the factors threatening Little Penguin populations and provide the penguins with a suitable habitat, by which to encourage the remaining penguins to repopulate and enjoy a higher breeding success rate. According to the New South Wales Government's Department of Environment (2010:30) the recovery process involves the following outcomes:

- *the monitoring program continues to evolve, and a better indication of the penguins' population's size and status is required;*
- *predator attack and disturbances to nest habitat is minimised and the number of attacks decreases annually;*
- *habitat is enhanced, as is the viability of encouraging penguins to areas of more secure habitat;*
- *the introduction of more artificial burrows is investigated;*

- *community members are involved in the monitoring program and are made aware of the threats to the penguin population, via efforts to make contact with local residents at least twice a year the publication of status reports regarding the size and status of the penguin population;*
- *existing penguin habitat is appropriately managed with the aid of guidelines;*
- *the relevant authorities and landholders are informed of the threats and sensitivities to the penguin population;*
- *appropriate research is initiated and coordinated through the recovery team;*
- *the recovery team has an annual meeting each march and a critical review of priorities will occur;*
- *a mortality register should be established;*
- *the community will be educated on the current threats to the Little Penguin colonies and their conservation value;*
- *appropriate signage will be erected in order to protect the colony;*
- *the community will be educated regarding responsible pet ownership and the companion animal's act will be enforced where appropriate;*
- *undertake pest management in Sydney Harbour National Park;*
- *include the colony in planning for marine pollution management;*
- *enforce north Sydney Harbour waterway regulations;*
- *monitor fish stocks in Sydney Harbour and surrounds;*
- *manage nesting habitat through regeneration and community action;*
- *continue the community outreach program;*
- *improve environmental planning;*
- *protect habitat of the Little Penguin population at manly through the environmental planning and assessment process; and*
- *coordinate and support research into the ecology of the population.*

#### **4.4 Summary**

In the three case study sites discussed in this chapter, namely, Granite Island, Phillip Island and Manly Point, common elements have been identified. Additionally the discussions on the Derwent Estuary program also acknowledged the requirements needed to achieve improved sustainability of Little Penguin colonies; many of the following items depicted in the three case study sites were also present in the Derwent Estuary program. The attributes required to increase the sustainability of Little Penguin colonies, include, but are not limited to the following;

- researched base line data;
- ongoing research;
- strategic planning;
- management plans, leadership and a vision;
- monitoring;
- habitat protection;
- risk analysis;
- rehabilitation;

- pest control;
- the provision of infrastructure;
- training and employment of guides;
- enforced legislation; and
- involvement of the community.

It would appear from the research depicted in this chapter that the factors which each case study appeared to acknowledge and endorse are important steps in working towards improved sustainability of Little Penguin colonies.

#### **4.4 Characteristics of Good Practice Commercial Wildlife Tourism**

In previous chapters Little Penguin biological needs have been discussed, various researchers' work on sustainable tourism has been quoted and examples provided of wildlife tourism and such as Granite Island and Phillip Island. These examples have suggested that the potential impacts of commercial tourism have been considered, and mitigation measures adopted. These measures have included site risk assessments, and development of management plans. In this section the characteristics of good commercial tourism, is explored and suggest what this might entail. For this purpose the Convention on Biological Diversity Guidelines on Biodiversity and Tourism Development has been considered along with other research such as the work of Dudley 2008 in the Guidelines for Applying Protected Area Management.

To be sustainable, tourism development in any destination required coordinated policy making, development, planning and management. According to Zedan (2004:7), this should involve the following steps;

- *baseline information and review;*
- *vision and goals;*
- *objectives;*
- *review of legislative and control measures;*
- *impact assessment;*
- *impact management and mitigation;*
- *decision making;*
- *implementation;*
- *monitoring and reporting; and*
- *adaptive management.*

The points above also appear to be supported by the Jackson Report (2009). In that report, it is suggested that key supply side impediments need to be addressed (Figure 13).

Infrastructure	Tourism is not adequately considered in infrastructure planning
Research and statistics	The existing information base is geared toward demand stimulus and promotion of tourism, and needs realigning with the supply side and industry development needs.
Labour and skills	There are imbalances between labour supply and the demand and skills portfolios.
Regulations, planning and approval processes	These are often seen as too complex and lacking transparency and are inconsistent in their application.
Investment	The private sector is ambivalent about investment due to incomplete information about tourism investment opportunities
Leadership	Fragmented leadership is leading to missed opportunities for productivity improvements

Figure 13 Key Supply side impediments, (Jackson, 2009:22)

#### 4.5.1 Baseline Information and Review

Frequently during this research thesis the need for baseline information, has been discussed. This argument is supported by Zedan who also suggests that such information is critical to enable impact assessment and decision making. Such base line information should include maps, geographical information systems and other versional tools, including identified zones and other parameters. It should according to Zedan contain all relevant information, it is not available it should be sourced (Zedan, 2004). Site specific information is also required, such as wildlife counts, local users and traditions, history, special circumstances, stakeholder involvement and existing commercial or other tourism activities. Both quantitative and qualitative information on the loss of habitats and species should be obtained and examined.

Harrigan (1992) suggested that the causes of death in Little Penguins at Phillip Island and other coastal areas of Victoria were mainly caused by; *trauma from predation, road traffic or starvation apparently directly resulting from food deprivation* Harrigan (1992:273). Harrigan concludes the paper by recommending that further research is required for more detailed information regarding Little Penguin biological needs (1992).

#### 4.5.2 Vision, Goals and Objectives

The main goal of any vision should be the maintenance and protection of the structure of the functioning ecosystems. Tourism needs to be compatible with that vision according to the Zedan (2004). Additionally it should be integrated, fair and equitable, and should prevent damage to biological diversity, ecosystems and natural resources. It should also be supportive of stakeholder and community participation and capacity building. The objectives should focus on actions to achieve the vision and goals. Additionally to establish the operational systems which will be utilised to exert control and achieve sustainability and protection and refurbishment of previously damaged systems (Zedan, 2004).

*The Tasmanian Nature Conservation Strategy, 2002*, supports the concept of capacity building as a tool for improved conservation measures, for the strategy documents: *In the context of the Tasmanian Natural Resources Management Framework, increase and recognise community involvement in natural conservation issues. This includes enabling the community to be more involved in policy setting and decision making* (unknown author, 2002: ii). The strategy concludes by saying; *this is essential to foster and build on community involvement and ownership of nature conservation* (unknown author, 2002: ii).

### **4.5.3 Protection of Biodiversity and Ecosystems**

Protection of the ecosystems and biodiversity should be the primary consideration of any activity that utilises wildlife, or wildlife habitat. Tourism must be compatible with this aim states the Zedan (2004:10). Wildlife tourism should prevent any lasting damage to biological diversity, ecosystems and natural resources, and should in fact restore past damages (Zedan 2004). Governments says the Zedan, have an important role to play at a state or national level. The process can then disseminate to on the ground actions to achieve predefined goals which meet the vision objectives (Zedan, 2004).

Additionally the Tasmanian Nature Conservation Strategy, 2002 (TNCS) has listed as one of its guiding principle, the protection of natural biodiversity acknowledging the need for protection: *Protecting natural diversity requires identifying, preventing and reducing threats and where necessary, acting cautiously, e.g. the precautionary principle should be applied* (TNCS, 2002:4).

### **4.5.4 Land Classifications and Reserves**

Land classifications and reserves are important methods of establishing various levels of protection, especially when coupled with appropriately incorporated sustainability objectives. Dudley (2008) in the Guidelines for Applying Protected Area Management says that protected areas are essential for biodiversity conservation: *They are the corner stone of virtually all conservation strategies; to set aside to maintain functioning natural ecosystems to act as refuges for species and to maintain ecological processes that cannot survive in most intensely managed landscapes and sea scapes. Protected areas act as a benchmark* (Dudley 2008:2).

Dudly continues this argument suggesting that today protected or reserve areas are often the only hope of stopping many threatened or endemic species from becoming extinct, saying: *Most reserved areas exist in natural or near natural ecosystems or could be or are being*

*restored to such a state* (Dudley 2008:2). Such protected areas Dudley suggests are critical for biological conservation and critical for the preservation and the commitment to future generations, conserving the natural biodiversity. However Dudley also reminds that many areas are not yet fully implemented or managed and there are still significant risks and challenges for local communities, governments and other stakeholders.

Periodically a review of legislation is appropriate to ensure that the legislation is providing the desired protection, and is providing the legislative control measures to ensure effectiveness, including enforcement (Zedan, 2004). Gaps in the legislation should be identified and measures taken to adjust as appropriate.

Supporting the argument of Zedan above is the *Tasmanian Nature Conservation Strategy, 2002* (TNCS, 2002) in recommendation 10, the Strategy says: *To create new nature conservation legislation by merging and extending relevant aspects of the National Parks and Wildlife Act 1970 and the Threatened Species Protection Act 1995. This should improve protection of all natural elements in all environments and across all land tenures. A review of the other statutes dealing with the protection of natural elements should also be undertaken with the aim of improving their protection* (TNCS 2002: iii).

#### **4.5.5 Licensing**

Control measures should include approval and licensing processes for tourism developments and activities, exerting appropriate control over planning for commercial wildlife tourism, ensuring the relationship between biodiversity and ecosystems is duly considered and steps are put in place to protect and mitigate any negative effects or potentially negative effects. Setting standards or criteria is important that are universally applied (Zedan, 2004).

#### **4.5.6 Impact Assessment**

Governments have a responsibility to lead or undertake impact assessments, these should be undertaken for both existing or new or potential tourism activities. Impact assessments should consider the existing impacts, potential impacts of all activities including the impacts of tourism at the site. They should involve the stakeholders and provide sufficient time for participation. According to Zedan (2004:10), identifies the impact assessment should incorporate such factors as;

- *damage to ecosystems and or biodiversity;*
- *impacts on habitat;*

- *risks of erosion;*
- *alternations to habitat or ecosystems;*
- *increased risk of alien species;*
- *un-sustainable consumption of natural resources, including flora and fauna;*
- *deterioration of natural supplies including, land and water ;*
- *introduction of pathogens,*
- *generation of wastes;*
- *contamination possibilities; and*
- *pollution possibilities;*
- noise
- road, tracks, traffic impacts;
- impacts of humans; including youth and children;
- impacts from indigenous and local communities;
- conflicts;
- economic factors;
- education and capacity building; and
- tourism satisfaction;

*The Tasmania Nature Conservation Strategy makes the recommendation supporting Zedan above by publishing the following statement: A number of other animal species are shot under licence during prescribed hunting seasons. Hunting seasons operate for wild duck ..... and short tailed shearwater. All of these activities should be managed under accredited sustainable management plans available for public scrutiny (TNCS, 2002:41).*

#### **4.5.7 Impact Management and Mitigation**

According to Zedan, 2004 and researchers such as Fortescue, 1995 and Dann, 2009 impact assessment is essential to avoid minimize any potential damage to biodiversity conservation and sustainable use that tourism development or activities might cause. Impact management can include the;

- control of visitor movements to minimise damage or support resting or regeneration;
- establishing visitor behaviour, such as staying to boardwalks, tracks, minimum viewing distances, use of lights, flash cameras;
- control behaviours such as local or indigenous use or harvesting of wildlife by setting guidelines;
- development of zones and appropriate activities in these differing zones – revegetation zone;
- protection of boundary ecosystems such as farming which may impact on significant sites;
- promoting the design of facilities to reduce impacts;
- conserving ecosystems and landscapes;
- utilise and empower local communities;
- align marketing and strategies and messages with the principles of sustainable tourism; and

- identification of those responsible for actions

As an example, Weerheim writes that the research has demonstrated the significance of landing sites to Little Penguins. In penguin colonies close to human settlement protecting the sea shore and access routes in land is important, further, that care should be taken to minimise disturbance to colonies (Weerheim *et al.*, 2003).

#### **4.5.8 Decision Making**

Governments have the lead role in decision making, ensuring that national and state strategies are duly considered and implementation strategies implemented. Ensuring that measures to protect and militate against impacts are enacted and that there is timely and appropriate monitoring and reporting steps set in place (Zedan, 2004). Decision making should be based on all relevant information and if this is not available delays are warranted in the approval process to ensure that these are sourced and delivered and adequately, subsequently assessed.

#### **4.5.9 Risk Management**

In the Coastal Risk Management Plan prepared by DPIW in 2009, a risk management template is provided, suggesting, risk management involves a combination of the presence or threat of a hazard to an asset, the likelihood of the hazard occurring and the consequences. The plan also provides examples sourced from the Emergency Management Australia, 2004, and suggests a process that could be used to assist in the development of a management plan by identifying possible risk and establish methods of mitigation:

- establish the context;
- identify the risks;
- analyse the risks;
- evaluate the risk;
- treat the risk;
- communicate;
- monitor; and
- review.

#### **4.5.10 Implementation**

Implementation follows a thorough process as outlined in above. The developer will be subject to the decisions that have emulated from this information gathering and decision making process. The developer will need to comply with the conditions imposed and contingency measures should also be adopted in the case of other circumstances which may arise unexpectedly (Zedan, 2004).

#### **4.5.11 Monitoring and Reporting**

Reporting and the control systems are a strong component of appropriate control, ensuring that ecosystems and biodiversity is being preserved, protected or enhanced. Some effects may be obvious immediately, while other effects have a cumulative effect and may not be evident for some time (Zedan, 2004). This is fundamentally why base line data is required and ongoing monitoring and reporting crucial. Factors worthy of consideration are:

- compliance;
- tourism activities and trends;
- impacts of activities;
- the success or otherwise of protection, mitigation or restoration and further actions required;
- ability to adapt and impose new conditions as required to alleviate pressures or pressures that were not considered previously;
- indicators of emerging problems; and
- effectiveness of impact management and other measures.

#### **4.5.12 Adaptive Management**

Adaptive management requires responses to problems or potential problems. Ecosystems are complex and human functions diverse and sometimes unpredictable. There is a level of uncertainty in any development, therefore adaptive responses are required to make revisions as necessary, the licensing arrangements need to utilise adaptive management techniques which support facilitated changes and improvements to be made as necessary, to protect ecosystems. As Zedan (2004) reminds us, there is a need for flexibility in management processes that operators need to consider and factor into their operations.

Shaughnessy and Briggs in their 2008 research project acknowledges that many writers have written about the negative effects associated with viewing of marine life, including Culik and Wilson 1995, Fraser and Patterson 1997; Cobley and Shears 1999, and Carlini *et al.*, 2007. Shaughnessy and Briggs in their research report that after disturbance by tourism began the number of birds declined (Shaughnessy and Briggs 2009). Indicating and supporting the further need for adaptive management, and the need for monitoring and appropriate action.

#### **4.5.13 Concluding Remarks**

This chapter has discussed the importance of management and the subsequent processes of effective management in relation to wildlife tourism and the protection of ecosystems and biodiversity. The examples provided in Chapter 4 appear to espouse many of these virtues

mentioned above and include measures to consider and plan for tourism activities that are compatible with both protection of the biodiversity and tourism. As Newman writes of the early conservation work of Phillip Island Penguin Reserve, noting that under the 'plan' it was recognised that there was an urgent need to have a better understanding of penguin needs (1992). At Phillip Island significant funds were sourced that enabled the management team to facilitate a substantial research program looking at the biological needs of Little Penguins. This funding has resulted in many research projects that have contributed to the sustainability of Little Penguins (Blake, 2006).

# **Chapter 5 Regulation and Management of Little Penguin Tourism in Tasmania**

## **5.1 Introduction**

This chapter will review the policies and legislation which have the potential to impact on any of the three case study sites, the subject of this research. Australia has a tiered approach to legislation and governance, commencing with the Australian Government, followed by state and territory governments, and lastly, local governments. There is both national and state legislation relevant to the case study sites, international, national and state policies are also of importance. The conservation, protection and maintenance of Tasmanian Natural Values rely fundamentally on strong and coherent legislative structures and these provide the basis by which the Government operate.

## **5.2 International and National Policies and Legislation**

### **5.2.1 Agenda 21 and the Convention on Biological Diversity**

At an international level, at the 1992 Earth Summit in Rio de Janeiro, leaders from around the world come together and agreed on a broad plan for sustainable development. The leaders signed the Convention on Biological Diversity and adopted Agenda 21, a plan for achieving sustainable development in the 21st century. Agenda 21 is an international agreement for pursuing global sustainable development that was endorsed by national governments, including the Australian Government. The Convention on Biological Diversity sets out the commitments for maintaining the world's ecological base. The Convention established three important goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. Article 10 is important to this thesis as it addresses criteria which management bodies should adopt, and has relevance to the sustainability of Little Penguins

*(b) adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity .*

Agenda 21 espouses the importance of adopting measures to, amongst other things, protect biological resources. The Little Penguins at the three case study sites, the subjects of this research project arguably are a biological resource, which should be protected under this international agreement. They are impacted by tourism, Agenda 21, reminds the reader that:

Tourism that focuses on natural environments is a large and growing part of the tourism industry. While it can contribute in a positive manner to socio-economic development and environmental protection, uncontrolled tourism growth can also cause environmental degradation, destruction of fragile ecosystems, and social and cultural conflict, undermining the basis of tourism (United Nations, 1992).

### **5.2.2 National Strategy for the Conservation of Australia's Biological Diversity**

Following the Convention on Biological Diversity, ratified by Australia in 1993, Australia adopted its own national strategy for the conservation of Australia's biological diversity. This aimed to bridge the gap between current activities and the effective identification, conservation and management of Australia's biological diversity. The strategy recognises that the conservation of biological diversity provides significant cultural, economic, educational, environmental, scientific and social benefits for Australians. Also, that there is a need for more knowledge and better understanding of Australia's biological diversity, additionally, that there is a pressing need to strengthen current activities and improve policies, practices and attitudes to achieve conservation and sustainable use of biological diversity in Australia. The core objectives of this strategy are to protect biological diversity and maintain ecological processes and systems, (Australian and New Zealand Environment and Conservation Council, 1976). There are important principles espoused in this strategy that are relevant and important to this thesis and its discussions on sustainable use of Little Penguin colonies used for commercial purposes, on these important points is shown below: *To protect biological diversity and maintain essential ecological processes and life-support systems* (DEST, 1996).

The guiding principles espoused are also very relevant to this topic, which suggest that although all levels of government have clear responsibility, the cooperation of conservation groups, resource users, indigenous peoples, and the community in general, are also critical components to the conservation of biological diversity. Additionally, it is vital to anticipate, prevent and attack at source the causes of significant reduction or loss of biological diversity; and that lack of full knowledge should not be an excuse for postponing action to conserve biological diversity (DEST, 1996).

### **5.2.3. Environment Protection and Biodiversity Conservation Act 1999**

The Commonwealth legislation, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and

internationally important flora, fauna, ecological communities and heritage places — defined in the Act as matters of national environmental significance.

Within the marine environment of the Australian coastline live thousands of marine species, some of which are unique to Australia and all of which contribute to making Australia the most biodiversely rich country. The Australian Government uses the EPBC Act to protect and manage threatened, migratory and marine species. It should be noted that the Australian Government has jurisdiction from three nm to 200 nautical miles (nm) from high water mark (hwm) – the Tasmanian Government has responsibility from hwm out to three nm. The EPA, 1999 provides protection and conservation of marine species under Section 266 (d) of the Act, the regulations may:

*(d) provide for the protection and conservation of listed marine species (Australian Government, 1999).*

To accomplish this Government has established a set of categories. Under the EPBC Act categories listed are; threatened species and ecological communities, critically endangered, conservation dependant and extinct in the wild, endangered, vulnerable and extinct for threatened species and critically endangered. Little Penguin is a listed marine species; it is not listed as an endangered, threatened or vulnerable marine species. However Little Penguins are afforded protected under the Act, through the protection of their environment, promotion of their biodiversity, and through the seeking of co-operative protection and management from governments, community and landholders (EPA, 1999).

Additionally, the Minister may use their powers and seek to have developed a wildlife conservation plan for a listed Marine Species, such as Little Penguins under Section 285 of the EPA 1999 Act. Further, Section 458 (b) of the EPA Act, 1999 also provides the ability of the Australian Government to seek an audit; such an audit would provide an assessment of the risks to the environment resulting from activities at a site or impacts from potential activities. While Section 96 of the Act provides the Minister with the ability to seek an environmental assessment of impacts at the site, arguably more importantly the Minister has the ability to tailor a response plan as a result of the identified impacts.

### **5.3 Tasmanian Legislation**

In Tasmania there are several important legislative Acts, which are relevant to this thesis, in particular these are:

- *Nature Conservation Act 2002* and the *National Parks and Reserves Management Act 2002*;
- *Crown Lands Act 1976*;
- *Resource Planning and Development Commission Act 1997*;
- *Land Use Planning and Approvals Act 1993*;
- *Dog Control Act 2002*; and
- *Vermin Control Act 2000*

In addition to the Acts mentioned above, consideration should also be given within this thesis to the:

- *Tasmanian Nature Conservation Strategy*;
- *Tasmanian National Parks and Reserves Code of Practice*; and
- *Tasmanian State Coastal Policy 1996*.

Therefore I will additionally provide a short descriptor of each of these strategies and acknowledging their contribution to environmentally sustainable development.

### **5.3.1 Nature Conservation Act 2002**

Under the Act, Section 6 provides the legislative framework providing the legal mechanism to set aside land for conservation purposes and for the promotion of conservation objectives on that land. The Act also seeks to promote research for the conservation of fauna and flora and seeks to promote and contribute to the development of management plans as well as providing the legislative means for the enforcement of regulations, this is achieved by authorising representatives; Parks and Wildlife Rangers are empowered in this manner. The Minister has the authorisation within this Act to identify land worthy of conservation and to set it aside for conservation purposes. Additionally to name the reserve, which will ultimately define its purposes, such land classifications are outlined below:

- National parks;
- State reserves;
- Nature reserves;
- Game reserves;
- Conservation areas;
- Nature recreational areas;
- Regional reserves; and
- Historical sites.

Under the *Nature Conservation Act, 2002*, land classification is important, as it sets out the uses or prohibited used on that reserved land. The Act directly prohibits the taking of wildlife or any products of wildlife; and or the keeping or possessing of any wildlife or the exportation or disposal of wildlife or the products of wildlife, except in a game reserve where it must be done in a sustainable manner. Also the Act sets the legislation which controls, and prohibits the removal of any protected plant species. It gives the authority of the governing body to authorise and grant a license and or the discretion to cancel, suspend or renew an existing license, and provides authorised officers with the power to arrest. *The Nature Conservation Act, 2002* also provides authorised officers the power to cancelling any license, or permit.

Of those reserves mentioned above there are two reserve types which are relevant to this thesis: Game Reserve, and Conservation Area. The first to be described below is the game reserve classification. A game reserve is an area of land set aside by the Minister under *the Nature Conservation Act, 2002*, in the same manner as other reserves, and is based on the same principles of reserving land for conservation purposes. It is a land that has: *Conservation of the natural values of the area that are unique, important or have representative value: Conservation of the natural biological and or geological diversity and the ecologically sustainable hunting of game species in that area.*

The objectives of the reserve are also similar to the objectives of other classified reserves, the objectives are listed below:

- *to conserve the natural biological diversity;*
- *to conserve sites of or areas of cultural significance;*
- *to provide for the taking on an ecologically sustainable basis, of designated game species for commercial or private purposes or both;*
- *to encourage appropriate tourism, recreational use and enjoyment, particularly sustainable recreational hunting;*
- *to encourage education based on the purposes of reservation and the natural or cultural values of the game reserve or both;*
- *to encourage research, particularly that which further the purposes of reservation;*
- *to protect the game reserve against and rehabilitate the game reserve following adverse impacts such as those of fire, introduced species, diseases and soil erosion on the game reserve natural and cultural values and on assets within and adjacent to the game reserve;*
- *to encourage cooperative management programs with aboriginal people in areas of significance to them in a manner consistent with the purposes of reservation and the management objectives.*

However in a game reserve there is the provision which allows the taking of game on the reserve: *To provide for the taking on an ecologically sustainable basis, of designated game species for commercial or private purposes or both.*

This allows for the taking of Little Penguins or other species located in the game reserve provided it was accomplished in a sustainable manner. Schedule 2 of the *Nature Conservation Act, 2002*, (b) sets the parameters for the, *taking of game; to provide for the fair, orderly and sustainable use and development of air, land and water.* Schedule 2, of the *Nature Conservation Act, 2002* Item (a) provides the definition of sustainable development: *Sustainable development means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while –*

*(a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and*

*(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*

*(c) avoiding, remedying or mitigating any adverse effects of activities on the environment.*

The Bruny Island case study site is located on a game reserve declared under the *Nature Conservation Act 2002*. Therefore the site is subjected to the sustainable *taking* of wildlife; such activities would require research, data collection and monitoring to ensure that the activity was conducted in a sustainable manner.

### **5.3.2. Conservation Area**

The second reserve classification land under the *Nature Conservation Act, 2002* which I would like to bring to the attention of the reader is the reserve classification; a conservation area. Land is reserved by the Minister under this Act as it is considered that the land has a relevant value which supports its reserve classification; that value for a conservation area is:

*An area of land predominantly in a natural state;*

The purpose of the conservation area is the protection and maintenance of the natural and cultural values of the area of land and the sustainable use of the natural resources of the area of land. The objectives of the conservation area are cited below:

- *to conserve the natural biological diversity;*

- *to provide for the controlled use of natural resources including as an adjunct to utilisation of marine resources;*
- *to conserve sites of or areas of cultural significance;*
- *to encourage research, particularly that which furthers the purposes of reservation;*
- *to protect the conservation area against and rehabilitate the conservation area following, adverse impacts such as those of fire, introduced species, diseases and soil erosion on the conservation area natural and cultural values and on assets within and adjacent to the conservation area;*
- *to encourage appropriate tourism, recreational use and the enjoyment consistent with the conservation of the conservation areas natural and cultural values;*
- *to encourage cooperative management programs;*
- *to provide for the taking, on an ecologically sustainable basis, or designated game species for commercial or private purposes or both.*

At the Low Head case study site, the land classification is; Conservation Area, such a classification would suggest that the land is valued because of its predominantly, natural state. Key objectives are to conserve the natural biological diversity, control use of natural resources, provide for the taking on an ecologically sustainable basis the taking of game, to encourage education, facilitate research and protect and rehabilitate the area, following events such as fire, introduced species, erosion, and lastly to facilitate cooperative management programs. The reserve classification allows for the sustainable taking of game, such activities would require research, data collection and monitoring to ensure that the activity was conducted in a sustainable manner, the definition of sustainability is provided in Chapter 2

### **5.3.3 National Parks and Reserves Management Act 2002**

The legislative powers of the *National Parks and Reserves Management Act 2002* are vested by way of the *Nature Conservation Act 2002* to authorised officers, Parks and Wildlife Rangers. It is these officers who have the authority to approve and manage licences to people of or business which operate on reserve classified land.

Some of the values attributed to reserve classifications as outlined under the *Nature Conservation Act 2002*, are notable Schedules within the Act, these appear very relevant to this research thesis. Schedule 37 gives authority of the authorised Parks and Wildlife Rangers to exclude the public from certain areas of land; this may be relevant for example if an area was set aside for restoration purposes. Schedule 60, (a) is important as it provides the protection and the preservation of fauna or flora on the reserve. Schedule 37 provides for a management plan, such a plan would appear to offer a reserve important considerations on a range of issues important to sustainable activities, would provide a vision, set goals and

generally provide a strategy for the future for the reserve. Schedule 30 of the *National Parks and Reserves Management Act 2002*, also appears important, as it sets out an important objective that the land is to be managed in a manner that is consistent with the purposes for which the land is reserved.

The *National Parks and Reserves Management Act 2002* also outlines the meaning of biological diversity, this definition is important to this thesis as it provides the definition which includes plants and animals as well as their ecosystems. Lastly it declares that land reserved under the Act should be used according to sustainable development principles. The description of sustainable development which has been endorsed by the Tasmanian Government states that sustainable development is managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, while ensuring developments;

- *sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations;*
- *safeguarding the life supporting capacity of air, water, soil and ecosystems; and*
- *avoiding, remedying or mitigation of any adverse effects of activities on the environment (State Policies and Projects Act, 1993)*

#### **5.3.4 Commercial Visitors Service License**

The *National Parks and Reserves Management Act 2002* requires that an operator conducting a business on reserve land have a Commercial Visitors Service License:

The *National Parks and Reserves Management Act 2002* therefore provides legislative cover for two of the three case study sites, Low Head which is a Conservation Area and Bruny Island which is a Game Reserve.

The primary aim of a Commercial Visitors Service License (CSV) is to ensure that activities do not compromise conservation values; they are in part to ensure that operators inform their customers of conservation values and the importance of conservation. One of the purposes of the CVS license system, which is particularly relevant to this research, is to: *Provide visitor services, which are ecologically sustainable in the longer term*, Department of Primary Industries, Parks, Water and Environment, (2009).

An important objective stated in the CVS license, is the need for the holder of the business licence to operate in an ecologically sustainability manner for the longer term. These words

are of critical importance to the case study sites, which are all used for commercial purposes under CVS licenses issued by the Department of Primary Industries, Parks, Water and the Environment, under the authority of the *National Park and Reserves Management Act 2002*.

### **5.3.5 Parks and Wildlife - Authorised Officers**

As the authorised local officers, the Parks and Wildlife Officers are responsible for the protection of wildlife under the *National Parks and Reserves Management Act 2002*, under Section 10. Additionally Parks and Wildlife administer regulations under the *Crown Lands Act 1976*, the *Dog Control Act of 2000*, the *Nature conservation Act 2002*, *State Coastal Policy Act 1997*, and the *Vermin Control Act 2000*.

Parks and Wildlife have an obligation to control vermin, and to protect wildlife. They also act as a visitor information service to actively promote penguin tourism on commercially leased sites as a means of conserving the penguins by discouraging indiscriminate viewing at other unprotected and un-regulated sites. Parks and Wildlife Staff operate under the authority provided in Section 10, of the *Parks and Reserves Management Act, 2002*, and under the principles espoused in Schedule 1. Generally their duties include the following:

- *conserve biodiversity;*
- *environmental protection, including flora and fauna;*
- *protect water catchments;*
- *vermin control;*
- *provide for the taking of game on sustainable principles;*
- *oversee license conditions;*
- *to encourage appropriate tourism;*
- *administer licenses;*
- *dog management;*
- *encourage research;*
- *rehabilitate the reserve after negative impacts, such as fire;*
- *promote and facilitate education;*
- *monitor wildlife wellbeing (Parks and Wildlife 2009).*

Additionally they are empowered to undertake a variety of activities espoused in the array of Tasmanian legislation as discussed in this chapter.

### **5.3.6 Crown Lands Act 1976**

Bicheno, one of the study sites is classified as Public Reserve and is located on Crown Land, and therefore is under the *Crown Lands Act 1976*. The Act provides for the establishment of public reserves. Key objectives for such reserves under the Act include; conserving natural biological diversity; to conserve sites or areas of cultural significance; to encourage education based on the purposes of reservation and the significance of the public reserve.

Importantly the Act specifically notes to encourage and facilitate research, to protect and rehabilitate the reserve after adverse impacts such as fire, erosion, disease and or introduced species, to safeguard the life-supporting capacity of air, water, soil and ecosystems.

Tourism and recreational use is to be encouraged providing it is consistent with the conservation of the area's natural and cultural values. Co-operative management programs are also encouraged. The Act also supports the allowance for private, commercial or industrial uses. Further, the Act stipulated that there should be controlled use of natural resources on Crown Land. The classification, values and purposes of reserves are espoused in Schedule 5 and a summary is provided below, the definition of values is important, as it states that the area is significant in some manner, it contains natural or other values. The purpose of the reserve class is equally important to this thesis as it stipulates the reason the land has been so reserved. The purpose of that reservation, as given in Schedule 5 of the *Crown Lands Act 1976*, is outlined below.

#### **Classification**

*Public reserve*

#### **Values**

*An area of Crown Land that contains biophysical, natural, cultural or economic values.*

#### **Purposes of Reservation**

- *The protection and maintenance of any natural, cultural or economic values of the area of land;*
- *The conservation of the natural biological diversity or geological diversity of the area of land, or both;*
- *Public recreation, education, scientific research and tourism consistent with conserving the values of the area of land;*
- *The sustainable development and use of the natural resources of that area of land while protecting and maintaining the values of that area of land;*

- *The creation and use of public roads or streets, or other internal communications, whether by land or water.*

Noteworthy the objectives are those espoused in the Resource Management and Planning System of Tasmania, Schedule 3, which supports the consistent approach of sustainable development as previously discussed in Chapter 1.

