

**Operator Compliance and
Attitudinal Compliance
to Aspects of
Australian Whale Watch
Management Conditions**

Thesis submitted by

Joline Michelle LALIME
B.Sc. Queensland, M.Sc. Missouri

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I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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STATEMENT OF CONTRIBUTION OF OTHERS

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ABSTRACT

Whale watching is a rapidly growing industry worldwide, involving vulnerable species, with few data on impacts and no data on success of enforcement of regulations. Because of this, the extent to which whale watching may impact on focal species is increasingly becoming an international concern. In early 1998, an international whale-watching research workshop in Monaco identified "problems of enforcement of regulations" as one of the four major problems with the management of whale watching. In 2000, Australia implemented the ANZECC Guidelines for Cetacean Observation in Commonwealth waters, while individual states are responsible for developing their own guidelines or regulations.

Effective management of the whale-watch industry is dependent on operators' compliance to the appropriate management regimes. Operators' compliance with existing regulations and guidelines has not been studied in detail. The study aimed to test whether existing distance and approach conditions for whale watch vessels are an effective regulatory tool by: 1) observing whale watch operations that target humpback whales (*Megaptera novaeangliae*) in Queensland and New South Wales' waters and 2) conducting a questionnaire survey of whale watch operators' attitudes towards compliance. Movements of whale watch vessels in relation to focal humpback whale pods were tracked using a handheld GPS, a Laser Range Finder and a Digital Compass at the two field sites. This provided an indication of operators' compliance with distance and approach guidelines and regulations. Questionnaire surveys were used to elicit the potential influence of operators' beliefs and perceptions concerning the whale watch guidelines on compliance.

Management differences between the states of Australia even for the same species of cetacean, is a management issue that needs resolution. I found that there are now a total of 35 legislative documents across Australia that provide general or specific protection to whales during general public or commercial vessel observation. Although the legislation is fairly consistent, the inconsistencies across jurisdictions regarding distances of approach and explanations of terms can lead to confusion and the perception that legislation has no basis, increasing the chance of non-compliance.

I used qualitative research methodology to understand the factors that influence the attitudinal compliance of whale watch operators. The whale watch operators' perceptions regarding the level of certainty or level of threat of legal sanctions, the level of monitoring, and endorsement of operators of non-compliance all had a positive relationship with attitudinal compliance of whale watch operators. Attitudinal compliance had a negative relationship with sole owner-operator status, the voluntary nature of guidelines, and the belief in the fairness of guidelines.

Compliance by operators to whale watch guidelines or regulations is influenced by the behaviour of the whale(s) being observed. There is a proportion of the migrating whale population that actively approaches vessels and although operators may encourage this behaviour, it is uncontrollable. Therefore, although there are instances of non-compliance by whale watch operators, it is the active approach by a whale pod that leads to the perception of higher rates of non-compliance by whale watch operators. There was no correlation between operators' level of vessel experience or environmental factors with actual compliance. Furthermore, operators' attitudinal compliance and actual compliance were not correlated.

Recommendations from this study include: 1) improving consistency in legislation to reduce confusion; 2) progressing guidelines to regulations to increase enforceability; 3) increasing person to person consultation between regulators and whale watch operators to increase the understanding of legislation and the perception of fairness and 4) investigating the proportion of migrating whales that are more likely to approach vessels to determine the actual percentage of the population on which the whale watch industry is based as a basis for evaluating the risk of possible detrimental impacts from whale watching.

Keywords:

Whale watch; compliance; tourism management; regulations; humpback whale

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Chapter One

Formative Concepts: Why Study Operator Compliance with Whale Watching Management Strategies?

1.1 Introduction

Let me take you on a brief journey that will be elaborated in the forthcoming chapters. Why is it important to investigate whether the management strategies implemented for whale watching in Australia are appropriate and functioning? There are several factors that might contribute to this situation including: society's generic concerns about sustainability, human emotional/ psychological connection with cetaceans, the rapid development of whale watching and specific concerns about the degree of compliance with management regimes.

1.1.1 Aiming for Sustainability

The environment used to be considered to be simply for human exploitation (Whitelock 1985; Pepper 1996). Despite the prior designation of some areas as national parks, it is widely accepted that major changes in the view that the environment existed only for human use did not occur until the late 1960s and early 1970s, as a result of the development of the conservation movement (Whitelock 1985; Pepper 1996). In particular, the need for more appropriate management of the environment was highlighted at the UN Conference on the Human Environment in Stockholm in 1972 (Reid 1995). During the 1980s, the concept of sustainable development was proposed as a solution to the ever decreasing availability of resources (IUCN/UNEP/WWF 1980; Pepper 1996). By the 1990s, this concept was expanded to include more appropriate use and management of impacts on the environment i.e., ecologically sustainable development (IUCN/UNEP/WWF 1980; Pepper 1996). Countries throughout the world, including Australia, have made a commitment to these principles through management regimes, however, there is still uncertainty as to whether these initiatives have been effectively implemented (Robinson 1992; Reid 1995; Garrod & Fyall 1998, Castaño 2002; Environment Australia 2002).

Concurrently and more specifically, wildlife management has developed and now can be broadly grouped into two approaches: 1) manipulative and 2) custodial (Caughley & Sinclair 1994). As new forms of tourism, nature-based tourism and ecotourism have added to the wildlife management challenge and innovative strategies have been developed to deal with these unique forms of human-wildlife interaction. Wildlife tourism, whether classed as nature based or more specifically as ecotourism, has positive and negative effects on wildlife (Duffus & Dearden 1990; Albert & Bowyer 1991). Wildlife tourism includes one of the most recently emerging and popular wildlife experiences, whale watching, which in turn has presented its own management challenges (e.g., minimising harassment of the focal species).

1.1.2 Whale Watching – Development and Concerns

Historically, cetaceans (whales, dolphins, porpoises) have been variously depicted on objects such as coins and in the literature as devils of the sea, great mythical creatures and exceptionally intelligent mammals of the oceans (Cirlot 1962; Matthews 1968; Brenner & Pilleri 1977; Cooper 1978). The reasons for the interest surrounding the approximately 80 cetacean species worldwide can only be postulated: is it their intelligence? ability to live in the ocean? or their 'personalities'? Whatever it is, cetaceans have now become 'flagship' species for conservation (Stevens *et al.* 1996). Although attitudes towards whales vary geographically, there has been a worldwide move towards the 'use' of live whales in the form of whale watching to bolster the economies of many areas (Braund *et al.* 1988; Glass & Englund 1989; Nagasaki 1994; Amante-Helweg 1996; Findlay 1997; Hoyt 2000; Russell 2001).

Beginning in 1950 from a modest land-based platform on the Californian coast, whale watching is now conducted in 87 countries worldwide (Ritter 1996; Hoyt 2000; Russell 2001). The industry is estimated to be worth USD\$1 billion globally (Hoyt 2000). Humpback whales, in particular, are the focus of many whale watch industries across the globe (Hoyt 2000). Diminished in numbers almost to extinction, humpback whales even now number only between 30,000 and 40,000 individuals worldwide (Clapham *et al.* 1997; Smith *et al.* 1999; Bannister & Hedley 2001; Paterson *et al.* 2001). Together the two populations that migrate up the Eastern and Western coasts of Australia are currently estimated to comprise less than 20,000 animals (Bannister & Hedley 2001; Paterson *et al.* 2001). The whales engage in energetically expensive and very long (from 4,500 –10,000 km round trip) migrations between foraging and mating/calving areas (Clapham & Matilla 1988, Darling *et al.* 1996). Human caused impacts other than whaling continue today and include pollution, changes in behaviour in response to

vessel presence, masking of vocalisations by vessel noise, displacement from preferred feeding areas, reduction in food sources, drowning in shark control nets and collisions with vessels (Watkins 1986; Baker and Herman 1989; Duffus 1995; Bannister *et al.* 1996; Olson *et al.* 1997; Erbe 2002; Williams *et al.* 2002; Limpus *et al.* 2003). Thus appropriate management regimes are required to ensure that whale watching has minimal impact on populations and species that are already considered endangered or vulnerable.

1.1.3 The Role of Compliance

Regimes to manage whale watching are in place in many areas, but what factors determine operator compliance? Research on compliance and theories predicting compliance have largely been developed in the context of research on criminal behaviour and deviance. Non-compliance within the area of taxation has been a particular focus. Early economic theories focused on the costs and benefits of only a few parameters to determine whether or not a person would be compliant (Becker 1968; Block & Heineke 1978). However, it is widely accepted that non-economic theories now predominate, therefore, a combination of several factors usually determines compliance (Bandura 1969; Kohlberg 1969; Mischel & Mischel 1976; Sirakaya 1997). The measurement of attitudes to explain and predict behaviour has also been applied to various situations related to the environment (Aipanjiguly *et al.* 2003). If the attitudes and other factors that have the potential to affect compliance can be measured, management agencies can use the information to implement more effective management frameworks.

Many now accept that whale watching is a potentially sustainable use of whales and that to achieve sustainability, management regimes must both protect the whales and encourage operator compliance. This study aims to determine if the management implemented in a portion of the Australian whale watching industry achieves this goal.

1.2 Why Conduct this Study?

The management framework and the compliance of tour operators within such a framework are the two major factors that contribute to the potential for whale watching to be a sustainable use of whales (Corkeron 1996; Malcolm & Duffus 1998).

1.2.1 The Management Framework

Although whale watching has now been conducted for over 30 years, many countries, including the United States do not have specific legislation relating to the management of whale watching (Hawke 1996; Ritter 1996). Instead, guidelines have been introduced or existing legislation has been amended to include only general protective regulations (i.e., not specific to whale watching). However, since the inception of whale watching in Australia in 1987, State and Commonwealth management agencies have developed and upgraded management regimes. For example, the Whale Management and Monitoring Area in Hervey Bay was declared in 1989 and amendments were made to the *Fishing Industry Organization and Marketing Regulations 1983 (Qld)* around the same time. The Nature Conservation (Whales and Dolphin) Conservation Plan was implemented in Queensland in 1997 with specific Regulations for commercial whale watching. The Australian Government developed and released for comment the Draft National Guidelines for Cetacean Observation in 1998 and these were implemented as the Guidelines for Cetacean Observation in 2002. Each state adopted the role of developing statutory instruments for whale watching as it was deemed necessary, leading to the situation where there are different management frameworks in different parts of Australia even for the same species of whale or the same stock of whale.

The International Whaling Commission (IWC) recognised whale watching as a use of whales in 1987, but it was not until 1997 that it was considered as a legitimate form of tourism (Orams 2000). The IWC is now taking an active role in identifying the growing need for regulations because the commercial development of whale watching has raced ahead of scientific research, promotion of education (i.e., development of whale watch interpretation) and conservation (Ritter 1996). Established whale watch industries and management initiatives have been used by people concerned about the possible impacts of whale watching as a resource for the development of management frameworks in areas where whale watching is introduced. In 1998, an international whale watching workshop, identified as one of four priority areas, the need for experienced assistance in developing management strategies in areas where whale watching is just beginning (Malcolm & Duffus 1998). However, there has been no research into whether management implemented thus far has been effective. Furthermore, the consistency of management throughout Australia has not been previously discussed in detail.

1.2.2 Previous Research regarding Compliance

When time, money and energy have been expended to implement a management framework, it is usually accepted that society perceives such a framework as defining acceptable behaviour (Akers 1985). Non-compliance or deviance from management guidelines or regulations is then perceived as unacceptable and defeating the purpose of the initiative. In 1998, the international whale watching research workshop mentioned above identified four priority issues for whale watching research and management, one of which was the "problem of enforcement of regulations" (Malcolm & Duffus 1998). Workshop members recognised that further research is needed into the design and implementation of whale watch management strategies (Malcolm & Duffus 1998).

Bryden & Corkeron (1990) and Smith (1997) documented breaches of the Queensland regulations as a result of their research on the whale watch industry in Hervey Bay in the late 1980s and early 1990s. Research on compliance in other areas such as Constantine's (2001) swim-with-dolphins tours or Gorzelany's (1998 & 2000) speed limits in manatee habitats also documented non-compliance with the associated regulations. A greater understanding of why people, and in particular whale watch operators, may not comply with the regulations is required, as none of the above studies included qualitative studies to explore perceptions of the regulations that may influence compliance. Sirakaya (1997) completed a study of compliance with generic eco-tour guidelines using a questionnaire to identify variables that can contribute to greater compliance. The questionnaire was divided into three sections: perceived sanctions and enforcement, socio-demographic variables, and beliefs and perceptions in relation to the guidelines (Sirakaya 1997). The first two of these sections was well constructed but the design of the section of beliefs and perception of guidelines required improvement (E. Sirakaya, Department of Recreation, Park and Tourism Sciences, Texas A&M University, pers. comm. 1999). I decided to address these concerns and apply the basic methodology of Sirakaya's (1997) research to my study to extend the use of this new theoretical framework to a different area of ecotourism.

1.3 Research Direction of this Study

1.3.1 Aims/ Objectives

The overall aim of this research was to examine the effectiveness of the management measures implemented to reduce impacts on whales that are the focus of the whale watching industry in Australia. This was achieved by:

- (i) reviewing current regulations and guidelines implemented throughout Australia;
- (ii) evaluating the attitudinal compliance of Australian whale watch operators with the National whale watch guidelines; and
- (iii) documenting the actual compliance of whale watch operators with the implemented guidelines/ regulations.

1.3.2 Thesis Structure

This chapter gives a brief overview of the thesis by introducing the topic of compliance with whale watching guidelines, providing a background to the rationale for studying compliance and outlining the structure of the thesis.

The conceptual framework for this study is developed in Chapter Two, which details the emergence of ecologically sustainable development and ecotourism – the principles most often used to justify whale watching. Chapter Two provides an overview of the development of whale watching globally and particularly in Australia and includes general information about humpback whales, a species that is the focus of whale watching around the world. I also discuss the development of whale watching globally, with a focus on Australia, as a relatively new form of tourism with new management challenges.

Before management principles may be tested, it is essential to obtain an understanding of current practice and how it developed. Chapter Three provides a historical summary of Australian regulations and guidelines as they progressed from being used for the management of whaling to the management of whale watching. A detailed review of the legislation for the protection of whales throughout Australia is provided in Appendix One.

Chapter Four provides a synthesis of the background information on the development of compliance theories and considers for the first time the relevance of these theories to the management of whale watching. I explain the economic and non-economic paradigms of compliance and include four case studies outlining which measurable variables have been found to influence compliance with guidelines and regulations within various professions. Chapter Four concludes with a summary of how compliance theories are applicable to whale watching guidelines and regulations.

These chapters 2-4 form the background to the overall aim of this study.

To test the specific objectives of this study, I used qualitative and quantitative research as discussed in Chapters Five and Six, respectively.