### **5.3.7 Tasmanian Government Resource Management and Planning System**

The Tasmanian Resource Management and Planning System, (RMPS) covers a suit of legislation concerning land use planning, environmental management, and pollutions control and development assessments. The objectives of the RMPS are to:

- *promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity;*
- *provide for the fair, orderly and sustainable use of air, land and water;*
- *encourage public involvement in resource management and planning;*
- *facilitate economic development in accordance with the objectives set out above;*
- *promote the sharing of responsibility for resource management and planning between the different spheres of government, the community and industry in the state;*
- *Sustainable development is the key guiding principle of the RMPS and one that must be embodied by all land use planning instruments.*

The principles of the RMPS include consideration of the following:

- *inter-generational equity: resource use decisions should be made taking into account the needs of future generations. in short, the long-term rather than the short-term view prevail;*
- *conservation of biodiversity: this requires that we maintain species and genetic diversity;*
- *precautionary approach: decisions should err on the side of caution where there is uncertainty surrounding the potential impact upon the environment;*
- *social equity: the private use or development of resources must consider the wider social costs;*
- *efficiency: resources must be used efficiently; and*
- *community participation: the community should be involved in establishing the parameters for the use and development of resources.*

The RMPS is important to this thesis in the context that it is to be applied to all planning schemes. It is through the RMPS that consideration is given to the Environmental Impact Assessments; considering, social, economic and environmental parameters, ensuring that developments are sustainable, as discussed in Chapter 1 under the interpretation given to the

International Convention on Biological Diversity and Agenda 21, the National Strategy for the Conservation of Biological Diversity and lastly to action at a local level, in this case the Tasmanian government.

Amongst other things, the *State Policies and Projects Act 1993*, which is part of the RMPS suite of legislation, provides for the development of state policies by the TPC – one such policy of relevance to the case study sites is the Coastal Policy, which is considered in this chapter.

### **5.3.8 Resource Planning and Development Commission Act 1997**

The Resource Planning and Development Commission (now referred to as the Tasmanian Planning Commission) is responsible for overseeing Tasmania's planning system, approving planning schemes and amendments to schemes and assessing Projects of State Significance. Additionally they receive Management Plans under the *National Parks and Reserves Act 2002* and conduct enquiries, if required, into the use of public land or reserve.

In applying the Tasmanian Resource Management and Planning System, (RMPS) several factors are outlined as important; they are encompassing and forward thinking strategic planning and ensuring that the impacts of today are considered in the long-term. Flexibility and currency strives to ensure standards are prescribed and that needs are balanced and applied. A whole of government approach should ensure that planning and management of resources is integrated. Public participation is encouraged and promoted and lastly that the state of the environment is monitored, and that monitoring ensures that all of the above mentioned important factors are considered, reviewed as necessary (RPDC, 2003).

All State Policies are encompassed by the RMPS and the local government planning system, with the Commission bearing responsibility for the functions as prescribed under various Acts, including the *National Parks and Reserves Management Act 2002*. Their functions in relation to the *National Parks and Reserves Management Act 2002* are to assess, to approve, to refuse or to approve with amendments, any planning scheme or planning amendment put forth by a planning authority including a government agency such as Parks and Wildlife. Important functions of the TPC also include the authority of the commission to conduct inquiries into the use of public land and the subsequent making of recommendations for its future use and management. A further important function in relation to the *National Parks and Reserves Management Act 2002* is to review draft management plans and to receive and review public submissions to that draft management plan, or to instigate and hold a public

hearing on the matter if they consider it warranted, under Section 23 (2) of the *National Parks and Reserves Management Act 2002*. The TPC is legislated to produce the State of the Environment Report (SoE), this report provides an assessment of how well Tasmania is progressing in terms of achieving the sustainable development objectives of the RMPS (TPC, 2010)

### **5.3.9 Land Use Planning and Approvals Act 1993**

The *Land Use Planning and Approvals Act 1993* (LUPPA) is the central legislation underpinning the RMPS system; it provides for the making, amending, and assessment and hears appeals of planning schemes, and has the legislative powers to impact on all land types including Crown Land. The key objective under Schedule One of LUPPA is to;

- *promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity;*
- *to provide for the fair, orderly and sustainable use and development of air, land and water*
- *sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations;*
- *avoiding, remedying or mitigating any adverse effects of activities on the environment;*
- *to require sound strategic planning; and*
- *to ensure the effects on the environment are considered* (LUPPA Section 88 Schedule One, 1993).

Additionally it provides the agreement, control and enforcement between planning authorities and landowners. LUPPA can also make planning directives ensuring that land use issues are consistently applied over municipal areas, which have been prepared by the RPDC, a planning authority, such as Parks and Wildlife or a Council, or a State Government Agency. The planning directive may cover an application of a State Policy, some of which are discussed in this research thesis. Importantly LUPPA has the ability to instigate a special planning order where no planning provisions are in place and action is required and it is in the public interest to instigate this action. LUPPA also ensures that environmental impacts have been considered in planning application (RPDC, 2003).

### **5.3.10 Dog Control Act 2002**

Parks and Wildlife Officers are authorised agents under the *Dog Control Act 2000*, and are authorised to seize a dog at large, and to destroy that dog if it is declared dangerous. The relevant Division under the Act is Division 4, Schedule 35.

(1) An authorised person may seize and detain any dog at large.

(4) If a dog is seized and its owner is not identifiable, the general manager, not less than 3 working days after its seizure, may –

(a) sell, destroy or otherwise dispose of the dog if it is not a dangerous dog; or

(b) destroy the dog if it is a dangerous dog.

Parks and Wildlife are authorised agents under the *Dog Control Act 2000* are authorised to declare a dog, dangerous under section 29 of the Act; the relevant section is sited below.

(a) may declare that dog to be a dangerous dog if –

(i) the dog has caused serious injury to a person or another animal; or

(ii) there is reasonable cause to believe that the dog is likely to cause serious injury to a person or another animal; and

This legislation is important to the three case study sites the subject of this research thesis. Dogs continue to be a problematic for many Little Penguin colonies around Tasmania and are reported by both the Operators and the Parks and Wildlife Interviewees to be problematic at the Bicheno site. Presumably they are also considered to be harmful to the colony at Low Head, as the regional NRM bodies have partially completed fencing around the colony to try and exclude dogs from that site, and in a recent newspaper article the deaths of 12 birds representing 12% of the Low Head population (at the time) were reportedly killed by a dog in the conservation area (Ranson, 2010).

### **5.3.11 Vermin Control Act 2000**

Fox and rabbits are the only declared vermin under the *Vermin Control Act 2000*, although the Minister does have the authority to declare other species, vermin. The Minister has the authority to enforce the removal of vermin or the setting of traps or fencing to remove vermin. Rabbits are present in the study areas, and foxes may be a threat in the future.

## **5.4 Tasmanian policies**

Tasmanian Policies provide an opportunity for guiding principles to be established which are espoused in various international and national legislations, and subsequently placing these in Tasmanian state policies. In the following section I discuss Tasmanian policies are discussed

which have relevance to this thesis, and the conservation of Little Penguins exploited for commercial tourism operations. These policies include the following:

- *Tasmanian Nature Conservation Strategy;*
- *Tasmanian National Parks and Reserves Code of Practice; and*
- *Tasmanian State Coastal Policy 1996.*

#### **5.4.1 Tasmanian Nature Conservation Strategy**

Following the 1996 the Commonwealth endorsement of the National Strategy for the Conservation of Australia's Biological Diversity, Tasmania also adopted a state wide strategy, the Tasmanian Nature Conservation Strategy. Such a strategy was specifically designed to develop action plans, which would develop and maintain plans to protect the biodiversity of the state. Significant for this research process is Recommendation No. 3; the need for greater local involvement and management in decision making processes; and No 4: increased measures to reduce the entry of weeds and pests into Tasmania and to improve control over those already there. Additionally, recommendation for actions that will increase surveillance, encouraging rigorous risk assessments and development of response plans to combat weeds and pests. Importantly in this strategy is the endorsement for environment management plans and onsite assessments, including increased scientific research, surveys, and habitat mapping.

#### **5.4.2 Tasmanian National Parks and Reserves Code of Practice**

The Tasmanian National Parks and Reserves Code 2002 was formulated to develop and implement a Code of Practice to cover all environmental practices in parks and reserves. Therefore the Code has relevance for the three case study sites, the subject of this research as they are all located on reserves. The key objectives of the Code are to document appropriate management practices and standards for reserve lands (Parks and Wildlife 2003). Importantly it recognizes that management plans and strategies which facilitate best practice operational standards on the ground. The Code endorses the principles of:

- *intergenerational equity;*
- *existence value;*
- *interdependency;*
- *principle of uncertainty;*
- *precautionary principle;*
- *principle of ecological sustainability;*
- *threatening processes which are degrading;*

- *restoration of degraded sites;*
- *monitoring of management performance and outcomes;*
- *principle of community involvement and the; and*
- *principle of transparency of decision-making.*

These principles are important to the sustainability of Little Penguins as portrayed in Chapter 1, as they espouse the factors necessary to ensure that conservation of colonies is fully considered and appropriate actions implemented. The Precautionary Principle is particularly relevant as if there is uncertainty, the Precautionary Principle can be applied: *Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation* (Strong, 1992).

The Precautionary Principle in the context of environmental protection is essentially about the management of scientific risk. It is a fundamental component of the concept of ecologically sustainable development (ESD) and has been defined in Principle 15 of the Rio Declaration (1992). The precautionary principle, which is part of all Tasmanian State Policies, is especially important, as this principle is to apply when a lack of information or poor understanding of a process leads to uncertainty as to the consequences of an action. The principle has relevance to the case study sites as it has the ability to be applied when there is insufficient information to ensure that there is not a detrimental effect by actions, by way of an example in the Game Reserve where there is permitted taking of wildlife- game in an ecologically sustainable manner, to achieve taking of game in such a manner would require base line data, research and subsequent data collection to support or otherwise that the taking of that game was done in sustainable ecological manner.

### **5.4.3 Tasmanian State Coastal Policy 1996**

The *Tasmania's State Coastal Policy 1996*, which includes the foreshore, dune, beaches, sea cliffs, hard rock areas, the water, plants and animals, associated areas of vegetation and associated areas of animal habitat, as well as associated areas of human habitat and activity. There are three guiding principles within the *Tasmanian State Coastal Policy*:

- *natural and cultural values of the coast shall be protected;*
- *the coast shall be used and developed in a sustainable manner; and*
- *integrated management and protection of the coastal zone is a shared responsibility.*

The first principal recognises the importance of maintaining representative or significant natural ecosystems and sites of biological importance, and the biodiversity of Tasmania's indigenous coastal flora and fauna. Amongst the Schedules relevant to this research are the following:

### **Schedule 1**

- *the coastal zone will be managed to ensure sustainability of major ecosystems and natural processes;*
- *the coastal zone will be managed to protect ecological, geomorphological and geological coastal features and aquatic environments of conservation value;*
- *the coastal zone will be managed to conserve the diversity of all native flora and fauna and their habitats, including sea grass and seaweed beds, spawning and breeding areas;*
- *exotic weeds within the coastal zone will be managed and controlled, where possible, and the use of native flora encouraged;*
- *appropriate monitoring programs and environmental studies will be conducted to improve knowledge, ensure guidelines and standards are met, deal with contaminants or introduced species and generally ensure sustainability of coastal ecosystems and processes and ensure that human health is not threatened;*
- *representative ecosystems and areas of special conservation value or special aesthetic quality will be identified and protected as appropriate;*

### **Schedule 2.1.2**

*Development proposals will be subject to environmental impact assessment....*

### **Schedule 2.3**

- *tourism use and development in the coastal zone, including visitor accommodation and other facilities, will be directed to suitable locations based on the objectives, principles and outcomes of this policy and subject to planning controls;*
- *tourism development proposals in the coastal zone will be subject to environmental impact assessment as required by state;*
- *public awareness of coastal issues and community participation in managing the coastal zone will be encouraged and facilitated, including networking between community groups working in the coastal zone; and*
- *research into coastal processes and matters related to coastal zone planning and management by government or research institutions will be encouraged and assisted where possible.*

All of the points in the schedules noted above are relevant to the sustainability of Little Penguins. In particular I would like to draw the reader's attention to the second guiding principle of the *Tasmania's State Coastal Policy 1996*, this principle states; to ensure

development is conducted in a sustainable manner; the definition of which has been portrayed in Chapter 1. Commercial Little Penguin tourism operators' fall under the guidelines imposed by the *State Coastal Policy 1996* with the mechanism of control and enforcement of the Tasmanian Coastal Policy is through LUPAA.

## **5.5 Conclusion**

The legislation outlined in this chapter have highlighted the relevant sections of various Tasmania Legislation which has the ability to impact on sustainability of Little Penguin colonies used for commercial tourism purposes. In this chapter I have also discussed the significance of an international agreement that Australia endorsed, following the Convention of Biodiversity and Agenda 21, the *Environmental Protection and Biodiversity Conservation Act 1999* and its relevance to the Tasmanian scene. The Tasmanian legislations was analysed with a view to its relevance to the sustainability of Little Penguins. More importantly the different legislation and schedules pertaining to each of the case studies were discussed. In conclusion it was identified that a number of Tasmanian legislations have the ability to impact on the three case study sites and Little Penguins. It was also established that the three case study sites did not share common legislation, and that Bicheno was governed by the *Crown Lands Act of 1976* rather than the *Nature Conservation Act 2002* and the *National Parks and Reserves Management Act 2002* as was the case for Bruny Island and Low Head. An important finding was that the CSV licences and subsequent schedules held by three operators at the three case study sites differed in the nature.

Chapter 7 a discussion will be conducted on the success or otherwise of the legislation discussed here, while in Chapter 8 recommendations are made with a view to increasing the sustainability of Little Penguin colonies used for commercial tourism purposes.

# Chapter 6 Examples of Current Practice in Tasmania

## 6.1 Introduction

This chapter presents an integrated account of the results obtained from:

- the literature review;
- field observations of the three case study sites;
- interviews with Parks and Wildlife Staff for three case study sites;
- interviews with the operators of Bicheno Penguin and Adventure Tours;
- a survey of visitors to the Bicheno Little Penguin Tours; and
- interviews with the operators of Inala Nature Tours at Bruny Island.

These results from these activities are organized under key themes which were developed from the data review and analysis. Legislation relevant to the case study is examined and the lease agreements of the Bicheno Penguin Tours (as far as possible) are reviewed against the lease agreements of the other two case studies; Inala Nature Tours and Low Head Penguin Tours, in order to identify the similarities and or differences. Additionally the chapter will make reference to the legislative and governance material which is discussed in depth in Chapter 5.

The chapter is organised according to the three case studies and six key themes, which have developed through interrogation and analysis of the interview data:

- Theme one - governance;
- Theme two - public perception and appreciation;
- Theme three - threats to population sustainability – introduced predators;
- Theme four - threats to population sustainability – tourism;
- Theme five - indirect threats to population sustainability; and
- Theme six - the tourism experience.

This chapter aims additionally to report on the survey results. As indicated in Chapter 2, the survey was designed around several factors of interest:

- the motivating reasons to be engaged in this little penguin tour;
- satisfaction levels associated with the tour;
- questions relating to the type and method of information distribution before the tour, and during the tour;
- the responsive action to that information;
- visitors views on impacts of people on the penguins;
- visitor opinions on how the penguin tours are managed; and
- visitor descriptive information, such as postcode, age, gender, affiliations with conservation groups, and finally qualifications and educational standards reached.

I was able to obtain fifty three responses from the Bicheno Penguin and Adventure tours, over two separate nights of surveying. At Low Head due to difficulties with securing the cooperation of the operator, I was unable to survey visitors to that wildlife experience. Bruny Island was also problematic in relation to obtaining a sufficient number of survey results. As only ten surveys results were obtained from Bruny Island this response rate was considered an insufficient number to provide a useful or representative sample (Hay, 2005: 72) and these were therefore not used in the subsequent analysis of the case study site.

## **6.2 Case Study One – Bruny Island**

### **6.2.1 Site description, use and regulation**

Bruny Island is an island off the south-eastern coast of Tasmania; it is separated by the D'Entrecasteaux Channel. Both the island and the channel are named after French explorer Bruni D'Entrecasteaux. Geologically, Bruny Island is two islands, North Bruny and South Bruny, joined by a long narrow sandy isthmus. The isthmus spans a distance of 1.5 kilometres and a road built across this ancient sand formation links the two islands together as one (Cochran, 2009) Figure 14 this area is called The Neck , it is an important breeding site for Short-tailed Shearwater and the Little Penguin.

On Bruny Island there are two Parks and Wildlife Rangers to cover approximately 1,450 hectares of reserves of various kinds including the Bruny Island Neck Game Reserve. Separate interviews were held with these two resident employees and another with the Bruny Island's wildlife tourism operator. The results of these interviews are explored in this chapter.

While it is acknowledged that there are a number of Little Penguins colonies on various parts of Bruny Island, including Cloudy Bay, and parts of the island, this thesis will confine the discussion to those colonies inhabiting The Neck. The rationale for this decision is based on the fact that infrastructure has been erected on this area of The Neck in order to enable both commercial and non commercial viewing of Little Penguins. It also appears to be the main viewing area for the Little Penguins, and is depicted as such in the island's visitor brochures and advertising material (Cochran, 2009). The Neck is also home to the migratory Shearwaters. The interrelationship between Little Penguins and the Shearwaters will also be explored later in this chapter as the interconnection is important.

To facilitate viewing of the Little Penguins at The Neck, viewing platforms were erected around the area. It can be argued that the building of this infrastructure has assisted in the conservation of the Little Penguins (Parks and Wildlife Interviewee #1). However it has also

been argued that there are now increased the pressures on the colony by further opening it to the public (Cochran, 2009). One Parks and Wildlife Ranger made a comment on the infrastructure, saying it was helpful in some ways but problematic, as it doesn't conform to any building code regulations, and is currently in need of repair or replacement (Parks and Wildlife Interviewee #1).

The viewing platform at The Neck consists of two sections of wooden platforms. The oldest section was built in 1970 and takes visitors to the very top of the sand dunes. The second section was added in 1995, and crosses the ridge from the roadside parking area, runs over the dunes and curves down towards the beach. At the end of the platform there is a small triangle shaped hide which can hold around twenty people. The idea behind the viewing hide was to allow visitors to view the Little Penguins without threatening or disturbing them by their presence, whilst the penguins made their way from the safety of the water to their burrows in the sand, beneath and around the boardwalk.

Although the site has not been monitored for some years, it is believed to have a population of approximately 800 breeding pairs of Little Penguins (Parks and Wildlife Interviewee # 1). It is not known how many Shearwaters use the site for breeding, however during the nights that the researcher was monitoring the area, many hundreds of birds were observed returning to their burrows at night. Parks and Wildlife would like to understand the relationship between these two species. For example, are the Shearwaters complementary to the Little Penguins or are they gradually taking over the Little Penguins' breeding area? Whether this relationship is complementary or destructive is not known at present (Parks and Wildlife interviewee#1).

People access the colony by several methods:

- formal tours such as the Inala Nature Tours and other such Tasmanian or interstate operators;
- formal and informal bus tours, (unknown tour operators);
- independent travellers; and
- local people who take the juvenile shearwaters, or mutton birding.



Figure 14 Bruny Island (Source: Google Earth)

There is no formal leasing structure for a designated tourism operator at The Neck. Unlike Bicheno and Low Head, the site at The Neck is open to anyone who chooses to use it. It is not clearly understood what numbers visit the Little Penguin site annually, although during a count at The Neck for the months between late May, 2009 and early March, 2010 36,400 visitors were recorded (Parks and Wildlife, 2010). It is estimated that between sixty to eighty thousand people visit Bruny Island each year (Tourism Tasmania, 2009). One of the tourism operators who conduct tours at the site, surveyed during this thesis was the operator of Bruny Island's Inala Nature Tours. The operator, Dr. Cochran, has a Commercial Visitors Service License (CVS) to operate wildlife tours at various locations, including Bruny Island. Cochran's Little Penguin tours utilise The Neck at Bruny Island in-exclusively. Inala Nature Tours takes small groups of people to view the colony at dusk, and shares with visitors a comprehensive explanation of The Little Penguin biology. While operating the tour there are sometimes other tours taking place at the same time, and members of the general public may also be present at the site.

The site at the game reserve is home to both Little Penguins and Shearwaters. Public accessibility means that Aboriginal families, as well as local individuals, harvest the Shearwaters annually. This disturbs the Little Penguin colony inhabiting the area. These disturbances to the population were also observed by Stevenson and Woehler. In their research they note that: *The viewing platforms and boardwalks do not constrain visitors, and on two occasions during the present study, visitors were observed walking through the colony, off the boardwalks, to obtain closer views of the birds. Because of the high number of*

visitors to the area and their inappropriate behaviour, the potential therefore still exists for burrows to be crushed and birds to be disturbed (Stevenson and Woehler 2007:71).

To describe the vegetation and habitat cover at The Neck I rely on the descriptions provided by Baker (2009). Baker's descriptions define The Neck's native vegetation as endangered and or rare and requiring management. There are also a number of weeds present in the area, Figure 15.

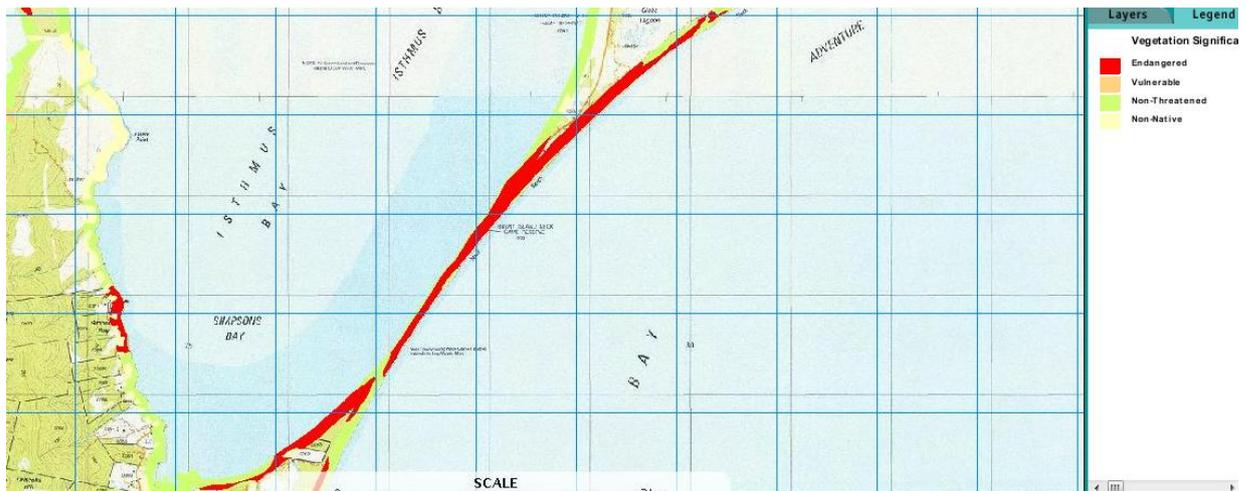


Figure 15 Vegetation Significance, the LIST, Coastal Values, Vegetation Classes, Baker, 2009.

### 6.2.1 Theme 1: Governance and tenure

The land utilised by Inala Nature Tours at The Neck is classified as a Game Reserve and as such is governed by the legislation espoused in the *Nature Conservation Act 2002* and the *National Parks and Reserve Act 2002*. This legislation is described in detail in Chapter 5 of this thesis.

All commercial operators are required, under the *National Parks and Reserves Management Act 2002*, to obtain a CVS license from Parks and Wildlife Service in order to operate. One of the key objectives of this license agreement is to ensure that the tourism operator provides visitor services which are ecologically sustainable over time.

Inala Nature Tours have the acquired a CVS license, which gives them authorisation to operate in an area managed by the Parks and Wildlife Service. As part of the licensee's agreement conditions, organisations are required to have an operations plan which includes an environmental risk assessment and the actions being taken to mitigate these risks (Parks and Wildlife 2009). However, such operational plans were unable to be sourced from Parks and Wildlife for this thesis; it is therefore not known if such plans have been provided by the operator.

From the extracts on the CVS licence provided by Parks and Wildlife, it does not appear that there are any restrictions on the number of visitors that the operator can take to The Neck at any one time. This stands in stark contrast to the Bicheno site, which has an upper limit of twenty people per tour, and the Low Head site, which has an upper limit of fifty people (Parks and Wildlife 2009). Figure 16 depicts the conditions imposed on the Inala Nature tours are shown on the left, with my comments shown on the right.

	Lease Conditions	Bruny Island	Comments
1	Ensure that the lessee endeavours to make sure all people taking part in a guided penguin viewing tour wear dark clothing and seek an observation point that has a dark background for camouflage purposes.	Requirement	Inala Nature Tours were observed to comply.
2	Where possible the approach to the observation point is to be from land and not along any beach	Requirement	Inala Nature Tours were observed to comply.
3	Use existing tracks and not walk through any penguin colony (as it destroys burrows) in order to reach an observation point.	Requirement	Inala Nature Tours were observed to comply.
4	Seek to reach the observation point and be settled before last night	Requirement	Inala Nature Tours were observed to comply.
5	Remain quiet and keep movement minimal while observing penguins	Requirement	Inala Nature Tours were observed to comply.
6	Not leave any food scraps behind during penguin tours	Requirement	Inala Nature Tours were observed to comply.
7	Not catch, attempt to catch or otherwise disturb, harass or harm the penguins in any way	Not a requirement	No comment
8	Flash cameras should not to be used on the beach while penguin watching, however video cameras without spotlights can be used.	Requirement	Inala Nature Tours were observed to comply.
9	Only use dim torches or a yellow or red spectrum light, and never shine lights directly at the penguins.	Requirement	Inala Nature Tours were observed to comply.
10	Ensure all penguins tours are conducted by a guide,	Requirement	Inala Nature Tours were observed to comply.
11	All guides must be over 18 years of age.	Not a requirement	No comment
12	All Guides must hold relevant qualifications and certificates.	Requirement	Information not available
13	All guides must hold first aid qualifications	Not a Requirement	No comment
14	Must have one guide for every 15 people on the penguin tour	Not a requirement	No comment
15	Must obtain written approval before using any newly	Not a requirement	No comment

	designed or replacement nesting box.		
16	Ensure that all clients and guides adhere to minimal impact techniques and relevant regulations at all times	Not a Requirement	No comment
17	There should be no removal or cutting of native vegetation	Not a Requirement	No comment
18	All rubbish generated by the business must be removed	Requirement	Inala Nature Tours were observed to comply.
19	No feeding of wildlife permitted	Requirement	Inala Nature Tours were observed to comply.
20	No camping permitted	Not a Requirement	No comment
21	Client ratio 50:1	Not a Requirement	No comment
22	Meet the requirements contained within the Fourth Schedule	Not a Requirement	No comment
23	Meet the requirements contained within the Second Schedule	Not a requirement	No comment
24	Observe r all information signs placed on National Park Land	Requirement	Inala Nature Tours were observed to comply.
25	Ensure that visitors do not go within 3 metres of the penguins, or prevent the penguins from accessing their burrows	Requirement	Inala Nature Tours were observed to comply.
26	The licensee may not undertake any works in the area ( with the exception of those works described within the Third schedule point 1) without written permission from the Senior Ranger	Not a Requirement	No comment

**Figure 16 Parks and Wildlife Commercial Visitor License condition extracts (Parks and Wildlife, 2009).**

An analysis of Figure 16 above shows that the conditions imposed on Inala Nature Tours are different from those imposed on the other two case study sites (Chapters 6.2 and 6.4), despite the fact that all the three operators run similar commercial Little Penguin wildlife viewing businesses.

The Senior Parks and Wildlife Ranger there acts as an authorised officer under the *Crown Lands Act 1976*, the *National Parks and Reserves Act 2002*, and the *Nature Conservation Act 2002*. It is suggested that the state of the reserve land has been compromised after years of illegal and intergenerational activity (Parks and Wildlife Interviewee #1 and #2). According to the Rangers report, the damage includes activities such as:

- damage and removal of native vegetation;
- damage to beaches, dunes and vegetation from vehicles;

- damage to beaches, dunes and vegetation from dinghies being pulled onto sand dunes and beaches and vegetation;
- planting of non native plant species;
- weed infestations;
- cutting down of trees for firewood or to improve water views;
- non-enforcement of covenants, regulations and laws;
- contractors not held accountable for their actions;
- breaches of legislative regulations; and
- indiscriminate taking of wildlife (Parks and Wildlife Interviewee #1)

Some areas of land at South Bruny Island have national park classification. Such national parks are a class of reserved land under the *National Parks and Wildlife Act 1970*. The South Bruny National Park has a management plan, which was developed in 2000, called the South Bruny National Park Management Plan. The Neck Game Reserve does not currently have a management plan, but one is being drafted at present (Parks and Wildlife Interviewee #1). Under the *Nature Conservation Act 2002*, and the *National Parks and Reserves Management Act 2002*, the name *game reserve* is applied to an area of land containing natural values that are unique, important or have representative value, with particular respect to game species (Parks and Wildlife 2009). This classification protects areas which are of cultural significance and/or those containing natural biological diversity, and whose objectives are:

- *to provide for the taking, on an ecologically sustainable basis, designated game species for commercial or private purposes;*
- *to encourage appropriate tourism, recreational, and enjoyment, particularly sustainable recreational hunting;*
- *to encourage education, based on the purposes of reservation and the natural or cultural values of the game reserve;*
- *to encourage research, particularly that which furthers the purposes of reservation; and*
- *to encourage cooperative management programs with Aboriginal people, in areas of significance to them, in a manner consistent with the purposes of the reservation and the other management objectives (National Parks and Reserves Management Act 2002).*

It was obvious that the interviewees were concerned about the island, and felt under resourced currently. As a consequence, their ability to do their job is compromised (Parks and Wildlife Interviewees, # 1 and # 2). Many infringement notices given to locals have reportedly been overturned. Such actions undermine the Parks and Wildlife Rangers position in the local society and reduce capacity to undertake work as per the legislative requirements (Parks and Wildlife Interview #1). One of the Rangers mentioned that he and his family had been subjected to personal threats, harassment and discrimination because of his job as an enforcement officer (Parks and Wildlife Interview #1). From discussion with the Parks and

Wildlife staff at the site, it appears that in reality it is difficult if not impossible to achieve the objectives of the Act's with the present resources and non-enforcement of government legislations (Parks and Wildlife Interviewee #1). This is partially due to Parks and Wildlife's annual budget, which has been decreasing every year for the past ten years (Parks and Wildlife Interviewee #1). There are several areas warranting attention suggested the Parks and Wildlife Rangers.

The first of these is the upper section of the boardwalk. As it has been suggested it does not meet the Parks and Wildlife Building Code (Parks and Wildlife Interviewee #1). There are also many occupational health and safety issues associated with the boardwalk including its step formation. *The load the boardwalk has to withstand on busy visitor viewing nights 100, sometimes up to 130 people* (Parks and Wildlife Interviewee #1).

The lack of funding and staff availability to adequately monitor and patrol the Shearwater annual harvest, which inevitably impacts on the Little Penguin colony, is also problematic (Parks and Wildlife Interviewee #1). Parks and Wildlife have no ability to manage visitors to the site; all access is therefore unregulated. The impact this has on Little Penguins is not known (Parks and Wildlife Interviewee #1). While it is acknowledged that there are a significant number of penguins at the Neck, the Parks and Wildlife Ranger informed the researcher that it is not known exactly how many penguins colonise there. There has been no official data collected for the site for some years, although, it has been estimated that there are about 800 pairs of breeding birds in the area (Parks and Wildlife Interviewee #1).

The colony at The Neck is a significant visitor attraction, and is regularly showcased in advertisements depicting Bruny Island (Tourism Tasmania, 2010). However, apart from the infrastructure at the site, and some responsible tour operators, such as Inala Nature Tours, the site remains completely unregulated during the night hours (Parks and Wildlife Interviewee #1). Inala Nature Tours regularly hosts international and domestic visitors who are keen to view the Little Penguins in the wild; these are however only small tours of one to eight people. Other tourism businesses also travel to Bruny Island via coach buses to visit the colony. *I don't know when these come, or how many people are on the buses or when they visit the Neck. There are no entrance fees* (Parks and Wildlife Interviewee #1)

License conditions are problematic for the Parks and Wildlife Rangers at Bruny Island. There are a number of operators who visit The Neck with visitor groups but the Parks and Wildlife Rangers do not know if these operators CSV license holders, or if they are licensed operators,

or if they are operators from interstate. The Rangers report they are not in a position to understand the license conditions attached to a CSV license (Parks and Wildlife Interviewee #1). *I think some of the buses are from the mainland, if so they might not have a Tasmanian CSV licence* (Parks and Wildlife Interviewee #1).

Bruny Island has a Summer Parks and Wildlife Ranger program, which in theory should provide assistance to the Parks and Wildlife Rangers in peak periods and assist with wildlife monitoring and visitor behaviour. However, the Parks and Wildlife Ranger suggest that this program is problematic for the following reasons:

- the program operates only during the daylight hours;
- the local people, who once filled these roles, are no longer interested, as they;
  - have to use their own car to transport materials;
  - have a low hourly pay rate;
  - are employed for only two hours per night;
  - commence work only when they arrive at The Neck;
  - consider it a small return for the time spent;
  - consider there is too much responsibility (it is possible to have responsibility for 100 or more people on a busy summer night); and
  - consider that they are ill-equipped to manage any occupational health issues which might arise.

The PSW Ranger suggested that this is detrimental to the overall objective of the Summer Ranger Program as it is often the locals who care most about the wildlife, and are aware of current as well as future problems that may arise. The Parks and Wildlife Ranger suggested that improvements to the program are worthy of consideration. *Bruny Island does have a Summer Ranger Program, but they don't operate at night, when the bulk of the visitors go to somewhere like the Neck to see the penguins* (Parks and Wildlife Interviewee #1).

The Parks and Wildlife Rangers commented that there is one community organisation taking an interest in the general area, called 'Friends of Adventure Bay' (Parks and Wildlife Interviewee #1). *I rely heavily on local people, as there is not the time, nor do I have the resources to do everything I would like to do, I rely heavily on the local group for a lot of restoration work* (Parks and Wildlife Interviewee #1).

### **6.2.2 Theme 3: Threats to population sustainability**

Human interference by people with pets, particularly dogs, despite signs which clearly indicate that dogs are prohibited from the Little Penguin colony, dogs are frequently sighted near the area with their visiting owners (Parks and Wildlife Interviewee #1).

Wild and wandering domesticated cats are reported to be one of the biggest threats to the colony of Little Penguins. To combat the growing problem, the Parks and Wildlife Rangers instigated a pest eradication program, which was a community wide initiative. The program began with an extensive communication program, brochures were printed and land holders were encouraged to participate. A number of cat traps were purchased and provided to land holders. The cat eradication program netted around eighty cats within 12 months. These results are very similar to those observed in Phillip Island over a similar time period.

This program was unable to be extended beyond the first year. The reasons for this remain undisclosed (Parks and Wildlife Interviewee #1). The impact on the Little Penguins from cats is thought to be greatest during the season in which the Shearwaters are absent from the colonies. Again there has been no research to determine the effect that the cat eradication program had on the penguin colonies at The Neck. However, if eighty cats can be eradicated within a 12 month period the effectiveness of this program is believed to be significant (Parks and Wildlife Interviewee #1).

Annual mutton birding activities also has an impact on the Little Penguin colony which cohabitates with the Shearwaters at the Neck. The number of juvenile Shearwaters taken each year is not known, for it is not monitored. However, evidence of the harvest can be seen on the sand dunes and on the infrastructure. Bird remains and rubbish are frequently cleared from the area. Both the primary activity and the consequential secondary activity inevitably impact by trampling of the Little Penguins' burrows. Parks and Wildlife Rangers are instructed to leave the site alone at these times of the year. Even if Parks and Wildlife Rangers were instructed to monitor the area during the "mutton birding season" the fact that there is only one ranger on duty at any one time would make this difficult. While Parks and Wildlife Rangers have the authority to make arrests and give infringement notices, they rarely do so, due to fears of retaliation from disgruntled perpetrators (Parks and Wildlife Interviewee #1).

Mutton birding, the taking of juvenile Shearwaters before their first flight, appears to be a long established tradition on Bruny Island. However the impact this has on the cohabitating Little Penguins is not monitored, nor understood (Parks and Wildlife Interviewee #1). Additionally, the impact, if any, of the cohabitation between the Shearwaters and the Little Penguins is not understood, as there is no monitoring or research work conducted at present.

*These people access the colony through or via the boardwalk, whenever they want, to get to the Shearwaters, and they trample the penguin burrows in the process. They leave blood over*

*the infrastructure, rubbish, bits, wire, cans, string and long sticks used to pull the birds out of their burrows* (Parks and Wildlife Interviewee #1).

At The Neck the Little Penguins burrow on fragile sand dune structures which are over 6000 years old and formed by tidal movements (Cochran, 2009). These sand dunes provide the land which connects the north and south islands of Bruny. Presently that connection is a gravel road, but there current discussion on sealing the road. Sealing the road will cause the speed limit to change from 70 to 80 kilometres per hour, which Cochran believes will result in increased road fatalities of Little Penguins (Cochran, 2009). The road is already quite problematic for the penguins that must cross the road, as many penguins cross the road at dawn and again at dusk. This same road is also used by visitors and locals on a daily and nightly basis. The Neck road is the only road that connects the South Island to the North Island and to the Ferry terminal, and the only land based method of exiting the island with a vehicle. While on the island, the researcher was able to join the Parks and Wildlife Ranger and an engineer to look at the penguin crossings from the west. Global positioning satellite (GPS) readings showed that there are around 100 Little Penguin crossings (2009). Current discussions are under way on how to deal with this road problem. As mentioned earlier, the road is gravel, low lying and is currently subsiding, due to erosion of the sand dunes. Efforts to stop that erosion have already negatively impacted on the west side of the beach, which in some places, has been replaced with rocks and boulders. These erosion mitigation methods may stop the subsidence of the road, but they make it difficult for the Little Penguins to get across (Parks and Wildlife Interviewee # 1). Additionally, the removal of vegetative cover which has taken place over the past fifteen years, has reduced their habitat cover on west side of the road, which has caused the habitat to be broken, removed or fragmented (Operator Interviewee #1).

Consideration was given during this road analysis to the development of culverts through which penguins could pass. Cochran was not adverse to this idea but mentioned a number of conditions that need to be satisfied in order for it to work. The first of these is that the culverts need to be build to a sufficient size in order to allow the penguins to pass through. Secondly, they need to be kept dry. Thirdly, the need to be built at a sufficient height in order to avoid storm surges, sea sprays and possibly rising sea levels due to climate change conditions. Finally, they need to be built at regular intervals up the coast if they are going to be effective helping penguins cross to the east (Cochran, 2009). *Speed humps to slow the traffic is another*

*requirement on this road, as well as an educational component, and signage, as some penguins appear to be targeted and killed on the roads, by persons unknown (Cochran, 2009).*

Cochran was concerned that sealing the road at the Neck would cause more penguin fatalities due to the accompanying increase in speed limits that would be initiated, (Cochran, 2009). *An attempt to suggest that speed humps be instigated was not met with wide community support (Cochran 2009).*

There is no management plan for this road but it was suggested by all of the interviewees that one should be developed. Road repairs are frequent on The Neck road. The road is frequently graded, where the grader turns around large intrusions are forged into the vegetation on the side of the road. These turning bays gradually increase in size as the grader activity continues, weed species become established in these opened up areas, rubbish accumulates and the scar in the landscape problematic to deal with subsequently (Parks and Wildlife Interview #1).

Grab-all nets are not allowed in any other state around Australia, except Tasmania, and they are used intensively around Bruny Island (Woehler 2004). There can be anywhere from 200 – 300 nets in the bay at any one time (Parks and Wildlife Interviewee #2). Grab-all nets or gill-nets are deadly to the Little Penguins, especially when they are set close to rocks, and are not used in accordance with regulations (Parks and Wildlife Interviewee #1). The gill-nets or grab-all nets are apparently a necessity when using craypots. The catches obtained from the grab-all nets or gill-nets are used to feed the crayfish pots, which are then used to catch crayfish. The Parks and Wildlife Rangers agree that Cray-fishing activities on Bruny Island are a highly destructive activity affecting wildlife (Little Penguins) (Parks and Wildlife Interviewee #1 and #2).

It is believed that fishermen take advantage of the fact that there is no boat capable of monitoring fishing activities in the area, as the Parks and Wildlife Rangers are lacking in the resources required to make this possible (Parks and Wildlife Interviewee #1 and #2). The use of these nets and their capacity for destruction has been well documented in a variety of letters written by Dr Eric Woehler and addressed to the Government, in 2003, 2004, 2006, 2008 and 2009.

The vegetation, which is largely mix of native species, is currently experiencing weed invasion, Figure 15. The weed species reported by the Parks and Wildlife Rangers includes marrum grass, and blackberries. The rangers acknowledge that there is a correlation between human activities and weed infiltration. However, due to lack of resources the Parks and

Wildlife Rangers are unable to effectively manage this growing problem (Parks and Wildlife Interview #1). A risk matrix (as adopted from Brothers *et al.*,) depicted in Figure 17 has been developed to highlight the perceived risks as identified by this thesis for the Bruny Island Little Penguin colony

- \* Low priority risks – risks that current or may potentially result in minor loss of Little Penguins
- \*\* Moderate risk – risks that currently or potentially result in moderate loss of Little Penguins
- \*\*\* High risk – risks that currently or may potentially result in the significant loss of Little Penguins

Rating	Disturbance
***	road kill
**	fire risk
***	predications from cats
*	attacks by dogs
***	tourism pressure
***	gill nets and recreational fishing
**	disturbance to penguins during breeding seasons

Figure 17 Bruny Island Risk Matrix, adapted from Brothers *et al.*, 2001

### 6.2.3 Theme 5 Pressures from development and tourism

Of the visitors to Bruny Island each year, a large proportion visits The Neck to view the Little Penguins (Operator Interviewee #1). During the day the number of visitors may range from between 30 to 60 people, but at night there may be 130 people on the infrastructure. This is problematic in itself, as the structure wasn't constructed to support that great a number of people (Parks and Wildlife Interviewee #1). Despite signage suggesting that people keep to the boardwalk, use only yellow flashlights and refrain from using flash photography instruments, people largely do what they want because they know that the site is unmonitored (Parks and Wildlife Interviewee #1). Cochran suggests that signs need to be visible at night:

*The signs are not illuminated, so that makes it harder when people turn up to the Neck at night, because they can't see the signage (Operator Interviewee #1).*

As Cochran suggests, unregulated viewing also has a number of other negative implications. The infrastructure is dangerous, which is an occupational health and safety issue. People could very easily hurt themselves in the darkness, tripping on the irregular steps. Additionally allowing a load of over 100 people on the boardwalk structure is a risk, particularly

considering the current age and state of the infrastructure. Unregulated viewing impacts on penguins especially in sensitive seasons (Cochran 2009).

*When the birds are courting and seeking a mate, it is a particular sensitive time for the birds. When in the chick raising stages, it is important for the returning parent to bring food home to feed the chicks and also to allow the nurturing parent, who has been fasting (waiting for the mate) to return to the sea to feed. Additionally at moulting time the birds are vulnerable, they can't go back to the sea until their new feathers are entirely grown and are water proof, during this period they remain without food, they are vulnerable at these time (Cochran, 2009). Attempts to light the area have resulted in vandals stealing the lighting structures and batteries (Parks and Wildlife Interviewee #1).*

Some members of the community demonstrate a poor regard for the Little Penguins. It appears that some locals actually target the penguins, swerving their cars while on The Neck road in a deliberate attempt to run over the birds (Parks and Wildlife Interviewee #1 and #2). Up to twelve penguins were found dead on the Neck road after a single night: *The way they are scattered across the road looks like they have been deliberately hit; I was very distressed (Parks and Wildlife Interviewee #2).*

Parking is an issue at The Neck. There is only a small dirt space for cars, buses, or coaches to pull off the narrow Neck road in order to view the penguins. On busy nights, during Easter or other holidays, buses and cars are parked right along the road. This is problematic for the Little Penguins as they come back to their burrows at night. It has reported the Little Penguins are virtually dodging the cars in order to get across the road (Parks and Wildlife Interviewee #1) many penguins are therefore killed. *There were eight penguins killed on the road near the Neck in one night, it was very distressing, I got the morning Ferry and I saw them there (Parks and Wildlife Interviewee #2)*

#### **6.2.4 Theme 6 Potential threats to the population**

There are several other potential threats to the Little Penguin population on Bruny Island. Climate change factors need to be considered in conjunction with the road infrastructure needs. A modelling analysis needs to be completed to ascertain the impact increases in sea levels is on future road requirements. Other considerations to take into account are the fact that the road is often subjected to flooding and sea spray during the winter months. It is also continuing to subsiding to the west, so is therefore in need of immediate attention.

Whilst considering the road widening project, consideration must also be taken to prevent future penguin fatalities. The subsequent increases in the road's speed limit will further threaten the Little Penguins. Consideration therefore needs to be given to the creation of both large and frequent road culvert structures when planning the new road. Traffic calming methods together with penguin fencing and re-vegetation plans are also needed to be included in the planning.

Cochran is also concerned about current breeding habits of the Little Penguins, saying that the breeding season was getting later each year. As the penguins are not listed as endangered species, there is no monitoring or analysis in progress at present, which is largely the cause for the void in information regarding the Little Penguins current status. The reasons for the delayed breeding cycle are therefore not known, however food shortages could be one contributing factor for this shift. The warming of the ocean could be contributing to this possible in food sources. It should also be noted that the Little Penguins also compete with food with humans, seals and other marine animals, and this may be having an effect on the colony's breeding habits. *More research is needed in this area urgently, we need to do this fairly quickly, the Little Penguins always hatched two clutches each year, and now it is only one. Into this mix must be a greater understanding of the grab-all nets and its impacts on the birds themselves but also on their food supply* (Operator Interviewee # 1).

Cochran also suggests that improved monitoring of The Neck during sensitive breeding seasons was an imperative: *When the Little Penguins are starting their relationships and pre breeding, birds can be forced back to the sea without matching up* (Operator Interviewee # 1).

### **6.2.5 Summary of findings - Bruny Island - Case Study One**

A number of problems have been highlighted in this chapter. Some improvements have been suggested by the operator of Inala Nature Tours, as well as the Parks and Wildlife Staff. These suggestions include:

- the development of management plan for the Neck site;
  - the establishment of a vision;
  - develop an educational and interpretation component;
  - improved sustainability provisions;
- tourism impact study;
- greater protection of some areas, including the ability close off sections for the purpose of rehabilitation, safety or nature conservation;

- improved infrastructure;
  - including replacement of the upper section of the board walk;
  - improved lighting;
  - upgrade to the sections of steps which are dangerous in low lighting situations;
  - improved weed and native vegetation management;
- road management plan including:
  - parking provisions;
  - a road maintenance schedule, including;
    - directions on road grading, use of gravel and rocks and efforts made to prevent disruption on the Little Penguin habitat whilst road maintenance works are being undertaken;
  - improved regulations;
  - improved signage – alerting drivers to the Little Penguins need to share the road;
- development of a visitor behaviour code of conduct;
- cat and dog management program;
  - signage;
  - community involvement;
  - re-instatement of the cat trapping program in conjunction with the local farmers and community;
- a shearwater/mutton birding sustainability management plan;
  - including increased staffing levels with authority to manage appropriately the annual harvest, ensuring there is minimal disturbance to Little Penguins and the harvest is sustainable;
  - development of a code of conduct;
- tourism monitoring and official counts recorded; and
- ban grab-all nets from Tasmania or at least develop and implement and enforce a code of conduct.

It was the considered opinion of those interviewed, that a number of steps could be taken in order to ensure that the on-ground practices matched the expectations espoused in the Acts (as described in Chapter 5). Sections of the *National Parks and Reserves Management Act 2002* are outlined in Figure 15 together with the researcher’s comments in relation to Schedule 1 of that Act. These points are in specific relation to the Bruny Island Neck Reserve.

<b>National Parks and Reserves Management Act 2002; Schedule 1</b>	<b>Comments</b>
To conserve natural biological diversity;	It was observed that the Parks and Wildlife that the conservation measures undertaken by the rangers was limited by their resources and rules of engagement.
To provide for the taking, on an ecologically sustainable basis, designated game species for commercial or private purposes, or both;	As there has been no monitoring of wildlife numbers at the site, nor has there been an impact assessment conducted at the site, it cannot be supported that the game is taken on in an ecologically sustainable basis.
To provide for other commercial or industrial uses of coastal areas;	Observed
To encourage education based on the purposes of reservation and the natural or cultural values of the conservation area, or both;	Within the limitations discussed in this Chapter there is educational provisions taking place through; signage at the site, and the Summer Ranger Program.
To encourage research, particularly that which furthers the purposes of reservation;	Observed. This research project was supported.
To protect the conservation area, and rehabilitate the conservation area following adverse impacts such as fire, introduced species, diseases and soil erosion It was observed that the Parks & Wildlife rangers conservation efforts were limited by their resources, and on assets within and adjacent to the conservation area;	It was observed that the Parks and Wildlife rangers' conservation efforts were limited by their resources.
to encourage appropriate tourism, recreational use and enjoyment (including private use) consistent with the sustainability of the conservation area's natural and cultural values;	It was observed that the Parks and Wildlife rangers' conservation efforts were limited by their resources.
to encourage cooperative management programs with the aboriginal people in areas which are of cultural significance to them in a manner that is consistent with the purposes of the reservation and the other management objectives.	It was observed that the Parks and Wildlife rangers' conservation efforts were limited by their resources

**Figure 18 National Parks and Reserves Management Act 2002, Schedule 1 with commentary**

As can be observed from Figure 18 there are a number of items in Schedule 1 of the *National Parks and Reserves Management Act 2002* that require attention. These will be explored in Chapter 7 with recommendations made for improvements to be discussed in Chapter 8.

## 6.3 Case Study Two – Low Head

### 6.3.1 Case Study Introduction

Low Head Penguin Tours operate their business within the boundaries of the Low Head Peninsula, in Northern Tasmania, in a dedicated Conservation Area reserved under the *Nature Conservation Act, 2002*. This site has provided me with an opportunity to observe the ramifications of continued commercial tourism use of a site using the Little Penguins as a primary draw card. This has been with particular reference to the analysis of that use from a wildlife sustainability point of view, a definition of sustainability was provided in Chapter 1.

### 6.3.2 Site description

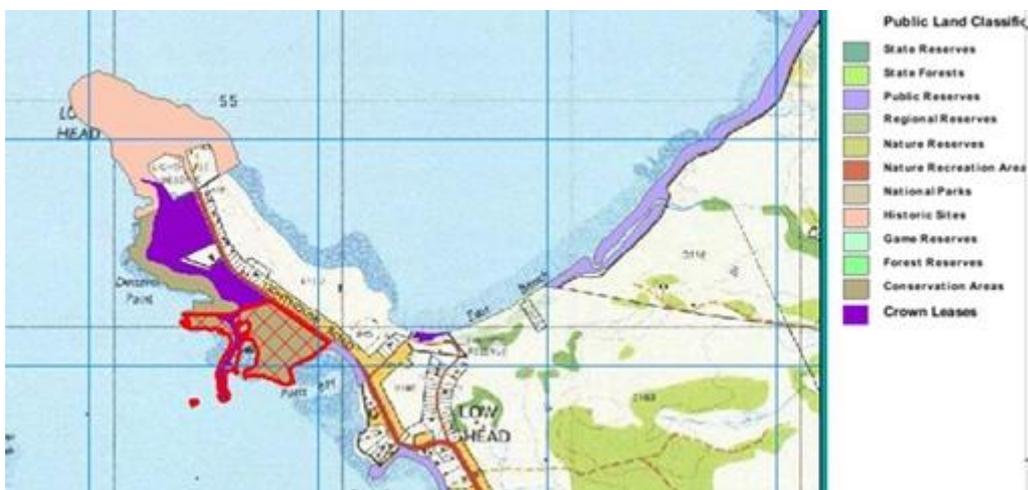


Figure 19 Low Head Case Study site as depicted by purple infill (The List)

The site is located at the mouth of the Tamar River on the Low Head Peninsula. The narrow strip of land, approximately 300 metres long and 800 meters wide used for the commercial wildlife tourism is depicted in Figure 19 and is shown as a Crown Lease in purple. The peninsula is made up of flat, open country with some rocky coastal outcrops between sandy beaches. Developments on the peninsula include the historic lighthouse and pilot station, a number of private housing lots, developments owned by the Low Head Company Pty Ltd which owns and operates a private golf course directly opposite the case study site area. Lastly there is the infrastructure associated with the Low Head Penguin Tours. The land to the north and south of the site is Heritage Reserved Land. The land to the east is privately owned and to west the Tamar River.

The case study site infrastructure includes a small wooden shed which provides an office for the operator and a small shelter or meeting room, which can provide some visitors with cover during inclement weather. A gravel path down to the beach provides visitors with clear,

unfettered access to the beach and a large wooden seating platform provides visitors with a place to sit whilst listening to their guide. Numerous informal sandy tracks meander through the Little Penguin colony.



**Figure 20 2010 Goggle view of Low Head Little Penguin Rockery – an open informal track networks through African Boxthorn (*Lycium Ferocissimum*)**

It is estimated that penguin wildlife tours have been operating at this site for over fifty years (Parks and Wildlife Interviewee # 3 2009). The present operator is the second known business to have operated commercial wildlife tours at the site. Tours are conducted all year round in the evening or on dusk. It is thought that approximately 5000 visitors view the Little Penguins at this site each year, at a cost of \$16.00 per adult. Visitors who wish to view the Little Penguins at Low Head can book a tour online or over the phone. Preceding the evening tour at dusk, visitors congregate at the small wooden office structure onsite. The guide then assembles the visitors and provides basic instructions of what to expect and discusses viewing etiquette and safety precautions. The tour runs for about an hour. The visitors are led down the gravel path to the wooden seating platform on the beach where a short talk is given and at this point it is hoped that the Little Penguins will emerge from the sea onto the sandy beach, making their way up to their burrows. Visitors are then escorted around the colony, on one or more of the many informal tracks which meander through the colony. Visitors on these tours can get close to the Little Penguins; at times they can be standing just a few inches from the birds. Low Head Little Penguin tours promote close interaction with the Little Penguins. They use several photographs in their website which depict close contact with the Little Penguins, one of which can be viewed in Figure 21.



**Figure 21** Group of visitors making a tunnel through which the Little Penguins must pass in order to reach their burrow (Low Head Penguin Tour web site, 2009)

Vegetation at the Low Head subject site is classified as ‘grossly altered vegetation structure in otherwise weed infested vegetation >90% weeds’ (Baker, 2009) Figure 15. At the Low Head case study site, the Little Penguins appear to exclusively use the site for breeding, unlike the case study site at Bruny Island, where the area is shared with a Shearwater colony (Parks & Wildlife, 2009). However, like Bruny Island and Bicheno the Little Penguins at the Low Head site are also impacted by human activity, which includes tourism.

Also important to this site is the impact from an oil spill which occurred in 1995, when the Iron Baron ran aground and oil spilt on the Tasmanian coast and in, particular on the Low Head coastal area. The number of Little Penguins killed in the South Eastern Bass Strait area was estimated to be between 7,000 and 17,000 birds. The impact the oil had on the penguin populations in general is poorly understood, because they were not surveyed until several weeks or months after the grounding of the Iron Baron, (Australian Maritime Safety Authority, 1995). However, the oil spill had an impact on the colony of Little Penguins at the Low Head site. Approximately 900 birds (from an unknown original number) from the site were successfully cleaned and returned to the wild. These numbers are important as they provide baseline data for the colony at that point in time (1995). It is understood that no other bird monitoring program has been instigated at the site since then (Parks & Wildlife Interviewee # 3).

When writing the National Review of the Conservation Status and Management of Australia’s Little Penguins Colonies Dann *et al.*, was aware of the situation of the Low Head site: *This colony was severely affected by the Iron Baron Oil spill in June 1995 and it may be some time before the number of birds at the site is adequate again for public viewing* (Dann *et al.*, 1996:51).

### 6.3.3 Theme 1: Governance and Tenure

The land at the subject site is classified as a Conservation Area and, as such, is governed by the *Nature Conservation Act, 2002*. This legislation has been explored in Chapter 5. In order to utilise the land at Low Head, a wildlife tourism operator must obtain a licence. The license conditions imposed by Parks and Wildlife stipulate that licensees must; *observe any restrictions, directions and operating terms and conditions provided to the operator by the Senior Ranger or District Ranger in respect of operations in National Parks, in State Reserves or on non allocated Crown Land, License Agreement, 6.1* (Parks and Wildlife 2009).

The licence permits the operator to conduct tours with a maximum of 50 people per tour with multiple tours per evening possible if warranted. The license entitles the operator to run commercial Little Penguin wildlife tours and gives the licensed operator exclusive use of the wooden infrastructure and office/ hut. However, the possession of the license does not restrict visitors or other licensed operators from accessing the site.

The terms of the Parks and Wildlife Service lease conditions imposed on each of the three study sites vary in nature. The conditions which are applicable to Low Head lease are depicted in the Figure 22. The lease conditions provided by the Parks and Wildlife Service was incomplete, therefore it should be noted there may be emissions.

	Lease Conditions	Low Head	Comments
1	Ensure the lessee (and use its best endeavours to ensure all other people taking part in a guided penguin viewing tour) wear dark clothing and seek an observation point that has a dark background for camouflage purposes.	Not a requirement	No comment
2	Where possible the approach to the observation point is to be from land and not along any beach	Requirement	The tour commenced at the small office located near the main road, progressed down the gravel path to the observation deck and through well worn sandy tracks in and around the colony
3	Use existing tracks and not walk through any penguin colony (as it destroys burrows) in order to reach an observation point.	Requirement	The tour on which the researcher was a participant used an existing track from the road down to the colony, which was well formed and constructed of gravel. The tour then proceeded to wander through the colony. The paths through the colony could be described as informal tracks as they had been well used by both the Little Penguins and visitors to the colony and grazing sheep. They are of a sandy nature and not defined. The description of tracks is problematic. It is noted that since the commencement of this thesis additional words have appeared on the website, and new changes have been made to the Low Head Penguin Tours website. This site now asks visitors not to walk through the colony. However on the tour that I was a participant we did walk in and around the colony.
4	Seek to reach the observation point and are settled before last night	Not a requirement	No comment

5	Remain quiet and keep movement to a minimum while observing penguins	Requirement	Observed
6	Must not leave any food scraps behind after a penguin watching tour	Requirement	Observed
7	Must not catch, attempt to catch or otherwise disturb, harass or harm the penguins in any way	Not a requirement	Observed
8	Flash cameras must not to be used on the beach whilst penguin watching; however video cameras without spotlights may be used.	Requirement	It was observed that the guide did instruct visitors that flash photography was not allowed
9	Must use dim torches or a yellow or red spectrum light and must never shine lights directly at the penguins.	Requirement	Observed
10	Ensure that all penguins tours are conducted by a guide,	Requirement	Observed
11	Guides must be over 18 years	Not a requirement	Information not available
12	Guides must hold relevant qualifications and certificates.	Requirement	Information not available
13	Guides must hold first aid qualifications	Requirement	Information not available
14	Must have one guide for every 15 people on the tour	Not a requirement	According to the license agreement, the Low Head Penguin tours ratio is 50:1
15	Must obtain written approval before using any newly designed replacement nesting boxes.	Not known	Reference to Schedule 3 which was not supplied by Parks and Wildlife for this research
14	Must ensure that all clients and guides adhere to minimal impact techniques and the relevant regulations at all times	Requirement	It was observed that several requirements were not met while the tour was conducted
15	No removal or cutting of native vegetation is allowed	Requirement	As this site is highly altered and there is no native vegetation on the site this requirement is irrelevant.
16	No feeding of wildlife is permitted	Requirement	There were no indicators observed to indicate that there was feeding of wildlife
17	No camping is permitted	Requirement	There were no indicators observed to indicate camping had occurred on the site
18	Client ratio 50:1	Requirement	It was unable to be confirmed that the operator adheres to this requirement.
19	Must meet requirements contained within the Fourth Schedule, of the Commercial Licence.	Requirement	<ul style="list-style-type: none"> <li>• First dot point on page 12 of Schedule 4, states the operator and guides are to use existing tracks and avoid walking through the colony. It was observed while on a tour that the tour did walk through the colony. Observations of the sandy tracks throughout the colony appear to suggest that the area is heavily impacted from visitors and the sheep that also graze there.</li> <li>• Point two of Schedule 4, states viewing should be at least 3 metres from penguins, while on the tour it was observed that visitors were standing a few inches from penguins at times</li> <li>• Point two of Schedule 4, states visitors should not block the penguins access to burrows, while on the tour it was observed that it could be interpreted that we as visitors were blocking penguin access to burrows.</li> <li>• Point 7 of Schedule 4, states shining torches directly down the beach should be avoided. It was observed while on the tour that torches were shown down the beach</li> </ul>

			<ul style="list-style-type: none"> <li>Point 8 of Schedule 4, states visitors should “wait until penguins have stopped coming up before moving quietly away”, it was observed while on the tour the tour moved freely about with the penguins as they were finding their burrows after coming up from the beach.</li> </ul>
20	Must meet the requirements contained within the second Schedule	Not a requirement	No comment
21	Must observe requirements of any information signs that may be placed on the National Park Land	Not a requirement	No comment
22	Must remain located at least 3 metres away from and do not block the penguins access to their burrows	Requirement	Point two of Schedule 4, suggests that viewing should be at least 3 metres from penguins, while on the tour it was observed that visitors were standing a few inches from penguins at times
23	The licensee must not undertake any works in the area (not including those works described herein in the Third schedule point 1) without the written permission of the Senior Ranger	Requirement	It was not observed that the operator undertakes any works on the site

**Figure 22 Low Head Commercial License agreement directives and observations**

It can be observed from Figure 22 that the conditions imposed on this case study site differ from those imposed on the other case study sites.

### **6.3.4 Theme 2: Public Perception and Appreciation of Little Penguins**

At Low Head, a site occupied by European settlement since 1804, there have been alternations to the site due to human activity and settlement, this continues today. However, despite the lack of a management plan, Parks and Wildlife and the regional NRM bodies are aware and concerned about the community sentiment and lack of general support for the sustainability of the Little Penguin colony at Low Head. *Really the biggest risk we have here is peoples’ attitudes, as they don’t want the penguins here. They don’t really want any vegetation which will restrict their views of the ocean* (Parks & Wildlife Interviewee # 3).

Parks and Wildlife and the two regional NRM Bodies, North and Tamar, consider that the public at Low Head are generally apathetic to the Little Penguins, and attempts to engage them in conservation work or rehabilitation work has met with limited success (NRM, North Interviewee # 1). By way of example, Parks & Wildlife reported that the majority of the community consider the fencing (partially complete around the site) is to keep the Little Penguins in, ensuring that the Little Penguins are not able to burrow under privately owned infrastructure, when the real purpose is to keep dogs out of the colony: *There have been attempts to involve the community and school kids (so they won’t poke sticks down Penguin burrows etc) but the community engagement process has met with limited success* (Parks & Wildlife Interviewee # 3).

Recent attempts to involve the local community by the two northern regional Natural Resource Management groups NRM Tamar and NRM North have again met with limited success, with only a small portion of the community participating in two projects recently instigated:

- trial plantings of native species; and
- manufacture and placements of artificial concrete burrows.

In the first example a successful trial involving the planting of native species would normally involve a number of activities such as:

- plant investigation and selection;
- trial sites developed;
- ground prepared and fencing complete to restrict grazing sheep and rabbits;
- plantings and watering, mulching and wind breaks as necessary; and
- ongoing maintenance such as weed removal, wind protection measures and regular watering.

However according to the two Northern NRM groups, there was little community interest, and the results can be seen by low survival rates of the trees planted, lack of water and lack of protection from the wind contributing factors to the demise of some plants (Figure 23)



**Figure 23** A 2009 view - attempts at regeneration at Low Head Penguin Colony by NRM Tamar and NRM North (photograph by Wendy Mitchell)

In a further example, in the manufacture of the concrete burrows, it appeared that these were required on the site because of the lack of native vegetation under which the Little Penguins could naturally burrow. The concrete burrows were made with the help of school children and

NRM Tamar, however, at the present time; they remain unplaced and unoccupied by Little Penguins Figure 24.



**Figure 24 A 2009 view of Concrete burrows, unplaced and unoccupied (photograph by Wendy Mitchell)**

On the subject of native vegetation, or lack thereof, Parks and Wildlife explained that one of the reasons the grass is extremely short and there has been no natural re-generation on the site is because of the informal (not licensed) grazing of sheep by local farmers.

The threat of fire appeared, according to Parks and Wildlife, NRM North and NRM Tamar to be a major concern for local residents, and appeared to be the main rationale behind not rehabilitating the site. However the Parks and Wildlife staff responsible for local fire response did not share this concern: *There is a perception by the community that re-vegetation of the site increases their fire risk; however our Chief Fire Management Officer says this is not the case, the increased fire risk is negligible* (Parks and Wildlife Interviewee # 3). *I completed a fire risk assessment on the Low Head Peninsula and there is no increased risk. Residents have a greater danger of fire from their own neglect of important fire issues, such as not cleaning gutters, having wood chips around the garden, and having piles of firewood stacked against sheds or houses or indeed under houses. People need to keep their yards free of dead wood and branches and refrain from putting that rubbish on Crown Land where it does become fire fuel in due course. The Low Head road acts as a natural firebreak and there are excellent fire fighters (trained for the possibility of large industrial fires in George Town) in the area ready to respond with excellent fire fighting equipment. Additionally the land is problematic for a dangerous fire; the small land area prohibits a fire from getting up a head of steam, e.g. the fire remains small. The wind in the area is also a factor; the moist coastal breeze is strong*

and will fan a fire, which may start in a localized direction, in a linear approach, making it easier for fire fighters to quickly get it under control. The biggest danger is ember attack, which residents can easily respond to. The real issue is the residents desire to maintain their sea view, which is disguised as concern over wild fire danger. There is a real and perceived risk, fire risk is calculated on:

- what local infrastructure is present;
- what other assets are there;
- what is the fire carrier (fuel);
- what services will be impacted;
- defensible barriers present;
- response times; and
- response team and their locality and equipment.