Chapter Five discusses the survey questionnaire I designed to study the attitudinal compliance of whale watch operators in Australia (i.e., operators attitudes towards the Australian National Whale Watch Guidelines). The questionnaire was developed to address three specific hypotheses regarding attitudinal compliance that:

- 1) There is no relationship between the attitudinal compliance of whale watch operators and their perception of sanctions and enforcement.
- 2) There is no relationship between the attitudinal compliance of whale watch operators and the characteristics of a whale watch operator and/or his/her business.
- 3) There is no relationship between the attitudinal compliance of whale watch operators and their beliefs about and perceptions of the whale watch guidelines.

Chapter Six discusses the vessel-based research I undertook to quantify operator compliance with the Australian National Whale Watch Guidelines. More specifically, my vessel-based research was designed to address the following five hypotheses:

- 1) Whale watch operators comply with the minimum approach distance regulations.
- 2) There is no correlation between an operator's level of vessel operation experience and percent level of distance compliance.
- 3) There is no correlation between environmental factors and percent level of distance compliance.
- 4) There is no correlation between attitudinal compliance and actual percent level of distance compliance.
- 5) Whale watch operators comply with the speed conditions when within 300m of a whale pod.

This thesis makes several contributions to the knowledge base regarding future management of whale watching. These are discussed in Chapter Seven. Firstly, the conceptual part of my research approaches the study of compliance to whale watch regulations utilising both quantitative and qualitative methodology in the one study. Secondly, my research provides an overview of the development and current status of whale watch legislation in Australia. Thirdly, the data collected via the qualitative

surveys provides new information on whale watch operators' perceptions of guidelines and regulations, which influence their compliance. Fourthly, data collected onboard the whale watch vessels documents the actual compliance by whale watch operators with particular attention to compliance with the minimum distance and speed regulations. Finally, the recommendations for enhancing the current regulations and upgrading the guidelines to regulations sets a framework for future management of whale watching. Through these contributions, my research seeks to empower the Australian whale watching industry to set an example for whale watching globally, and to progress the phenomenon of whale watching toward the sustainable tourism that it aims to be.

Chapter Two

The Development of Whale Watching

2.1 Introduction

Whale watching is a highly variable wildlife viewing experience in terms of the species viewed, viewing platforms and the style of interpretation. As such, whale watching has been perceived by some as a form of ecotourism i.e. tourism which values nature by increasing the potential for conservation and reducing impacts on the ecology (Hodda 1996). In turn, ecotourism is considered to be an “ecologically sustainable” activity, because in theory, it is a sustainable method of utilising wildlands and wildlife for the benefit of people, while providing funding for conservation of the focal area or species (Nelson 1994; Obua 1997; World Ecotourism Summit 2002). However, because the meaning ascribed to ecotourism has become so varied, others do not believe that all whale watching businesses meet ecotourism standards. Therefore they view whale watching simply as another form of nature-based tourism, which “uses natural resources in a wild or undeveloped form” (Goodwin 1996; Reid 1999).

As outlined in Chapter One, this chapter develops the conceptual framework for this study. Beginning with the developmental history of environmental attitudes, I detail the emergence of ecologically sustainable development (ESD) with a specific focus on ESD in Australia. My review of the historical changes in attitudes with regards to human interactions with wildlife, including management of and tourism based on wildlife, leads into a discussion of the development of ecotourism and the development and management of whale watching. As a focus of whale watching around the world and of the whale watch operations in this study, I also include information about humpback whales.

In the last 20 to 30 years, whales and dolphins have become “flagship” species for environmental issues around the world (Stevens *et al.* 1996). This increased interest has encouraged the whale watching industry, which is rapidly spreading worldwide (Hoyt 1996; Hoyt 2000). This rapid development has created new challenges in wildlife management and in the ability of the whale watch experience to meet ecotourism criteria.

As the impacts of tourism on local communities and the natural environment are increasingly questioned, the requirement to manage in an ecologically sustainable manner has become an important consideration in the development of tourism-based industries (Blamey 1995; Godfrey 1998). Ecologically Sustainable Development (ESD) consists of three major entities: the economic, the social, and the environmental (Hare 1991). Whale watching brings economic benefits to local areas (Hawke 1996), which in turn may alter the interdependencies of people within the area. Environmental awareness may also be increased through the focus on whales and their habitat (Crabtree & Weiler 1996). Thus whale watching has inherent social impacts, which may be positive or negative. Whale watching also has the potential to impact on the environment, including the bay and ocean ecosystems in which the whales are watched, as well as, on the whales themselves (Baker & Herman 1989; Corkeron 1995; Erbe 2002). Additionally, the economic, social and environmental effects of whale watching may be felt through the money, energy and carbon required for tourists to reach a particular whale watching destination. In order to maintain the whale watching industry it must be managed sustainably, taking into consideration all the aspects of the activity.

Ecotourism was relatively unheard of only a few years ago. As an alternative to the consumptive uses of wildlands and animals, ecotourism can increase the appeal of the non-consumptive use of wildlife (Barnes *et al.* 1992). It has been recognised, however, that while ecotourism is "smokeless it is not harmless". Tourism can have substantial negative impacts on host communities (Hall 1994; Ananthaswamy 2004). Ecotourism is most commonly defined as consisting of three main dimensions. Such tourism must be nature based, environmentally educational and sustainably managed (Blamey 1995). Whale watching is definitely nature based, however, whether it is environmentally educational or sustainably managed is controversial (Amante-Helweg 1996; Crabtree & Weiler 1996; Findlay 1997).

Many whales, especially large whales have been listed by the IUCN (2003) – the World Conservation Union as Endangered or Vulnerable. Thus whale watching may involve threatened species, with little data on potential impacts and no data on the success of the enforcement of regulations (IFAW/Tethys Research Institute/Europe Conservation 1996). Furthermore, there are few studies that address the sustainability of the industry. Because of this, the extent to which whale watching may impact on focal species is becoming increasingly an international concern (as shown by a workshop

series organised to discuss special aspects of whale watching - IFAW/Tethys Research Institute/Europe Conservation 1996; Spalding 1998).

Increased competition between humans and wildlife for space, as well as conflict between consumptive users, wildlife managers, non-consumptive users and animal rights advocates, have reduced the capacity of management agencies to conserve wildlife through the use of laws and policies (Kellert & Clark 1991). In January 1998, an international whale watching research workshop, identified "problems of enforcement of regulations" as one of the four major problems with the management of whale watching (Malcolm & Duffus 1998). There is considerable debate as to the effectiveness of guidelines and regulations. Sirakaya (1997) found that compliance of ecotour operators with ecotourism principles was dependant on several interacting factors including "the type of social and economic sanctions, gender of the respondents, perceived moral obligations and the revenue obtained from ecotourism". Personal morality or ethics was the most important factor determining compliance by ecotour operators (Sirakaya 1997). Therefore, understanding the behaviour of operators is important to encourage the sustainable use of tourism resources. My research contributes to this understanding through the exploration of both personal attitudes and actual behaviour of whale watch operators in Australia.

Early in 1998, Environment Australia sent out for public review "Draft National Guidelines for Cetacean Observation" and a "Draft Discussion Paper: Areas of special interest for cetacean observations in Australia" (Environment Australia – Biodiversity Group 1998a,b). A second draft was released in 1999 (Refer Appendix 1). These were adopted in February 2000 as the "ANZECC Australian National Guidelines for Cetacean Observation and Areas of Special Interest for Cetacean Observation" (Commonwealth of Australia 2000). Many of the Draft National Guidelines were also inserted into the *Environment Protection and Biodiversity Regulation 2000* which was enacted under the Commonwealth's environmental legislation, the *Environment Protection and Biodiversity Act 1999*. Operators' compliance with, and the enforcement of, guidelines and regulations have not previously been studied in Australia. Management differences between the states of Australia, even for the same species of cetacean, also require resolution (Corkeron 1998). As an example, Queensland has whale watching regulations that govern specified whale watch areas and approach distance conditions, while New South Wales has regulations for approach distances but only guidelines for approach methods and no specified whale watch areas (Refer Appendix 1).

Humpback whales were hunted almost to extinction during the period of legal whaling. Since whaling ceased, their population recovery has been impressive – between 11.7% and 12.3% p.a. over the periods 1984 to 1992 and 1981 to 1996 respectively for the population migrating up the east coast of Australia (Paterson *et al.* 1994; Bryden *et al.* 1997). This whale population (Group V stock) is the focus of the whale watching industry in New South Wales and Queensland (Anderson *et al.* 1996). Along the Western Australian coastline, the population growth of the migrating humpbacks has been estimated between 10.9% p.a. and 13.4% over the periods 1963 to 1991 and 1989/90 to 1999/2000 (Bannister 1994; Matsuoka *et al.* 2000). This population is the focus of the Western Australian whale watching industry. Migration is an energetically expensive component of a whale's behaviour, especially since migratory whales are known to eat relatively little (Clapham 1996). Additionally, mating and calving, which occur mostly at the lower latitude termini of the migration route, and lactation, which occurs during the return journey to the higher latitude termini, are also highly demanding energetically (Lockyer 1984). It is unknown whether or not whale watching may have an impact on the further increase in this population of humpback whales or whether the guidelines/regulations currently in place are appropriate to minimise potential impacts.

It is important to the conservation of whales and dolphins that the management of issues surrounding human-cetacean interactions is addressed. ESD of the whale watch industry is important to the future existence of whales and dolphins. Management representatives, researchers, whale watch operators, non-governmental organisations and the public, all have a role to play in ensuring the sustainable development of the whale watch industry. Through this study, a greater understanding of the role of whale watch operators will provide baseline information for the future research into the sustainability of the industry and may be applied to Australian or foreign whale watch areas. The generic findings of my study will also be applicable to the discipline of wildlife management.

2.2 Developmental History of Environmental Attitudes

Early historical attitudes towards the environment and its development have fluctuated, being dependent on social, cultural, economic and political constraints of the era and region (Whitelock 1985). In Europe, views of the universe and people's place in it during medieval (fifth to fifteenth century) times were based on an integration of the ideas of Aristotle and Judaeo-Christian beliefs (Pepper 1996). They were a mixture of

cosmology and the work of God (Pepper 1996). During what is termed the “scientific revolution”, Copernicus (16th century), Newton (17th century), Kepler, Galilei and Bacon (16th-17th centuries), all regarded people and nature as separate entities (Pepper 1996).

The beliefs of these and others formed the basis for “the view that environmental problems must be approached and managed scientifically, objectively and rationally ...” while nature was conceived “... as machine-like and fundamentally separate from humans, and open to control and manipulation once it is understood” (Pepper 1996). O’Riorden (1989) refers to this as “technocentrism” which is believed by Pepper (1996) to have “constituted the official, dominant set of attitudes towards nature and environmental issues in modern Western society”. Technocentrism supports exploitation of nature through utilitarian attitudes inherent in the scientific world view (Pepper 1996). Few people other than St. Francis of Assisi were believed to have questioned the exploitative nature of western attitude before the late seventeenth century (Passmore 1974; Pepper 1984).

Throughout the nineteenth and early twentieth centuries, many continued to perceive that development was achievable through economic growth and that nature could and should be used to its fullest potential (Whitelock 1985). However, others considered unbridled exploitation to be no longer acceptable and “the need to manage what was left in the interest of sustainable, rational exploitation” as the way forward (Pepper 1996). During the early 1900s in the United States, the number of national forests was dramatically increased and the National Conservation Commission was set up under the administration of then president Theodore Roosevelt (1901-1909)(Whitelock 1985). Whitelock (1985) considered that this showed “the first serious recognition by a world power of the need for conservation”.

Subsequently, publications such as Leopold's (1949) “A Sand County Almanac”, Carson's (1963) “Silent Spring” and “Meadows” (1972) “The Limits to Growth”, and the views of Muir, Thoreau and other “eco-philosophers” stimulated changes to attitudes of nature and the place of humans (Simonds 1991; Pepper 1996). Additionally, in 1960 James Lovelock and Lynn Margulis developed the Gaia hypothesis. This considers the Earth in its entirety as a living organism (Thompson 1980; Lovelock 1989; Simonds 1991; Pepper 1996). This train of thought is referred to by O’Riorden (1989) as “ecocentrism” and by Simonds (1991) as “deep ecology”. Pepper (1996) regards “ecocentrism” or “deep ecology” to have “become the modern science, and moral

philosophy, of ecology – a strand emphasising conservation as a management strategy”.

As a result of these new ideas, the "environmentalist" movement of the 1960s and 1970s grew and non-governmental organisations concerned with the environment flourished (Whitelock 1985). Furthermore, it was recognised by the early 1970s that resources were being diminished to such an extent that they would be unable to meet the needs of future generations and the developmental goals of underdeveloped countries (Pepper 1996; Caldwell 1994).

As mentioned in Chapter One, in 1972, the UN Conference on the Human Environment (Stockholm conference) “focused global attention on the environment as intrinsic to human health and well-being and began the process known as ecological valuation” (Reid 1995). Additionally, Meadows’ (1972) Report to the Club of Rome on “The Limits to Growth” opened the debate on sustainability of Western-style growth stating that if present growth trends continued then “the planet’s carrying capacity would be exceeded within 100 years”. Caldwell (1994) claims that it was this publications’ opening of the debate that led to the sustainable development movement.

The concept of “sustainable development” was first outlined in the “World Conservation Strategy” (IUCN/UNEP/WWF 1980) and then in the Brundtland report “Our Common Future” (WCED 1987). The Commission defined “sustainable development” as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (IUCN/UNEP/WWF 1980; Caldwell 1994). These publications were aimed at helping to “advance the achievement of sustainable development through the conservation of living resources” (IUCN/UNEP/WWF 1980). A Report by a Commonwealth Group of Experts on “Sustainable Development” by Marstrand *et al.* (1991) set out six principles for sustainable development. These principles emphasised that marked changes in everyday human life were needed to bring about sustainable development (Marstrand *et al.* 1991). Additionally, in 1991, “Caring for the Earth: a strategy for sustainable living” was published (IUCN/UNEP/WWF 1991) to encourage the goal of sustainability (Holdgate & Munro 1992; Robinson 1992). Subsequently the United Nations Conference on Environment and Development (UNCED - Rio Conference), held in 1992, focussed on linkages between environment and development and the “need to eradicate global poverty via ecologically benign economic development” (Reid 1995; Pepper 1996). The World Summit on Sustainable Development reaffirmed these principles and broadened and

strengthened the understanding of sustainable development (IUCN/WSSD 2002). However, it fell short of delivering a “comprehensive, collaborative and integrated plan of action for the implementation of sustainable development” (Castaño 2002).