Therefore Low Head is determined by the Fire Response Section of Parks and Wildlife to be a low risk. More information can be obtained from *Flammable Australia a CSIRO Fire ecology publication and the Australian Academy of Sciences Fire and the Australian Biota* (Parks and Wildlife, Interviewee # 4).

In 2008 the Northern Regional NRM groups sought and obtained funds to develop a brochure which could be distributed locally with a hope it may help to promote interest in conservation of the Little Penguins, however it was unsuccessful: *I don't think the brochure generated any interest from the community* (NRM North, Interviewee # 1).

When the question was put to the Land Managers, Parks and Wildlife, *what would you like to see at this site?* The response was: *What we need is a survey of peoples' attitudes (in order to better understand what our (management) plan should include* (Parks & Wildlife, Interviewee # 3).

### **6.3.5 Theme 3: Threats to Population Sustainability**

Colony surveys in Tasmania by Stevenson and Woehler (2007), suggest that there were four colonies which have suffered colony collapse and a further two had decreased significantly. In relation to the Little Penguin at Low Head, they do still inhabit the site; however their sustainability is not understood. A risk matrix (as adopted from Brothers *et al.*,) depicted in Figure 25 has been developed to highlight the perceived risks as identified by this thesis for the Low Head Little Penguin colony.

\* Low priority risks – risks that current or may potentially result in minor loss of Little Penguins

\*\* Moderate risk – risks that currently or potentially result in moderate loss of Little Penguins

\*\*\* High risk – risks that currently or may potentially result in the significant loss of Little Penguins

Rating	Disturbance
***	weed infestation
***	loss of habitat
*	road kill
***	climate change
***	impacts from grazing
**	fire risk
***	predications from cats
***	attacks by dogs
*	oil spill
***	tourism pressure
*	gill nets and recreational fishing
***	disturbance to penguins during breeding seasons

Figure 25 Low Head Risk Matrix, adapted from Brothers *et al.*, 2001

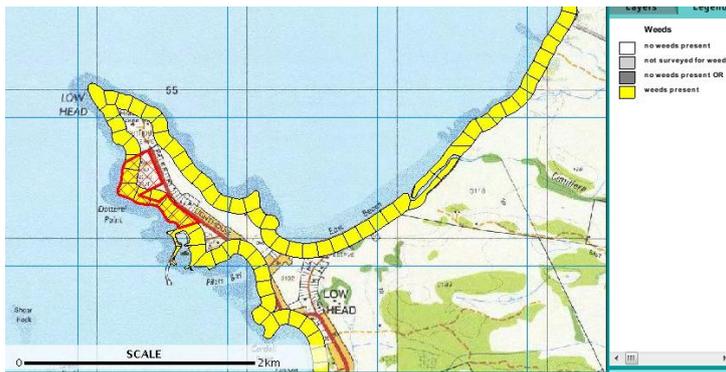
At Low Head the lack of native vegetation and habitat is problematic, the extent of which will only be determined by a survey of numbers using the 1995 post Iron Baron Oil spill as base line data. While the threat of a further oil spill appears unlikely, it is a possibility and has occurred in the past. The risk is greater for this colony of Little Penguins than at the other two case study sites as the Tamar River is a large and active major port with numerous shipping vessels using the waters each day. Such activities will increase when the Tamar Pulp Mill commences. At Phillip Island they are aware of the consequences of an oil spill on their colony of Little Penguins and suggest: *Prevention and preparedness are the best ways that the risk of significant populations' losses in an oil spill can be reduced. The management of the Penguin Reserve should maintain an interest in and actively pursue policies that will ensure the highest levels of maritime safety in Victorian waters and similarly of public awareness of the dangers of oil to penguins. Oil spills, fire and food shortages are the most likely disasters to befall penguins at Phillip Island and the Penguin Reserve should have appropriate contingency plans and maintain appropriately trained staff* (Dann, 1996:21).

The role of cats in determining the distribution and abundance of Little Penguins at Low Head is not clearly understood. It is well documented that both feral and domestic cats cause significant problems at some sites (Dann, 1996, Parks and Wildlife 2009, and Pryor *et al.*, 2008) it is not known what impact they have at this site. Cat management or eradication plans have captured and removed large numbers of cats at some sites, for example, 80 cats per year at Phillip Island, 75 during the one and only cat removal program at Bruny Island (Parks and Wildlife 2009). Without base line data, it is difficult to know if cats are a problem at Low Head.

Whilst undertaking the onsite inspections it was noted that signage at the entrance explicitly says that dogs are prohibited from the site and no dogs were sighted in the colony during visits to the site. However a subsequent article in the Examiner stated that 12 penguins had been killed in a dog attack (Ranson, 2010). During one of the inspections with the two regional NRM bodies present, a very large cat was sighted in the undergrowth. Parks and Wildlife stated that they had no formal management plan, or cat eradication plan for the site, but if a cat or dog was sighted in the Conservation Area a Parks and Wildlife Ranger would respond: *Dogs are excluded from the colony and mostly residents abide by this ruling, but cats are a problem in the colony, we respond to when the Operator calls us regarding one in the colony. I believe NRM and George Town Council handle this sort of thing* (Parks & Wildlife Interviewee # 3).

However I was unable to verify if the George Town Council had such a plan. Parks and Wildlife when interviewed commented that it is difficult to make any changes at the site with the present licensing arrangements. Generally the license continues, unless there are complaints: *The lease conditions are broad and do not have performance criteria's attached, in any case we are limited in our response capability due to lack of resources, if we had more resources a closer partnership would be desirable and we could undertake more rehabilitation work and conservation. The operator is more than happy to put money into the site; currently the operator will slash each side of the gravel track (down to the beach) from their own funds. We have had no complaints; complaints are used as a measure, if the operator wasn't there dogs would be allowed to run free. So there is a level of protection simply by having an operator there. The operator does comply with the viewing operations, although there are only a few of those. The lease renewal is fairly automatic if there are no complaints, and we need those in writing, it's difficult and problematic to cancel a license. This lease is up for renewal now and it is time to establish some new procedures for the operator to follow. It would be very problematic for us to make changes or to close the tourism operation, as there are commercial considerations here, and we would quickly have to respond to questions from the local business operator, possibly Council, and then the local politician, all of which would be undesirable* (Parks & Wildlife, Interviewee # 3).

As discussed in the site description at the beginning of this chapter, the site at Low Head is highly modified and is void of natural vegetation. The site is in heavily invested with weeds, as can be observed in the weed description provided by the LIST shown in Figure 26.



**Figure 26 Low Head Weed Description (The List, Sharpe's 2009)**

These weeds are predominately African Boxthorn (*Lycium Ferocissimum*) and Sea spurge; (*Euphorbia paralias*) have invaded the site (NRM North Interviewee #1). While the African Boxthorn is a declared weed under the *Tasmania Weed Management Act 1999* (Baker, 2009) it also represents the only vegetative cover providing habitat for the Little Penguins at the present time. The management implications of this will be discussed in Chapter 7 and 8.

At the time of this research the land is used for sheep grazing, which effectively keeps grasses short and prevents any natural regeneration, which may have occurred in an otherwise ungrazed situation. The impacts on the Little Penguins caused by grazing animals such as sheep has been on the agenda of the developers of the conservation status and management of Australian Little, in this document the authors say: *Trampling of burrows by humans and stock is an important contributor to habitat loss particularly where erosion develops as a consequence. Fire and rabbits can be a danger by destroying the above ground vegetation among which the nests are situated or which provides the soil support to stop burrows collapsing. Some introduced species cause severe loss of breeding habitat, such as Kikuya grass and Cape Ivy* (Dann *et al.*, 1996:16).

The ramifications of fire on the only habitat species, the African Boxthorn while remote, would have serious implications on the sustainability of the Little Penguins, as the demise of this bush would leave penguins exposed and susceptible. Parks and Wildlife are aware of this problem and have considered options, which were first mentioned in the Habitat Management booklet produced by Lee *et al.*, (2008). *Of the things we need to achieve on this site is a weeds and management plan. It has been discussed that we would spray off the African Boxthorn, leaving its skeleton on which we would grow other natural species* (Parks & Wildlife Interviewee # 3).

Dann identified that the development of holiday housing in coastal areas interfered with penguin nesting habitats. At Low Head development pressures impact on the colony in a

similar manner to that described at Phillip Island. At Low Head development pressures appear to include the following:

- there is a privately owned land parcel within the conservation land area;
- greater presence of cats and dogs;
- pressure not to rehabilitate and regenerate the degraded site, under the cloak of reducing or minimizing fire risks by local residents;
- greater intrusion into the colony, especially impacting in sensitive breeding seasons, for example when young fledglings are out of the burrow and defenceless;
- erosion caused by lack of vegetation and sheep grazing;
- lack of habitat cover as a result of sheep grazing;
- increased tourism visitation to an already degraded site, forging new paths through the colony, opening up the habitat and exposing the vegetation to increased exposure/erosion from strong, relentless, moist sea breezes;
- the need for and lack of a management plan, cat eradication plan, weed management plan;
- inadequate and outdated governing license arrangements; and
- a lack of resources for the governing body to implement needed works.

As can be observed in Figure 27 there is also privately owned land in the centre of the Conservation Area at Low Head. Phillip Island experienced a similar situation, where private land appeared to impact on conservation issues. At Phillip Island it involved a housing estate called Summerland. The local government in 1970 first recognized that this housing estate was impacting on the sustainability of the Little Penguin colony and instigated a buy back scheme (Hall 2004). In 1985 the Victorian Government became involved and continued the process; with the goal to eventually buy back all the land and houses within that Estate which involved 774 titles:

*There is an on-going buy-back of the Summerland Estate. Houses may only be sold back to the Government. Over time this will mean the removal of every house in the area. Currently approximately 85% have been bought back and reverted to penguin habitat; the aim of the buyback is to protect the largest remaining Little Penguin colony on the island (DSE, 2008:1).*

The buyback of the Summerland estate at a significant cost is acknowledgement that a housing estate within a national park is not appropriate. Among other things it increases the traffic, both pedestrian and car, impacts on native vegetation, introduces other, sometimes undesirable species and increases the presence of predators and opportunities for road kill

(Dann *et al.*, 1996). Similarly I suggest that a privately owned parcel of land (Figure 27) within the Conservation Area at Low Head is equally undesirable.



**Figure 27 Privately owned Land in the Conservation area shown in white (The LIST 2010)**

The land is not managed with the conservation of Little Penguin habitat in mind and as can be observed in Figure. 28 the owner is removing the only habitat on the site (available to the Little Penguins), the African Boxthorn.



**Figure 28 A 2009 view of privately held land in the Conservation Area (photograph by Wendy Mitchell)**

As it is private land the owner of this land is able to undertake activities which could impact on the Little Penguin, such as destroying burrows to deter the birds from nesting there, introducing animals and predators to the area, and taking vehicles and machinery in to undertake activities the owner considered necessary. Such intrusion into the Conservation Area appears to contradict the intent of the Zone as mentioned in Chapter 5.

The argument that housing developments introduce elements to an environment which impact on the natural environment is supported by the research of many, including Stevenson *et al.*, who suggests: *Increased development in coastal areas has resulted in a significant decrease in the extent of suitable habitat. Housing and commercial industries are rapidly expanding into many coastal areas, resulting in the destruction or alternation of current and potential breeding habitats* (Dann, 1994, as cited in Stevenson *et al.*, 2007).

At Philip Island extensive loss of breeding habitat for seabirds was largely due to agriculture erosion, human settlement and the introduction of weeds (Dann 1992). Erosion and agriculture also impact on the site at Low Head. Agricultural operations such as sheep grazing continues to occur in the Conservation Area and this practice has resulted in the destruction of habitat by sheep movements in and around the vegetation and has caused some erosion. Grazing sheep cause the grass to remain short and develop paths and tracks, which when unchecked become erosion paths where water runs, forming gullies and depressions. Grazing sheep prevent new grasses and re-vegetation from growing and open the area to environmental damage from wind and in the case of Low Head, moist laden strong sea breezes. The subsequent tracks the sheep develop in and around the colony are in turn used by locals and visitors to the site. This has effectively opened up the site, escalating the ability of the moist sea breezes to buffer the coast, which decreases the vegetation cover for the Little Penguins, and makes the available habitat sparser and less protective for nesting birds, increasing the exposure of chicks and eggs to the elements and reducing hatching success.

It appears that the lack of resources experienced by Parks and Wildlife impact on the site in a number of ways, the most obvious the inability of Parks and Wildlife to develop a management plan for the site. Planning is highly desirable as good planning can lead to appropriate ground level action reminds Ewert. It is in the development of the plan when consideration is given to numerous issues that need to be considered and addressed, such as budgeting, partnerships, legal considerations, information and risk management (Ewert *et al.*, 2004).

A management plan would outline within its structure the response to fire and may incorporate a fire protection plan and identify other mitigation opportunities available for the site to reduce fire risks. Similarly a management plan may have attached a Little Penguin predator response plan. Such a plan may have several elements which alleviate the risk associated with domestic cats and dogs and feral cats, and would undoubtedly have a process to involve the community and gain much needed local input (Baker 2006).

### **6.3.6 Theme 5: Pressure on the Colony from Commercial Tourism**

The total Low Head Little Penguin Tourism site area is open to the public all year; there are no sections are closed during the breeding season or for rehabilitation purposes.

The breeding season can be problematic for Little Penguins, as it is a time when young fledglings stand outside their burrows unattended; waiting for a returning parent and this is when they are most vulnerable. Stahel acknowledges that the breeding season is problematic:

*Care should be taken also to minimise disturbance within the colony during the breeding season, acknowledge that good vegetation is a factor in colony success, for penguins that breed on the surface, good vegetative cover is essential (Stahel et al., 1987, as cited in Weerheim et al., 2003:156). Weerheim also acknowledges the correlation between the distribution and density of nests, and the distance from footpaths (pedestrian access): Little Penguins are known to consistently use some landfall areas, and seem reluctant or unable to take alternative route if their normal access is blocked (Weerheim et al., 2003:155).*

The area where the Low Head Little Penguins colonise is also the area utilised for Little Penguin viewing, and additionally is well traversed by visitors including local walkers. This has increased the intensity of interference to Little Penguins at this relatively small site. The effects of long-term visitation to this site are evident, as the land is degraded and in poor condition, the connection to tourism and development is through its long history as a favoured place by Europeans. It is these days a place of an intensive commercial operation, which allows visitors to view the wildlife each day and evening. The pressure from visitors and locals using the area or visiting the area is relentless.

Wildlife tourism is categorised by its very nature in that it is viewing wild animals in their natural environment. Low Head cannot be described as a natural environment due to its alerted state. That Little Penguins still are loyal to the site and have adapted to utilise the African Box thorn suggests it could be rehabilitated back to a near natural state. Figure 29 shows the East Beach area where the sand dunes are natural and high on the water side, vegetative cover is intense and includes herbs, grasses, shrubs and small trees. While it is acknowledged that this degradation has taken place over an extended period of time and was not entirely caused by commercial tourism activities, it is observed that commercial tourism continues to put pressure on the site.



**Figure 29** Low Head area, early 19th century (Launceston State Library Collection)



**Figure 30** A 2009 view of the Low Head commercially operated Little Penguin colony showing one of the many informal tracks forged by both visitors, walkers and sheep (photograph by Wendy Mitchell)

At various times in the breeding season the birds are more susceptible to both human and animal disturbance. These are when the birds are at their most vulnerable, where the chicks are at the defenceless, fledgling stage and perhaps out of the burrow waiting for a returning parent. Additionally during the moulting season, the birds fast on land until their old feathers have been moulted and an entirely new covering of feathers have grown, are oiled, and water proof, only then can the Little Penguins return to the sea to feed again.

It is considered by at least one of the guides at the Low Head case study site, that the Little Penguins who colonise there are not affected by their commercial tourism operation. Our guide explained that although the Little Penguins are a wild animal, they have little fear of

humans. He reiterated a story when he observed a young girl who wore white shoes, which apparently attracted the penguins, and subsequently stood on each of her feet. The penguins have so little fear that, the guide explained that: *The Little Penguins will walk through a human tunnel formed by visitors quietly standing over them; they have become so accustomed to us* (Guide 2009).

However despite the fact that a guide can make a statement that the Little Penguins do and have become habituated at the Low Head Case Study site, this statement is not backed up by any scientific evaluation of Little Penguin behaviour towards visitation at the site.

Whether visitor impacts lead to reduction in numbers is difficult to judge because habituation may occur (Otley 2005, as cited in Tin *et al.*, 2009) and it is possible that some individuals may relocate to other sites. Without annual surveys it is not possible to ascertain the impact at the Low Head case study site from tourism. However according to Tin *et al.*, 2009, the duration of visitations, frequency and intensity do have impacts on the penguins studied in the Antarctic, so it may be assumed that the Little Penguins at Low Head case study site are similarly affected by these same factors. It has, for instance, become evident that the behaviour and the physiology of individual animals can be affected strongly by parameters such as visit duration, visit frequency and intensity and duration of contact by a researcher (Salwicka & Stonehouse, 2000; Weimerskirch *et al.*, 2002 and Pfeiffer, 2005, as cited in Tin *et al.*, 2009). It is argued that, human visitations have been having such an effect for many years the supporting evidence for this is in the observations of the current state of the environment.

Human visits may lead to either direct or indirect consequences, (Tin *et al.*, 1997). A bird may exhibit behavioural and physiological changes in accord with a stress response, which if prolonged, could have a negative impact on reproduction and survival. Tin *et al.*, explains that in the worst case birds can leave their young, or delay feeding, or food meant for regurgitation to feed young may be absorbed by the parent before it can be fed to the chick:

There appear to be many factors which impact the Low Head site, which I describe as the most effected and degraded site of the three case study sites, For example at the Bicheno case study site, the Little Penguins have a fair covering of native vegetation, walking tracks are restricted and narrow and visitors are required to stay on this narrow path. Little Penguins once inside their vegetative cover are no longer under the gaze of visitors and the visitor to guide ratio at Bicheno is 20:1, while at Low Head the visitor to guide ratio is 50:1, and

visitors can follow the penguins to their burrows in an environment which is of a more open nature.

Claridge discusses the seemingly adaptability of Little Penguins to their environment, an environment to which they are very loyal, and a factor which was noted with the oil clean up after the Iron Baron, when Little Penguins cleaned and released in other locations around Tasmania found their way back to the Low Head site within days of being released. However Claridge cautions regarding long term impacts and it is this factor, which is clearly not understood at Low Head: *Although penguins are adapted to environmental variability, long term deterioration of environmental conditions that favour penguins are likely to decrease penguin populations, strong fidelity to their breeding colony and nest also makes penguins vulnerable to deterioration of environmental conditions on land as well as in the local marine environment* (Claridge, 1997:11). The following observations are made for the Low Head site:

- lack of visitor infrastructure, toilets, visitor shelter, acuminated signage, infrastructure such as board walks or special paths which would limit the impact of visitors to the colony;
- the lack of investment back into the site by the operator. This is in contrast to the Bicheno site where the operator was observed to be continually working within the colony with a view to improving the sustainability of the colony. It was noted that work included, formation of some board walks, purposely narrow paths, formed tracks which visitors must stick to, low level lighting, artificial nesting boxes, native plantings, equipment on the ready in case of fire, and a continual program around predator eradication from the site;
- the site is open and accessible to all locals, general visitors and visitors on a paid tour and the site is well walked by a variety of people daily. This is in contrast to the Bicheno site, which is not accessible through the day, in theory this would allow fledglings waiting outside of their nest for a returning parent to do so unmolested; and
- the site is very windswept and vulnerable to the elements, this is in direct contrast to the other two case studies where there is considerable vegetation, including native species. Such canopy cover provides a measure of temperature control for the penguins, especially on hot days both for the eggs and for the young fledglings.

### **6.3.7 Theme 6: Visitor Experience**

It is also important to consider that the tourism experience includes the components of conservation values, animal welfare, visitor satisfaction and profitability (Higham *et al.*, 2003). At Low Head I had some difficulty in applying these concepts. This is due in part to the inability to successfully conduct a visitor survey at the case study site and also due to the parameters of this thesis and the methods of research.

There are key questions around visitor satisfaction that remain unanswered. For example, does the level of visitor satisfaction and profitability impact on the sustainability of this colony used for commercial tourism purposes?

Reynolds suggests it would, indicating that the authenticity of the experience and subsequent satisfaction levels impact on the ability of the commercial enterprise to sustain itself, and in turn sustain the colony used for the wildlife viewing experience: *Visitors to wildlife tourism attractions can provide valuable insights into the sustainability of the businesses that they visit* (Higham *et al.*, 2003:25).

The difficulty with the concept mentioned by Reynolds at this site is the relationship the operator has with the Little Penguins. The assumption the researcher makes of Reynolds theory is that if the operator is to make more profitable returns then it must be reinvested in improvements at the site. This is not evident at Low Head, however in some defence of the operator they are under no obligation under their license arrangement to make investments in the site or take measures to assist in the sustainability of the colony. However neither are the operators at Bicheno, who do make considerable investment at their site on a regular basis. It would be difficult if not impossible for the operators or guides to promote their conservation values at the site, as identified in an earlier chapter, as there is no management plan for the site and without substantiating data it is unwise to suggest that the colony is healthy, thriving and sustainable.

### **6.3.8 Summary of Findings – Low Head Case Study Two**

The objective in reviewing this case study site was to determine if the colony used for commercial tourism purposes at Low Head was sustainable. In particular I desired to gather information about the case study site through:

- field observations;
- interviews with key informants and relevant management authorities;
- review of relevant documentation relevant to the case study site; and

- surveys of Little Penguin visitors.

For the Low Head case study site the first three of those requirements were met and the subsequent remarks are based on information gained from those three activities. It is timely at this point to revisit the requirements for the site under the framework legislated in the *National Parks and Reserves Management Act, 2002*. This Act was examined in Chapter 5, but it is appropriate in the summation of this case study site to re-assess the schedules, and to make comment regarding the performance at the site against those schedules. It should be noted that not all schedules are addressed, rather just those considered to be relevant to this case study site. The legislative framework which includes measures that should protect and enhance the site at Low Head does not provide the site with adequate protection.

In Figure 31, I have provided the schedule detail in relation to the *National Parks and Reserves Management Act 2002, Schedule 1* and provided a comment in relation to the Low Head case study site and that schedule:

<b>National Parks and Reserves Management Act 2002; Schedule 1</b>	<b>Comments</b>
To conserve natural biological diversity;	As official counts are not conducted and no base line data is available it is not possible to determine if the colony diversity is conserved.
To provide for the controlled use of natural resources, including as an adjunct to utilisation of marine resources;	There is no management plan or monitoring of resources to determine any effects tourism is having at the site or on the sustainability of the colony of Little Penguins.
To provide for the taking, on an ecologically sustainable basis, of designated game species for commercial or private purposes, or both;	There is no management plan for the Conservation area and therefore it is understood there is no such activity as it would be impossible to determine while taking of game if it was on an ecologically sustainable basis unless official counts were available and management plans in place to determine the sustainability of that "taking".
To provide for other commercial or industrial uses of coastal areas;	Low Head Penguin Tours have an exclusive license and under the current agreement no other party will be granted a license to operate.
To encourage education based on the purposes of reservation and the natural or cultural values of the conservation area, or both;	NRM North have made attempts to implement a communication strategy, through school based activities, brochures, and a community survey, and have conducted activities such as making concrete burrows for location on the site with school children. These new burrows have been haphazardly located on site but are not occupied due to their locality. Additionally attempts to involve the community in re-vegetation projects have been attempted, and these have met with limited success. NRM North and NRM Tamar report mixed success for these initiatives saying it has been difficult to get the local community involved (NRM Tamar, NRM North 2009)
To encourage research, particularly that which furthers the purposes of reservation;	NRM North, NRM South, Birds Tasmanian, UTas, Tourism Tasmania and Tamar NRM have been supportive of this thesis, as has Parks and Wildlife. The operator after initially providing access and support withdrew that support after objecting to questions on the visitor survey, attempts to remedy the situation were unsuccessful.
To protect the conservation area against, and rehabilitate the conservation area following, adverse impacts such as those of fire, introduced species, diseases and soil erosion on the conservation areas' natural and cultural values and on assets within and adjacent to the conservation area;	The operator is not obliged under their exclusive lease arrangement to undertake any rehabilitation or conservation works. NRM North and NRM Tamar have undertaken some re-vegetation work at the site with limited success due to adverse coastal conditions. Additionally they have been monitoring the infestation of the African Boxthorn and are contemplating the correct action considering that the only vegetation species providing habitat cover for the resident, Little Penguins is the African Box thorn and any attempts to remove it without providing adequate alternative cover would be detrimental for the sustainability of the colony. Parks and Wildlife, due to resource constraints do not have any activities planned for the site in the foreseeable future. The weed Sea Spurge is becoming established.
To encourage appropriate tourism, recreational use and enjoyment (including private uses) consistent with the conservation of the conservation areas' natural and cultural values;	The operator has been conducting Little Penguin tours at this site since 1992 under license. This license does not prohibit other recreational users of the site.

**Figure 31 National Parks and Reserves Management Act 2002, Schedule 1 and commentary**

There is little doubt that the Low Head site represents an area where Little Penguin Commercial tourism has operated for an extended period of time. It is also an area that was exploited heavily by European settlement from as early as 1804. As a consequence settlement and farming activities have been deployed in the area and have over time removed most of the native vegetation, and allowed weeds and predators to invade the site. Therefore it is probably not surprising to the reader that the Low Head case study site is considered by the researcher to be the most degraded and vulnerable site of the three case study sites. Its vegetative state is described by The LIST to be in a grossly altered state with predominately a weed covering and with very remaining natural vegetation species left at the site. Observations during onsite inspections support the view that the site is void of natural vegetation, is weed infested and has some areas where soil erosion is occurring.

The Little Penguins which have colonised this site are in turn impacted by these factors. To what extent is impossible for the researcher to ascertain at this time as there have been no surveys completed to determine colony numbers since the Iron Baron Oil spill in 1995. Such a survey would be required, providing base line data. In subsequent surveys it could be established if the colony was declining under these pressures or not. The apparent lack of community interest, support and efforts is obvious at Low Head; it appears the community shows little interest in the conservation of the Little Penguins. The removal of coastal vegetation continues and animals are allowed to roam sometimes attacking wildlife. There appears to be a lack of interest in the rehabilitation of the site. In stark contrast is the community interest at Phillip Island. Phillip Island in their annual report acknowledges the crucial work that the communities do at their site, saying: *Community members have worked over many years to preserve lands which are today part of the Nature Park. Individual families on the Island donated some sections of the Nature Park. Local community groups and volunteers make an invaluable contribution to the work of the Nature Park in habitat rehabilitation and maintenance, interpretation and natural and cultural conservation* (Dakin, 2006:6).

Farming activities have a long history in this area, the grazing of sheep on the case study site continues on the site through an informal lease arrangement with Parks and Wildlife. The sheep impact on the colony of Little Penguins by keeping grasses short, preventing re-growth to occur and forging tracks through the vegetation where Little Penguins burrow, opening the cover up to the pressures of wind and erosion and to visiting tourists who also subsequently use these tracks.

The tourism enterprise at the site while generating significant income for the operator and fees for Parks and Wildlife appear not to benefit the site or Little Penguins. Rather tourism increases the stress on the birds by the close viewing techniques favoured by the operator.

Housing development pressures associated with development at the site have arguably been in existence since settlement in 1804. Coastal vegetation has been continually removed at the site, with this evident in the burnt out skeletons of the African Boxthorn, generally around the coastal area. With settlement and people come their pets, predominately cats and dogs, and it is assumed (due to lack of data) that these animals have some effect on the population, to what extent it is impossible to ascertain. Phillip Island in their management plan remove around 80 cats per year from their conservation area, and Bruny Island in their one and only cat eradication program removed 80 cats from that general area.

The lack of research data for the site is problematic when considering the sustainability of the colony. It is impossible to determine the health and wellbeing of the colony without such information and any information currently available is purely of a speculative nature and without a reliable basis.

The matrix highlights the biggest perceived risk to colony sustainability at this site which is used for commercial tourism as:

- loss of habitat is evident at the site;
- climate change - a one-meter sea level rise would inundate some burrows. Whilst warmer temperatures are expected to reduce food availability for breeding seabirds leading to a reduction in breeding success. Little Penguins are altering their breeding time in response to warmer temperatures (CSIRO, 2009);
- predation from cats is known to occur, no monitoring or trapping program is evident the damage is unquantifiable;
- dog disturbance – dog management, dog fencing and signage prohibiting walking dogs in the colony is evident;
- fire could destroy the African Boxthorn the only vegetation providing habitat cover for the Little Penguins;
- tourism pressure is evident at the site, large open tracks are evident in and around the colony where visitors walk to view the penguins;
- disturbance during sensitive breeding seasons – there is no evidence to suggest that sections of the colony are isolated in sensitive breeding seasons;
- impacts from grazing is evident at the site, grass is short, sheep open up tracks, increasing the wind exposure for the remaining habitat of the African Boxthorn;
- heavy weed infestation is evident at the site;

- there is no evidence of Little Penguin deaths caused by local traffic;
- oil spill, the colony is located on the mouth of the Tamar River a heavily used sea traffic river and another oil spill is a possibility; and
- gill-nets were not evident at the time of any inspections at the low head site.
- a high impacting event – oil slick;
- lack of management plan and adequate interest and resources;
- community apathy; and a
- lack of research data.

In this chapter the researcher has considered and responded to Ballantyne statement/hypothesis in relation to this site: *There is evidence that in some settings, visitation leaves imprints that can have cumulative and substantial negative impacts on wildlife and habitat. These impacts include injury, stress or death of animals, disruption to foraging, nesting or breeding behaviours; habituation to humans, destruction or alterations of animal habitat and changes to animal feeding patterns* (Ballantyne *et al.*, 2008). It appears to the researcher that such an accumulation has occurred at the Low Head site.

## **6.4 Case Study Three - Bicheno Penguin Tours**

### **6.4.1 Introduction**

Bicheno Penguin and Adventure Tours operate from a coastal site on the East Coast of Tasmania as depicted in Figure 32. The joint operators, the Wardlaw and Male families have operated a wildlife Little Penguin Tourism experience since 1992 at a site approximately six kilometres north from the beachside town of Bicheno. The land area of approximate eight hectares is home to an estimated colony of approximately 600 Little Penguins, who breed on the coastal strip (Operator Interviewee # 2). On Diamond Island, which is directly opposite the site used for the Bicheno Penguin and Adventure Tour operation, there are thought to be 200 Little Penguins breeding (Operator Interviewee # 2).

The site of the Bicheno Penguin and Adventure Tours is important to the research as it represents a Little Penguin wildlife viewing operation which has been operating for over 15 years at the same site. Therefore it appears to represent a site similar in age and use to the case study site at Low Head, which has also been operating for a period greater than a 15-years.

It is also a commercial enterprise which operates under lease conditions and a commercial operator license, also similar to the Low Head site. This provides the researcher with an

opportunity to analyse the license or lease conditions imposed on both sites and to consider any differences in lease conditions or other parameters, as well as other factors which may contribute to penguin sustainability.

The site is also important as it is directly opposite, and very close to Diamond Island, which is according to Parks and Wildlife an important breeding ground for marine birds including Little Penguins. Diamond Island was classified as a Nature Reserve in 1977 due to its status as a regionally important little penguin-breeding site (McCuaig *et al.*, 2002).

In 2002 the Small North East Island Management plan was developed in accordance with the *National Parks and Reserves Management Act 2002*, within that document the authors adapted a *Key*, first developed by Brothers *et al.*, 2001. This *Key* assisted the authors of the Small North East Island Management plan to represent the native species on the islands and their susceptibility to habitat destruction and their degree of susceptibility to human disturbances. The *Key* states that Little Penguins are a species moderately susceptible to human interference, and their habitat is highly susceptible to habitat destruction. McCuaig research work of 2002 indicated that Little Penguins are largely extinct on mainland Australia; the work also outlines the impacts on penguins from a number of activities or factors: *Penguins breed mainly on islands in temperate seas off the south coast of Australia and around the coast of New Zealand. This species' Australian stronghold is in the Tasmanian region with birds nesting on many islands either in burrows or rock crevices, where it is possible for them to gain access to the sea. They are largely extinct from many mainland Australia sites due to the impact from dogs, cats, foxes and coastal development. Threats to their Tasmanian island breeding sites include oil spills, fire and drowning in gill-nets* (McCuaig *et al.*, 2002).

The impacts which have been espoused in the Small North-East Islands Draft Management Plan (2002) will be explored along with other aspects of sustainability for Little Penguins, with a particular focus on the tourism operation.

#### **6.4.2 Site description, use and regulation**

The site at Bicheno has been the subject of a lease by the tourism operators under a five year commercial leasing arrangement from the Tasmanian Government via the agency, the Parks and Wildlife service. The site area is surrounded by private land tenure to the west, which is used for grazing and tourism accommodation and includes the Diamond Island Resort, and has the ocean and Diamond Island to the East.



**Figure 32 Site of the Bicheno Penguin Tours (Google Earth)**

Diamond Island has around 200 breeding pairs of Little Penguins; the operators of the Bicheno Penguin and Adventure Tours believe that around 300 pairs of birds also breed on their leased site, which is directly opposite Diamond Island (Operator 2009)

The infrastructure at the site is a track from the main road down through private farming land to the coastal reserve strip and a turning circle in which the twenty seater bus can manoeuvre. Further towards the sea a small shed provides a place for tools and equipment and houses the lighting infrastructure components used to eliminate the penguin tour path at night.

The Male and Wardlaw families operate Bicheno Penguin and Adventure Tours. They have an office and tourism outlet in the town of Bicheno and it is from this site that they operate the Bicheno Penguin and Adventure Tours. Visitors interested in a tour book through various mechanisms and meet in the late afternoon. The operators transfer visitors to the colony via their twenty seater bus in groups of twenty, when the tour is finished visitors are ferried back to the office where they can depart to their individual transport or to the various accommodation houses in the town. The bus continues this procedure until all visitors have been returned to Bicheno, taking around 2.5 hours to complete the transport to the colony, penguin viewing and transport back to Bicheno.

The site is a narrow strip of land which runs along the coast and comprises around eight hectares of land, it is a modified site, with some weed infestation, but it also comprises healthy indigenous specimens which provide good cover for the Little Penguins. Alongside the colony on one side are commercial tourism (accommodation) units and on the other side a commercial sheep grazing operation. Both these operations place some impost on the Little

Penguins. The modified habitat of the Bicheno Penguin Tours includes the following vegetative species.

Native Flora	Introduced species
Native grasses	African Boxthorn; <i>Lycium Ferocissimum</i> ,
boobialla	Hawthorn
Coastal wattle; <i>Acacia sophorae</i>	Blackberry
Pig Face; <i>Carpobrotus rossi</i>	Boneseed
Melucca	Thistle
Coastal saltbush. Creeping ground cover. <i>Rhagodia candolleana</i>	Introduced grasses
Spreading flax-lily (purple berry) <i>Dianella revoluta</i>	
Dolly bush; <i>Cassina aculeata</i>	
Boobialla; <i>Myoporum insular</i>	
Coast wattle; <i>Acacia sophorae</i>	

Figure 33 Native Flora and introduced species at Bicheno Little Penguin Tourism site area, (Operator Interviewees #1 and #2 2009).

Unlike the colony at Bruny Island, Bicheno’s Little Penguins do not share the colony with Shearwaters, rather the Little Penguin have an exclusive breeding on the coastal strip, their breeding ground appears to extend south of the Blow hole in Bicheno, along the coastal strip beside the town and north to the area which is leased by Bicheno Penguin Tours a distance greater than fifteen kilometres along the coast line.

The coastal strip is mostly a rocky outcrop to the sea, with one small beach and sand area. There are introduced species such as rabbits, but most of the management problems come from wandering domestic and wild cats and dogs from the local town (Operator Interviewees 1 and 2). Visitors can access the colony from the beach, by boat, through Diamond Island Resort private land, or if they have authority, through private farming land.

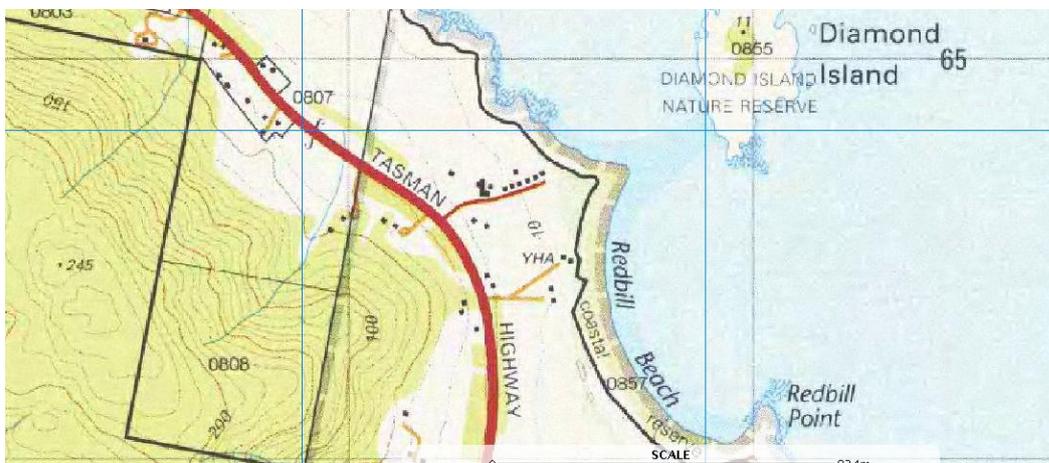
### 6.4.3 Theme 1: Governance and management

The land utilised by the operators for their penguin wildlife tourism experience is classed as Public Reserve under the *Crown Lands Act 1976*. Public Reserve is subject to the legislative requirements as depicted in Chapter Five.

All operators who utilise land, classified as a Reserve are required under the *Crown Lands Act 1989* to obtain from the Parks and Wildlife Service a Commercial Visitors License (CVS). One of the key objectives of this license agreement is to ensure that the tourism operator

provides visitor services which are ecologically sustainable in the longer term (Parks and Wildlife, 2004).

Bicheno Penguin Tours have a Commercial Visitor Service License (CVS) which gives them authorisation to conduct a business on an area managed by the Parks and Wildlife Service. As part of their license agreement conditions, operators are required to have an operations plan which includes an environmental risk assessment and actions taken to mitigate (Parks and Wildlife 2009). However such operational plans were unable to be sourced from Parks and Wildlife, it is not known if the operator has provided such an operator's plan to the Parks and Wildlife Service.



**Figure 34** Bicheno site is classified under the Public Land Classification as Public Reserve (The LIST).

Parks and Wildlife are satisfied with the current performance and management of the tourism operation and believe it takes pressure away from other penguin sites and colonies. Parks and Wildlife believe the operator has a genuine concern for the welfare of the penguins and have a good philosophy of caring for the colony, undertake crowd control measures, ensuring no more than 60 people are in the colony at one time. Generally Parks and Wildlife considered that people/visitors are managed appropriately at the colony; a bus will take a group of 20 people to the colony, in waves; three or four buses are common per night, depending on holidays and seasonal issues (Parks and Wildlife Interviewee # 1). The site is actively managed by the operators; they undertake such activities as, re-vegetation, instillation of new nesting boxes, removal of stray dogs and cats, fencing, maintenance of tracks, and the development of exclusion zones, preventing visitors from accessing some sensitive areas (Parks and Wildlife 2009). *Some re-vegetation and vegetation conservation has occurred on the site, more could be achieved, said the operator, especially with more grasses and native trees (Operator Interviewee #1). If vegetation on the site was under threat so would the*

*penguin colony; they are intrinsically linked, and it is in everyone's interest to ensure colony sustainability (Parks and Wildlife Interviewee #1).*

This can be achieved through improved understanding of penguin biology, managing introduced species and wild and domestic cats and dogs. Under present licensing arrangements, Parks and Wildlife have the authority to ask licensee's to undertake training; however this has not been requested at this point in time (Parks and Wildlife Interviewee #1).

#### **6.4.4 Theme 2: Public perception and appreciation of Little Penguins**

Parks and Wildlife suggest that the public in the municipality have a limited appreciation of the value of the Little Penguin colony at Bicheno. Spending patterns in comparison to Phillip Island's return from visitor spending is low, possibly due to a range of factors which could be explored in a subsequent thesis study, but it is thought to be a Tasmanian model which puts a relatively small value on the viewing of Tasmanian wildlife, as these are arguably perceived to be in abundance (Parks and Wildlife Interviewee #1). Greater public appreciation may have an improved environmental, social and economic impact. If locals assisted visitors to participate in a commercial wildlife tour, the impacts on unregulated sights would be reduced and more tourism dollars would flow into the community. However locals regularly encourage visitors to view penguins at unregulated sights. This has two effects, increased pressure on penguins at unregulated sites, and less economic return for the town, additionally the perception that wildlife has little value perpetuates in the community, this can be observed to be in direct contrast to commercial Little Penguin tourism enterprise such as Granite Island and/or Phillip Island where the return from tourism is higher, which in turn facilitated the increased and continual investment in the local area, in improved conservation measures or local infrastructure. *Local knowledge, empathy and expectations are relatively low and entrenched paradigms which support the concept that "free" is best and "secrete locations" exist hinder the ability of the community to take full advantage of the uniqueness of the Little Penguins in the area (Parks and Wildlife Interviewee #1, 2, 3). There is a perception that Tasmanian visitors have low access to disposable holiday funds, and that Tasmania should continually provide, "a free add on" (Parks and Wildlife Interviewee #1, 2, 3). Often recommendations are made by shack owners, B and B operators and or hoteliers, for visitors is to access free viewing of Little Penguins by either going to the beach in front of the local hotel or the Bicheno Blow Hole. This type of informal visitation puts more pressure on these colonies which are unprotected and takes valuable tourism dollars away from the local operator (Parks and Wildlife Interviewee # 3).*

A suggestion from Parks and Wildlife was for locals to receive free access to the penguin tour when accompanying visitors and their guests; this would support the local operator. Increasing the tourism return from the tourism venture, would take pressure off other sites and Little Penguins and would allow the operator to invest in improved infrastructure. At the same time it is clearly acknowledging that Little Penguins are a significant resource to be valued by the community and the operator. Free access is not effective method of valuing wildlife or assisting their sustainability, say Parks and Wildlife interviewees, rather when people have to pay for the experience it places an appropriate value on that activity, Parks and Wildlife use the success of Phillip Island as an example. *Accumulative value back to the local community is low when compared to Phillip Island where visitors are charged \$79.00 for a tour such as Bicheno provides for \$20.00* (Parks and Wildlife, interviewee #1). *It is perceived that Tasmania has an abundance of wildlife, therefore their values is less* (Parks and Wildlife, interviewee #1). *There is a clear opportunity for a greater revenue stream and income for the community; with our tours being conducted at twilight visitors require local accommodation and meals* (Operator Interviewee #2).

Parks and Wildlife comment that the life cycle of the bird is not clearly understood by the public, visitors to a commercial site get the benefit of comprehensive information about the Little Penguins which should encourage continued support for their preservation.

Such public perception is problematic for the both the Bicheno Penguin Tours and for the general welfare of the Little Penguins in the vicinity, explained both the Operators and Parks interviewees. When unregulated viewing at non designated sites occurs, the potential for damage increases, with disturbance to penguins, from human interference including dogs, habitat is damaged, destroyed or removed. *It is much more preferable for us that viewing occurs at designated sites, it takes the pressure of other sites which aren't regulated* (Parks and Wildlife Interviewee #2).

Unregulated viewing can have impacts on Little Penguins; if penguins returning from the sea are delayed (from relieving their mate and feeding chicks) there can be detrimental consequences on breeding success (Cochrane 2009).

Locals complain about the Little Penguins, saying they are noisy and smelly; they are troublesome because they want to nest under their shack, under the house, in the boat shed, even under the dog kennel, but the Parks and Wildlife and the operators say it's a matter of education, helping people, the locals to understand that they have something very special in

their midst, Little Penguin colonies, and far from being troublesome they are an unsurpassed asset to the community.

Interestingly, five thousand visitors to Bicheno would return \$100,000 gross income to the operators, however based on the figures that Phillip Island charges the same visitors would return around \$375,000 (Phillip Island, 2010). Both Parks and Wildlife and the Operators suggest that the tour that visitors to Bicheno can enjoy a much closer contact with Little Penguins than the experience at Phillip Island, where visitors are required to remain either on platforms or seating arrangements while viewing the penguins. At Bicheno, people can be just a few inches from the penguins as they try and pass, sometimes between people's legs to get to their burrows. *People should realise that we are the custodians for these unique little creatures* (Operator Interviewee #1).

#### **6.4.5 Theme 3: Threat to population sustainability – introduced predators**

There are many potential threats to the viability of Little Penguin populations therefore it is important to identify those which may have an impact on long term survival of the population at Bicheno. Experimental learning could be a viable method for Tasmanian governing bodies to identifying what experience and evidence have concluded at other sites where the sustainability of Little Penguin colonies is important. Phillip Island is one such place where experimental learning together with scientific research has helped to build a knowledge bank relating to sustainability of Little Penguin colonies (Dann 1996).

The researcher suggests that we can draw on this knowledge and experience to formulate the management plans necessary to ensure sustainability of the colonies in Tasmania which are exploited for commercial tourism purposes, as Claridge suggests, predators can have a significant impact on seabirds: *Perhaps the greatest potential problem for breeding seabirds from exotic animals arises from the introduction of predators, particularly dogs (Canis familiaris), foxes (Vulpes vulpes), cats (Felis catus) and rats (Rattus rattus, Rattus norvegicus)* (Claridge 1977:29).

At Bicheno the threat of introduced species is evident, and confirmed by the operators; the most significant direct threat at the Bicheno colony has been and continues to be destruction caused by roaming cats and dogs in the reserve (Operator Interview # 2).

Dog management continues to be problematic for Parks and Wildlife. Under the current legislation, *the National Parks and Reserve Management Act 1999* and the *Dog Control Act*

2000, Parks and Wildlife rangers have limited ability to prevent dogs re-offending (Operator Interview # 2). *The control of cats and dogs is paramount for the breeding success of the colony. Dogs can kill for the sport and when in a pack can inflict carnage on 100 birds or more in a single night. Cats can target young fledglings whose parents are out fishing, (leaving them defenceless) (Operator Interviewee #2). Dogs are continually problematic for the conservation of the colony and Little Penguins when these animals are allowed to wander freely at night. They have done, and can do immense damage in a very short space of time. We capture dogs and cats, then they go back to the owner and we catch them again. Stronger control is required, a curfew would be good or a no dogs or cat policy in Bicheno would be better, we have even had a rock wheeler who ran amuck killing birds in front of our visitors (Operator Interviewee #2).*

It is suggested by the Operators there is an interconnection between the colonies of birds that breed at their commercial site and the birds that breed on Diamond Island. Often the impacts, the operators suggest, are interrelated and impact on successful breeding of Little Penguins in the locality generally. The Operators maintain there is pressure on the breeding colonies, which use the island. Such a suggestion appears to be supported by the Parks and Wildlife North East Small Island Management Plan 2002: *Pressures on small islands worldwide, such as fisheries interaction, marine and terrestrial pollution and disturbance to breeding birds and their habitats..... When surface-nesting birds are directly disturbed or constantly disrupted by noise or activity, they will desert nests and nesting sites, in some instances, never returning. Their breeding success can be interrupted for years. Burrow-nesting birds are put at risk by trampling of their burrows and disturbance to vegetation (Salm et al., 2000, cited in North East Small Island Management Plan 2002).*

Despite Parks and Wildlife signage prohibiting dogs from the island, dogs are frequently observed on the island. It is unknown what damage dogs and cats do to this population (Operator Interviewee # 2) it could be argued that the colonies at Diamond Island and the site subject of this research are the same colony. While the relationship between the birds separated by the short expanse of high tide water is not clear, it is possible that the sites are related in regard to sustainability of the colony in general and with regard to the biodiversity of the birds who may seek partners from one site or the other. Schreiber explains that the biological gene pool is important: *In order to optimize reproduction success birds must choose a mate that will enable them to produce as many high quality offspring as possible a mate whose geno type will allow the offspring to inherit the best combination of genes*

(Schreiber *et al.*, 2002:279). The operators stated that there concern for the Little Penguins, which inhabit the island: *It is not known what damage dogs and cats do to this population as there is no data collection activities associated with the Little Penguin Colony at Bicheno at this time* (Operator Interviewee #2). *The ability of PWS staff to protect native fauna from dangerous dogs is difficult, Dogs need to be declared dangerous, and virtually be caught re-offending before Parks and Wildlife can intervene* (Operator Interviewee #2). *We get worried about the colony at Diamond Island, the colony there is accessible by land or sea by anyone at any time, people take their dogs there, even though signs say they can't, its completely unregulated, and we have no ability to protect these birds from intrusions, it can be distressing at time, it is an important breeding ground, perhaps the largest in Tasmania, the laws should be enforced to protect the birds there* (Operator Interviewee #2).

The operators have their own cat control program operating, and over the years say they have removed hundreds of cats from the colony. It is an ongoing battle they wage, enticing cats to a trapping cage with sweet smelling liver (Operator Interviewee #1). The problem of cats ,like at other Little Penguin Colonies such as Philip Island, is troublesome for managers and represents the most significant threat to sustainability of the colonies.

Cat management at Philip Island appears a problem which is not abating; with numbers trapped each year continuing to stay relatively consistent (Phillip Island Management Plan 2009). At Bicheno anecdotal evidence suggests their problem of cats is not abating either (Operator Interviewee #1). *Since we started getting rid of the cat's numbers of penguins have gone up from 32 pairs to 600 pairs since 1995* (Operator Interviewee #2).

While the numbers discussed by Operator Interviewee #2, regarding the population increases which he contributes to the removal of cats from the colony are significant, the researcher is reminded that scientific data collection has not been instigated at the colony, nevertheless this anecdotal information is important to this thesis. The differentials between wild cats and domestic cats are also not understood, by the operators: *We catch about 30 – 40 cats each year, It is hard to know if these cats are pets or wild, mostly we destroy them* (Operator Interviewee # 1).

The destruction caused by cats and dogs continues to be problematic for the colony as previously discussed in this chapter: *Cats are continually problematic for the colony; animals are allowed to roam free at night, and have done and do immense damage in a night, targeting defenceless young birds. We have a cat trapping program, we catch the cats, in*

*some cases they go back to the owner and then we catch them again. Stronger control is needed; we need a 'no' cat or dog policy in Bicheno, or a curfew (Operator Interviewee #2).*

Additionally it is suggested by the Parks and Wildlife that improvements in legislation would assist rangers to be more effective in this area as in the current legislation, the *Vermin Control Act, 2000*, cats are not classed as vermin (Parks and Wildlife Interviewee, #2).

The only classification of vermin under the Act, Section 3 is (a) fox; and (b) rabbit; and (c) any other animal or bird declared under Section 5 of the *Vermin Control Act 2000*; consequently there is little Parks and Wildlife can do without community support, Shannon, 2008. Parks and Wildlife have a limited ability to respond to dogs as mentioned previously in this chapter. *Alongside the activities that Parks and Wildlife can achieve; more assistance from the Tasmanian Police and greater assistance and self-management by the local population would be of significant assistance to conservation issues. The cat eradication programs which were conducted at Bruny Island, removing 80 cats in a year was used as an example of the type of activities which could also possibly be conducted at Bicheno. The Micro chipping of domestic cats would assist in the identification problems, which currently exist. Working closely with the Local government is a necessity (Parks and Wildlife Interviewees #1 and #2).*

#### **6.4.6 Theme 4 Threats to population sustainability – Tourism**

There appears to be several types of human interference of Little Penguins at the Bicheno site. One form of human interference comes from locals and visitors who feel that they should have free access into the colony at any time, and further, that they have the right to take their dogs in as well, either on a leash or off the leash. *Locals will stand up to us and abuse us if we try and keep them away from sensitive sites in the sensitive breeding season. Putting up signs to stop people walking into the colony is a waste of time, they only last a day. We have intercepted people trying to dig out Little Penguins to show their children; they just think it's their right, to walk right through the colony with their dog (Operator Interviewee # 2).*

Commercial tourism while not without its faults, does provide the colony with a measure of management and care (Parks and Wildlife 2009), however there are other types of visitors to Little Penguin colonies which are not of a commercial nature and are not regulated; it is these sites which cause the most concern.

There appears to be a general philosophy in Tasmania that suggests that the state has an abundance of natural attractions including flora and fauna, which result in suggestions to

visitors that Tasmanian's have secret locations which can be accessed, free of charge. "There is no need to pay for a Little Penguin Tour when I can share with you my secret location". This theory was presented by both by the Parks and Wildlife interviewees and the Tourism operators as occurring regularly, at Bicheno arguably; a "service" provided by hoteliers and Bed and Breakfast operators to their visitors.

The practice is detrimental to the local economy; they don't realize what damage they are doing by following this practice; to the Little Penguins at the Blow Hole and to the community in general. At Phillip Island the whole economy has momentum due to the number of visitors to the Little Penguins, people pay \$72 per person to view the Penguins from a platform, and here visitors can walk up close to the Little Penguins for just \$20 (*Parks and Wildlife Interviewee # 2*).

It was suggested by the operators and Parks and Wildlife staff that there was room for improvement and increased information and education for visitors, acknowledging the importance of education and the need to ensure commercial wildlife tourism is commercially sustainable, as with that sustainability comes the ability to work towards sustainable development, as espoused in Chapter 1, not only for the enterprise but for the colony the subject of that enterprise. *There is room for improvement in the dissemination of information to the public, and raising awareness of the need to look after something unique and special and to look after tourism business so they prosper and the town subsequently prosper* (Parks and Wildlife Interviewee #1).

Parks and Wildlife suggest that shack owners and business people in the community might respond more positively to sending visitors to the Bicheno Penguin Tours if they were able to accompany their guest free of charge themselves (Parks and Wildlife Interviewee #2).

Perhaps due to ignorance and lack of available information but frequently locals or visitors will bring in a little baby penguin they have found on the beach, unfortunately their best intentions has meant the Little Penguin will surely die. *They think because its standing on the beach or in the sand dunes on its own that its been abandoned, its not, its simply waiting outside its burrow for mum or dad to come home and feed it, when little babies are bought into us like this, which happens quite frequently, they are virtually signing the death warrant for the bird, as its problematic trying to return the baby to the right spot* (Operator Interviewee #2).

A further type of human interference at the Bicheno site is from vandals. Vandals cause significant concern at the Bicheno site; attacks by predominately, young men using sticks and golf clubs on penguins, fledglings and eggs continues to be distressing for the Operators.

*Two vandals a 19 year old and a 21 year old, both males, killed penguins in front of visitors, crushing eggs, and breeding pairs, by lifting the lid of boxes and crushing the bird inside with rocks; we were dismayed at the fairly seemingly minor repercussions on the men resulting from police action (Operator Interviewee #2). We as operators are powerless to do much about this behaviour, as Parks and Wildlife staff operate predominately from 9 to 5 getting a ranger after hours is a difficult proposition, and it is largely left to us to manage a situation, which is virtually an impossibility (Operator Interviewee #1).*

Clearly the behaviour of some young men is distressing and problematic for the operators. Such behaviour has clear ramifications on Little Penguin welfare; additionally there are possible ramifications of an economic nature; if for example visitors boycotted the tourism attraction anticipating further similar behaviours of locals, or fears that the operators do not have the welfare of the Little Penguins in mind. *One tour was cancelled and we had to refund the money (Operator Interviewee #1).*

In relation to the development of good-practice tourism guidelines, the topic of this thesis; it is important for tourism operators to portray an ongoing respect and appreciation for the wild nature of this tourism experience. Indeed the principle on which wildlife tourism is based is sustainability of the wildlife that is viewed during the experience. Destruction of the Little Penguin and their eggs is clearly thought to be intolerable by the operator and methods discussed which would raise the level of awareness and appreciation of the Little Penguins in a local context should be instigated.

From governance prospective the operators have little ability in their own right to prevent access to the colony by other people (people not on an organised tour), and have no formal ability to stop such wonton destruction. *The police are the only ones who have the power to arrest, which has happened in the past, sadly but very little comes of it (Operator Interviewee #2).* To emphasise the importance of influencing human behaviours, Ballantyne and Packer make the comment; *There is increasing subscription to the viewpoint that humans are an integral part of nature and that conservation must occur in varying degrees ... thus interpretive messages and experiences need to be designed not only to meet immediate on site*

*needs, but also to contribute to enhanced wildlife conservation awareness which visitors may take with them* (Ballantyne and Packer 2005 in Ballantyne *et al.*, 2008).

The impact risk assessment I have prepared for Bruny Island is depicted in Figure 35. This is based on a model adopted from Brothers *et al.*, 2001 and is meant to highlight the current impacts I have identified for the site.

- \* Low priority risks – risks that current or may potentially result in minor loss of Little Penguins
- \*\* Moderate risk – risks that currently or potentially result in moderate loss of Little Penguins
- \*\*\* High risk – risks that currently or may potentially result in the significant loss of Little Penguins

Rating	Disturbance
*	weed infestation
*	loss of habit
**	road kill
*	climate change
*	impacts from grazing
**	fire risk
***	predications from cats
***	attacks by dogs
*	oil spill
***	tourism pressure
*	gill nets and recreational fishing
**	disturbance to penguins during breeding seasons

Figure 35 Bicheno Risk Matrix, adapted from Brothers *et al.*, 2001

#### 6.4.7 Theme 5 Indirect threats to population sustainability

Little Penguins nest at this site in burrows, which are either a hole in the ground, in man made structures such as concrete burrows or wooden structures, and in natural hollows made by rock formations and under vegetation, including the African Boxthorn (*Lycium Ferocissimum*).

Little Penguins in the vicinity of Bicheno Penguin Tours nest not only in the leased area, they also nest across the sheep grazed paddocks, across the highway and into the hills, farmland and house yards beyond, some two kilometres from the ocean, making that trek both at dawn and dusk to and from the sea. *They also like to nest under sheds, upturned boats, under houses they cross the road, go under shearing sheds and even have been known to nest under dog kennels* (Operator Interviewee #1).

Little Penguin burrows which are outside the fenced coastal strip zone are impacted by grazing sheep; there is loss of cover and change in vegetation species and removal or decline of native habitat species favoured by the Little Penguins in the paddocks. Such removal of native vegetative cover increases the vulnerability of the Little Penguins to sustain their co-habitation existence with introduced species such as sheep, and forces them to make their nests in other spots, less favoured by humans, for example, under houses and sheds. The operators do make conscious efforts to increase the areas suitable for nesting and burrows; several concrete nesting structures have been made by the operators and are located in and around the subject site, even in the bus turning circle in the car park, the concrete nesting structures are occupied.

Grazing and housing developments have had and continue to have impacts on the distribution and abundance of penguin in some areas this is due to habitat loss, trampling of burrows, weed infiltration, pressure from grazing and vermin increases, (Harris and Bode 1981, Fortescue, 1995 as cited in Dann 1996). At Bicheno grazing activities do impact on the Little Penguins, the penguins while they do nest in adjacent paddocks are generally fairly restricted and limited to the narrow coastal band, which can be identified in Figure 36.



**Figure 36 2009 view of the Bicheno Little Penguin colony site adjacent to a major tourism structure in the distance and grazing land to the right (photograph by Wendy Mitchell)**

Such removal of native vegetative cover increases the vulnerability of the Little Penguins to sustain their co-habitation existence with introduced species such as sheep. Removal of

vegetation and penguin habitat increases the likelihood of penguin looking for alternative accommodation, with interesting results suggests the Operator: *Locals are fairly tolerant when Little Penguins nest in the garden, but they are not happy when the penguins nest under their houses, they don't like the noise or the strong fishy smell, and penguins can talk all night* (Operator Interviewee #1).

The issue of grab all nets was raised by Parks and Wildlife staff, these nets are permitted for use by recreational fishermen on the Tasmanian Coast; Tasmanian is the only state to permit the use of grab all nets; Parks and Wildlife recognise the destruction the grab all nets can cause as they say on their portal: *Thoughtless activities also cause problems for Little Penguins when fishermen put their grab all nets close to rocks and a Penguin Colony* (Parks and Wildlife, Interviewee # 1).

Park and Wildlife team say that the nets are very destructive, they capture everything and everything caught, dies. The operators also mentioned floundering as an activity that can also cause disruption to the Little Penguins; while people are floundering in the shadows with lights and spears, the Little Penguins delay coming ashore (Operator Interview #2). Despite the Little Penguins classification as a marine animal under the *Living Marine Resources Act 1995*, it would appear they are still dying in grab-all nets (gill-nets) on Tasmanian coasts (Operator Interview #2) an argument support by Woehler: *Birds Tasmania has great concerns for the Little Penguin (Fairy Penguin) population in Tasmania. Recent surveys in 2002 clearly indicated substantial decreases in many colonies in the east and southeast of Tasmania. While gill netting is not the sole contributor to this decrease, it is one factor that can be addressed relatively simply and easily – by the banning of gill nets within 1km of penguin colonies. With almost 9,000 registered gillnets in Tasmania, there is a very real potential for these “wildlife interactions” to have a significant impact on the populations of seabirds caught in these nets. Gillnets are deployed during the summer breeding season of seabirds, and any drowning event will also invariably result in the death of any chick(s) in nests/burrows, as the single remaining parent is unable to feed the chick(s) in the absence of a mate. Thus the impact is not confined to the drowned birds; it is also the adverse impact on the season's breeding efforts, with the failure of the breeding pair involved to successfully raise their chick* (Woehler 2009:2).

On analysis, Dann's work clearly makes the connection between habitat loss and penguin sustainability at a site; 'It is clear that indirect threats such as habitat loss through weed invasion, erosion, grazing and housing developments have an impact on distribution and

abundance of penguins in some areas' Harris and Bode 1981, Fortescue, 1996 in Dann (2008).

At this study site, there has been some encroachment from housing development. A recent example of habitat destruction was provided when new operators purchased the Diamond Island Resort complex, this complex has seaside frontage, which joins the land leased by the operators of the Bicheno Penguin and Adventure Tours. The Little Penguin habitat (and a large part of the colony) is between the ocean and the Diamond Island Resort. Operators of the Bicheno Penguin Adventure Tours were notified that penguin habitat and sand were being removed from the area by heavy earth moving equipment. Quick action put a stop to the distraction, but the episode highlighted the apparent ignorance of the new owners in relation to the colony, the habitat and indeed to the *Tasmanian State Coastal Policy Act 1999*.

Some weed infiltration continues to occur at the Bicheno site and according to the operators including; African Box Thorn, *lyceum ferocissimum*, radiata pine, *pinus radiata*, blackberry, *Rubus Fruticosus aggregate*, thistle, and boneseed to name a few. The operators have an active management plan to remove weeds and replace these with native vegetative species; this is in contrast to the case study sight at Low Head where the operator does not get involved in such activities.



**Figure 37 Native Vegetation viability, (The List 2009)**

According to the Tasmanian Government website, the LIST, the vegetation under the category Native Vegetation Viability is listed as viable but at risk and is marked as orange in Figure 37. This classification description is; *A vegetation unit that requires significant management due to the presence of weeds and/poor has additional exposure to risk of degradation through the presence of roads, houses or cleared land* (Barker 2007).

Fortescue's research supports the theory that weed infiltration is problematic for Little Penguins and requires managements, indirect threats such as habitat loss through weed invasion, erosion, grazing and housing developments have an impact on distribution and abundance of penguins (Fortescue, 1996 as cited in Dann 2008).

Fire and rabbits can be problematic on burrows, contributing to the loss of vegetative cover and subsequent collapsing of burrows, additionally introduced weeds such as Kikuyu Grass, (*Pennisetum clandestinum*) is difficult for the birds to penetrate, Cape Ivy also reduces available space for burrowing seabirds (Dann, 2008). At the Bicheno site erosion caused by removal of vegetative cover and resulting from wind, or flooding damage is monitored by the operators of the site and appears to be adequately managed in accordance with leasing legislation (Parks and Wildlife Interviewee # 3).

Fire as mentioned above is potentially problematic for penguin habitat, at Bicheno the operators understand the potential threat from fire on the colony and have contingency plans in place as part of the risk assessment strategy. *We have industrial pumps on the ready, while we have some fresh water; in an emergency we could pump seawater onto vegetation, hopefully averting a wholesale disaster* (Operator interview #1).

A further potential predator has the capacity to inflict untold damage is the fox; currently it is unclear about fox establishment in Tasmania, although fox scats have been confirmed to have been collected (Parks and Wildlife 2010). Both the operator of this wildlife tourism site and the Parks and Wildlife staff interviewed, indicated that they are aware of the possible implications of foxes becoming established in Tasmania and hope that it does not occur as it is suggest that they would have a far greater impact on the colony if established than both cats and dogs do at present. *If foxes became established in Tasmania it could be devastating on Little Penguin colonies, but the Government continue to monitor the situation* (Parks and Wildlife Interviewee #2). Foxes continue to be problematic at Victorian Little Penguin colonies including Phillip Island (Dann *et al.*, 2006).