Subsequent to all this activity, there is still confusion and disagreement about the meaning of sustainable development and whether or not it is actually achievable (Robinson 1992; Duffus 1993; Caldwell 1994; Reid 1995; Bergh 1996; Godfrey 1998). The phrase “sustainable development” can and is interpreted in numerous and differing ways because of the different interpretations of the individual terms within the phrase and their respective influence on each other (Caldwell 1994; Bergh 1996). The controversy over the interpretations and understandings of “sustainable development” has also led to different views concerning the success of the reports and conferences discussed above (Pepper 1996).

It is accepted, however, that there are basically two ethical concerns that underlie the goal of sustainable development. These are: 1) “the anthropocentric objective of intergenerational justice” and 2) “the ecocentric dimension of concern for nature” (Marstrand *et al.* 1991; Robinson 1992; Bergh 1996). Thus, as I mentioned earlier, sustainable development consists of three intimately interdependent dimensions: the economic, the social, and the environmental (Marstrand *et al.* 1991; Bergh 1996). It remains to be seen if sustainable development is achievable.

2.3 Ecologically Sustainable Development

2.3.1 Development of the ESD Concept

At the Rio Conference in 1992 an action program to promote sustainability (Agenda 21) and guiding principles for the achievement of sustainable development for the international community (the Rio Declaration) were adopted (Pepper 1996). The precautionary principle, which states that “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”, was part of this declaration (Pepper 1996). It emphasised the environmental or ecological component of sustainability. Due to the apparent focus by humans on the improvement of their welfare at the expense of the environment, the term “Ecologically Sustainable Development” (ESD) was developed to emphasise the integration of the three major components. It has now become a key component of the development of environmental policies by many governments.

In general, ESD is aimed at improving the quality of life, while addressing the interconnectedness of the environment and development (Hare 1991; Commonwealth of Australia 1992). In some instances Sustainable Development and ESD are used interchangeably (Anonymous 1991). The anthropocentric objective of intergenerational justice and the ecocentric dimension of concern for nature also apply to ESD (Hare 1991; Robinson 1992). Furthermore, Robinson (1992) and Holdgate & Munro (1992) state that in respect to ESD, “sustainable use only occurs when the rights of different user groups are specified, when human needs are met, and when the losses in biodiversity and environmental degradation are acceptable”. “Acceptable” was not defined.

2.3.2 Problems of Implementing ESD

There is disagreement about how much progress has been made in implementing ESD (Robinson 1992; Reid 1995; Bergh 1996; Pepper 1996). Reid (1995) claims that both the Stockholm and Rio conferences effectively conveyed their aims in regard to the sustainable development of the environment. In support of the implementation of ecologically sustainable development, Blamey (1995) stated that ESD has become an important part in the sustainable development of industries such as those based on tourism as the impacts of tourism on local communities and the natural environment are increasingly questioned. However, Callicott & Mumford (1997) and Garrod & Fyall (1998) consider that the use of Sustainable Development and ESD has not progressed much further than the theoretical stage. Furthermore, although the 2002 World Summit on Sustainable Development reaffirmed the principles and understanding of sustainable development, Castaño (2002) considered that the development of a plan for implementation was not achieved.

It has been argued by some that we cannot move forward to implement Sustainable Development or ESD until there is an agreed definition of these concepts. Others consider that it is time to move from discussion of definition to effective implementation of the strategies (Garrod & Fyall 1998). As seen in the discussion above, others debate the success or failure of strategies already implemented (Robinson 1992; Owen *et al.* 1993; Reid 1995; Bergh 1996; Pepper 1996).

The first steps towards the implementation of ESD concepts have been to hold meetings, form working groups and set agendas for implementation. Agendas arising from the working groups should then be implemented accordingly through project

design. Project designs usually go through a rigorous process of cost-analysis. Cost-benefits and Environmental Impact Assessments are used to address environmental concerns (Bartelmus 1994). However, funding must be available for the projects to be implemented. Legislation and regulation binds principles of ESD into (theoretically) enforceable documents that should be adhered to by all. The establishment of laws and regulations then provides the capacity to ensure compliance and enforcement to these legislative documents (Bartelmus 1994). Nevertheless, the rigidity of any legislation is dictated by its enforceability. Perhaps above all, operationalisation of ESD is dependent on changes in the current use of resources, which in turn is dependent on changes in attitudes. A change in our attitudes to human use of resources seems to be the most difficult goal to achieve.

2.4 Environmental Awareness and ESD in Australia

Post European settlement, the dominant early beliefs in Australia were as Whitelock (1985) claimed “a largely derivative culture...” looking “...to other countries for ideas and examples”. The majority of Australian perspectives of the environment and the relationship of humans to it came from Europe and the United States (Whitelock 1985). The three major positions held by European Australians were that: human treatment of nature has no constraints; humans are obliged to care for nature; and perfection of nature can be achieved by working with it (Frawley 1992). Thus Australia mostly followed the general trend of development and exploitation (Whitelock 1985).

Heathcote identified six visions of the Australian environment, from 1770 to the 1990s (Heathcote 1994). Three of these were realised before the middle of the 19th Century. The “scientific vision” was stimulated by the fact that everything was “novel” in Australia (Heathcote 1994). This novelty and apparent lack of modification by humans stimulated a parallel “romantic vision”. However, both of these visions were soon supplanted by the “colonial vision” (Heathcote 1994), which became dominant in Australian history (Frawley 1992). This vision stemmed from a desire to “improve nature”, which offered little commercial value as it was. By the late 1800s, conservationist attitudes were beginning to emerge (Whitelock 1985), although a “national vision” related to pride in developmental achievements was stronger (Frawley 1992; Heathcote 1994). It was not until the middle to late Twentieth Century that the “ecological vision” and the “vision of guilt” grew from the realisation that development at the current rate could not continue.

Australia developed a National Conservation Strategy in 1984 based on the World Conservation Strategy (Australian Department of Home Affairs and Environment). After the World Commission on Environment and Development meeting resulting in the report "Our Common Future," Australia produced its own edition of "Our Common Future" in which operational principles were defined (Australian Government & WCED 1990). Australia then moved forward to define its position and develop theories and strategies on ESD.

The Australian Government (see Commonwealth of Australia 1992; Australian Government 1998) defined ESD as "development that improves the quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends". In Australia, nine working groups (agriculture, forestry, fisheries, energy production, manufacturing, mining, transport, energy use & tourism) were set up to identify major issues, policy options and costs (Anonymous 1991; Noble 1994). The final ESD working-group reports were released in 1991, containing more than 500 recommendations (Noble 1994). The report most applicable to whale watching, the ESD Working Group Final Report - Tourism (Commonwealth of Australia 1991), will be discussed below.

Based on the results of the working groups, a National Strategy for ESD was endorsed by the State/Territory and Federal Governments in December 1992 (Noble 1994). The Australian ESD Steering Committee identified three focal objectives. These are:

- "1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
2. To provide for equity within and between generations; and
3. To protect biological diversity and maintain ecological processes and systems"

(Commonwealth of Australia 1992)

The final National Strategy on Sustainable Development, produced in late 1992 by the Commonwealth, was a very watered down version of the working-groups' recommendations (Noble 1994) and did not result in the allocation of any dedicated funding for its implementation. Rather it is "subject to budgetary priorities and constraints in individual jurisdictions" (Noble 1994; Australian Government 1998). However, Noble (1994) claims that the ability to question government actions that fail to fulfil agreed criteria is also strongly embedded in some clauses of the strategy. Since

then, Environment Australia has “implemented a number of initiatives to progress sustainability in Australia” (Environment Australia 2002). These include a commitment to Local Agenda 21 (a program that provides a framework for implementing sustainable development at the local level) and incorporating the requirement of organisations to report on the “environmental performance and contribution to ESD” in their Annual Reports in the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* (Environment Australia 2002). Local Agenda 21 is based on Agenda 21, the global blueprint for sustainability that was agreed at the United Nations Conference on Environment and Development in 1992.

Two applications of on-ground implementation of ESD strategies that are relevant to whale watching are sustainable wildlife management and ecotourism. These issues and the applicability of the ESD Working Group Final Report - Tourism (Commonwealth of Australia 1991) to whale watching are discussed below.

2.5 Wildlife Management

2.5.1 Historical Development

Whale watching is understood to be a form of wildlife viewing, which in turn is a form of nature based tourism. Nature based tourism encompasses “mass tourism, adventure tourism, low-impact tourism and ecotourism” (Goodwin 1996). The extent to which whale watching is then considered to be ecotourism is dependent on the definition of ecotourism being used (Goodwin 1996; Hodda 1996; Reid 1999) and is discussed in greater detail later in this chapter. However, ecotourism has indeed developed from a need to reduce the impacts of tourism on nature (flora and fauna). It is also seen as a way to use wildlife sustainably (Orams 2000). Thus the management of ecotourism may be viewed as a method of managing wildlife. In the discipline of wildlife management, the term “wildlife” designates free ranging birds and mammals (Caughley & Sinclair 1994). Wildlife management is the “manipulation or protection of a wildlife population to achieve a goal” (Caughley & Sinclair 1994; Reynolds & Braithwaite 2001).

Humans have managed the world’s wildlife in varying ways since prehistoric times. Management of wildlife is dependent on cultural perspectives, which vary over time (Caughley 1985). In this review, only westernised perceptions of wildlife management will be discussed.

In 1985, Caughley suggested that the management of wildlife was dependent on our perception of the species in question. He categorised species into four distinct groupings: nasties, lovelies, commodities and irrelevancies. Caughley (1985) claimed that management strategies are applied dependent on this categorisation, which varies both culturally and temporally. For example, in Australia, Japan, Norway and the United States of America, whales were once regarded almost solely as a “commodity”. However, they are now regarded as both a “commodity” and a “lovely” in Japan and Norway, whereas in Australia and the United States they are viewed almost solely as a “lovely”.

Caughley & Sinclair (1994) identified two forms of wildlife management: manipulative or custodial, which are implemented according to whether the wildlife is to be harvested or protected. The application of these wildlife management options is complex and should be developed cautiously (Caughley 1985). It can be seen from the history of wildlife management that management decisions were not always to the benefit of the wildlife and were more likely to be beneficial to humans. However, in the twentieth century there has been a tendency towards more ecosystem orientated management strategies. Therefore, increased value has been placed on humans as being part of the environment and managing the ecosystem as a whole.

In many westernised countries, wildlife management traditionally focused on consumptive uses, with the aim of promoting the survival of certain species for hunting and fishing (Whitelock 1985; Duffus & Dearden 1990; Duffus & Wipond 1992). Other species perceived to be in competition with either the desired wildlife or humans in general, were removed or sterilised (Balsler 1964; Duffus & Wipond 1992). The consumptive nature of humans and their disregard for nature led to destruction of habitats and huge decreases in wildlife populations.

As early as 1760, it was necessary to implement legislation to try to protect the forests and wildlife of Mauritius after widespread degradation (Grove 1992). However, it was not until the turn of the twentieth century that the real beginnings of wildlife management started to be developed in North America (Daneke 1991) with other westernised countries following by example. With the realisation that some species were in danger of extinction, flora and fauna sanctuaries were created, non-governmental environmental organisations were formed and new legislation implemented (Whitelock 1985; Knight 1996).

Transformations in perceptions were shaped in many ways. In the 1960s, members of “The Wildlife Society” accepted “that the wildlife resource management will encompass as much effort toward non-consumptive subject matter as to the consumptive activities of the past and present” (Evenden 1965). Scheffer (1976) predicted that the “course of wildlife management will be redirected by those ... who appreciate the wholeness of nature”. The writings and actions of people such as Aldo Leopold and John Muir, also stimulated new ways of perceiving human relationships to nature and wildlife (Leopold 1949; Knight 1996).

By the middle of this century, new theories were developed by wildlife researchers to explain possible conservation and management possibilities (Paine 1969; Mills *et al.* 1993; Estes 1996; Fredman & Boman 1996; Simberloff 1998). Wildlife management shifted from a largely “use and eradication” based system to a “limited to no use” system. It also changed from “single species” management to “ecosystem” management, except in the case of “endangered” species (Estes 1996). Furthermore, input from the general public became accepted as a valid contribution to wildlife management (Scheffer 1976; Johnson *et al.* 1993). However, wildlife management has and will always be based on the values people put on particular species (Decker *et al.* 1991).

Some of the most influential attitudes to wildlife management have been those of the animal rights' movement (Decker *et al.* 1991) which contributed to an extreme preservationist viewpoint. However, others such as Barnes *et al.* (1992) believe that the extreme preservationist “no use” option provides limited incentives for local people to conserve the resource in question and therefore frequently fail. Changing values and “growing public interest in wildlife-related activities that are non-consumptive i.e., in which wildlife are viewed or enjoyed without being hunted or captured” provided the background incentives for conservation and management (Barnes *et al.* 1992; Duffus & Wipond 1992). It was from these attitudes that general wildlife tourism and more specifically, ecotourism developed.

2.5.2 Wildlife Tourism

Changing attitudes towards wildlife and increased awareness of degradation of habitats have led to pressures on wildlife managers to develop management regimes directed at non-consumptive uses (Duffus & Dearden 1990; Duffus & Wipond 1992). Wildlife-based tourism, of which wildlife viewing (e.g., whale watching) is a component, is a non-consumptive means of using wild resources to benefit human populations (Barnes

et al. 1992; Reynolds & Braithwaite 2001). Wildlife oriented recreation including wildlife viewing is made up of three components: "the focal species or species groups, the human user, and the history of the relationship between the two" (Duffus & Dearden 1990; Reynolds & Braithwaite 2001). Wildlife viewing can have a positive impact in that those (humans) involved may increase their awareness of the relationships within nature and provide revenue for their management (Clayton & Mendelsohn 1993; Manfredo & Larson 1993; Jacobson & Lopez 1994; Johns 1996; Menkhaus & Lober 1996; Obua 1997; Burger & Gochfeld 1998). It may also be detrimental in that there can be possible disturbance of wildlife from concentrated viewing efforts (Albert & Bowyer 1991; Blane & Jaakson 1994; Jacobson & Lopez 1994; Obua 1997; Burger & Gochfeld 1998; Gibeau *et al.* 2002; Ananthaswamy 2004). Consistent with Caughley's (1985) categorisation, the approach to management of wildlife viewing depends on the country it is in, social and cultural attitudes and the focal species.

Duffus & Wipond (1992) have noted three criteria, which they consider, should be met by a wildlife viewing program. It should:

- "1) be ecologically sound by providing viewing opportunities that minimize influences on natural ecosystem functions;
- 2) meet recreational demand and provide social benefit, both economic and non-economic, that justifies the use; and
- 3) lay the foundation for the development of a conservation ethic that embraces and enhances the role of wildlife in the fabric of modern society."

It is difficult to manage wildlife and wildlife viewing when one aims to provide wildlife experiences that are both gratifying to the viewer and protection of the focal species (Duffus & Wipond 1992). Ecotourism has been perceived by some as a way to achieve these goals.