The principle on which wildlife tourism is based is the continuing sustainability of the wildlife that is viewed during the experience. Therefore it is important for tourism operators to portray an ongoing respect and appreciation for the wild life the subject of their wildlife tourism experience

Little Penguins killed on roads can be problematic for a colony a problem arguably exacerbated by the precondition of Little Penguins being faithful to their nesting sites

(Shaughnessy *et al.*, 2008). In Victoria, causes of death of Little Penguins, *Eudyptula minor*, found dead at Phillip Island and other coastal areas of Victoria between 1983 and 1987 were determined by post-mortem examination. Adults from breeding colonies were generally in good nutritional condition and had no major parasitism or other disease: deaths were mainly due to trauma from predation or road traffic (Harrigan 1992). Road deaths are a frequent occurrence in the Bicheno area, and arguably contribute to a significant loss of life; Each Little Penguin killed on the road impacts on hatching success, therefore colony sustainability, for without a returning parent to assist with incubation of the eggs and or feeding of subsequent chicks, the prodigy is doomed as the waiting bird must eventually abandon the eggs or chick or risk starvation themselves (Croxall and Ricketts 1983 in Numata *et al.*, 2000). *Little Penguins are frequently killed on the local roads, accidental death of Little Penguins on the roads; we estimate to be around 200 per year* (Operator Interviewee #1).

Such a heavy death rate of penguin due to road facilities would equate to around 20% of the estimated colony at the Bicheno case study site (Operator Interviewee # 2) and arguably is a significant loss to the colony. By way of an example; the effect of road mortality on Little Penguins living on the inside of the loop road on Summerland Peninsula in Victoria In 1984, was up to 20% of the population who lived there also. *Up to 20% of the birds were killed on the roads each year until a traffic control system was installed in the late 1984. Following the installation of this system, the mortality dropped to less than a few percent of the estimated numbers breeding within the loop* (Dann 1992).

Little Penguins are territorial and continue to inhabit their long-term burrows even when roads cut through their territory. They do breed on the other side of the road, and have to cross the road every night and morning. On dusk when the Little Penguins return to their burrows, and at dawn when they return to the sea, they are particularly vulnerable on the dark road surfaces as they cross: *They (Little Penguins) are virtually impossible to see, especially if they are walking away from the car lights, they are the same colour as the road* (Operator Interviewee #1). *There are reportedly very few efforts to prevent or reduce this carnage on the Little Penguin population evident* (Operator Interviewee #2).

The problem of road kill at this site appears to be significant based on anecdotal evidence from the Operator. Such a significant and ongoing yearly death count of Little Penguins impacts on the colony, as when a penguin dies, there is a potential loss of the offspring if that penguin was engaged in egg-laying, or chick-raising. Without a mate to relieve with

incubation and/or feeding of the young, the offspring cannot survive when the remaining penguin is forced from the nest due to the possibility of their own starvation (Obendorf and McColl 1980 as cited in Harrigan, 1992).

#### 6.4.8 Visitor survey results

A number of survey questions were devised to draw information from visitors to the wildlife experience. Fifty-three survey forms were either partially or comprehensively completed during the two evenings when surveys were conducted on site at the Bicheno Penguin and Adventure Tours at Bicheno, in Tasmania. The questions put to visitors are outlined below:

- motivation to visit a commercial Little Penguin Tourism site;
- satisfaction levels attributed to that visit;
- information provision;
- visitor responses to information;
- knowledge obtained from information provision;
- opinions on impacts from human activities at the site;
- behaviour modification information; and
- personal information.

#### 6.4.9 Visitor Characteristics

Question Seven as depicted in Figure 38, sought information on visitor origins, respondents were asked to provide their post codes.

Australian	Visitors by %
NSW	28.89
Qld	26.67
Vic	6.67
WA	4.44
NT	4.44
Tas	2.22
SA	2.22
<b>Total % Australian visitors</b>	<b>75.55</b>

Figure 38 Visitor nationality (n=53)

<b>International</b>	<b>Visitors by %</b>
Germany	6.67
UK	6.67
Hong Kong	4.44
USA	2.22
Belgium	2.22
Italy	2.22
<b>Total % International Visitors</b>	<b>24.44</b>

**Figure 39 Visitors origins, percentage responses against each question, (n = 53)**

As can be observed from Figure 39 Visitor origins, respondents (n=53) came from a variety of places, with the largest number of visitors coming from New South Wales at 28.89%, followed by Queensland at 26.67%, Germany, 6.67%, Victoria, 6.67%, the United Kingdom, 6.67%, Western Australia, 4.44%; with smaller number of visitors from the Northern Territory with 4.44%, Belgium with 2.22 %, Italy with 2.22%, Hong Kong with 4.44 %. The lowest proportions of visitors were from Tasmania with 2.22 % and South Australia also at 2.22%. The total percentage of international visitors was 24.22%. Australian visitors represented 75.55% of the total number of respondents.

In Question Eight respondents were asked to state their age. The results as shown in Figure 40, visitor respondents age range, This Figure shows that the largest percentage of visitors were aged between 19 and 26 years of age with a total of 26 visitors in that age range. This was followed by 22% in the 36 – 45 age range, 10% of visitors were in the age range between 56 and 65 years of age.

	<b>&lt;18 Year old</b>	<b>19 – 25 Year old</b>	<b>26- 36 year old</b>	<b>36 to 45 year old</b>	<b>46 – 55 year old</b>	<b>56 – 65 year old</b>	<b>65+ year old</b>
<b>Percentage of Visitors</b>	4%	26%	20%	22%	18%	10%	0%

**Figure 40 Visitor Respondent age range, percentage responses against each question, (n = 53)**

Female visitors represented a larger proportion of visitors to the site than men with 60% female to 40% males.

Question Ten, sought information from respondents on their affiliation with organisations involved in some form of conservation group, only one of the 53 respondents claimed membership of such an organisation, that being, Coast Care.

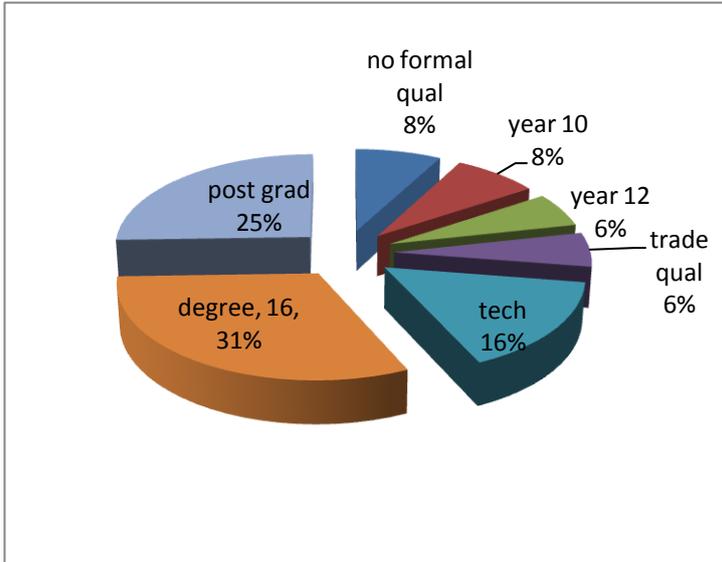


Figure 41 Respondents Educational standards, percentage responses against each question, (n = 53)

Question Thirteen, as depicted in Figure 41 sought information regarding respondent's educational standards. The survey results showed that 31% of respondents held a formal degree, 25% of respondents held a post graduate qualification, 16% of respondents held a technical qualification, 6% a trade qualification, 6% reported they had finished year12, while 8% said they had finished year 10. Predominately the visitors showed a high level of education with 78% of respondents confirming they held a trade qualification, technical qualification, a degree or a post graduate qualification.

#### 6.4.10 Visitors motivations

The following sets of data relates to the responses received from Bicheno Penguin and Adventure tour visitors during two nights of surveying on site.

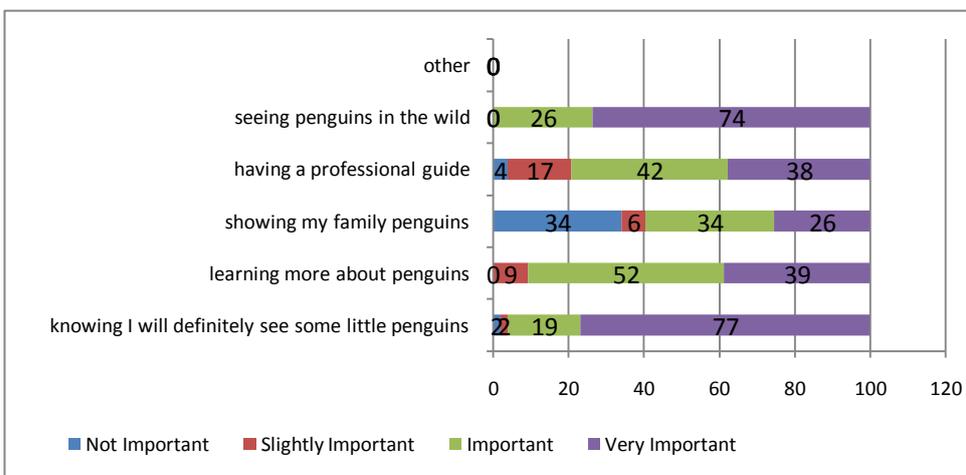
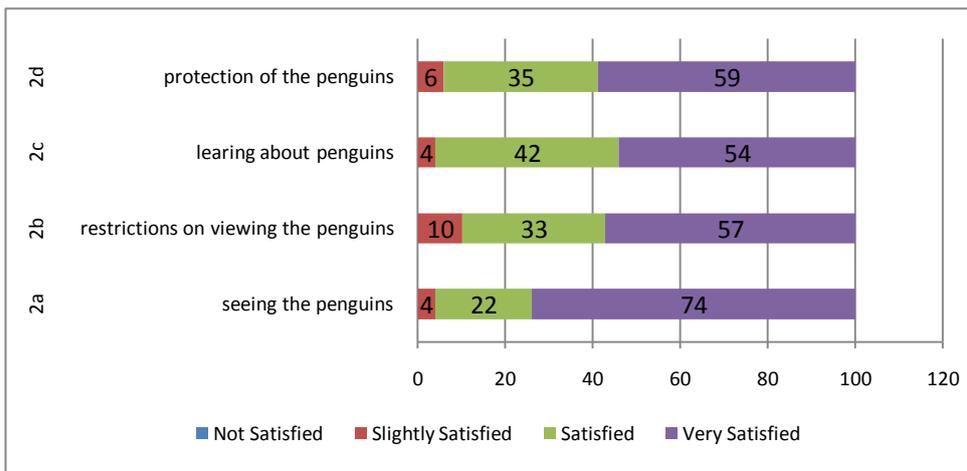


Figure 42 Tour motivations, percentage responses against each question, (n = 53)

Question one, depicted in Figure 42, sought information from respondents regarding their motivation to visit this Little Penguin Wildlife tour.

- 74% of respondents said that seeing penguins in the wild was very important.
- 79% of respondents said it was either important or very important to have a professional guide.
- 91% of respondents stated it was either important or very important to learn more about penguins on their tour.
- 96% of respondents said it was either important or very important to see penguin on the tour.

Therefore we can determine from these responses that viewing penguins in the wild was important to the visitors, and visitors wanted to learn more about the penguins. Additionally the visitors generally considered that guides were helpful in providing the information they sought.



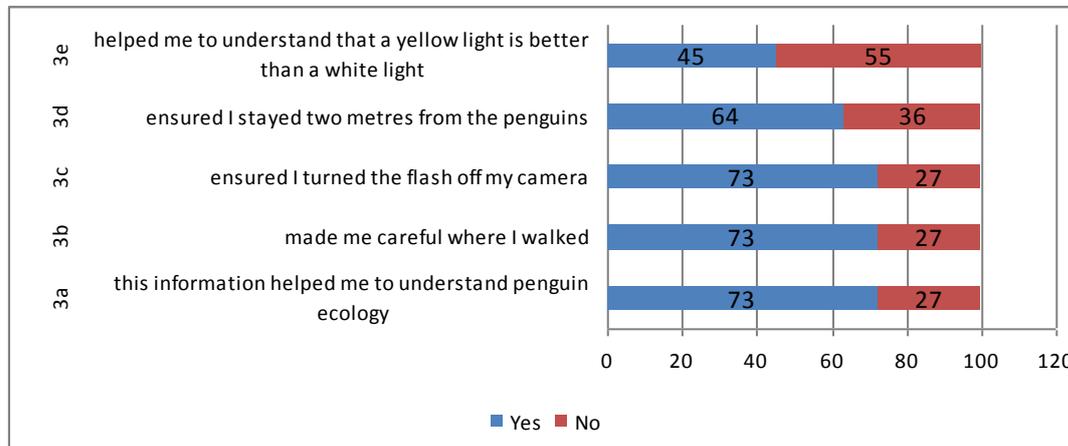
**Figure 43 Satisfaction Levels of visitors, percentage responses against each question, (n=53)**

Question two; depicted in Figure 43, sought satisfaction levels from respondents on visiting the Little Penguin Tour, respondents recorded a very high satisfaction level.

- 90% of visitors were either satisfied or very satisfied with the restrictions imposed on visitors viewing penguins.
- 94% of respondents were either satisfied or very satisfied with the current level of protection of penguins.
- 96% of visitors were satisfied at seeing penguins on the tour.

- 96% of visitors were either satisfied or very satisfied with learning about penguins on their tour.

Therefore we can determine from these responses that consumers are largely happy with the performance of the operator at this Little Penguin wildlife tourism facility.

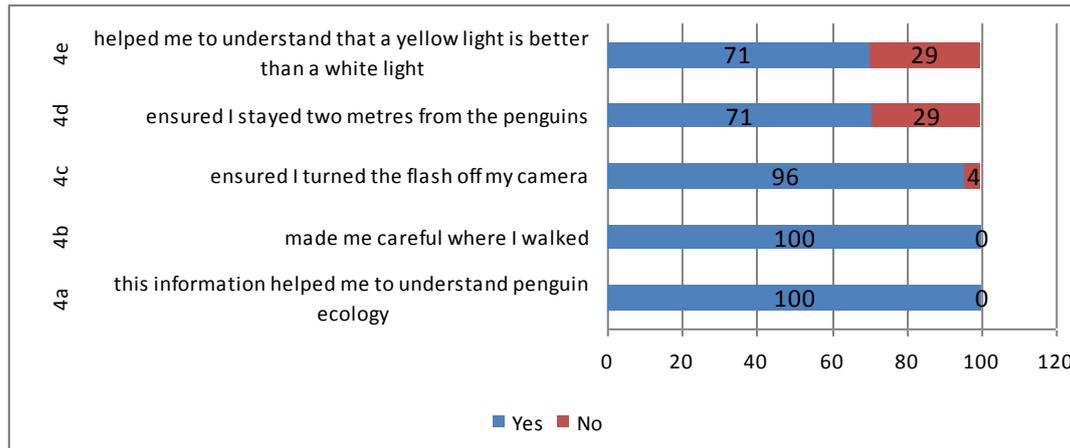


**Figure 44 Information and educational, percentage responses against each question, (n = 53)**

Question Three, depicted in Figure 44, sought to understand the level of information provided to visitors before their tour and subsequently if that information had helped them to modify their behaviour while on their tour, as a result. Largely the information was successful in changing or modifying their behaviour.

- 45% of respondents agreed that the information they received helped them to understand that a yellow light was better than a white light on penguins
- 64% of respondents said the information they received ensured they stayed two meters from penguins.
- 73% of respondents confirmed the information they received helped them to understand penguin ecology, while 27% of respondents said it was not helpful.
- 73% of respondents confirmed the information they received made them careful were they walked, while 27% of respondents said it was not helpful.
- 73% of respondents confirmed the information they received ensured they turned their flash off on their camera, while 27% of respondents said it was not helpful.

Therefore we can determine from these responses that provided good information is provided the take up rate of that information, and subsequent modified behaviour is high.



**Figure 45 Modified behavior as a result of information, percentage responses against each question, (n = 53)**

Question Four, depicted in Figure 45, sought to understand the level of information provided to visitors during their tour, and subsequently if that information had helped them to modify their behaviour as a result. Largely the information was successful in changing or modifying their behaviour.

- 64% of respondents said the information they received ensured they stayed two meters from penguins.
- 71% of respondents agreed that the information they received during the tour assisted them to understand that a yellow light is preferable to a white light, 29% of respondents said the information they received during the tour did not assist them to understand that a yellow light is preferable than a white light.
- 96% of respondents confirmed that the information they received during the tour ensured they turned their flash off on their camera, 4% of respondents did not agree that the information helped them to turn off the flash on their cameras.
- 100% of respondents confirmed information provided did make them careful where they walked.
- 100% of respondents agreed that the information which was provided to them during the tour helped them to understand penguin ecology.

Therefore we can determine from these responses that provided information is readily accessible the take up rate of that information is high.

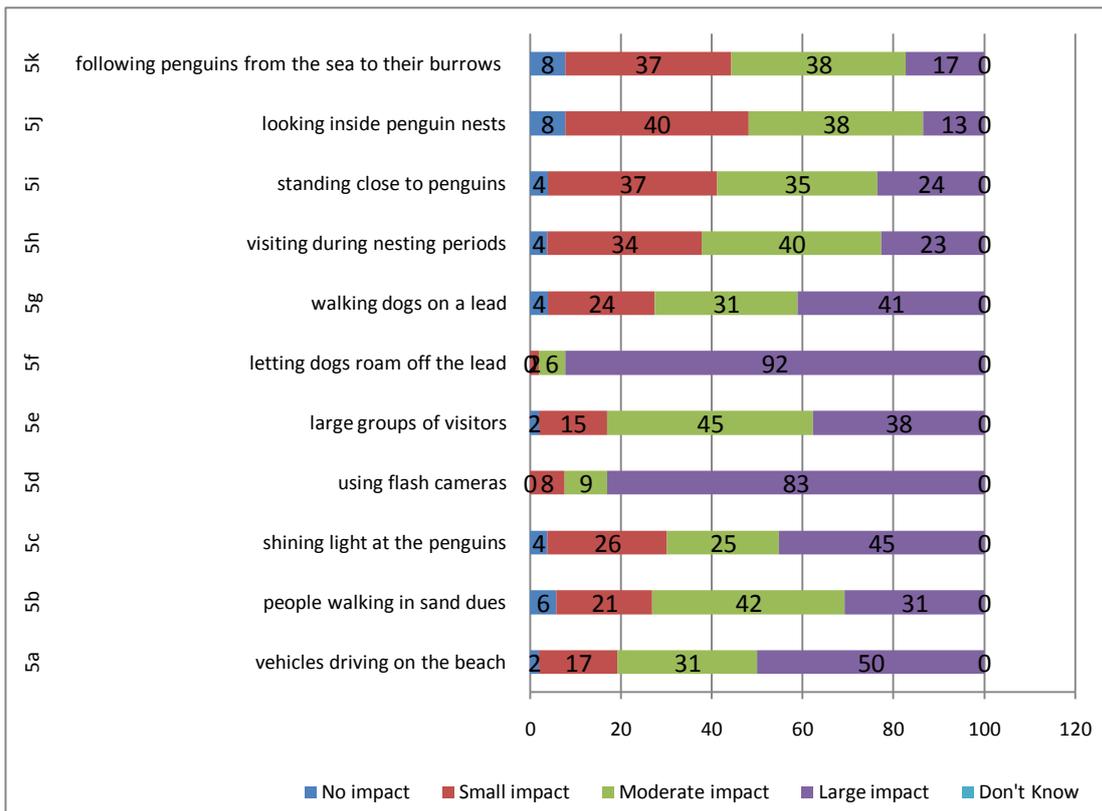


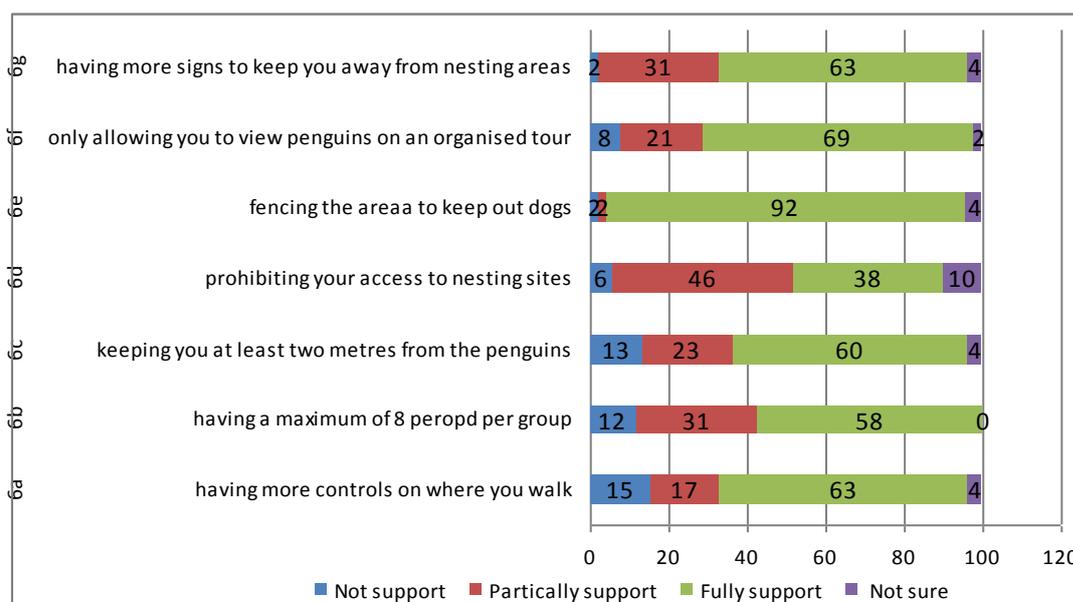
Figure 46 Visitor perceptions and understanding, percentage responses against each question, (n = 53)

Question Five, as depicted in Figure 46, sought information from respondents on their level of understanding regarding impacts of certain activities on Little Penguins during wildlife tours. Largely the respondents showed a high level of understanding of the impacts as summarised below.

- 88% of respondents think there is an impact on Little Penguins by allowing vehicles on beaches.
- 92% of respondents were aware that following Little Penguins from the sea has an impact on them.
- 94% of respondents think there is an impact on penguin's people walking in sand dunes.
- 96% of respondents believe there is an impact from shining lights on penguins.
- 96% of respondents are aware that walking a dog on a lead in a colony of Little Penguins has an impact.
- 96% of respondents were aware that visiting a Little Penguin Colony during the nesting season has an impact.

- 96% of respondents were aware that standing close to Little Penguins has an impact on them.
- 98% of respondents are aware that large groups of people have an impact on Little Penguins.
- 100% of respondents were aware that flash lights have an impact on Little Penguins; this appears to indicate that the message from guides is being received and understood.
- 100% of respondents say they are aware that letting dogs roam of the lead have an impact on penguins.

Therefore we can determine from these responses that visitors are largely aware of the impacts on Little Penguins caused by activities as discussed with them during the survey and as depicted in Chapter 2.



**Figure 47 Support for changes which may assist Little Penguin sustainability, percentage responses against each question, (n = 53)**

Question Six, as depicted in Figure 47, sought information from respondents about the level of support they would offer for changes which might assist Little Penguin sustainability. The responses indicate a high level of support for changes which may assist sustainability of the Little Penguins, as depicted in the summary below.

- 80% of respondents either fully or partially support the concept of more control over where visitors can walk.

- 83% of respondents either supported or partially supported the concept of keeping a distance of at least 2 meters while viewing Little Penguins in a wildlife setting.
- 89% of respondents support the concept of limited visitors to eight people on a tour.
- 90% of respondents said they would either partially or fully support only allowing people on an organized tour.
- 94% of respondents said they would either fully support or partially support having signs to keep people away from nesting areas.
- 94% of respondents fully or partially support the concept of fencing to keep dogs out of areas where Little Penguin colonise.

Therefore we can determine from these responses that provided an educational component is attached to any contemplated changes to viewing conditions; based on these survey responses it appears that such changes would be well accepted by visitors. Such changes should provide an explanation to visitors on how such changes are expected to contribute to the Little Penguins sustainability.

#### **6.4.11 Summary of findings**

The objective in reviewing this case study site was to determine if the colony used for commercial tourism purposes was sustainable. To assist with this a number of key objectives were established in Chapter 4; of particular importance is Objective 4 which outlines the research objective in relation to the case study sites. In particular, the researcher desired to gather information about the case study site through:

- field observations;
- interviews with key informants and relevant management authorities;
- review of relevant documentation relevant to the case study site;
- a survey of Little Penguin visitors to the site.

For the Bicheno case study site the researcher was able to achieve the four research methods mentioned above. The following remarks are based on information gained from those activities. It is at this point the researcher would like to re-introduce to the reader the requirements for the site under the legislative framework espoused under the *Crown Lands Act 1976*; it is this Act which provides the legislative framework which governs the management of this site. This Act was discussed and examined in Chapter 5, but it is appropriate in the summation of this case study site to re-assess the schedules of *the Crown*

*Lands Act 1989* and to make comment regarding the performance at the site with regard to the schedules espoused under that Act. It should be noted that not all of the provisions in Schedule 4 have been addressed; rather the researcher has shown those considered relevant to this case study site considering the objectives of this research.

Crown Lands Act 1989, Schedule 3	Comments
To promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity	As official counts are not conducted and no base line data is available it is not possible to determine if the colony diversity is conserved or the development (tourism) is sustainable.
Crown Lands Act 1989, Schedule 4	
to encourage education based on the purposes of reservation and the natural or cultural values of the conservation area, or both;	There are two road signs depicting penguins in Bicheno, one is located near the blowhole. There is also a descriptive sign located at Red Bill Beach. There is a Parks and Wildlife board, which says “Penguin Rockery, dogs and pets prohibited”. No other educational activities were observed or noted from discussions with key respondents locally apart from the activities of the Operator at official tourism to their site.
to encourage research, particularly that which furthers the purposes of reservation;	NRM North, NRM South, Birds Tasmanian, UTas, Tourism Tasmanian and Tamar NRM have been supportive of this thesis, as has Parks and Wildlife. The Operator was also supportive of this research project
Crown Lands Act 1989, Schedule 5	
The protection and maintenance of any natural, cultural or economic values of the area of land	It has been observed that there are various measures to protect and maintain the values of the area, including the removal of introduced species and pests, improved habitat protection and fire ready programs.
The conservation of natural biological diversity of the land	While there are attempts to conserve the natural biological diversity of the land this information has not been quantified.
Public recreation, education, scientific research and tourism consistent with conserving the values of the area of land	It is observed that public have an opportunity to participate in a recreational tourism viewing activity. It is observed there are efforts to inform and educate the visitors in penguin biology. This thesis was supported by both Parks and Wildlife, and the Operator, therefore it is observed that scientific research is supported and encouraged.

**Figure 48 Crown Lands Act 1989, Schedule 3 with commentary**

Under the *Crown Lands Act 1989*, legislative authority is delegated to the Parks and Wildlife, and it is through the instrument a CSV license that management of the tourism venture is undertaken. Parks and Wildlife have the opportunity under the CSV to ask licensee’s to undertake further training; however this has not been requested at this point in time by the managing authority. It appears from the interviews held with Parks and Wildlife Rangers that they are satisfied with the current performance and management of the tourism operation and believe it takes pressure away from other penguin sites and colonies (Parks and Wildlife Interviewees). Parks and Wildlife believe the Operator has a genuine concern for the welfare of the penguins and has a good philosophy of caring for the colony, has crowd control measures in place, allows no more than sixty people in the colony at any one time, (Parks and

Wildlife Interviewees). Parks and Wildlife believe visitors are managed appropriately at the colony, a bus takes groups of twenty people to the colony in waves; three or four buses are common per night, depending on holidays and seasonal issues. The site is actively managed by the Operators, as an example, there is a re-vegetation program established, efforts to place new nesting boxes/logs. There is an active program to removal stray dogs and cats and fencing and tracks are maintained (Parks and Wildlife 2009). Due to these efforts the Operators believe that bird numbers are increasing at the site. Nevertheless, the researcher does have a concern regarding the operations at this site, due to:

- the site configuration;
- tour methodology;
- the sandy/gravel walking track used by visitor;
- the sheer number of visitors on the track at any one time, up to sixty;
- the lack of a raised board walk to lift visitors over the penguins.

Visitors are in many instances just inches rather than meters from Little Penguins on this tour. The researcher observed Little Penguins unable to cross the track due to the number and density of visitors. Birds must wait until the visitors moved on before they can cross the path to their colony and their burrow, or walk between the visitors, sometimes between the visitor's legs to pass. Such delay has been well documented by Woehler *et al.*, 1993, Stevenson, *et al.*, 2007, Shaughnessy, 2008, and Walker, *et al.*, 2006, suggesting that such delays are detrimental to the well-being of the colony as they cause a delay in feeding or nurturing young, or prevent the penguin partner returning to the sea to feed. Delays to a penguin returning to feed the chick means the parent has less food available to feed the young because their body has absorbed a higher proportion of it during the period they are waiting to return to their nest, partner or young (Stevenson and Woehler, 2006). The researcher however believes that the delays experienced by the returning penguin could be alleviated. The raised boardwalks favoured by other sites, such as Phillip Island and Bruny Island are effectively used to get visitors to sites up and over the Little Penguins. A structure such as a raised board walk allows the birds to pass unhindered to their colony, and also provided visitors an opportunity to view the penguins without putting unnecessary pressure on the birds during the viewing experience.

An issue that emerges from conversations with both the Operator and Parks and Wildlife is that there is no official data available on Little Penguins numbers at Bicheno. Research data would provide the Operators together with Parks and Wildlife staff the ability to monitor the

wellbeing of the colony over time. The Operator is however supportive of such monitoring. Such monitoring would provide the quantitative information necessary to determine if this site is sustainable as per the definition discussed in Chapter 1. Sustainability of the colony is seen as important to the Operators, and, as has been pointed out in this chapter the Operators have undertaken a range of measures to increase colony sustainability. It was stated by both the Operator and Parks and Wildlife that some further ways of further increasing the sustainability of the colony is through improved understanding of penguin biology; increasing local support, managing introduced species including both wild and domestic cats and dogs, and providing a supporting habitat while minimizing human disturbances.

From the conversations with both Parks and Wildlife staff and the Operators it is clear that these people believe that there are activities which affect the sustainability of Little Penguin in the area, and one of these important effects come from human activities. Some of these pressures are directly related to tourism; many are not. Indiscriminate viewing, unofficial visits, attacks by vandals, increased pressure of domestic pets, stalking birds, actions of neighbours, some fishing activities are also seen to impact on the Little Penguins at Bicheno in some manner, (Parks and Wildlife Interviewees and Operator interviewees). Some of these human activities involve the local community. The impression of both the Operators and the Parks and Wildlife Rangers, is that the community is not fully aware of the needs of the Little Penguins at Bicheno, nor are they aware of the social and economic impacts that the Bicheno Penguin and Adventure Tours have for the area in general. It was thought that the community required assistance to understand and appreciate these factors with a view to increasing the methods available for locals to look after the sustainability of the colony. Such support from the community may see greater economic return for the community (Parks and Wildlife 2009).

Road mortality appears to be an issue of some substance for this colony. It was suggested by the Operator that 20% of the colony of Little Penguins are killed on the roads in the area as they cross the road at dawn or dusk, going to, or coming from their burrows. This figure appears significant and further research desirable to understand the situation and its impacts on colony sustainability. However the Operators at this site are concerned and active for the welfare of the penguins, they are aware of the interconnectedness of the Little Penguins who breed on Diamond Island to the penguins who breed across the narrow stretch of water, at their reserve. The Operators also appear to have assessed the impacts or possible threats at the

site. Such a procedure was identified by Dann (1996), in his research into threats to Little Penguin sustainability at Phillip Island in Victoria, as an important first step in formulating an action plan to address the threats identified. The Operators are active in their management of the site, and undertake conservation work which includes gradual removal of weeds and replacing with natural species, maintenance of paths and walk ways and some board walk structures (over low lying or rough ground), maintenance of low level lighting, development of artificial burrows and general maintenance of the grounds and fencing. An important aspect of their work is the management of introduced species which continue to be problematic at the site. Through discussions with Parks and Wildlife staff and the tourism operation it was identified there were a number of direct and indirect threats for the Little Penguins in the location of Bicheno and at the site used for commercial tourism operations.