2.6 Ecotourism

2.6.1 Historical Development

There is a great deal of confusion surrounding the meaning and application of ecotourism (Cater 1994; Nelson 1994; Goodwin 1996; King & Stewart 1996; Reid 1999; Ross & Wall 1999). However, most people agree that ecotourism aims to exploit tourism's potential for conservation and development, while valuing the intrinsic value of nature and averting its negative impact on ecology, culture and aesthetics (Barnes *et al.* 1992; Western 1993). It is most often based on non-consumptive use of wildlife resources and is sometimes referred to as nature based tourism (Valentine 1992;

Western 1993) although others believe that not all nature based tourism can be classified as ecotourism (Goodwin 1996).

There also seems to be some confusion around the origin of the term “ecotourism”. Nelson (1994) claims “the idea of ecotourism is an old one, which seems to have taken on its modern manifestation in the late 1960s and early 1970s”. Furthermore, he suggests that publications such as “World Conservation Strategy” (IUCN/UNEP/WWF 1980) and “Our Common Future” (WCED 1987) “saw the introduction of the idea of sustainable development ... in its modern form”, affording the “background that ecotourism, sustainable tourism and other ... more environmentally and socially compatible forms of tourism, grew” (Nelson 1994). According to Young (1992), Ceballos-Lascuráin coined the term in 1983 as an argument against the development of wetlands in northern Yucatan, Mexico. Others use a definition supposedly provided by Ceballos-Lascuráin in 1987 (Goodwin 1996). However, Ceballos-Lascuráin (1993) stated that “only a few years ago, the word “ecotourism,” which is a “logical component of sustainable development, didn’t exist”. Furthermore, Valentine (1993) stated that “the idea of nature-based tourism has come to fruition (only) in the last five years”. Thus although the background to the ecotourism concept may have been developed earlier, the term itself evolved in the late 1980s or early 1990s as a result of the move towards ESD.

Since then, the use of the term “ecotourism” has spread rapidly throughout the world (Ceballos-Lascuráin 1993; Western 1993; Hall 1994; Nelson 1994). It has been suggested as a panacea for the environmental and socio-economic problems of less developed countries, as well as, to the destructive elements of tourism (Nelson 1994; Obua 1997; Garrod & Fyall 1998). However, ecotourism has also been recognised as potentially damaging to the environment and disruptive to the wildlife on which it often depends (Boo 1990; Valentine 1992; Jacobson & Lopez 1994; Obua 1997; Wall 1997; Burger & Gochfeld 1998). The question is, “for whom will ecotourism development be sustainable?” What may appear to be sustainable from one point of view is unlikely to be so from another (Cater 1994).

Ecotourism was originally defined as “...travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas. In these terms, nature-oriented tourism implies a scientific, aesthetic or philosophical approach to travel

although the ecological tourist need not be a professional scientist, artist or philosopher. The main point is that the person who practices ecotourism has the opportunity of immersing himself/herself in nature in a manner generally not available in the urban environment” (Ceballos-Lascuráin’s definition quoted in Boo 1990 and Goodwin 1996).

Since then, Ross and Wall (1999) believe that the meaning ascribed to ecotourism has become “so varied that it is practically discredited”. Goodwin (1996) states that there “is no internationally accepted definition of ecotourism”. Although some make no distinction between nature based tourism and ecotourism, Goodwin (1996) regards only a proportion of nature based tourism as being able to be classified as ecotourism. Believing that ecotourism should include both the enjoyment of nature and a contribution to conservation Goodwin (1996) proposed the following definition: “low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing their wildlife heritage area as a source of income.” Ross and Wall (1999) state that ecotourism should be “viewed as a means of protecting natural areas through the generation of revenues, environmental education and the involvement of local people.” They state that there are five fundamental functions of ecotourism: protect the natural environment; generate money; educate; provide quality tourism and enable local participation (Ross & Wall 1999). The Ecotourism Association of Australia has defined ecotourism as “ecologically sustainable tourism with a primary focus on experiencing natural areas that fosters environmental and cultural understanding, appreciation and conservation” (Ecotourism Association of Australia 2002a). However, until one of these definitions is recognised by a majority of countries, the confusion surrounding ecotourism and its management will remain. Furthermore, the debate surrounding whether or not some or all whale watching can be considered as ecotourism will continue.

2.6.2 Ecotourism Management

It has been recognised that, dependent on the interpretation and use of the term ecotourism and the strategies used to implement ecotourism developments, tourism impacts may be both detrimental and beneficial. Ceballos-Lascuráin (1993) contends that, as a logical component of sustainable development, ecotourism requires a multi-disciplinary approach, careful planning and strict guidelines and regulations that will guarantee sustainable operation. Western (1993) maintains that ecotourism should

enable the value of wildlands and seas to be quantified and tourist dollars to flow back into conservation.

Additionally, the sustainability of tourism and ecotourism have been questioned (Giannecchini 1992; Jacobson & Robles 1992; McKercher 1993; Sirakaya 1997). These authors claim that as tourists represent the potential to generate needed revenue for the protection of the wildlands and wildlife on which they depend, they have the potential to be destructive through overuse. Governments, the private enterprise, local communities and non-governmental organisations (NGOs) all have an important role (Ceballos-Lascuráin 1993; King & Stewart 1996) in the management of ecotourism. It will only be through this inter-sectoral involvement that ecotourism will truly achieve its goals (Ceballos-Lascuráin 1993). In May 2002, in a possible attempt to initiate this inter-sectoral involvement, the “Québec Declaration on Ecotourism” was developed by the World Ecotourism Summit held in Québec, Canada. The main purpose of the declaration was to establish “a preliminary agenda and a set of recommendations for the development of ecotourism activities in the context of sustainable development” (World Ecotourism Summit 2002). The participants at the World Ecotourism Summit then requested the dissemination of the Declaration at the World Summit on Sustainable Development (World Ecotourism Summit 2002).

The management of ecotourism is dependent on the area or species of its focus (Nelson 1994). One of the major difficulties in managing the impact of tourism on the environment in Australia is the nature of the country's political system. Australia is a federation in which the primary constitutional responsibility for environmental management and land use, including coastal waters, lies with the individual state or territory. In respect to environmental matters, the Commonwealth had only a limited range of powers, which related to foreign affairs, trade, commerce and foreign investment (Hall 1994). This changed somewhat with the introduction of the *Environment Protection and Biodiversity Act 1999 (Cwlth)*.

The management of ecotourism is divided between the Commonwealth and the States/Territories (Hall 1994). The major document which addresses this is the “Ecologically Sustainable Working Group's Final Report – Tourism” which resulted from the establishment of the succession of ESD Working Groups (Commonwealth of Australia 1991; Hall 1994) as explained above. The 31 recommendations of the Ecologically Sustainable Tourism Working Group included: the establishment of an Office of ESD; integration of planning to “accommodate cross boundary and national

issues”; implementation of a “national representative system of protected areas”; participation of Indigenous peoples; education and training for the tourism industry and provision of research funding. The Ecologically Sustainable Tourism Working Group (Commonwealth of Australia 1991) stated, “tourism has an excellent opportunity to achieve ecological sustainability” especially as the Australian tourism industry recognises its dependence on the maintenance of a healthy natural environment for future economic viability.

Although their recognition of the need for ecologically sustainable tourism is laudable, the working group failed to pay adequate attention to the integration of economic, ecological and social factors within the context of sustainable development (Hall 1994). Hall (1994) identified the need for the tourism industry to provide funding for “the development of models which include economic linkages within the industry and between tourism and other industries”. However, the working group’s discussion of social and economic aspects is severely limited.

There has been increased pressure on tourism operators from environmentalists concerning the environmental impacts of tourism (Hall 1994). This has stimulated the Australian Tourism Industry Association to produce a self-regulatory code of environmental practice for members and the Western Australian government to develop a set of guidelines for sustainable tourism development. The Ecotourism Association has developed a “Nature and Ecotourism Accreditation Program” (NEAP), which accredits company products such as accommodation, tours and attractions based on the associations’ definition of ecotourism. In conjunction with the Australian based Cooperative Research Centre (CRC) for Sustainable Tourism, the Ecotourism Association of Australia has also developed an International Ecotourism Standard, which is based on NEAP, Agenda 21 and the Mohonk Agreement (guiding principles for sound ecotourism certification developed by meeting of ecotourism certification experts in 2001) (Ecotourism Association of Australia 2002b). This benchmark aims to provide an internationally accepted definition of ecotourism and standard of practice.

Wildlife management and in particular the management of ecotourism and wildlife viewing, including whale watching, will continue to be on the agenda of wildlife and nature conservation managers with the increase in demand for such opportunities. Much can be learnt from the sustainable management plans already implemented that may be applied to new management regimes. One of the greatest problems for implementation of sustainable management projects will be funding. Duffus & Wipond

(1992) consider that non-consumptive wildlife opportunities "may be the most significant route available to exploit conservation value". If so, they will require effective management in place.

2.7 Whales as Wildlife

"Some claim it is because of their apparent intelligence; others are in awe that air-breathing mammals, like us, are able to thrive in such an alien underwater world. Some people are inspired by their ability to explore places out of our reach, experience things we will never experience, and see things we will never see. Others see them, as we would like to see ourselves - free, graceful, compassionate, peaceful, and full of energy. Undoubtedly, the amazing sense of mystery surrounding these enigmatic creatures, is itself a major part of their appeal."

(Carwardine *et al.* 1998)

As explained in Chapter One, cetaceans (whales, dolphins and porpoises) have been found in drawings and literature and on coins, mosaic floors and sculptures done by Greeks and Romans as early as 500 BC (Brenner & Pilleri 1977). Historically, cetaceans were viewed as sea monsters, gods, reincarnations, guardians and sources of food and income (Hawley 1989). Before the sixteenth century, drawings most often depicted whales with large nostrils expelling water and showing aggressive behaviour towards boats and men (Matthews 1968; Brenner & Pilleri 1977). During this time, the lore about sea creatures including whales, was also extremely distorted in fables and myths (Matthews 1968). In a few instances "friendly" whales were depicted rescuing sailors attacked by "evil whales" (Matthews 1968). The whale as a symbol represented "the body and the grave" (Cirlot 1962) and the power of regeneration (Cooper 1978). With an apparent resurgence of science in the 16th and 17th centuries, whales began to be depicted more accurately (Matthews 1968).

Dolphins, being smaller, have been viewed as gentle, trusting, affectionate and helpful (Matthews 1968; Brenner & Pilleri 1977). Additionally, they are highly regarded by people and have been shown to have great social affinity with humans (Lockyer 1990). Many cultures, such as the ancient Greeks and Maoris of New Zealand have woven positive interactions with dolphins into their folklore (Alpers 1963; Hawley 1989; Lockyer 1990).

In general, attitudes to cetaceans vary depending on the social, cultural, economic and political background of the people and country. In Japan, Norway, Iceland and the Faroe Islands, as an example, many people continue to consider whales as an exploitable consumptive resource (Braund *et al.* 1988; Glass & Englund 1989; Sigurjónsson 1989; Nagasaki 1994), whereas whale watching nations treat whales as an exploitable non-consumptive resource (Amante-Helweg 1996; Findlay 1997) and some fishers view them as a nuisance because of net entanglement or fish loss (Hofman & Bonner 1985; Ashford *et al.* 1996; Russell 2001). Australian views on whales and dolphins vary temporally and culturally. Whaling played a major role in the country's early history (Frost 1978) and there were several captive facilities until the mid-1980s (Cawthorn & Gaskin 1984; Senate Select Committee on Animal Welfare 1985). Early whalers considered Orca (*Orcinus orca*) as friendly for their "co-operative fishing efforts" (Wellings 1944; Mitchell & Baker 1980; Lockyer 1990), but fishermen now consider some species of whales as "nasties" (Beach & Weinrich 1989). The dominant view in Australia today is opposed to whaling and the keeping of cetaceans in captivity. Nonetheless, whale watching seems to be viewed positively by most people, with some cautions being issued (Colgan *et al.* 1996).

The aura surrounding cetaceans has existed in many forms, from folklore and classic Greek mythology to religion and popular entertainment, such as the television series *Flipper* (Hawley 1989) and movies such as *Free Willy*. Captive individuals have also played a controversial role in increasing positive attitudes (Steering Group 1988) and scientific knowledge of cetaceans in general (Nakahara & Takemura 1997). Today, cetaceans are predominantly portrayed as friendly, gentle, caring, and altruistic with complex social lives and great intelligence, especially the smaller cetaceans. Together the use of cetaceans in popular entertainment and in captivity has served to bring attention to the group and to catapult them to a new realm of awareness.

It can only be postulated why whales inspire this special excitement in humans. They are now depicted as "everything from extraterrestrial intelligence to our last hope for accepting our ecological responsibility as subduers of nature" (Hawley 1989; Russell 2001). In the last twenty to thirty years, cetaceans have become "flagship" species (Stevens *et al.* 1996) due to their almost "religious" appeal. The number of cetacean oriented public-interest groups in the last half-century has increased dramatically and the focus has shifted to experiencing cetaceans in their natural habitats (Scheffer 1989). Cetology now attracts many people, both professionals and amateurs. There is

now a proliferation of articles in glossy wildlife and general readership magazines and newspapers on whales and dolphins.

2.8 Humpback Whales

2.8.1 General Information

The humpback whale (*Megaptera novaeangliae*) (Borowski 1781) has a particularly distinguished place in people's perceptions and attitudes towards humpback whales have shifted dramatically from being a “commodity” to a “lovely”. Although they were almost hunted to extinction less than 40 years ago (Paterson *et al.* 1994), a large component of the whale watch industry is now focused on the humpback whale (Colgan *et al.* 1996) in several countries, including Australia, Japan and the USA (Anderson *et al.* 1996; Forestell & Kaufman 1996; Mori & Yamada 1996).

Humpback whales are the fifth largest of the “large whales”. The humpback whale is classified under the suborder Mysticeti (Winn & Reichley 1985; Clapham 1996; Hoyt 1996). The only member of the genus *Megaptera*, the humpback whale belongs to the Family Balaenopteridae (Johnson & Wolman 1984). The species occurs in all oceans and is cosmopolitan in its distribution (Johnson & Wolman 1984; Brown 1996; Clapham 1996) and migrates from low latitude winter breeding areas to high latitude summer feeding areas each year.

Humpback whales are long-lived, slow breeding animals. They have a gestation period of almost twelve months and interbirth interval of approximately two years (Chittleborough 1958; Winn & Reichley 1985). Born at 4.5 - 5.0 m in length, young humpback whales grow to an adult size of between 12 and 15 m (Chittleborough 1958; Johnson & Wolman 1984). Between the ages of four and five years, both male and female humpback whales reach sexual maturity (Winn & Reichley 1985; Clapham 1996), living at least 30 years (Evans 1987). Males and females are not distinctly sexually dimorphic, although females are slightly larger (5% or approximately 1m) than males (Lockyer 1984; Brown 1996; Clapham 1996). Orca (*Orcinus orca*) are their only known non-human predator (Whitehead & Glass 1985; Flórez-González *et al.* 1994).

The annual migration of humpback whales between their breeding and feeding grounds is extremely long (between 4,500 km and 8,000 km), requiring a great deal of energy (Clapham & Mattila 1988; Darling *et al.* 1996). Although there have been reports of humpback whales feeding during migration, it is generally accepted that this is more

often the exception than the rule (Dawbin 1966; Slijper 1979; Baraff *et al.* 1991). Because of the tendencies of some stocks to migrate close to coastlines several populations of humpback whale can be watched either from land or vessels along their migration route (Beach & Weinrich 1989; Anderson *et al.* 1996; Stevens *et al.* 1996). Other populations that migrate across vast expanses of ocean are watched principally at the termini of their migrations (Forestell & Kaufman 1996; Mori & Yamada 1996).

Along the east Australian coast, humpback whale migration is staggered both with respect to the different sexes and female reproductive conditions (Brown *et al.* 1995; Constantine *et al.* 2003). The ratio of male and female humpback whales migrating is 2.4:1, thus not all females are migrating (Brown *et al.* 1995). Dawbin (1966) and others have also shown that humpback whale migration is temporally structured. Last to migrate back to the feeding grounds are females with calves (Corkeron *et al.* 1994). Humpback whales usually travel singly or in small groups of two to three while on the migration route, however on feeding and breeding grounds they may be found in groups up to 20 individuals (Brown & Corkeron 1995).

Because of the timing of the migrations, it is believed that there is no interaction between northern and southern hemisphere populations of humpback whales. Photo-identification studies (Calambokidis *et al.* 1996), analysis of song (McSweeney *et al.* 1989; Clapham & Mattila 1990), and genetic studies (Baker *et al.* 1994) support this contention, demonstrating isolation of humpback whale populations in both hemispheres. Within the Southern hemisphere, humpback whales are divided into six stocks: Area I (60°W - 120°W), Area II (0° - 60°W), Area III (0° - 70°E), Area IV (70°E - 130°E), Area V (130°E - 170°E) and Area VI (170°W - 120°W) (Paterson 1998). Whales in Areas IV and V are the focus of whale watching along the West and East Australian coasts, respectively.

Humpbacks are known for their long complex songs (McSweeney *et al.* 1989). Songs are made up of several sections and change somewhat each year (McSweeney *et al.* 1989). The male humpback sings during the breeding season (McSweeney *et al.* 1989) but no confirmed recordings have been made of female humpbacks singing. The humpback whale song evokes strong reactions from people. Some have used the whales' song as backing for their compositions (Hawley 1989). "Roger Payne's *Songs of the Humpback whale*" was released in 1970, and has gone on to become the most successful nature recordings ever" (Hawley 1989). It is thought that males sing during the breeding season for courtship. There are indications that a combination of boat

noise, time of day and background sea noise affects the audibility of whale song (McCauley *et al.* 1996).

Winn & Reichley (1985) note that the humpback whale is one of the "most acrobatic" whales. Humpback whales are noted for the propulsion of most of the body out of the water, behaviour referred to as breaching (Winn & Reichley 1985), as well as, several other surface activities. A great deal of speculation surrounds the reasoning for breaching and no consensus has been reached (Whitehead 1985). Their acrobatics, especially breaching, make humpback whales extremely popular with whale watchers (Hoyt 1996). People travel all over the world to see free-ranging humpbacks.

2.8.2 Population Level and Status

In 1985, the world-wide population of humpback whales was estimated to be at least 6,000 - 9,000 individuals (Winn & Reichley 1985). A recent estimate of the North Atlantic ocean-wide population of humpback whales is 10,600 (95% CI 9,300 - 12,100) (Smith *et al.* 1999). Clapham *et al.* (1997) estimate the California/Washington population of Pacific humpback whales to be 600 and suggest that "the pre-exploitation stock was considerably larger". There have been no recent estimates for the North Pacific and Northern Indian Ocean.

The pre-exploitation size of the Southern Hemisphere humpback whale population was estimated by Chapman (1974) to be between 90,000 and 100,000. The total catch of humpbacks from the southern whaling areas was 93,000 (Findlay & Best 1996). However, Soviet whaling was incompletely reported (Zemsky *et al.* 1996; Mikhalev 2000) which greatly affects estimates and recovery trajectories. Nevertheless, the Southern Hemisphere humpback whale populations were depleted to such an extent by the early 1960s that whaling was no longer commercially viable (Paterson 1998).

A summary of current estimated population sizes for the Southern Hemisphere humpbacks is given by Paterson (1998) (year of most recent estimate) as follows: Area I - 170-450 (1986-88); Area II - 127 (1988); Area III - 1700 (1990); Area IV - 3800 (1994); Area V - 3500-4000 (1998) and Area VI - no data. Significant recovery of Area IV and Area V populations has been noted since the cessation of whaling (Paterson 1987; Bryden *et al.* 1990; Paterson *et al.* 1994; Bryden *et al.* 1997). Bannister and Hedley (2001) and Paterson *et al.* (2001) updated Area IV and V population estimates for 1999 to 8,207 – 13,640 and 3,160 – 4,040 respectively. Some controversy surrounds the population growth estimates of the Area V population. These estimates

are based on numbers from the east Australian coast as studies in New Zealand, have not yet been carried out (Paterson 1998).

IUCN (2003) lists the humpback whale in the Indian and Pacific Oceans as "Vulnerable". Bannister *et al.* (1996) gave the Australian humpback whale populations an Australian Action Plan status of Vulnerable. Vulnerable in the Action Plan is referred to as "taxa with populations that have been seriously depleted and whose ultimate security has not yet been assured" (Bannister *et al.* 1996). The *Environment Protection and Biodiversity Act 1999 (Cwlth)*, which integrated the principles of several older acts including the *Endangered Species Protection Act 1992 (Cwlth)*, classified the humpback whale populations of Australia as Endangered (Anderson *et al.* 1996). Therefore a major part of whale watching in Australia is focused on a threatened species.

2.9 Whale Watching

2.9.1 Historical Development

Whale watching has been defined by Hoyt (1996; 2000) as "tours by boat, air or from land, formal or informal, with at least some commercial aspect, to see, swim with, and/or listen to any of the some 83 species of whales, dolphins and porpoises." The earliest account of "modern whale watching" was from a public whale watch lookout converted out of an old U.S. Army gun station in 1950 (Hoyt 1984). Gray whales (*Eschrichtius robustus*) were the focus of whale watchers at this southern Californian site (Hoyt 1984). Until the early 1980s, the majority of land and vessel based whale watching took place in North America (Hoyt 1996). Since then, it has "experienced explosive growth" (Hoyt 1996) in many countries.

In 1983, there were approximately 12 countries where any whale watching occurred. Rapid world-wide growth in the industry saw whale watching spread to 30 countries by 1992 with an average annual increase from 1991 – 1994 of 10.3% per year (Hoyt 1996). By 1994, 65 countries and island territories had whale watching industries, while eight more countries had planned pilot tours or were expected to begin whale watching operations in the following two years (Hoyt 1996; Orams 1997). By 1999, the number of countries involved in whale watching had increased to 87 (Hoyt 2000; Russell 2001). Whaling countries such as Japan and Norway also have whale watching industries (Hoyt 1996, Mori & Yamada 1996). With the exception of most of the beaked whales, the majority of the known cetacean species is included in whale

watching programmes (Hoyt 1996). As an indication of the growth of whale watching, there has been a proliferation of guides to whale watching around the world (e.g., Kaufman & Forestell 1996; Carwardine *et al.* 1998) and in Australia (e.g., Tucker 1989; Dalton & Isaacs 1992).

The emergence of the Australian whale watching industry in the late 1980s and its rapid growth mirrored the world situation (Hoyt 1996). Australian whale watching began with bottlenose dolphin feeding at Monkey Mia in Western Australia, which became popular in the 1960s (Lockyer 1990, Gambell 1995).

The vessel-based whale watch industry began on the east coast in Hervey Bay in 1987 and on the west coast around Perth, in 1989 (Anonymous 1989; Gambell 1995; Anderson *et al.* 1996; Jackson & Osmond 1996). The seasonal migration routes of humpbacks and right whales, which had allowed for their earlier consumptive exploitation, formed the foundation of vessel and land based watching development (Anderson *et al.* 1996). The existence and expansion of appropriate tourist infrastructure have served to mould further growth (Anderson *et al.* 1996; Forestell & Kaufman 1996).

“Australian coastal and territorial seas provide the setting for a very wide range of whale watching experiences” (Stevens *et al.* 1996). Before 1996, commercial whale watching operations had been based primarily on three of the approximately forty-three species of cetaceans in Australian waters: humpback whales, southern right whales and inshore bottlenose dolphins (Anderson *et al.* 1996). Following Hoyt’s definition, whale watching in Australia now includes: vessel and land based observations of humpback and southern right whales and inshore bottlenose dolphins; swims with bottlenose dolphins and dwarf minke whales; feeding of inshore bottlenose and Indopacific humpback dolphins; and aerial watching of several species (Orams 1994; Corkeron 1996; Arnold & Birtles 1997; Marsh *et al.* 1997; Arnold & Birtles 1998; Corkeron 1998). Opportunistic sightings of sperm, pilot and killer whales and common dolphins also occur from commercial vessels (Anderson *et al.* 1996). Whale watching in Australian waters now occurs in all states, except the Northern Territory (Anderson *et al.* 1996).

2.9.2 Impacts of Whale Watching

Short-term research on human disturbance of large terrestrial mammals has shown negative impacts such as dispersal from home range, flight responses, reproductive

pauses and delayed use of foraging grounds (Duffus 1995; Olson *et al.* 1997). There is similar potential for marine mammals to be disturbed by human activities. Bannister *et al.* (1996) recognised the potential for direct disturbance to cetaceans on the migration path and in breeding areas from human activities, including whale watching and research vessels. It was noted that with the expansion of whale watching and the expected further increase in humpback numbers, this potential would be magnified.

Scientific data into disturbance of cetaceans by human activity is slowly accumulating. There have been indications of positive and negative responses by whales to human presence. Changes in behaviour of humpback whales on Alaskan feeding grounds were correlated with speed, size, distance, and the numbers of vessels within 4km of them (Baker & Herman 1989). Baker & Herman (1989) stated that temporary displacement of whales from preferred feeding areas had resulted from repeated approach or passing of vessels. There was also an indication of a considerable degree of short-term changes in whale behaviour in response to vessel traffic (Baker & Herman 1989). Williams *et al.* (2002) demonstrated disturbance in the form of changed swimming speed and pattern in Orca in Johnstone Strait, British Columbia. Reactions of humpback whales to boats at another feeding ground off Cape Cod changed over 25 years from "mixed responses often negative" to "often strongly positive" (Watkins 1986). Whales appeared capable of detecting and recognising the sounds made by particular whale watching vessels at distances of up to 8-10 km (Watkins 1986). Erbe (2002) found masking of Orca vocalisations by whale watching vessels. If these disturbances occur over many years they may contribute to a slowing of population growth.

To date, whale watching has not been shown to have had a significant detrimental impact (i.e., damage or decrease) on whales at the population level, although single incidences of harm e.g., whale strikes, have been recorded (Constantine *et al.* 2003; Waples 2003). Additionally, the populations of gray whales off the Californian coast and the humpback whales off the east-Australian coast have increased their size, despite being the focus for whale watching for at least 35 and 10 years, respectively. Significant increases in the populations of Northern Hemisphere humpbacks have only recently been recorded although they have also been protected for several decades (Smith *et al.* 1999). However, Taylor and Gerrodette (1993) found that a significant decrease in a population might not be able to be detected until too late due to insufficient statistical power of data on an already small population. Therefore, impacts

of whale watching at a population level may be reducing the rate of increase but are impossible to prove.

Humpback whales migrating up the east-Australian coast (Antarctic Area V stock) were reduced almost to extinction by whaling. Although increasing significantly each year, this population continues to "remain at a small fraction of its hypothesised size prior to commercial whaling" (Bryden *et al.* 1990, Corkeron 1995). Thus care must be taken when implementing management strategies for activities such as whale watching which may impact on the population. Corkeron (1995) found short-term behavioural changes in whales in Hervey Bay. However, long-term and population level effects could not be determined due to the inadequate length of his study. No comparative studies are available.

Although the studies already discussed indicate that boat traffic, including boat-based commercial whale watching, can alter the behaviour of humpback whales or affect their distribution patterns, most studies have investigated the impact of vessel traffic on behaviour but only at the termini of migrations (Corkeron 1995). Corkeron's (1995) study was conducted in Hervey Bay, along the migration path.

2.9.3 The International Whaling Commission

After the failures of several agreements, conventions and protocols to effectively halt the overexploitation of whales, many whaling nations recognised that a new international convention was required (D'Amato & Chopra 1991; Maffei 1997). Fifteen states signed the International Convention for the Regulation of Whaling (ICRW) in December 1946 (D'Amato & Chopra 1991; Maffei 1997). The International Whaling Commission (IWC) was established under Article III of the ICRW. A single commissioner from each contracting government constitutes the IWC, whose role is to annually review and update quotas and identify which species need to be protected from whaling (Frost 1979; D'Amato & Chopra 1991; Maffei 1997).

International co-operation on the management of whale stocks has been conducted primarily through the IWC. The twenty-five years, from 1946 – 1971, brought discussions on the humanity of killing whales, the conclusion of the Antarctic Treaty, introduction of the International Observer Scheme and protection of humpback (1963) and blue (1965) whales (D'Amato & Chopra 1991; Cooke 1994; Maffei 1997). Protection of the environment came to the forefront of international awareness in the 1970s and with it came "conflict between non-whaling or minor whaling nations on the

one side and major whaling states on the other side" over proposed "conservationist" amendments to the Convention (D'Amato & Chopra 1991). In 1975, the IWC adopted the New Management Procedure (NMP) in an attempt to base management of whaling on scientific data (Cooke 1994).

The late 1970s and the 1980s also brought a realisation that the scientific data required to sustainably manage whaling were not available. After several calls for moratoria on commercial whaling, a 1982 proposal by the Seychelles for quotas to be set at zero to come into effect by 1986 was approved (D'Amato & Chopra 1991). Although controversial, most member states complied with the moratorium by 1988 (Cooke 1994). The Indian Ocean Sanctuary was established in 1979 and the Southern Ocean Sanctuary was established in 1994 (Maffei 1997). An alternative to the NMP, the Revised Management Procedure (RMP) was being prepared in 1993 and accepted by the IWC in 1994 (Cooke 1994).