First on the list and most importantly because of their immediate and potentially catastrophic impact on the birds, is the removal of dogs from the site. Dog and cat management continues to be problematic for Parks and Wildlife as under current legislation, the *National Parks and Reserve Management Act 1999* and the *Dog Control Act 2000*, Parks Rangers have limited ability to prevent dogs offending for returning and re-offending. Dogs caught by Parks and Wildlife staff destroying native fauna can be captured and can only be destroyed if unclaimed within five days of a notification to the owner, or if they have been declared a dangerous dog, otherwise they are simply handed back to their owner. In many cases it was suggested by the Operator that dogs simply return to re-offend. Cats are also a problem for the Operators, a significant impact to the birds is from both domestic and wild, or feral cats. It was suggested by the Operator that in the wild, cat numbers can grow quickly if a problem is not addressed. At Bicheno the number of feral cats in the wild is not known, although due to the number of sightings and trapping success (Operator Interviewee #1 and #2), it is thought to be significant, the Operators have consistently been trapping approximately 30 cats per year for a number of years (Operator Interviewee #1). A similar trapping program instigated by Parks and Wildlife at Bruny Island netted eighty cats in its first year of trapping (Parks and Wildlife, Bruny 2009). Phillip Island Nature Park also recognizes the threat from cats and has had a cat trapping program which has been running since 1997. In the first year it trapped 65 cats, and due to increasing numbers in 2009, 125 cats were trapped (Phillip Island Annual Report 2009). These figures and anecdotal evidence from the Operators suggest that an ongoing program is required and there is no 'getting on top' of the situation, without incorporating other measures such as greater community participation and or an education program

Both Parks and Wildlife and the Operators appear to understand the connection between sustainability, adequate habitat and Little Penguins. Habitat disturbance can be caused through a number of activities, including human interference and development encroachment; an instance of this was discussed in the chapter. Disturbance to habitat can also occur at the site from weeds, competition with other animals; fire can destroy habitat cover within a few minutes. However generally there is consideration of mitigation measures evident at the site and importance is placed on habitat protection and rehabilitation by the Operators and measures are in place to improve the habitat at the site for the Little Penguins. Re-vegetation and vegetation conservation has occurred on the site, according to the Operator there are still improvements to vegetation that can occur.

Some fishing activities in Tasmania are considered by the interviewees as being destructive on the Little Penguins, these include the grab-all nets and a fishing activity called, foundering. The destruction caused by grab-ball or gill-nets are eloquently discussed in a letter to the Tasmanian Government by Birds Tasmania in 2009, urging the government to apply the Precautionary Principle owing to their destructive nature on marine bird life and in particular Little Penguin. With over 9000 gill-nets in Tasmania the damage to penguin colonies is significant and impacts on the east coast of Tasmania, in the vicinity of the Bicheno case study site (Birds Tasmania 2009).

Lastly, the survey material gave valuable insights into visitor thinking and behaviours. Demonstrating that well educated, both interstate and international visitors are motivated to see penguins in the wild in Tasmania. Further, those visitors were enthusiastic about learning more about the birds, and acknowledged the contribution provided by the guide in improving their knowledge of Little Penguin biology. Arguably the most important of that information is the approval of visitors to make changes to Little Penguins tours where clear evidence can be demonstrated that the changes will assist in improved sustainability of the colony. The survey found that visitors considered information dissemination important during tours. Finally it appears that the information guides provide to visitors during their tour is a successful method of modifying visitor behaviour and could be used to a greater extent to make changes which will assist Little Penguin sustainability, along with other methods, such as improved, eliminated signage and pre-tour information.

## Chapter 7 Researchers Analysis

### 7.1 Introduction

This chapter will allow me to draw from the information portrayed in each of the preceding chapters and offer my own analysis of the research. The sustainability of Little Penguins colonies used for commercial purposes is important, as without the colony there is no commercial activity possible. The connection between sustainability, commercialism and wildlife has been documented by a number of writers (Lindsay *et al.*, 2007; Shaughnessy and Briggs, 2008; Patterson *et al.*, 2003 and Ballantyne *et al.*, 2008).

These writers highlight the need to reduce the negative impacts on the Little Penguins, through appropriate planning and management strategies. This is essential to the development of sustainable wildlife tourism. *The challenge is to design engaging experiences that provide close encounters with wildlife, yet still protect animals and their habitats. To achieve this, many wildlife tourism experiences are accompanied by conservation-themed interpretation that aims to increase tourist awareness of conservation issues and encourage them to comply with pro-conservation practices while participating in the experience* (Ballantyne *et al.*, 2008:659).

This chapter will make comparisons between the three case study sites, in terms of the legislation, governing arrangements and management techniques applied in each region. This information will then be used to support the recommendations made in Chapter 8.

Further research is a fundamental need for the three case study sites examined in Chapter 4. The need for further research will be discussed in more detail within this chapter. Many researchers refer to the lack of current research on the Little Penguins colonies; *although penguins are among the best studied birds in the world, there is insufficient information about many of the interactive factors affecting their survival* (Ellis *et al.*, 1998: 98).

This chapter will also discuss the difficulties faced by the regulatory authorities, and the effect that this has on the case study sites in question.

Lastly, the threats relevant to the three case study sites will be thoroughly examined, with each threat discussed and analysed in detail. This discussion will then be used to support the recommendations made in Chapter 8.

## 7.2 The Importance of Strategic Planning and Vision Establishment

Development of sustainable wildlife tourism attractions is important because it is believed it has the capacity to bring about long term conservation and sustainability for wildlife and their important habitat (Higginbotto, 2004, as cited in Ballantyne *et al.*, 2008). But a fundamental question is how this is to be achieved. The answer, in part, is the establishment of an overall vision for that wildlife or activity. This vision must list a set of ideals and priorities create a picture of the future, explain what makes the enterprise special and unique list the core set of principles that the enterprise stands for, and describe the criteria that must be met in order to achieve organizational success (Harari, 2004: 2). According to Harari, a vision should be:

- *realistic - must be based on reality to be meaningful to an organization;*
- *credible: must be believable in order for it to be relevant;*
- *attractive: must be able to inspire and motivate those in the organization. People must want to be part of the future envisioned for the organization;*
- *related to the future of the organisation;*
- *attracts commitment and energize the people involved. one of the primary reasons for having a vision is its motivational effect;*
- *establish a standard of excellence; and*
- *bridge the present with the future. The right vision will take the organization out of the present, and help it focus on the future (Harari, 2004: 3).*

If a vision is the desired future state for the organization, the strategic plan is a description of how the organization is going to get there from its present state (Harari, 2004). A management plan is a living, evolving structure as shown in the diagram shown below, Figure 49.



Figure 49 The Improvement Management Plan Model (Jones 2005:1).

This diagram shows the evolution of a plan over time and all the elements involved in its development including the process of: planning, doing, evaluating learning and adjusting. The development of a management plan is a continual process, which involves a continual cycle of adjustment and planning.

The establishment of a vision statement and the subsequent development of a management plan are both intertwined. Without a vision or management plan there is no plan of action. The case study sites depicted in Chapter 3 appear to espouse sustainable practices; each site has a vision statement and a management plan. In contrast, none of the three case studies mentioned in Chapter 6, the focus of this research thesis, have such plans in place.

### **7.3 Legislation: the Power and the Will to Enforce**

While it is hoped that people, involved in wildlife tourism enterprises, will do the right thing; leaving that to chance is problematic. Curtin suggests that self regulation does result in the outcomes that one expects: *In numerous instances of tourist-wildlife interactions, voluntary codes of conduct and self regulatory practices have been shown not to work. Instead, sustainable management requires strict licensing and regulation* (Curtin, 2008:103).

The appropriate protective legislation there must be complemented with the ability to enforce that legislation. Thorough planning and implementation must be developed in order for legislation to be effective in mitigating negative impacts. *Reducing negative impacts through the implementation of appropriate policies, planning and management strategies is essential to the development of a sustainable wildlife tourism industry. The challenge is to design engaging experiences that provide close encounters with wildlife yet still protect animals and their habitat* (Higginbottom, 2004, as cited in Ballantyne *et al.*, 2008).

The Legislation relevant to Little Penguins was discussed in Chapter 5. In Chapter 1 the sustainability goals used to set the standards for governing bodies and thus ground operators was reviewed.

If these legislative instruments were effectively implemented they would be more than adequate in ensuring that the Little Penguins colonies used for commercial wildlife tourism are managed in a sustainable manner. The enforcement of current legislation should therefore be made a priority.

According to Ananthaswamy (2004), our wild animals are currently under pressure, and recent observations of changes in their behaviour are of great concern. Many of our wildlife, including the Little Penguins, are becoming restless and stressed, causing them to

lose weight resulting in death in some cases. Ananthaswamy believes that Ecotourism, which is supposed to have a positive impact on the environment, is the main cause of the problem. According to Ananthaswamy the growth in Ecotourism has resulted in a number of subtle yet very real issues. Differences in the animals' heart rates, physiology, and social behaviours have been observed. Tourists are the cause of these changes Ananthaswamy (2004). There appears no doubt that ecotourism or wildlife tourism is increasing worldwide. According to the international ecotourism society, the industry is worth almost 6.5 trillion dollars, is responsible for over 230 million jobs, and makes up for over 10% of the gross domestic product worldwide. For the world's 40 poorest countries, tourism is the second most important source of foreign export, after oil (Ezaki, 2010). Within Tasmania, statistics show that during the month of September 2009, 917,100 visitors contributed nearly 1.5 billion to the Tasmanian economy (Tourism Tasmania, 2008). Despite the obvious economic and social advantages associated with wildlife tourism current management practices are decreasing the sustainability of Tasmania's wildlife. *Many ecotourism ventures are un-audited, un-accredited and their so called, sustainable practices only address a small percentage of the number of threats at play* (Ananthaswamy, 2004:2). *The guidelines that do exist mostly address the obvious issues such as changes in land use, cutting down trees, making tracks, or scaring wildlife* (Ananthaswamy, 2004:2).

Despite legislation being available from a number of Legislative Acts the principles are only being loosely applied, and in some cases, not applied at all (Ananthaswamy, 2004). Chapter 5 described the Legislative Acts which are in place to protect Tasmania's biological diversity. However its effectiveness appears to be diluted due to a number of factors, including:

- a lack of political will;
- a perceived lack of resources;
- a lack of strategic planning;
- soft enforcement measures;
- inconsistent approaches;
- conflicting interpretations;
- economic and social factors taking priority over long term sustainability; and
- the slow decline and incremental degradation over an extended period of time.

This last dot point is known as the 'boiled frog syndrome'. If people become acclimatized to a situation over a sufficient period of time, they come to accept the state of affairs as normal (Yates, 2010). As an example, Parks and Wildlife's ability to improve the

sustainability of the Little Penguins at the Low Head is dependent on the conditions imposed under the license conditions. Chapter 5 explored the current licensed conditions that are currently in effect. A comprehensive review of the current licensing conditions imposed on Little Penguins tourism operators is needed, in order to make the legislative processes effective. Lease or license conditions must reflect the expectations espoused in the Acts governing sustainable tourism practice such as: *The Nature Conservation Act 2002, the National Parks and Reserves Management Act 2002 and the Crown Lands Act 1979*. Such provisions in the lease or license arrangements would give the managing authority, Parks and Wildlife, the ability to improve licensing arrangements, enlist greater operator responsibilities, to monitor the on- ground actions of the operator and enforce compliance. The Parks and Wildlife Rangers' current efforts to instigate improvements are presently being hampered by loose license conditions which are interpreted and applied differently. A change in lease conditions would be one of the first steps towards improving the sustainability of the Little Penguins colonies used for commercial purposes. The implementation of on groundwork projects would also be of great assistance to the Little Penguins' ongoing sustainability. Recommended projects aimed at supporting the sustainability of the Little Penguins include, providing a natural habitat setting and reducing the number and extent of negative impacts on the Little Penguin colonies. The first step to achieving this is the development of a risk analysis plan, which identifies all of the risks to a Little Penguins sustainability at each commercial site.

A risk analysis plan and management plan should be developed for every Little Penguins colony which is used for commercial wildlife tourism operations. According to Ballantyne; *reducing the negative impacts through the implementation of appropriate policies, planning and management strategies is essential to the development of a sustainable wildlife tourism industry* (2008:658).

It is imperative that the development of the risk analysis plan is followed by a plan of action, or management plan. The values espoused in the relevant state government legislation should form the framework for the development of such plans.

The legislation has been developed to afford protection and to provide guidance to managing authorities and I consider that more effective measures need to be implemented in order to ensure that the legislation is effectively applied and enforced. Figures 14, 22 and 32 are a brief identification of risks (adopted from Brothers *et al.*, 2001).

#### **7.4 The Need for Management of Introduced Species**

Little Penguins have continued to populate the windswept site at Low Head Peninsular despite the decline in natural vegetation. Native vegetation over an extended period of time has been replaced with weeds, predominately the African Boxthorn, (*Lycium ferocissimum*) and Sea Spurge (*Euphorbia paralias*). However, as there has been no monitoring or counts of the Little Penguins, it is not understood if the lack of native vegetation and extensive weed infestation is putting the Little Penguins at risk. Despite this lack of evidence the current situation is believed to be placing a threat on the Little Penguins' sustainability. The lack of native vegetation, the sparseness of weed cover, (which provides the only habitat), and the exposed nature of the site put the Little Penguins under great risk. Reliable scientific data is urgently required in order to determine if the numbers of penguins are on the decline at the Low Head site. Therefore an annual Little Penguins count is required at the site. To facilitate this action, commitment is required from a large number of stakeholders, including, the staff at Parks and Wildlife, The Operator, Researchers, Birds Tasmania and the regional NRM Body. One of the most obvious negative factors influencing the sustainability of this site is the apparent lack of community interest and involvement. Improvements would be longer lasting, cheaper and more effective if strong community support was able to be enlisted. Good education is required in order to encourage this increase in community involvement. Additionally a greater buy-in from the operator appears mandatory for effective improvements to be made.

There are a number of initiatives which could mitigate the negative impacts and contribute to a more sustainable Little Penguins colony. The suggested initiatives include:

- An biological diversity and environmental impact assessment to be conducted at each case study site;
- the development of a site management plan, including a weed eradication program;
- a detailed long term community educational program;
- a commitment to re-vegetate the site with native species;
- a commitment to remove (gradually in some cases) weed infestations;
- greater operator involvement in biological diversity and habitat protection;
- revision of the monitoring and site management plans; and
- communication and celebration of any successful outcomes.

The problems of weed infestations at Low Head are less critical than Bicheno and Bruny Island. Despite this, there are still weed problems at the sites which warrant attention. A long term commitment to remove the weed infestations at these sites is required, as is the planting

of native species of plants. This initiative will help provide appropriate habitat cover for the Little Penguins.

### **7.5 The Importance of Risk Assessment and Mitigation Measures**

In the previous section I introduced the reader to the concept of a risk analysis believing that the development of a risk analysis is of critical importance. Chapter 6 discussed the risks problematic for the sustainability of the Little Penguins. There were a number of risks observed when studying each of the case study sites. An effective good risk assessment should analyse the effect of issues such as. A risk assessment would analyse such issues as;

- the appropriateness of the site to be used for commercial wildlife tourism;
- the risk factors associated with that use;
- the perceived risks at the site;
- the estimated success of mitigation measures;
- prediction of outcomes, in regard to continual current use, use with improved conditions or the cancellation of license after analysis of the above factors;
- the ability of the current and revised (to be developed) license arrangements to meet the sustainability objectives espoused within the relevant legislation;
- the ability for the governing body to adequately monitor, access and provide appropriate enforcement for misconduct;
- the likelihood of sustainability of the colony over time; and will
- define how this is to be measured.

A complete action plan must include the following elements:

- a risk assessment;
- mitigation measures;
- an action plan;
- action; and
- revision and monitoring.

I envisage that the implementation of these actions will help reduce the number and extent of the negative impacts on the Little Penguins colony. This is explored in great detail by Ellis *et al.*, (1998:98) and portrayed in Figure 50.

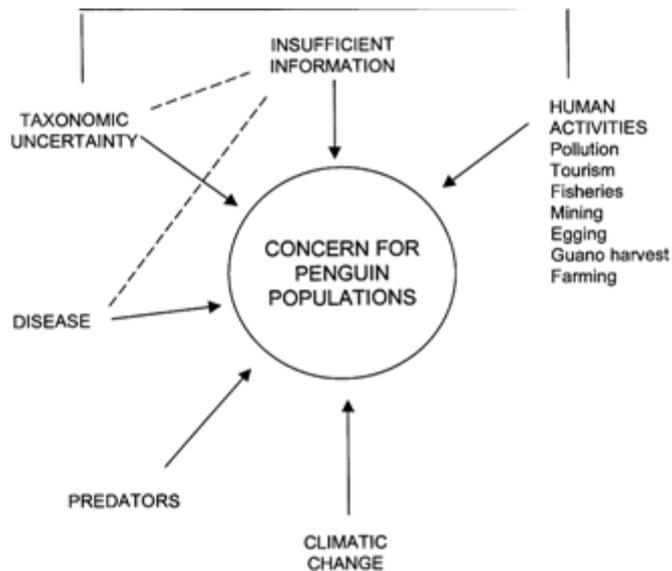


Figure 50 Influences on Penguin Populations (Ellis *et al.*, 1998: 98).

Ellis has developed a model which portrays the different threats and pressures on the Little Penguins colony. Additionally I have adopted an impact model, as adopted from Dann, 2006 in Figure 11. These threats stem from a variety of causes including, but not limited to: insufficient information, predators, disease, and human activity, tourism, oil slicks, shipping, commercial fishing, recreational fishing, gill-nets, and risks associate with inadequate legislation for example the capacity for the taking of game because of the *game reserve* classification at Bruny Island and the ability also for game to be taken under the *conservation area* classification a Low Head. This legislation allows the taking of game, in a *sustainable manner*, however it could be argued that because there is no official counts or monitoring this is not done in a *sustainable manner*.

### 7.6 The Need to Understand and Address the Impacts of Visitation

Swarbrooks says that almost by definition, *visitors have a negative impact on the environment*; saying the vegetation is often; *disturbed, taken, trodden down or destroyed. Wildlife is killed and habitats damaged, graffiti, erosion and pollution can also result* (Swarbrooks 1995:24). A number of researchers agree that the effects of human presence at seabird colonies can be broad ranging, from trampling of burrows, birds spending increased time on defensive behaviours', or delaying return to colony areas, to elevated heart rates and production of stress hormones, all affecting breeding success, including (Burger and Gochfield 1993, Woehler *et al.*, 1994, Nimon and Stonehouse 1995, Giese 1996, Simone and Schlatter 1999, Yorio *et al.*, 2001 and McClung *et al.*, 2004 in Otley 2005).

The impacts of visitation is not confined to Tasmania, other areas are also experiencing increased visitor pressure, Otley in New Zealand writes of the conflict between the desire of humans and the need for normal wildlife activity; *At some Yellow eyed Penguin *Medgadyptes antipodes* colonies in New Zealand, the afternoon peak in visitors coincided with the return of breeding birds to burrows and visitor induced delays in the feeding regime have been suggested as one explanation of lower chick masses at one well visited site as compared with chick masses at an unvisited site* (Wright 1998, Mc Clung *et al.*, 2004, Seddon *et al.*, 2004 as cited in Otley 2005).

Wildlife tourism often attracts high visitor pressure during the breeding season when the Little Penguins are highly vulnerable to disturbance (Lindsay, 2008) such pressures can be reduced by on the ground works and operator best practice. These best practice guidelines would be exposed during the risk analysis and subsequent management plan which subsequently transposes into the operator license or lease conditions. These imposed conditions may well include provisions such as;

- isolating sections of the colony from visitors;
- the construction of raised board walks;
- development and adherent to minimum viewing distances;
- more control over visitors and visitor numbers;
- increased signage and the appropriate placement of eliminated signage;
- improved means of interpretation;
- a process for training guides and establishment of minimum standards of education to visitors;
- establishment of minimum impact strategies;
- improved appropriate lighting; and
- improved viewing techniques and code of practice.

I would like to point out in this section that my observations have revealed a number of impacts from commercial visitations. Some appear to be quite severe and need to be addressed urgently, still others while less severe still need to be addressed. For example at Low Head the impacts of accumulated visitation over a period of years is clearly visible at the site, therefore I consider the site requires an urgent risk assessment and management plan. At Bicheno a simple board walk structure would reduce the impacts of sixty visitors on site at any one time, by allowing Little Penguins to pass beneath the structure, while still allowing

full viewing by visitors. At Bruny Island a number of issues need to be understood including the practice of mutton birding and a risk assessment completed.

### **7.7 The Importance of Collaborative Relations and Partnerships**

Partnerships with the community, governing bodies and other organisations such as Birds Tasmania are particularly important. Birds Tasmania and its affiliation with Birds Australia has the ability to assist both the governing bodies and on ground operators to develop continuous improvements. The guidelines espoused in the Birds Australia, Guidelines on Recreational Bird Watching should be applied throughout this process.

### **7.8 Community Support**

Within Chapter 4, and the case studies showcased there, it became obvious to me that community involvement is a powerful tool in conservation. A common element associated with successful sustainability within each site is community involvement in the protection of the Little Penguins. Community involvement is also seen as critical element of ‘the *National Strategy for the Conservation of Australia’s Biological Diversity*’. Objective 5 within this document espouses the need to have an interest and commitment from the community. While all of the sub sections in Objective 5 are important, I draw the reader’s attention to Objective 5.1.2:

*(b) increasing community involvement in research and management activities relating to protected areas and vegetation remnants and in biological diversity programs, particularly those involving survey, re-vegetation and rehabilitation (ANZECC 1993:65).*

This Objective clearly outlines the areas requiring critical improvement within the severely degraded Low Head site. Community participation is again imperative within the Bicheno site. The following must be obtained:

- a community commitment to reduce the impact on Little Penguins at Bicheno due to domestic cats and dogs; and
- a community commitment to promote a commercial tour over promotion of unregulated/supervised self guided tours.

At Bruny Island community involvement may assist the Parks & Wildlife Rangers in a number of ways including;

- eradication of pests and weeds from the Neck site;
- repairs to infrastructure;

- reduced environmental and wildlife impacts through an improvement of visitor behaviours;
- community commitment to live by the rules and regulations which assist in biological sustainability for the Little Penguins.

Other activities which are required at the sites which could be assisted by community involvement are:

- a public awareness and involvement program;
- fencing of areas for re-vegetation, regeneration and rest;
- analysis and documentation of vegetation species which would have populated the site before its deterioration;
- seed collection and propagation;
- fencing and construction of wind break areas;
- planting, watering and maintenance;
- removal of the weed sea spurge;
- gradual removal of African Boxthorn after the alternative vegetation is sufficient for the occupancy of the Little Penguins;
- eradication of rabbits;
- a community management program in relation to domestic and feral cats;
- a community management program for coastal gill netting near the colony of the Little Penguins;
- fencing to expel dogs from the colony;
- fencing of sections of the colony for rehabilitation and rest periods;
- community involvement during the sensitive breeding season, to ensure viewing parameters are met; and
- improved infrastructure, such as boardwalks where appropriate.

### **7.9 Improve Operator Engagement and Responsibilities for Biodiversity Protection**

Presently there is no requirement on operators to protect the Little Penguins or their habitat in any licensing or other arrangements. Yet the operators arguably generate a living from such an operation, e.g. generate profits, but do so without a commitment to ensure the sustainability of the wildlife they exploit. This does not appear a model ensuring sustainability for the attraction, the Little Penguins (as described in Chapter 1). It appears obvious to me that improved sustainability options for the Little Penguins are intrinsically linked with improved operator investment of time, resources and performance.

### **7.10 The Necessity for Critical Habitat Maintenance**

From this research and others as documented, the provision and maintenance of adequate and appropriate habitat is considered to be fundamentally important to the long term sustainability of the Little Penguins colonies used for commercial tourism purposes. This research has highlighted the need for the safety and security that is provided by adequate habitat. This is necessary to successfully maintain Little Penguins breeding success. Lack of habitat is largely

responsible for the decline of the Little Penguins at the Derwent Estuary, and contributed to the decline at Granite Island, Phillip Island and a number of cases as researched by Stevenson and Woehler (2007). It has been demonstrated at Phillip Island, Granite Island and the Derwent Estuary in Tasmania that concerted efforts to improve habitat and nesting sites with exposure to tourism has slowed negative population trends and in some cases, halted them completely (Lee *et al.*, 2008).

The Little Penguins' habitat must fulfil a number of functions including:

- provide thermal insulation, which protects, young birds particularly, from extreme weather conditions, both hot and cold;
- provide protection from predators;
- provide a supportive place for courtship and mating;
- provide a place which supports the natural seasonal processes such as molting, and raising chicks, who at times are left unattended outside their burrows; and
- facilitates undisturbed penguin activities, such as grooming;

Without the cover of habitat it is not possible for the birds to thrive, for nesting success is reduced which leads to a decline in numbers and eventually a loss of biodiversity. As Stevenson and Woehler found (2007) whole colonies can suffer collapse.

The three case study sites have offered the Little Penguins vastly different levels of habitat protection. By far the most degraded of the three sites is the Low Head site, which observations show is at a critical level. Urgent re-vegetation is required at this site. In Bicheno, habitat protection is supported by the operators. Provided that they continue to follow their unofficial habitat management plan I do not see any major problems for the habitat at this site. Despite this, it would be desirable however to create a formal site management plan. At Bruny Island the habitat cover is in good condition is described as needing management by Chris Sharple's Land Information Systems, The LIST. Again, a site management plan is required.

## **7.12 Effective Communication**

There must be a strategy in place to ensure that communication, starting at the ministerial level, filters through all relevant levels of management and results in a better experience for the visitors and more sustainable management of the wildlife concerned. Parks and Wildlife Rangers need the knowledge, skills, resources and ability to understand and implement legislation and to translate and communicate that legislation to activities on the ground.

For the license agreement to be effective it must facilitate a monitoring and evaluation process, while addressing the on ground responsibilities and defined actions and enforcing

them as necessary. The legislation and subsequent on ground actions or behaviours need to be effectively, clearly, and visibly portrayed to visitors, through appropriately illuminated signage.

The operators' actions should be supported by training programs and rigorous licensing arrangements, in order to help them provide a wildlife experience that meets the conditions espoused in the governing legislation. The communication message from the operator to the visitor is also important. In Chapter 6.4 it became evident after analysis of the survey results that the interpretative experience, learning about penguins was important to the visitor. It is important messages are accurate, informative and educational. One of the ultimate goals of wildlife tourism is to increase the knowledge of visitors in order to ensure sustainability of the species being viewed. Visitor funded income can provide support research and appropriate responsive management (Roe *et al.*, 1997).

### **7.13 Critical Infrastructure**

Improvements need to be made to the infrastructure within the penguin viewing areas in order to support wildlife tourism and enable it to continue generating economic wealth for the area. The addition of the following infrastructure would alleviate some of the current pressures on the Little Penguins colonies:

- appropriate car parking;
- appropriated placed illuminated signage;
- low level lighting;
- designated walking paths with appropriate directional signage;
- raised boardwalks; and
- fencing and sectioned off colony areas for breeding purposes and/or native vegetation rehabilitation.

Such measures would help alleviate a number of problems. *Measures to avoid problems with burrow-nesting species include: the construction of hard surface pathways or boardwalks through colony areas to prevent trampling of burrows* (Claridge 1997: 71).

The provision of infrastructure should be in direct response the specific risks identified at each site. The ultimate goal of this exercise is to minimise the impact of visitation on the Little Penguins colonies used for commercial tourism. The following observations were noted when assessing the signage at the three case study sites:

- the number, distribution and theme of signage at the three case study sites is different despite the fact that they are managed by the Parks and Wildlife Service;
- the information on these signs varies between sites;

- the signs are not illuminated at night. This is particularly problematic at the Bruny Island site. As the Neck at Bruny Island is predominately unregulated, visitors may arrive there in relative darkness. The ability to address the issues pertaining in the signage is limited to one's ability to see the sign.

Signage has a number of advantages that is useful in the strategy towards sustainability. It lets the visitors appreciate that the site is of significant importance, while also seeking to improving visitors' behaviour and overall attitude towards the area. In some cases, such as Granite Island, it can be an effective means of disseminating information such as Visitor Code of Practice. As in the case of Low Head, it could be used to manage sites that are used for other activities during the day, such as dog walking, swimming and recreation. Signs help keep visitors to formed paths and inform the public of what is permitted on that reserved/category of land, for example, whether dog walking is permitted or not? If an activity is restricted, signage may provide an explanation as to the rationale for this regulation. The survey results as analysed in Chapter 6.4 suggests that visitors will accept restrictions on their viewing activities if they understand the rationale behind such requests, and if they believe that such activities will be of assistance to the conservation of that species.

#### **7.14 Critical Need for Education and Communication**

Communication and education have been identified as key priority areas for the three case study sites. There are a number of stakeholders which need to be kept informed including:

- the local council and council staff;
- potential developers;
- the community;
- local residents;
- local agricultural community;
- environmental groups;
- operators;
- guides;
- visitors;
- local police;
- regional NRM bodies; and
- the Regional Fire Authority.

The risk assessment, discussed earlier in this chapter, will when completed, outline the educational requirement that is needed to increase stakeholder knowledge and participation. It is desirable that an educational and communication strategy or plan be developed to address the needs identified in the risk assessment, pre-empting that the non engagement of some identified stakeholders is an important issue that needs to be addressed. Such a plan can work

towards achieving sustainability for the Little Penguins colonies. For example the Bicheno Education and Communication Plan aim could be to improve the relationship between the operators, Parks and Wildlife Rangers, the local police the colony of Little Penguins with the local community. As an example, the ultimate goal, might seek to produce improvements in community attitudes towards the management of cats and dogs, particularly at night when they are a potential predator to the Little Penguins. At Low Head improved education and communication may encourage community members to assist in the re-vegetation and rehabilitation of the site. In time, this may develop into a community regulation program, whereby the community monitor any undesirable activities at the site and help educate others and maintain the standards set for that location. Such a strategy might mitigate some of the undesirable behaviours mentioned which places unnecessary pressure on the Little Penguins colony.

At Bicheno, where I was able to conduct a survey of visitor attitudes, the observations collected were very similar to that obtained by Orams and Hill (1998). Orams's study investigated the impact of a dolphin education program on tourist behaviour. Following the intervention a number of significant improvements in the tourists' behaviour was observed including: a lessening of the number of people touching the animals (Orams and Hill, 1998, as cited in Ballantyne *et al.*, 2008).

The Bicheno survey demonstrated that visitors are likely to be supportive of changes to wildlife viewing practices if it can be demonstrated that those changes are of benefit to the wildlife's sustainability.

### **7.15 The Importance of Research and Monitoring**

According to Ellis *et al.*, (1998), adaptive management based on research will soon become a fundamental component of all conservation and suitability programs. Research based management can be defined as a management program which includes a strong communication between management activities, followed by an evaluation of those activities to assess their effectiveness (1998). Survey and data collection helps build an understanding of what is transpiring at a site (Ellis *et al.*, 1998). As an example, the Phillip Island Management Plan supports the need for ongoing research and is committed to an ongoing data collection program. Research provides the management body with vital information about the dynamics of an area, and can be used as supporting evidence to apply for funding to complete work or undertake ongoing projects. The importance of

research has been revisited several times within this thesis. Research is urgently needed at each of the three case study sites studied in this thesis, and is likely to be needed at the other Little Penguins sites throughout Tasmania. Presently there is no monitoring of the number of Little Penguins at any of the sites studied in this thesis. It is therefore not possible to accurately determine the current and future sustainability of the penguin colonies in question. The penguin colony at The Neck at Bruny Island requires urgent research in order to determine whether the harvesting of Shearwaters is having a negative effect on the colony of Little Penguins. The site at Low Head is heavily impacted by human activity, which means that research on the severity of this threat is also required. Constantine says that nature-based tourism needs to be developed cautiously and research used to support initiatives. The animals' welfare should be the number one priority because without them there would be no wildlife tourism (Constantine, 2004).

#### **7.16 The Need for Investment and Funding**

All businesses and enterprises need investment and funding to ensure that appropriate developments are supported. I would argue that commercial Little Penguins tourism ventures are based on a profit driven commercial basis and need the same forward planning and investment as any other commercially business. Careful management of resources in any business is fundamental to ensure business continuity. The natural resource used in the case studies depicted in this thesis, are Little Penguins. As the businesses are using a resource to make a profit, it should also be their responsibility to ensure its sustainable use. Key stakeholders, including the community, government and the operators should have a level of responsibility ensuring that the state's natural resources are maintained. In order for this to be achieved stakeholders and operators may be expected to invest in the natural resources that they are profiting from, such investment may include:

- funding of research projects;
- development of appropriate and approved infrastructure, including paths and boardwalks;
- re-vegetation and rehabilitation of degraded sites;
- funding rehabilitation programs for sick or injured birds;
- protection of those wilderness areas which are off limits to visitors;
- investment in training and ongoing accreditation
- weed and pest eradication programs;
- fencing as required;
- education, communication and signage; and
- development and maintenance of critical infrastructure.