Although whale watching had been considered as a "use" of whales as early as 1983, the IWC did not formally recognise it as a "legitimate tourism industry which provided for the sustainable use of these animals" until 1993 (Orams 2000). In 1994, the IWC passed a "Resolution on Whalewatching" (Gambell 1995; IWC 1996; Berrow 2003). This resolution requested that particular information be provided by the Scientific Committee to the Whalewatching Working Group to allow for the provision of advice on development of regulatory frameworks for whale watching (IWC 1996). The Scientific Committee was asked to:

1. "identify and assess the possible effects of whale watching operations on cetaceans/whales;
2. examine the current status of methods of assessment of impacts, including assessment of behavioural change; and
3. provide advice on future whalewatching based on assessment of impacts"

(IWC 1996)

In 2000, a special workshop entitled "Assessing the Long-term Effects of Whalewatching on Cetaceans" was held before the 52nd Scientific Committee meeting to "expedite the collection, exchange and synthesis of information necessary" for this topic (IWC 2000a). This involved discussion of research being conducted on long-term effects, collection of data by whale watch operators, a review of national whalewatching guidelines and reviews of new information with regards to dolphin-feeding programmes

and “swim-with” programmes. The IWC Whalewatching Scientific Sub-Committee then reviewed the information presented to the workshop and agreed that a “review of research on effectiveness of and compliance with national whalewatching guidelines and regulations” be included in the work plan (IWC 2000b). The IWC is however, divided on its role in the management of whale watching, with some countries stating that they believe that since the IWC budget is limited, the time and monetary resources should be spent on discussing issues of higher relevance than whale watching (IWC 2000b). To date there has been no indication by the IWC that it will cease discussing the issues of whale watching, including feeding and “swim-with” programmes.

2.9.4 Management of Whale Watching - Internationally

As whale watching developed in various countries, groups of interested parties formed interest groups and discussed relevant guidelines for whale watching in their area. The rules vary quite considerably, even for the same species and within the same country (Carlson 1995; IFAW/Tethys Research Institute/Europe Conservation 1996).

New Zealand for example, has regulations developed and enforced by the Department of Conservation (Hawke 1996). In Ogasawara, Japan, only voluntary rules, set up by the Ogasawara Whale Watching Association are in place for the larger whales, and nothing is in place for dolphin watching (Mori & Yamada 1996). Mori & Yamada (1996) considered these rules ineffective. Patagonian laws have been developed as a result of recognition of the growing tourism potential. The government, scientific representatives and whale watch guides identified the need, as early as 1982, to establish rules for whale watching and the protection and conservation of the species and its habitat (Orri & Visintini 1996). Commercial whale watching was restricted to certain areas and strict laws were implemented. In the USA, the *Marine Mammal Protection Act 1972*, includes strict regulations on harassing whales and dolphins and their conservation and protection. It does not however, include legislation pertaining specifically to whale watching. The USA has separate guidelines for whale watching, which include remaining a minimum 100 feet from whales, no chasing and no disruption of normal behaviour (Beach & Weinrich 1989). Humpbacks, as an endangered marine mammal are also protected under the U.S. *Endangered Species Act 1973* (Forestell & Kaufman 1996).

A workshop on the Scientific Aspects of Managing Whale Watching was held in Italy in 1995, to discuss the worldwide whale watching situation and develop “a framework to guide the process of defining new rules and modify existing rules for whale watching”

(IFAW/Tethys Research Institute/Europe Conservation 1996). In January 1998, an international whale watching research workshop, held in Monaco, identified four priority issues in whale watching research and management: "research programs - "quick & dirty" versus long-term (i.e., the need for more long term studies); need for a more holistic approach; the need for experienced help in areas where whale watching is just beginning; and problem of enforcement of regulations" (Malcolm & Duffus 1998). Although all the issues need to be addressed, the workshop members saw the enforcement of regulations as one of the most serious problems. Further research is also needed into cetaceans, the effects of whale watching and the design and implementation of management strategies.

2.9.5 Management of Whale Watching - Australia

Development of the management of whale watching in Australia is discussed more thoroughly in Section 3.4 Development of Australian Whale Watching Legislation and Policy, therefore will only be summarised here.

As early as 1935, Australia implemented laws relating to the management of whales in the form of the *Whaling Act 1935 (Cwlth)*. However, by the early 1970s whaling had become economically unfeasible and an inquiry into "Australia's policies on whales and whaling" was conducted by Frost, leading to an almost overnight change in policy and legislation from one promoting whaling to one promoting protection of cetaceans. Commonwealth legislation has been amended several times and now includes sections referring specifically to whales, the latest of which is the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. Protection aimed specifically and indirectly at the protection of whales has also been introduced into State policy and legislation e.g., *National Parks and Wildlife Act 1974 (NSW)*, and Queensland's *Nature Conservation (Whales and Dolphins) Conservation Plan 1997*.

Australia is party to several International treaties that have the potential to influence marine mammal management. The Reform of Commonwealth Environment Legislation Consultation Paper (Commonwealth of Australia 1998) and The Action Plan for Australian Cetaceans (Bannister *et al.* 1996) both mention the importance of the International treaties and Australia's role within them, as well as, their impact on Australian legislation.

Early whaling severely depleted both humpback and southern right whale populations, resulting in concerns being raised regarding the impact of whale watching on

recovering species (Bryden & Corkeron 1990; Bannister *et al.* 1996). This is especially important, as we do not as yet know the full impact of whale watching on any cetacean species. Two conferences have been held specifically dealing with whale watching in Australia: "Encounters with Whales '93" and "Encounters with Whales 1995". The outcome statements of both these conferences recognised the need for further research into cetaceans, education of tourists, improvement of vessel design, and development of appropriate management strategies (Postle & Simmons 1994; Colgan *et al.* 1996). Bannister *et al.* (1996) recommended the assessment of possible disturbance, such as whale watching, to humpback whales in key areas.

Bryden & Corkeron (1990) showed that operators in Hervey Bay did not always comply with the *Fishing Industry Organization and Marketing Regulations 1983 (Qld)*, the only regulations in place at the time in regard to whale watching. Additionally, Bryden & Corkeron (1990) found that "the further from the boat harbour pods occurred, the more likely it was for the pods to have a greater number of boats around them" suggesting that enforcement was important but inadequate. The degree of compliance of whale watching vessels with Commonwealth distance of approach guidelines within Commonwealth waters is unknown (Corkeron 1998). Further research into effects of whale watching on cetaceans and design and implementation of management strategies is needed.

2.9.6 The Future of Whale Watching

The rapid expansion of the whale watch industry in Australia and worldwide, increases the urgency of establishing whether or not the industry is sustainable. There are several issues that need to be addressed through research, including:

1. Ecological Issues
 - The difficulty of assessing population scale impacts of whale watching at time-frames useful to management (Malcolm & Duffus 1998)
 - The difficulty of determining the population level significance of the immediate responses of individual whales to whale watching (Corkeron 1996)

2. Economic & Social Issues
 - The relative magnitude of the local socio-economic costs and benefits of whale watching and the way it is managed (Burger 1996; Kleinschmidt 1996; Parsons 1996; Stevens *et al.* 1996)

3. Management Issues
 - The effectiveness of the management measures in reducing impacts on the whales at a local scale (Beach & Weinrich 1989; Paterson & Paterson 1989; Bannister *et al.* 1996; Corkeron 1996; Hodda 1996; Marsh *et al.* 1997).
 - The effectiveness of local management measures in reducing cumulative impacts across jurisdictions (Spalding 1998).
 - The level of compliance with the management regime (Malcolm & Duffus 1998).
4. Educational
 - The nature and effectiveness of the interpretative programs offered by whale watch operators (Beach & Weinrich 1989; Forestell 1993; Olesinski 1994; Amante-Helweg 1996; Crabtree & Weiler 1996; Department of Environment & Heritage 1996; Hearne 1996; Macpherson 1996; IFAW/WWF/WDCS 1997; Findlay 1997; Corkeron 1998).
5. Ethical
 - The legitimacy of commercial viewing potentially-vulnerable species which are still recovering from whaling

2.10 The Research Framework

Although there is a great deal of confusion regarding definitions of ecologically sustainable development and ecotourism, it is generally accepted that the aim of environmental management regimes is for the perpetuation of the environment in such a form as that future generations may also be able to experience it as we do today. This means that there should be as little impact as possible on the flora and fauna that is the focus of ecotourism industries, such as whale watching. Humpback whales are a focus of whale watching worldwide and management regimes have been implemented in many areas to try and reduce potential impacts of the industry. However, research into the ability of such management regimes has not previously been conducted.

In this thesis, I inform the debate about management of whale watching by studying how some of the above management issues are being confronted by Australian Commonwealth and State environmental regulators and in the humpback whale watch industry at field sites on the east coast of Australia.

Chapter Three

From Whaling to Whale Watching: the Development of Australian Whale Watch Management

3.1 Introduction

This chapter reviews the development of the management framework for the protection of cetaceans, in particular whale watching in Australia. Firstly, an outline of the types of policies and legislative documents that a management framework may consist of is provided. Secondly, a theoretical background to wildlife management is presented to allow for an understanding of the decision processes involved in the development of wildlife management, in particular management of whale watching. Thirdly, as this research is concerned with compliance to whale watch regulations and guidelines within Australia, a review of all legislation and policies within Australian and its States and Territory waters concerned with cetacean conservation and protection and in particular, whale watching is provided to give an understanding of the complexity of the situation in this country. Finally, I provide an assessment of the current situation as it applies to whale watch management in Australia.

3.2 What are Policies and Legislative Documents?

Acts, regulations and guidelines manage the actions of human populations throughout the world. In many instances, when humans come into contact with marine mammals either in their natural habitat or stranded on land, Acts, regulations and guidelines are used to manage human actions around marine mammal(s).

Laws are passed, programs initiated, money time and personnel are allocated and organizations are created to combat or control the occurrence of particular behaviours in relation to certain activities when society agrees that there is the potential for a problem (Akers 1985). However, although there may be agreement on implementing regulatory methods, there are usually differences regarding the appropriate level of control (Akers 1985). The development of these regulatory methods is sometimes

arbitrary, sometimes uses the Precautionary Principle, and is frequently based on the knowledge and experience of other countries.

Guidelines are the initial starting point with groups of interested parties coming together to discuss activities that they consider require management. Guidelines are established on a voluntary basis therefore there is no monitoring or enforcement. Codes of Practice or Codes of Ethics are other forms of guidelines that can be applied to management. Defined by Malloy and Fennell (1998) "Codes of Ethics" are "messages through which corporations hope to shape employee behaviour and effect change through explicit statements of desired behaviour". They considered that these codes should: "a) establish moral values recognised by a company; b) communicate the company's expectation to employees and c) demonstrate to all that the company operates within these parameters". Furthermore, the codes are meant to be a set of guidelines applicable in day-to-day situations that Act to translate theories into practice. Codes can also be applied across an industry and implemented for the same reasons.

Guidelines or Codes of Practice/Ethics are usually the foundation for the formation of Acts and regulations. Under the Westminster system of government, once it is agreed that the guidelines or codes should become enforceable, a proposal for law is introduced to the Parliament. This proposal is referred to as a bill. When the bill is passed by the Parliament and assented to by the Governor it becomes law, as an Act. An Act may set out what is or is not permitted in certain situations, whether a permit is required and gives definitions of terms to try to ensure there is no misunderstanding. An Act may also provide for the formation of regulations, which set out in greater detail the conditions of management specific to certain groups, areas of environment or species. For example the *Nature Conservation (Wildlife) Regulation 1994 (Qld)* was formulated under the *Nature Conservation Act 1992 (Qld)*. The Act specifies what can and cannot be done with regards to nature conservation in general while the regulations are more specific. Acts or regulations may provide for the implementation of management and zoning plans or conservation policies for specific areas or species. For example, an area may be divided into several zones of different protective classifications to allow for varied and controlled use, protection and conservation.

In this chapter, I discuss the development of the regulatory tools that are used throughout Australia to regulate whale watching including Acts, regulations, management or zoning plans, conservation policies and guidelines or codes of practice. Although some of these legislative tools do not directly apply to whale

watching, they may be the only protection afforded to cetaceans, which have the potential to become the focus of whale watching.

3.3 Wildlife Management Theory

The development of wildlife management and the management of whale watching was discussed in Chapter 2. In this chapter, I provide only a brief overview as a pretext to the actual management framework previously and currently present in Australia.

"The problem of game management is not how we shall handle the deer - the real problem is one of human management. Wildlife management is comparatively easy; human management is difficult."

Aldo Leopold (1949 - Sand County Almanac)

It can be seen from the history of wildlife management in Chapter 2 that management decisions were not always to the benefit of the wildlife and were more likely to be beneficial to humans. The consumptive nature of humans and their disregard for nature led to destruction of habitats and huge decreases in wildlife populations. However, in the twentieth century there was a tendency towards more ecosystem orientated management strategies. Therefore, greater value has been placed on humans as being part of the environment and managing the ecosystem as a whole.

"The overall goal of management strategies designed to control the interaction between tourists and the natural environment is twofold: first, to protect the environment from detrimental impacts and, second, to provide for and promote enjoyable tourist experiences."

(Orams 1995)

Tourism management itself is a rather recent application. It is an extension of generic management theory of which functional aspects such as marketing have been the focus (Malloy & Fennell 1998). Malloy & Fennell (1998) believe that much of tourism management has lacked an ecologically and ethically sustainable perspective. Tensions tend to be created between managers and users of the wildlife tourism experience because members of the general public tend to be humanistic and moralistic, where wildlife managers tend to be ecologically and scientifically focused and utilitarian (Reynolds & Braithwaite 2001).

Malloy & Fennell (1998) found that associations such as NGOs provided the predominant input into management regimes. Furthermore, input from such NGOs, government or industry tended to be generally applicable and deontological in nature, i.e. ethical behaviour based on duty to follow rules, rather than teleological, i.e. ethical behaviour with the aim of producing a good end product (Malloy & Fennell 1998). In addition, during the development of management regimes people promote the use of the same word in different contexts, which can be ambiguous and create multiple meanings. Therefore, people who are concerned with “policy on the environment” and are involved in the “world of legislation” try to ensure that their interpretation of a particular word or words is introduced into statutes, regulations, and judicial opinions (DiMento 1989). Further problems arise when interest groups also promote different interpretations of what it means to comply because of the significant “financial, environmental, and philosophical implications of the choice of a meaning” (DiMento 1989).

Malloy & Fennell (1998) found that management was more likely to be based on a deontological approach. Therefore, current management strategies fail to provide the decision maker i.e., anyone in the position to decide whether or not to abide by a particular code in a particular situation, with the rationale for abiding by the code. Fortunately, they also found that the majority of research has supported the teleological approach, as many people will follow codes unquestioningly and no rationale is required (Malloy and Fennell 1998). Although many people may follow codes unquestioningly, there are most likely many who will not, therefore, the importance of educating people about any rules or codes that apply to different situations, as discussed in Chapter 4, is important.

Individuals are not the only cause of environmental violations. Small or large collectives and their interactions often have a greater impact on the environment than individuals (DiMento 1989). Thus, a single tour operator in an area may have only a slight effect, however, several tour operators in the same area have an amplified or cumulative impact. Sirakaya and Uysal (1997) believe that many ecotour operators have realised the potential for their activities to have adverse socio-economic, cultural and environmental impacts on tourist destinations and consequently have developed guidelines or codes of conduct/ethics to regulate themselves voluntarily with regard to their operations.

Nonetheless, DiMento (1989) highlighted three factors that were important to successful compliance. These were: the enforcement of regulatory policies, communication of regulations and a focus on the characteristics of the actors in compliance, (e.g., government regulators, business firms, special interest groups). Stabler and Goodall (1997) found that environmental objectives and practices were more likely to be incorporated by business, if it could be demonstrated that they were beneficial. Reynolds & Braithwaite (2001) stated that interactions with wildlife used to be controlled primarily through external manipulative methods such as physical barriers and regulations, however, economic and educational strategies are now becoming more common. They characterised management methods for control of the tourist experience as either physical or intellectual: the former an actual barrier, the latter a psychological one based on knowledge (Reynolds & Braithwaite 2001). This knowledge, in turn, leads to a better understanding and in most instances higher compliance.

Most regulatory design adopts two main strategies: proactive and reactive enforcement (Petts 2000). The former uses inspection regimes to encourage individuals, businesses or industry to take appropriate actions. It relies on cooperation and discussion and encourages a working, negotiable relationship between the regulator and regulated (Petts 2000). The latter emphasises the use of enforcement and prosecution, which is very time-consuming and expensive. Petts (2000) advises that to be effective, a balance of pro- and reactive regulation is required. In response to this, DiMento (1989) believes that there are two types of compliance, the individual/business or specific compliance and general compliance that apply to the overall reaction of an industry. The former is in relation to a specified incentive or sanction and the response is believed to be consistent with societal objectives or regulations (DiMento 1989). The latter refers to the responsive behaviour by sections of industry that the government aims to effect by regulation (DiMento 1989). DiMento (1989) stated that compliance is attained through the application of a variety of methods within one regulatory system. Petts (2000) believes that this system of direct control over activities and organizations as command-and-control regulation is the primary method by which environmental protection policies are achieved.

Self-regulation occurs when the regulated are allowed to "manage" the regulatory process (Petts 2000). It has been promoted by Agenda 21 of the 1992 Rio Earth Summit as a means of achieving sustainable development (Stabler & Goodall 1997). However, Sirakaya and Uysal (1997) found that observance levels amongst tour

operators varied significantly because of the voluntary nature of guidelines. They suggested that a site-specific ecotourism monitoring mechanism should be designed and implemented in each area to allow for assessment of the long-term impact of tourism development. Guidelines outlining appropriate behaviour for tourists in Antarctica are seen by Davis (1999) as a "critical step in modifying behaviour". However, the guidelines have been created on a reactive basis and as such "lack a cohesive, unified philosophy" (Davis 1999). Therefore, she recommended a visitor management model to add greater ability for management decisiveness within the Antarctic (Davis 1999). Davis (1999) considered that Antarctic tourism was at such a point that it required more than just guidelines for appropriate management. In a study of codes of ethics and tourism, Malloy & Fennell (1998) found that most guidelines become difficult to enforce because they are too generic and cannot cover all circumstances. Companies that implement codes are often more concerned with public relations than realistic changes (Malloy & Fennel 1998). However, Malloy & Fennel (1998) and Davis (1999) stopped short of recommending any move from guidelines to regulations and I am not aware of any other study within tourism management that has recommended such a shift. Nevertheless, a perception that regulations have greater enforceability than guidelines seems to be accepted internationally, as more and more guidelines are being pushed towards the status of regulations.

In a study of environmental awareness in the Guernsey hospitality sector, Stabler & Goodall (1997) found limited or no understanding of tourism-environment interactions. Few respondents to their questionnaires saw any connection between an increase in tourist numbers and problems such as traffic congestion and sewage generation (Stabler & Goodall 1997). Petts's (2000) study of small and medium scale enterprises reiterates Stabler & Goodalls' finding. Petts (2000) found that many individuals were sceptical of regulation effectiveness and "appear to lack a full appreciation of the relevance of some regulatory requirements in terms of environmental protection."

Reynolds & Braithwaite (2001) believe that both economic and non-economic values are integrated into recreational use of wildlife. However, wildlife resource management usually concentrates on short-term economic benefits (Reynolds & Braithwaite 2001). This is usually the result of competing values, trade-offs and compromise options that wildlife tourism managers must deal with and is represented by "values of conservation vs. animal welfare vs. visitor satisfaction vs. profitability" (Reynolds & Braithwaite 2001). Reynolds & Braithwaite (2001) state that wildlife management is complicated

by the perception that there appears to be a lack of understanding by both tour operators and protected area managers of the constraints and pressures on each other. Furthermore, the most common problem seems to be that tour operators seek greater and closer contact to the wildlife being observed while managers seek to restrict access and increase the distance (Reynolds & Braithwaite 2001).

From a marketing perspective, it can easily be seen from whale watch brochures and advertisements (Figure 3.1) that getting close to whales is what attracts customers. This assumption has also become the basis, at least in part, for the way in which the whale watch industry operates, while the management framework tends to be based on the premise that the close proximity of vessels is problematic for the whales (Orams 2000). Orams (2000) states that although this may be a reasonable assumption, it should be noted that globally there are few restrictions on commercial shipping and the tens of thousands of ferries, fishing and sailing vessels that travel the oceans and seas of the world. Thus, in a few isolated areas, restrictions are placed on cetacean based tourist activities while few restrictions exist elsewhere. However, in a study of bottlenose dolphin surfacing patterns in response to boat traffic, Janik & Thompson (1996) found that because the commercial dolphin-watching vessel “differed from all other boats in its behaviour” i.e., “following and attempting to stay in the vicinity of the dolphins”, it accounted for a greater number of interactions with the dolphins than any other type of vessel. Furthermore, dolphins significantly decreased their surfacing in response to the approach of the dolphin-watching vessel, but no significance was found in response to other vessel traffic (Janik & Thompson 1996). The situation has become contentious however, as some research has suggested that the geographical proximity of a vessel to a pod of whales or dolphins is less important than the type of vessel, the noise it creates or the way it is operated (Orams 2000).

Orams (2000) found that whale watch operators do not need to get close to whales to satisfy their customers. As a result, he concluded that “management agencies can change their efforts from a reactive, punitive approach to possible transgressions of regulations to a pro-active educational approach which points out that close geographical proximity to whales is not what their customers are actually looking for”. Instead Orams (2000) notes that humans spend a considerable amount of money, time and effort to see and experience marine mammals. By 1998, the worldwide whale watch industry itself was valued by Hoyt (2000) at USD\$1 billion (Refer Chapter 2). Therefore, Orams (2000) believes that development of management strategies should focus on an understanding of the factors that motivate people to go to such effort and

expense. Stabler and Goodall (1997) also consider that, although providers and users of environmental tourism experiences have a common interest in the areas being utilised, an understanding of a business's motives and the environment in which they operate is required to comprehend how operations will react to pressures to operate in an environmentally responsible manner.

Figure 3.1: Examples of brochures from the 1998 and 1999 whale watch seasons, advertising the whale watch experience.

Top Left: Moreton Bay Whale watch Top Right: Princess II

Lower Left: Fraser Coast Tourist Information Booklet Lower Right: Spirit of Hervey Bay

Nonetheless, the results of Muloin (1998) and C. Malcolm (University of Victoria, Canada, *pers. comm.* 2002) support the assumption that tourists want to get as close as possible to the whales. Muloin's (1998) study found that "seeing humpback whales close to the boat" and "regulations controlling how closely boats may approach the humpback whales" were ranked as the third and fourth most important factors influencing visitor satisfaction with whale watching (after "seeing humpback whales in their natural habitat" and "watching natural humpback whale behaviour"). This indicates that, although visitors like to get close to whales, they show some understanding of the importance of distance regulations. This may have resulted from a brochure outlining the regulations being given to each person boarding the vessel and further elaboration of the regulations by the naturalist on board (Muloin 1998). During my research, I also noted several instances where passengers stated that they wished to be closer to the whales, although I knew, because of the range-finder measurement, that the vessel was at or close to, the minimum approach distance and the passengers were supposedly aware of the regulations because of the provision of an explanatory brochure.

Orams (2000) states that the "use" of whales as a tourist attraction is perceived by some as another form of harmful exploitation of these marine mammals. As early whaling severely reduced both humpback and southern right whale populations, concerns have been raised on the impact of whale watching on the recovering species as discussed in Chapter 2 (Bryden & Corkeron 1990; Bannister *et al.* 1996). This is especially important, as we do not as yet know the full impacts of whale watching on any cetacean species. The Whale Watching Scientific Committee at the 52nd IWC meeting in Adelaide, Australia identified swimming with dolphins as a greater problem than watching cetaceans from land or vessels because of the aggressiveness of the interactions (IWC 2000a). Those involved in swim-with programs or tours were found to be actively approaching the cetaceans (mostly dolphin species) inappropriately and closer than regulations or guidelines stipulated (Constantine 2001; Scarpaci *et al.* 2003). However, the Whale Watch Committee pointed out that further research was required to understand the long-term impacts of whale watching as these were still of significant concern (IWC 2000a).

Duffus and Dearden (1993) state that the ability to regulate the human component of whale watching is influenced by whether the activity primarily involves commercial or private vessels. Management via licensing and peer pressure is thought by Duffus and Dearden (1993) to be the most likely avenue for managing commercial vessels,

however, management via education is seen to be more appropriate for private vessel users. The major difference in the management styles is as a result of numbers i.e., it is far easier to license the relatively low number of commercial operators than the hundreds of thousands of private vessel users. Furthermore, I have observed instances of non-communication between operators brought about by one operator perceiving another operator as “no good”. This situation usually resulted in one operator having greater difficulty than the other in locating cetaceans for his passengers to observe. Although also important for commercial operators, education can reach a greater number of individuals (e.g., through educational signs or brochures) and is therefore a very useful tool in the regulation of private vessel users.

The requirement for regulation stems from the knowledge of impacts on wildlife from interactions with humans including the wildlife tourism aspect (Reynolds & Braithwaite 2001). Reynolds and Braithwaite (2001) list at least eight categories of impact that could apply to whale watching. These are outlined in Table 3.1 and consist of pollution; animal emigration; reduced animal production and reproduction; habituation; aberrant social behaviour; increased predation; modification of activity patterns and altered community structure.

As originally conceived for whale watching in Hervey Bay, Australia, the Australian whale watch guidelines were based on those in use in the United States of America (P. Corkeron, James Cook University *pers. comm.* 1998). In other areas of Australia where whale watching has developed, guidelines from both the United States of America and Hervey Bay have been used as the foundation for developing local guidelines. These guidelines have been developed in accordance with the current knowledge level with respect to the particular species being observed and environmental factors peculiar to the area e.g., bay vs. open coastline. In special cases, such as the swim-with-dwarf minke whales situation in Far North Queensland, guidelines have been developed using the experience of the vessel crew and researchers (Arnold & Birtles 1998).

Table 3.1: Impacts of human-wildlife interactions that may apply to whale watching [Adapted from Reynolds & Braithwaite 2000 p.35]. the list is not exhaustive.

Potential Impact	Description
Pollution	Introduction of harmful concentrations of chemicals into habitat may affect animals directly (building up in blubber) or indirectly (contaminating a food source) or ingestion of marine debris e.g. plastic can cause starvation
Animal Emigration	Usually resulting from disturbance - but may also be produced by habitat modification, prey movement or pollution
Reduced Animal Production & Reproduction	A decrease in feeding time and/or increase the energy expenditure because of disturbance from perceived danger, may contribute to a deterioration in the animal's condition, causing a decline in reproductive success
Habituation	The learning process by which the animal learns to respond to stimuli may be stressful
Aberrant Social Behaviour	If the frequency of encounters between animals is increased by interaction with humans, this can cause alterations in their usual social interactions.
Increased Predation	Disturbance of breeding animals can decrease their vigilance of young and increase the risk of predation
Modification of Activity Patterns	Activity patterns of animals are generally a compromise between the need for feeding and avoiding predation. Repeated human interaction may change these patterns
Altered Community Structure	If a species leaves an area then inevitably species composition changes. Also possibility that this will impact remaining species and may facilitate the establishment of exotic species

3.4 Development of Australian Whale Watching Legislation and Policy

In Australia, there is separate legislation for State controlled waters (those that extend from the coastline to the 3 nautical mile line) and Commonwealth-controlled waters (generally those waters extending from the 3 nautical mile line to the Exclusive Economic Zone i.e., 200 nm line). An exception to these definitions occurs when a Marine Park is legislated by the Commonwealth, but covers what would usually be considered State waters. In these instances, such as the Great Barrier Reef Marine Park off the east coast of Queensland, all waters within the marine park except for the intertidal zone are then considered under Commonwealth legislation (D. Savage, Queensland Parks and Wildlife Service, *pers. comm.* 2000). In this case, the Great Barrier Reef Marine Park is managed by the Great Barrier Reef Marine Park Authority under the *Great Barrier Reef Marine Park Act 1975*.

I collected copies of all guidelines and legislative policies relating to cetacean protection for the Commonwealth of Australia and each of its States and Territories, except for the Australian Capital Territory, which is landlocked. Each document was then reviewed for its application to the protection of cetaceans and in particular the conditions of minimum distance of approach and approach method as it applies to whale watching. A more detailed review is provided in Appendix 1.

Australia's first laws concerning whales were those relating to whaling. The first Act, the *Whaling Act 1935 (Cwlth)* was enacted to ensure the application of the provisions of the 1931 Convention on Whaling (Frost 1979). The next Commonwealth statute was the *Whaling Act 1948 (Cwlth)* (Frost 1978; Frost 1979; D'Amato & Chopra 1991) in which provision was made for the International Convention for the Regulation of Whaling 1946 to be brought into effect. Finally, the *Whaling Act 1960-1973 (Cwlth)* (Frost 1979), section 4, repealed all earlier statutes and remained the only Commonwealth regulation affecting whales in Australian waters until the enactment of the *National Parks and Wildlife Conservation Act 1975 (Cwlth)*. These legislative changes were the result of a change in attitude to whales in Australia.