### **7.17 Marine Impacts Including Recreational and Commercial Fishing**

Evidence has been established within this thesis, and again by Birds Tasmania and the Tasmanian Conservation Trust, that gill-nets or grab-all nets should be banned using the *Precautionary Principle* (which was discussed in Chapter 5). Conversations with the management authorities at some sites confirmed that many Little Penguins deaths are caused by entrapment in gill-nets. It has also been suggested that the management requirements are not being enforced, which has resulted in the regulations being flaunted, with fishermen placing nets in inappropriate locations, such as close to rocks, (penguin landing sites), or close to the penguin colony itself. Many nets are left illegally overnight. The distress and powerlessness of the management authorities to improve this situation, was evident to me during the interview process.

### **7.18 Rehabilitation Programs**

After completing a risk assessment a rehabilitation program needs to be developed as appropriate. The habitat recommendation for the Derwent Estuary (Booth, Wells and Lee, 2003) and the Management Recommendations and Guidelines developed by Lee and Booth (2003) have helped to build awareness of the importance of protecting the Little Penguins' habitat. Additionally the Guidelines for Works in Areas of Little Penguins Habitat by Marker and Wind (2003) provided guidance on how this can be accomplished. While communication and education of employees within the relevant council departments will help improve levels of knowledge, commitment to protecting the Little Penguins habitat, and prevent destructive policies and activities from going ahead. Further work and possibly research is required to establish;

- the species suitable for the different coastal areas;
- seed propagation collectors and seed banks;
- methods of plant establishment;
- control measures, including fencing, wind, erosion, vermin and insect control; and
- involvement from community groups to instigate and provide the necessary after care work, such as watering and maintenance.

### **7.19 Commitment to Maintain Biological Diversity**

If the maintenance of biological diversity is important then it should be a priority to protect Little Penguin colonies such as the one at Low Head. A commitment should be established to ensure that these colonies are preserved, and that the measures outlined in this chapter are

adopted to ensure ongoing sustainability of the colony. The work by Stevenson and Woehler (2007) documents the demise and in some cases total collapse of several Little Penguins colonies in Tasmania. The stakeholders involved need to make a commitment to the protection of biodiversity, so that sites such as Low Head are maintained and returned to as near as original condition as possible.

### **7.20 The Establishment of Exclusion Zones not Accessible to Visitation Other Than Approved Research**

Dann suggests that some areas used by the Little Penguins colonies at Phillip Island should not be accessible to the public. This supports the maintenance of the biological diversity of the Little Penguins colonies (Dann 1996). The idea of creating a exclusion area, an area kept at its natural state or nurtured back to a near original state, would allow penguins to co-habitat unmolested by visitors. Comparisons could then be made between the breeding success of colonies subject to visitation and those left to themselves, with the view of improving the management of Little Penguins used for commercial purposes.

### **7.21 Conclusion**

This chapter has allowed me to discuss the issues that are of the most relevance and importance to this thesis. The ultimate aim of these discussions is to improve the sustainability of Little Penguins colonies used for commercial tourism purposes. A number of important elements have been drawn from the preceding chapters; these have been discussed with a view to making recommendations in Chapter 8. Research has shown that there are a large number of factors impacting on the sustainability of the Little Penguins colonies used for commercial tourism purposes.

These impacts could largely be minimized by the development of;

- site risk assessments;
- development of adaptive management plans together with the implementation strategies,
- appropriate funding and support from governing agents;
- improved lease conditions imposed on commercial operators, which address the risks identified; and
- the enforcement of relevant legislation.

In the next chapter, I will conclude the research and provide a more in-depth look at the different methods of minimising the impacts on the Little Penguins, additionally to outline a Recommendations Code of Practice for Operators and Good Practice Guidelines.

## Chapter 8 Conclusion and Recommendations

### 8.1 Introduction

This chapter provides the conclusion for this thesis and in so doing reconsiders the purpose of the research and the extent to which the objectives provided in Chapter 1 have been met. Additionally and importantly in this chapter the findings regarding sustainability of the colonies of Little Penguins used for commercial tourism will be presented, while acknowledging the impacts and potential impacts on penguin colonies used for commercial tourism; and providing the steps that could be adopted to alleviate or militate against the identified impacts.

Lastly this chapter will offer recommendations which I believe will assist the management of Little Penguin colonies used for commercial tourism purposes to move closer towards sustainability.

This research project aimed to contribute to the development of good practice guidelines for minimizing human disturbance to penguins at commercial penguin viewing operations in Tasmania. The research anticipated doing this by highlighting factors which was considered important to sustainability of the Little Penguin colonies. The methods undertaken were designed to provide a thorough research project which involved a multidiscipline approach. In order to achieve this, the following activities were undertaken:

- potential case study options were considered and selection made;
- literature and legislative review was completed;
- three case studies were analysed;
- key informant interviews were conducted;
- visitor surveys were completed; and
- field observations were undertaken at the three case study sites.

The resulting information allowed conclusions to be drawn which are provided in the following sections. These conclusions have been based on direct observations together with interviews with key stakeholders, surveys with visitors and reviews of relevant legislation. That information was then considered against other Little Penguin commercial operations with a view to making comparisons and the drawing of assumptions. Finally the factors which were considered as critical points have been developed into a series of recommendations for the three case study sites, which were:

- the commercial Little Penguin viewing enterprise at Low Head;
- the Neck at Bruny Island; and
- the commercial Little Penguin viewing enterprise at Bicheno.

In undertaking the research I was able to identify and describe the characteristics and potential impacts of commercial Little Penguin tourism in Tasmania. This was achieved through the multidisciplinary approach suggested by both Denzin (2004) and Hay (2005). The combination of the dialogue with Parks and Wildlife staff, interviews with operators and surveys of visitors combined with the literature review; legislative review and field work supported establishment of the characteristics and potential impacts. These impacts were subsequently developed into key themes in Chapter 6.

- theme one – governance;
- theme two – threats to population sustainability – introduced predators;
- theme three - threats to population sustainability – developments including tourism; and
- theme four – indirect threats to population sustainability.

These themes have been teased out to produce the threads of knowledge which have subsequently developed into the recommendations shown below. In the recommendations section these themes have been expanded to encompass the following important considerations;

- the importance of a vision, goals and leadership;
- the necessity for a review of appropriate legislation and its ability to protect the natural biodiversity of Tasmania;
- the requirement for appropriately empowered governance and management structures;
- the need for licensing arrangements that achieve objectives; and are attached to a rigorous yearly license renewal process;
- the need for a operator code of best practice with yearly objectives;
- the requirement for impact assessments to be conducted;
- the need for management plans for each site;
- the need for base line data;
- the need for good infrastructure;
- the need for operator reinvestment in species and habitat protection;
- the need for community involvement;
- the importance of ongoing research; and
- the need to maintain monitoring and reporting with a view to adaptive management implementations as appropriate.

## **8.2 Summation and Findings**

Tasmania has many opportunities to view and market wildlife tourism; it has an external image of clean and green with a wonderful abundance of beautiful wildlife. Tasmania is recognizing that wildlife tourism represents a product that has the capacity to attract and

please visitors: *Tasmania is Australia's island of experiences – abundant wildlife and nature. In Tasmania's wild places, rare plants and amazing animals thrive* (Tourism Tasmanian, 2005: 3).

Many would agree that wildlife is in abundance and there are many opportunities for increasing wildlife tourism, bringing economic and social development to Tasmania. However that should not be at a cost to the sustainability of the colony used for that tourism experience, as MacLellan (1999) reminds us the cost of tourism should not be the wildlife itself.

The purpose of the legislation of the Tasmanian Government is to have developments of a sustainable nature. The relevant legislation which was discussed at length in Chapter 5 has at its core, sustainability. However for a variety of reasons I have formed the opinion that in some cases the relevant legislation is not working effectively to meet this goal of sustainability. For effective legislation there needs to be a number of key points addressed; such as the legislative power and the will and ability to enforce. To have legislation which is not empowered or under resourced hinders the ability of the authorised officers to act. The evidence, I suggest, can be seen in the examples outlined in Chapter 6 for the case study examples of Low Head and Bruny Island. The legislation relevant for these sites are the *Nature Conservation Act 2002*, the *National Parks and Reserves Management Act 2002*; and the *Crown Lands Act 1976*, however it appears the activities on the ground do not match the rhetoric. For example in the case of Bruny Island the values of the reserve has been established as they have: *Natural values of the area that are unique, important or have representative value (Nature Conservation Act 2002)*. Additionally the objectives have been clearly articulated, for example, the *Nature Conservation Act 2002 – Game Reserve classification states*:

- *to conserve the natural biological diversity;*
- *to protect..... to rehabilitate; and*
- *to encourage cooperative management techniques with the Aboriginal community.*

The same legislation allows for the *taking of game*. That taking of game (juvenile Shearwaters) impacts on the Little Penguins by disturbance to penguins within burrows mistake for Shearwaters and the trampling of burrows during the process of the *taking of game*. The authorised officers' state they are not empowered and with limited resources they do not have the ability to enforce the legislation in a manner which meets the occupational health and safety codes of the Parks and Wildlife Service.

The similar scenario applies for Low Head. At the Low Head case study site, the land classification is Conservation Area, also under the *Nature Conservation Act 2002*. The classification states that the land is valued because of its predominantly, natural state. The key objectives are to conserve the natural biological diversity, control use of natural resources, provide for the taking on a ecologically sustainable basis the taking of game, to encourage education, facilitate research and protect and rehabilitate the area, following events such as fire, introduced species, erosion, and lastly to facilitate cooperative management programs. The reserve classification allows for the sustainable *taking of game*, such activities would require research, data collection and monitoring to ensure that the activity was conducted in a sustainable manner.

A major problem that has been uncovered is that of the differing licensing arrangements for Little Penguin commercial tourism operators. License agreements are inconsistently applied across the three case studies. This appears to put some license conditions on some operator and not others. This is a problem as the legislation is not uniformly being applied across the sites, and greater cost imposes on some operators which are not imposed on others. The Legislation should be uniform across the state, and as and when updates to license arrangements made these should be simultaneously applied across all operators, which is within the legislative power of the governing body to accomplish discussed in Chapter 5.

Further it appears the operators are not required to invest in the site they lease. This was very evident at Low Head where there appears to be little proactive work at the site to enhance the sustainability of the penguin colony there. On the other hand, it is noted that ongoing work appears to be a high priority for the Bicheno site where it appears the operators, on a voluntary basis, undertake restoration work. Clearly the operators at Bicheno understand the connection between the number of penguins they have at the site, and the habitat available for those birds and the sustainability of their wildlife tourism business.

Each of the three case study sites appeared to experience the same level of community disinterest. This impacts on each of the case study sites and appears to be a significant problem, for example, at Low Head; the community could be involved in improving many facets of the site, such as;

- fencing off of areas to rehabilitate and provide critical nesting habitat;
- seed collection, propagation, planting, weeding, watering;
- removal of predators, including, rabbits, dogs and cats;
- development and maintenance of a raised board walk, restrictive visitor fencing; establishment of clear paths, while blocking access to others;

- penguin counts and monitoring;
- education and communication to other members of the community; and
- supervision of out of hour's visitations as appropriate.

Such programs if successful would have immediate benefits for the Little Penguins and would provide benefits to the community through increased social interaction, a sense of purpose and responsibility. At the moment the Little Penguin colony is vulnerable. Additionally there is the legislative capacity for a person, business or group to *take game* (Little Penguins) and although there is no evidence that this has occurred to date, clearly such an action would be detrimental to the colony as the taking of one bird clearly impacts on their mate and their ability to raise a successful chick (Lindsay *et al.*, 2007). In theory it is possible that an organization such as the pulp mill proposed for George Town could take Little Penguins to test for chemical contamination, under the current legislation this is possible.

The activities that impact on Little Penguins at Bruny Island are many and varied; refer to Chapter 6.3, Figure, 17. Organizations such as Birds Tasmania are lobbyists for legislative change, saying among other contributing factors, the use of gill-nets or grab-all nets, (banned from other states) is destructive to Tasmania bird life, including Little Penguins. *Birds Tasmania has great concerns for the Little Penguin population in Tasmania. Recent surveys in 2002 clearly indicated substantial decreases in many colonies in the east and southeast of Tasmania. While gill netting is not the sole contributor to this decrease, it is one factor that can be addressed relatively simply and easily – by the banning of gill-nets within 1km of penguin colonies* (Woehler, 2009:1).

Both the Parks and Wildlife staff together with Dr Cochrane from Inala Wildlife Tours stated their concerns regarding other operators who use The Neck at Bruny Island for wildlife tours, saying it is not known who these operators are, or indeed if they are licensed operators (Parks and Wildlife Interviewee # 1) Cochrane also voiced her concern regarding the desire to improve and seal the road at The Neck, saying the activity needs to be carefully considered to reduce the impacts on the Little Penguins who cross the road during their daily activities.

As discussed previously in this thesis the impacts by individuals *taking of game* or juvenile Shearwaters is a regular occurrence, it is not known if this activity is sustainable. The activity, according to Parks and Wildlife Interviewee #1 also impacts on the Little Penguins, clearly the legislation around this activity needs to be re-assessed.

This research thesis has established that Little Penguins at the three case study sites are all under pressure of varying degrees from tourism and other activities at their sites, as discussed

in depth in Chapter 6. However, without base line data and ongoing monitoring it is not possible to determine the degree of risk associated with this pressure from human activities. The establishment of base line data is the first critical recommendation, for without reliable data there is not an ability to compare and analyze in the future to determine the health and sustainability of the colonies in question.

As discussed in the Low Head case, base line information that could be used for this purpose is the data which was collected following the demise of the Iron Baron, when many hundreds of Little Penguins were affected at Low Head by the subsequent oil slick associated with the tanker collision. The clean up involved many hundreds of Little Penguins with 900 being successfully returned to the wild in 1995 (Australian Maritime Safety Authority, 2010). Arguably since that time tourism pressures have only increased or certainly not subsided, a subsequent count of Little Penguins would provide answers to the sustainability of the colony. Over the past few years some activities have been attempted at the site, mainly by the regional NRM bodies. The regional NRM bodies have embarked on some important initiatives at the site at Low Head, and have tried to enlist community support, some of their activities include;

- dog proof fencing – partially complete;
- signage – restricting dogs from the colony, limited success;
- native plantings – three small trial plots have been established;
- school campaigns making concrete burrows, still to be successfully placed in position; and
- development of a local brochure which was hoped to increase the local community's interest and involvement in the colony of Little Penguins.

The initiatives have all experienced relatively small outcomes compared to their initial intentions (NRM interviewee #1). A crucial step in securing improvements for the colony of Little Penguins at Low Head appears to revolve the local community. The reason for the lack of interest from the local community is not clearly understood. Further research is required to understand the community's apparent lack of interest in the unique feature of a colony of Little Penguins. Community support and involvement if improved may benefit the long term sustainability of the colony. Other activities which appear to be required, but which have not been established these include:

- a site risk assessment;
- habitat restoration plan;
  - sea spurge removal;
  - gradual removal of African Boxthorn as alternative habitat becomes established;
- a management plan;
- a cat management plan;
- program to increase greater community involvement;

- lease arrangement improvements; and
- greater investment in environmental and habitat protection efforts from operators.

In considering the main question this research project sought to understand; *are the colonies used in Tasmanian for commercial wildlife viewing sustainable*, my summation conclusion for each of the study sites are as follows.

### **8.2.1 The Neck at Bruny Island**

The Neck at Bruny Island appears sustainable due to the fair covering of natural vegetation which provides a suitable habitat and due to the high numbers of birds who appear to colonise there. However the research has highlighted that the Little Penguins are impacted by a variety of development activities at the site which includes; unregulated tourism activity including unregulated tourism *operator* activity, impacts from mutton birding, impacts from illegal fishing and marine activities, impacts from road infrastructure, including, maintenance (destroying habitat and encouraging weed infestations) and road deaths due to the high volume of traffic on The Neck road. While it appears that the Little Penguins are sustainable this is based on anecdotal evidence and there is no official data collected which can be analysed to support such a claim. Such information and data collection should be commenced as soon as practicable.

### **8.2.2 Bicheno Site**

The research has highlighted that there are impacts on the colony of Little Penguins; these include the delays (experienced by penguins accessing/reaching their burrow) caused by the extent and volume of tourism activity and impacts from predators and local residents. One of these impacts could be easily alleviated by installing a board walk under which the Little Penguins could pass. The habitat at the site is actively maintained by the operator which appears to alleviate pressures associated with habitat loss which is evident with another site such as Low Head. However impacts such as the construction of concrete burrows and the purposeful placement in the drive way and turning circle appears to be a potential and unnecessary risk, with one Little Penguin documented to have been squashed by the tourism bus on entry to the site. The colony appears to be sustainable; however, again there are no official counts to confirm this conclusion. Such information and data collection should be commenced as soon as practicable.

### **8.2.3 Low Head Site**

At the Low Head site the colony is not sustainable in its present format. I have determined this through a careful analysis of all relevant factors that the colony is at risk and vulnerable. The states of affairs at Low Head have arguably been developing over a long period of time. It is an area that was settled and developed very early in Tasmania history (1804). The impacts on the Little Penguins have probably been accumulating gradually over that extended period of time. It is my opinion that the site is now in an extremely degenerated state, this has been well described in Chapter 6.3. Therefore I would argue that the colony at Low Head is not sustainable and requires urgent attention. Again there is no official monitoring of the penguin numbers and this requires rectification as the first step, further recommendations have been made in Chapter 6, 7 and 8 in this regard.

The following section is devoted to the recommendations, and have been developed using the case study examples, Bruny Island, Low Head and Bicheno.

### **8.3 Recommendations**

8.3.2 Presents the improvements that are recommended for the three case study sites. These recommendations have been based on all of the activities which have formed the fabric of this thesis. It is anticipated that the development and implementation of these recommendations would facilitate improved opportunities for Little Penguins colonies used for commercial tourism purposes and move them closer towards sustainability.

Figure 51 represents the improvements that are recommended for the three case study sites. These recommendations have been based on all of the activities which have formed the fabric of this thesis. It is anticipated that the development and implementation of these recommendations would facilitate improved opportunities for Little Penguins colonies used for commercial tourism purposes and move them closer towards sustainability.

Figure 52 represents a suggested Code of Good Practice Guidelines for Tourism Operators who use Little Penguins as their primary draw card with a view to increasing the sustainability outcomes.

Figure 53 represents Standard Operating Procedure outline, to be applied to commercial Little Penguin Wildlife sites.

### 8.3.1 Recommendations

Title	Recommendation	Bruny Island	Low Head	Bicheno
Vision goals and leadership	Establish the vision, goals, objectives of the measures which will be used to protect the biodiversity of Little Penguins and their habitat in Tasmania. Promote the appropriate leadership models to ensure the vision is enacted	√	√	√
Base Line Data	Fund and facilitate the development of research that will provide the base line data which can be subsequently used to monitor progress towards meeting objectives	√	√	√
Impact assessment	Fund and facilitate impact assessment at all sites where commercial tourism utilises Little Penguins as natural resource	√	√	√
Legislation	<p>Undertake a Legislative review with a view to supporting the PWS efforts to protect Little Penguins through appropriate legislation. Achieved by reviewing the following Legislation to determine its ability to protect the natural biodiversity of Little Penguins in Tasmania.</p> <ul style="list-style-type: none"> <li>• <i>Dog Control Act, 2002</i></li> <li>• <i>Vermin Control Act, 2002</i></li> <li>• <i>Nature Conservation Act 2002</i></li> <li>• <i>Crown Land Act 1976</i></li> </ul> <p><i>In particular to review the status of “controlled use of natural resources”</i></p> <ul style="list-style-type: none"> <li>• <i>National Parks and Reserves Management Act 2002</i></li> </ul> <p>In particular to review the status of the land tenure and with a view to changing the status from a game reserve to an alternative classification which would afford the Little Penguins and the Shearwaters the protection they deserve at such a highly visible tourism destination, such as Low Head and Bruny Island’s Neck.</p>	√	√	√
Governance and management	<p>To mitigate the adverse impacts or potential impacts at sites used for commercial wildlife tourism legislation needs to be revised as appropriate to ensure that the biological diversity of the locality is afforded protection. Further that the governance entrusted by that legislation is resourced and empowered to enact that legislation, effectively providing protection offered under the legislation. Various aspects need consideration such as:</p> <ul style="list-style-type: none"> <li>• revise licensing arrangements and an annual renewal process;</li> <li>• define greater obligations of operators, develop criteria and enforce, regulate and monitor;</li> <li>• complete a risk assessment on the site;</li> <li>• develop a management plan for the site;</li> <li>• develop a fire safety plan;</li> <li>• track visitor numbers;</li> <li>• enforce regulations;</li> <li>• increase monitoring and supervision;</li> <li>• develop and instigate a weed removal program as appropriate to the site;</li> <li>• develop appropriate accreditation and training programs; with an annually update and renewal process ;</li> <li>• re-instate or develop the cat eradication program; and</li> <li>• protect, enhance and maintain critical habitat through appropriate planning and implementation programs.</li> </ul>	√	√	√
	<p>Undertake analysis and research work as appropriate:</p> <ul style="list-style-type: none"> <li>▪ ban mutton birding or the taking of juvenile shearwaters from The Neck;</li> <li>▪ study the relationship between Shearwaters and the Little Penguins;</li> <li>▪ research the effects of fishing in the area;</li> <li>▪ enforce fishing licenses;</li> <li>▪ disconnect a Cray fishing license to also include a grab-all net; and</li> <li>▪ ban grab-all nets.</li> </ul>	√		
	<p>Increase parks and wildlife funding/resourcing to support:</p> <ul style="list-style-type: none"> <li>▪ summer ranger program;</li> <li>▪ local ranger program; and</li> <li>▪ provide adequate and appropriate marine infrastructure (boat, vehicle, outboards, fuel etc).</li> </ul>	√		

Infrastructure	<p>Infrastructure is an important consideration in wildlife viewing, having the capacity to reduce impacts on the wildlife that is viewed if developed and maintained appropriately. The previously mentioned risk assessment and subsequent management plan will identify the needs of various sites in relation to appropriate infrastructure, these may include, but may not be confined to:</p> <ul style="list-style-type: none"> <li>• install appropriate tracks, paths or boardwalks or improve or maintain existing infrastructure as appropriate;</li> <li>• provide interpretative illuminated signage; and</li> <li>• fence off sections of the land reserve for biodiversity protection or habitat rehabilitation, excluding visitors, walkers and tourists.</li> </ul>	√	√	√
	<ul style="list-style-type: none"> <li>• develop a road infrastructure plan with a maintenance and funding policy, sensitive to Little Penguin needs;</li> </ul>	√		
Licensing arrangements	<p>The wildlife tourism sites operate under licensing arrangements with the State Government. These arrangements provide the means of setting codes of conduct. Ensuring standards are met with a view to protecting critical habitat and the means of providing the critical protection for a species such as Little Penguins, improvements or considerations of the following are considered important:</p> <ul style="list-style-type: none"> <li>• review and update licensing arrangements to ensure uniformity across the state;</li> <li>• ensure operators are appropriately licensed;</li> <li>• enforced standard licensing arrangements across the state;</li> <li>• seek investment from operators into the site, including critical habitat maintenance, development, protection or refurbishment within the licensing agreement;</li> <li>• develop Code of Operator Practice.</li> </ul>	√	√	√
Capacity raising	<p>The community can be an effective mechanism to ensure that sustainability issues are considered both all the stakeholders. Efforts to raise community capacity, interest and engagement are observed to be critical, improvements could involve:</p> <ul style="list-style-type: none"> <li>• funding to develop extensive and ongoing community development campaign, with a view to assistance from the community with: <ul style="list-style-type: none"> <li>○ habitat maintenance;</li> <li>○ monitoring and surveillance;</li> <li>○ weed and vermin including cat and dog management programs; and</li> <li>○ seed collection, propagation, planting fencing, maintenance and watering.</li> </ul> </li> </ul>	√	√	√
Research	Facilitate, fund and support appropriate research.	√	√	√
Monitoring and reporting	<p>Monitoring and reporting are fundamental needs of sustainability issues for wildlife tourism including the sustainability of Little Penguin colonies that are used for commercial tourism purposes. It is a critical component in understanding the impacts on colonies and the results of those impacts. This data can subsequently be used to understand and mitigate against those pressures and includes:</p> <ul style="list-style-type: none"> <li>• facilitate, fund and support appropriate ongoing monitoring; and</li> <li>• report in the Tasmania State of the Environment Report.</li> </ul>	√	√	√

**Figure 51 Recommendations, (Wendy Mitchell 2010).**

### 8.3.2 Good Practice Guidelines for Operators

Title	Recommendations	Comments
Accreditation and training program	All guides to have Wildlife Tourism Guide Accreditation	Accreditation or training to be developed by Parks and Wildlife, with an annual renewal process.
License	Annual renewal licence fee, with appropriate fee structure, that is used for research projects.	Parks and Wildlife to develop a license renewal process.
Licensing requirements	<p>All licensed operators to submit a yearly business plan, including:</p> <ul style="list-style-type: none"> <li>• annual habitat state of the environment report, works on site, improvements on habitat, with pictorial reference of achievements or progress;</li> <li>• yearly habitat maintenance program to be submitted to parks and wildlife;</li> <li>• yearly impact assessment to be submitted to parks and wildlife;</li> <li>• fire safety plan;</li> <li>• weed management plan;</li> <li>• vermin control program; which should include dogs and cat management, and community engagement strategy;</li> <li>• infrastructure and refurbishment plan – track development and maintenance, fencing, regeneration, boardwalk development and maintenance;</li> <li>• reinvestment program – annual report – 25% of operator profits to be reinvested in approved activities on the site for the maintenance of habitat, direct protection or enhancement measures, community engagement or infrastructure development;</li> <li>• research and development – outline of direct or indirect activities undertaken or supported;</li> <li>• community engagement plan.</li> </ul>	<p>To be submitted to form part of the annual license renewal process.</p> <p>Yearly requirements including photographic documentation, depicting on site works and habitation restoration success factors and work in progress.</p>
Monitoring	<ul style="list-style-type: none"> <li>• daily monitoring of visitor numbers</li> <li>• daily estimates little penguin landings</li> </ul>	Submitted monthly to Parks and Wildlife
Reporting	Immediate notification of any sick or distress birds to parks and wildlife.	Immediate notification
Standard Operating procedures to be imposed at all sites	<p>Develop uniform minimum viewing guidelines including which are applied universally across Tasmania at all commercial viewing sites:</p> <ul style="list-style-type: none"> <li>• maximum people 60 people on a site simultaneously, implement staggered visits to colony.</li> <li>• minimum approach distances of 5 meters;</li> <li>• no flash photography;</li> <li>• no white lights;</li> <li>• stay on formed boardwalks and tracks;</li> <li>• no handling or harassment of wildlife;</li> <li>• no food to be taken into the colony;</li> <li>• no feeding of wildlife;</li> <li>• use existing tracks;</li> <li>• stay to formed paths;</li> <li>• no removal or cutting of native vegetation or other habitat without prior approval from Parks and Wildlife;</li> <li>• no artificial burrows or other wildlife habitat to be artificially placed in traffic areas;</li> <li>• no feeding of wildlife permitted;</li> <li>• no camping permitted;</li> <li>• all guides over 18 years with all license requirements, including first aid, and accreditation as a guide through the Parks and Wildlife accreditation program.</li> </ul>	
illuminated Signage	Install and maintain approved illuminated signage (well away from colony).	To be approved by Parks and Wildlife before installation.

Figure 52 Good Practice Guidelines (Wendy Mitchell, 2010)

### 8.3.3. Standard Operating Procedures

Standard Operating procedures to be imposed at all sites	Bruny Island	Low Head	Bicheno
Develop uniform minimum viewing guidelines including which are applied universally across Tasmania at all commercial viewing sites: <ul style="list-style-type: none"> <li>• maximum people 60 people on a site simultaneously, implement staggered visits to colony.</li> <li>• minimum approach distances of 5 meters;</li> <li>• no flash photography;</li> <li>• no white lights;</li> <li>• stay on formed boardwalks and tracks;</li> <li>• no handling or harassment of wildlife;</li> <li>• no food to be taken into the colony;</li> <li>• no feeding of wildlife;</li> <li>• use existing tracks;</li> <li>• stay to formed paths;</li> <li>• no removal or cutting of native vegetation or other habitat without prior approval from Parks and Wildlife;</li> <li>• no artificial burrows or other wildlife habitat to be artificially placed in traffic areas;</li> <li>• no feeding of wildlife permitted;</li> <li>• no camping permitted;</li> <li>• all guides over 18 years with all license requirements, including first aid, and accreditation as a guide through the Parks and Wildlife accreditation program.</li> </ul>	√	√	√

Figure 53 Standard Operating Procedures, (Wendy Mitchell 2010, adapted from Parks and Wildlife Service License agreements)

### 8.3 Concluding Statement

The results of this research have a range of possible implications for future governance and management of coastal developments and tourism particularly in relation to Little Penguin tourism. For example, the findings of this research may be helpful for the governing body to strength the licensing arrangements and their enforcement for wildlife tourism operators. This is a measure identified within the research that will increase the sustainability of wildlife utilized for commercial tourism operations.

The research has highlighted the need for improved practices, in particular in relation to the preservation or enhancement of critical habitat for Little Penguins. Discussed the need for improved performance from operators who run commercial Little Penguin wildlife tours further the thesis has offered suggestions as to how this might be accomplished.

Additionally the research has outlined the research of other organizations and writers on the topic of sustainability for wildlife tourism with a particular focus on the Little Penguin wildlife tourism. Examples have been provided which showcase the research and efforts to mitigate the impacts of developments and commercial tourism: the examples used were Phillip Island Nature Park and Granite Island. Many of the impacting factors I have identified as affecting colonies of Little Penguins at the three case study sites in Tasmania have been experienced at these sites, and we can learn from their experiences.

The surveys conducted at Bicheno have provided data supporting improvements to signage, improved training and interpretation experience for guides. The data have suggested that providing visitors know that the Code of Conduct imposed on their visit help improved sustainability outcomes for Little Penguins, visitors would support such changes.

Importantly the thesis has highlighted the need for additional research that is required. The legislation which should protect the Little Penguins requires that the wildlife is sustainable, but without base line data and ongoing research and monitoring it is impossible to determine if the colonies used for commercial tourism are sustainable.

Throughout this thesis the research has continually highlighted the impacts of development and tourism on the Little Penguin colonies; tourism and development pressures. These are the same impacts that Zedan highlighted in 2004 in the International Dialogue on Tourism and Cultural Diversity and Sustainable Development; increasing human presence leads to destruction of habitats, that human behaviour disrupts normal behaviour of wild animals affecting their motility and reproduction. My findings have support these findings, but more importantly I have offered the solutions or mitigation measures to alleviate these pressures. In particular these include the need for;

- improved legislation: review of reserve status - change from Game Reserve and/or Conservation Area to a category which will protect the biodiversity of Little Penguins;
- a review of legislation that impacts on the direct health or indirect health of Little Penguins;
- re consider the licensing arrangements for gill-nets or grab all nets;
- conduct impact assessments to determine the risk factors which impact on Little Penguins at all sites;
- adaptive management plans to mitigate against those identified impacts;

- improved licensing arrangements with tourism operators with a requirement on operators to re-invest in biodiversity protection and or enhancement.
- licensing arrangements that are rigorous, require standards to be met on an annual basis before renewal;
- development and implementation of a state wide, universally applied Code of Operator Practice;
- investment in infrastructure that is appropriate to each site which reduces the pressure of viewing on Little Penguins;
- a concerted and sustained effort with appropriate funding to improve and maintain critical habitats;
- community engagement strategies which will achieve greater community understanding, empathy and support for Little Penguins; and
- training and accreditation processes for guides.

This research has highlighted the important issues of critical habitat maintenance which as the research has shown continually is impacted by development pressures. This is most obvious at the Low Head site where the site is depicted to be completely void of native vegetation, yet a major tourism attraction for the region. Similarly at Bicheno the pressures being experienced there could be alleviated quickly by appropriate board walk infrastructure that gets the visitors up and over the Little Penguins. At Bruny Island the reserve classification which continues to allow the taking of game in a major tourism attraction clearly needs addressing.

Lastly I believe the research has highlighted the need for improved management of tourism operations who utilize Little Penguins as their draw card. I have drawn the conclusion that operators should be licensed to contribute to the well being of the colony in a number of ways. This could be achieved through expecting a financial contribution to be used for protection, infrastructure or regeneration activities, or it could be expected that licensed operators achieves these goals. At the moment operators are not expected to improve or protect the environment or the Little Penguins from which they draw their tourism incomes.

In Adlam's (2003) thesis on wildlife tourism Adlam identified that there was a distinct lack of research regarding sustainability of the wildlife tourism industry in Tasmania. It is hoped that this thesis has contributed to the research which will move Tasmania closer towards sustainability of an animal unique to the southern waters of Australia.

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