Prior to the 1970s, the growth and development of Australia's whaling had followed a similar path to those in many other whaling countries. The "Inquiry into Whales and Whaling" led by Sir Sydney Frost was established in March 1978 to "examine and report on Australia's policies on whales and whaling, including the position Australia adopts internationally and to make recommendations accordingly". Whaling had almost ceased because it had become economically unviable, however, Frost's (1979,)

detailed report, led to an almost overnight change in policy and legislation. The Australian government has held a position strongly against whaling since 1980.

In 1980 the *Whale Protection Act (Cwlth)* was enacted which repealed the *Whaling Act 1960 (Cwlth)*. The *Whale Protection Act 1980 (Cwlth)* extended the influence of the previous Act to the Exclusive Economic Zone, as well as, to any Australian vessel, aircraft or person, whether within Australian waters or not. Together the *National Parks and Wildlife Conservation Act 1975 (Cwlth)* and the *Whale Protection Act 1980 (Cwlth)* formed the basis of cetacean conservation within Australian legislation. The then Australian National Parks and Wildlife Service (ANPWS) administered both of these Acts. Later amendments to the *Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)* and the *Endangered Species Protection Act 1992 (Cwlth)* included sections referring specifically to the conservation and protection of whales.

In 1998, the then Environment Australia (the former Australian Nature Conservation Agency and prior to that, the ANPWS) started to coordinate the development of a national strategy for guidelines specifically focusing on human-cetacean interactions including: whale watching from vessels, aircraft and land; feeding of cetaceans; restrictions on touching cetaceans and noise production when in the vicinity of cetaceans; and swimming with cetaceans. At this time, Environment Australia sent copies of the Draft National Guidelines 1998 to at least 129 vessel operators (including whale and dolphin watch, scuba and marine based tours) Australia-wide in its attempt to gain comments and input (G. Larmour, Environment Australia *pers. comm.* 2000). In a separate paper the Commonwealth of Australia (1998) put forward recommendations that five of the most important Commonwealth environmental statutes, four of which referred in some way to marine mammal conservation required revision and amalgamation (Commonwealth of Australia 1998). In 1999, the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* updated, consolidated and replaced the *Environment Protection (Impact of Proposals) Act 1974 (Cwlth)*; the *National Parks and Wildlife Conservation Act 1975 (Cwlth)*; the *Whale Protection Act 1980 (Cwlth)*; the *Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)*; and the *Endangered Species Protection Act 1992 (Cwlth)*. The Australian and New Zealand Environment and Conservation Council (ANZECC) accepted and published the ANZECC Australian National Guidelines for Cetacean Observation and Areas of Special Interest for Cetacean Observation in early 2000 as guidelines for interactions with cetaceans in Australian and New Zealand waters (M. Rafic, Environment Australia *pers. comm.* 2000; Constantine *et al.* 2003; Waples 2003). Also

in 2000, the Tier 1 guidelines for whale watching as outlined by ANZECC became enforceable when they were integrated, as Part 8, into the *Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)*.

Protection aimed specifically and indirectly at the protection of whales had also been introduced into State legislation. Queensland, New South Wales, Western Australia and South Australia now have regulations, also based on those from the United States of America, specifically concerning whale watching. Victoria also has regulations in place but they are primarily concerned with dolphin swim tours. To allow for greater site and species specificity, individual Australian states are able to amend the ANZECC (2000) guidelines to form their own guidelines or regulations.

Australia is party to several International treaties, which have the potential to influence marine mammal management e.g., Convention on the Conservation of Migratory species of Wild Animals, which influenced the *Endangered Species Protection Act 1992 (Cwlth)*. The International Whaling Commission (IWC) first considered whale watching as a “use” of whales in 1983 (Orams 2000). Bannister *et al.* (1996) stated that Australia recognises that, if whale conservation is to be effective, international co-operation is essential.

By 1996, no fewer than 14 Acts were involved in cetacean conservation and protection in Australia (Bannister *et al.* 1996). Bannister *et al.* (1996) recognized that at a national and state level, the roles of different agencies with respect to cetaceans required clarification. Corkeron (1998) stated that in Australia whale watching in Commonwealth waters is mostly unregulated. He also concluded that management differences between the States/Territories of Australia, even for the same species of cetacean, also required resolution. The situation has changed little over the last ten years despite the consolidation resulting from the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*.

I present here an overview of all policy framework documents relevant to whale watching in Australia to provide an indication of the level of protection afforded to cetaceans. Although only Queensland, New South Wales and Western Australia were included in this study, I provide a complete overview to show the complexity of the situation in Australia. A detailed review is provided in Appendix 1 – Review of the Australian Whale Watching Legislation and Policy.

Though several Commonwealth Acts were consolidated into the *Environment, Protection and Biodiversity Conservation Act 1999 (Cwlth)*, there continue to be thirteen acts within Australia that are relevant to whale watching. The number has only decreased by one since 1996 because the individual states have implemented new legislation. Nine acts focus on cetacean protection and conservation and are not specific to whale watching. The Commonwealth now has two acts, a set of regulations, a set of guidelines (which are promoted although they have been integrated into the regulations) and a conservation policy. State legislation includes at least eleven acts, seven regulations and five other policy framework documents (Table 3.2). The summary is presented chronologically, with respect to geographical area.

Table 3.2 Current legislation and guidelines relevant to whale watching in Australia

Area	Legislation or Guidelines	Total
Commonwealth	<ul style="list-style-type: none"> • ANZECC Guidelines for Cetacean Observation • <i>Environment Protection & Biodiversity Conservation Act 1999</i> • <i>Environment Protection & Biodiversity Conservation Regulations 2000</i> • <i>Great Barrier Reef Marine Park Act 1975</i> • Great Barrier Reef Marine Park Authority Whale & Dolphin Conservation Policy 2000 • Whitsundays Plan of Management 2002 • Great Australian Bight Marine Park (Commonwealth Waters) Plan of Management 	3 Australia wide 3 specific to the GBR ¹ 1 specific to GAB ²
Queensland	<ul style="list-style-type: none"> • <i>Nature Conservation Act 1992</i> • <i>Nature Conservation (Wildlife) Regulation 1994</i> • Nature Conservation (Whales & Dolphins) Conservation Plan 1997 • <i>Marine Parks Act 1982</i> • <i>Marine Parks Regulation 1990</i> • Marine Parks (Hervey Bay) Zoning Plan 1989 • Marine Parks (Moreton Bay) Zoning Plan 1997 	7
New South Wales	<ul style="list-style-type: none"> • <i>National Parks & Wildlife Act 1974</i> • <i>National Parks & Wildlife Regulation 2002</i> • <i>Threatened Species Conservation Act 1995</i> 	3

¹ GBR – Great Barrier Reef; ² GAB – Great Australian Bight

Table 3.2 (continued) Current legislation and guidelines relevant to whale watching in Australia

Area	Legislation or Guidelines	Total
Western Australia	<ul style="list-style-type: none"> • <i>Wildlife Conservation Act 1950</i> • <i>Wildlife Conservation Regulations 1970</i> • <i>Conservation & Land Management Act 1984</i> • <i>Conservation & Land Management Regulations 2002</i> • Wildlife Conservation (Close Season for Marine Mammals) Notice 1998 	5
Australian Capital Territory	<ul style="list-style-type: none"> • None – Land Bound 	0
Victoria	<ul style="list-style-type: none"> • <i>The Wildlife Act 1975</i> • <i>Wildlife (Whales) Regulations 1998</i> 	2
South Australia	<ul style="list-style-type: none"> • <i>National Parks & Wildlife Act 1972</i> • <i>National Parks & Wildlife (Whales & Dolphins) Regulations 2000</i> • Great Australian Bight Marine National Park Plan of Management 1998 	3
Tasmania	<ul style="list-style-type: none"> • <i>Whales Protection Act 1988</i> • <i>Threatened Species Protection Act 1995</i> • <i>Wildlife Regulations 1999</i> 	3
Northern Territory	<ul style="list-style-type: none"> • <i>Territory Parks & Wildlife Conservation Act 2001</i> 	1
Total Number of Acts in Australia		13
Total Legislation/Guidelines in Australia		31

3.5 The Current Regulatory Framework

In 1996, there were 14 acts concerning cetacean protection and conservation (Bannister *et al.* 1996). In the Action Plan for Australian Cetaceans, Bannister *et al.* (1996) recommended that 1) “Commonwealth and State agencies regulate the expanding whale/dolphin watching industry in Australia in regard to, among other things conduct and practices, to avoid detrimental impacts on targeted species” and 2) “where relevant, whale watching guidelines be converted to enforceable regulations and that they be uniform throughout Commonwealth, State and Territory waters”.

Legislative policy introduced by the States since 1996 includes:

- Queensland – Nature Conservation (Whales & Dolphins) Conservation Plan 1997, Marine Parks (Moreton Bay) Zoning Plan 1997;
- New South Wales – *National Parks & Wildlife (Fauna Protection) Amendment (Marine Mammals) Regulations 1997*;
- Western Australia – Wildlife Conservation (Close Season for Marine Mammals) Notice 1998;
- Victoria – *Wildlife (Whales) Regulations 1998*; and
- South Australia – *National Parks & Wildlife (Whales & Dolphins) Regulations 2000*.

New South Wales, Western Australia, Victoria and South Australia have also all introduced regulations, some of which were previously guidelines (e.g., National Parks & Wildlife (Whales & Dolphins) Regulations 2000 (SA)).

There are now thirty legislative or policy documents concerned with the protection of cetaceans in Australian and Australian state and territory waters of which eleven are Acts. The reduction in the number of acts is as a result of several Commonwealth Acts being revoked and consolidated into one. The overall increase was caused by the introduction of State policies. Several of these policies were formerly guidelines that had been converted into regulations as Bannister *et al.* (1996) had recommended.

Bannister *et al.* (1996) also stated that one of three major concerns at the State and Territory level of legislation is the “lack of legislative uniformity or complementarity across Australia”. With regards to minimum approach distance stipulations (Table 3.3), the Commonwealth, Queensland, New South Wales and Western Australia all have the same 100m minimum approach distance for all vessels. Victoria and South Australia also have a 100m minimum approach for non-commercial vessels, but Victoria has a 150m minimum for commercial vessels and South Australia does not allow commercial vessel based whale watching. The rationale for Victoria’s stipulation of an additional 50m is unclear, but may stem from the fact that there is the potential for Southern right whales that are calving to be observed in Victorian waters. However, Southern right whales are also observed in Western Australia, which has a 100m minimum approach distance. The irregularity reduces the consistency and complementary measures to protect cetaceans across management jurisdictions. It also suggests to anyone who desires to observe cetaceans from vessels that the management framework is not based on research findings, but rather is arbitrarily formed by the management agencies. This perception may, in turn, lead to a reduction in compliance.

In addition, the Whitsundays off the Queensland coast, (a portion of which is under Commonwealth jurisdiction), the Ticonderoga Bay Sanctuary off Victoria and Encounter Bay off South Australia, all have special restrictions, each of which is different. This is possibly a result of the consideration for different species (humpback whales and Southern right whales) and behaviours occurring in the different areas, as well as the fact that the Whitsundays and Encounter Bay have been recognised as important calving areas (Great Barrier Reef Marine Park Authority 1999c; E. Reid, South Australian Whale Centre *pers. comm.* 2000).

On a second tier of protection, the Commonwealth and all States have a 300m minimum of approach if vessels are travelling above a certain speed, however, this speed varies between “no wake speed”, “slow wake speed”, “4 knots” or “5 knots” (Table 3.3). In the cases where “no” or “slow” wake speeds are used, they are defined such that an actual speed cannot be ascertained (e.g. “no wake” speed as defined in the Glossary of Terms in the ANZECC guidelines means: “a slow speed at which wash created by boat passage is negligible”). This makes examination of compliance more difficult for management staff.

The Commonwealth and Queensland regulations state that vessels should remain at least 300m from a whale if there are already two or three vessels respectively within 300m of the pod. Only the Commonwealth and South Australia have a policy requiring a vessel operator to move the vessel to 300m from a whale if the whale is disturbed or distressed. When a calf is present, the Commonwealth and South Australia restrict the minimum distance to 300m, New South Wales restricts it to 200m. These regulations provide some recognition that calves may potentially be more susceptible to disturbances such as increased duration of interaction with vessels than adults.

The management framework for whale watching in Australia is complex and sometimes confusing. In this thesis, I investigate and discuss whale watch operators’ perceptions and beliefs of and actual compliance to this framework.

Table 3.3: Whale Watching Policy* - a comparison of distance and approach methods across jurisdictions

Jurisdiction	Queensland	New South Wales	Western Australia	South Australia	Victoria	Commonwealth
Minimum approach distance	<ul style="list-style-type: none"> • 100m 	<ul style="list-style-type: none"> • 100m 	<ul style="list-style-type: none"> • 100m 	<u>Commercial Vessels</u> <ul style="list-style-type: none"> • prohibited² <u>Non-commercial Vessels</u> <ul style="list-style-type: none"> • 100m 	<u>Commercial Vessels</u> <ul style="list-style-type: none"> • 150m • 200m in Ticonderoga Bay Sanctuary <u>Non-commercial Vessels</u> <ul style="list-style-type: none"> • 100m 	<ul style="list-style-type: none"> • 100m
300m approach limitations	<ul style="list-style-type: none"> • 300m at <4knots • 300m if ≥3 vessels ≤300m • 300m if vessel behind & oriented same direction 	<ul style="list-style-type: none"> • 300m slow wake speed 	<ul style="list-style-type: none"> • 300m if within 30° arc (directly in front or behind) 	<ul style="list-style-type: none"> • 300m if calf² • 300m if distressed² • 300m in Encounter Bay Restricted Area² • 300m at <5knots² 	<u>Commercial & Non-Commercial</u> <ul style="list-style-type: none"> • 300m at <5knots 	<ul style="list-style-type: none"> • 300m <no wake speed • 300m if disturbed • 300m if calf • 300m if ≥2 vessels ≤300m

*Conditions are for watching whales from boats only. Other craft (e.g. jet ski), or swimming are not included.

¹ Guidelines Only ² Guidelines during my study period, now Legislation

Table 3.3: Whale Watching Policy* - a comparison of distance and approach methods across jurisdictions (continued)

Jurisdiction	Queensland	New South Wales	Western Australia	South Australia	Victoria	Commonwealth
Other approach limitations	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • 200m minimum to calf or animal escorting calf 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • 200m if disturbed 	<ul style="list-style-type: none"> • None
Approach Method	<ul style="list-style-type: none"> • from 30° to the side • not in path & not from directly behind • not cause to alter direction, speed or behaviour • not separate individuals from pod 	<ul style="list-style-type: none"> • from 30° to the side • not in path & not from directly behind 	<ul style="list-style-type: none"> • from 30° to the side • not in path & not from directly behind • if disturbed move away at >5knots until no longer disturbed 	<ul style="list-style-type: none"> • parallel & slightly to the rear • not in path & not from directly behind • avoid sudden direction changes 	<ul style="list-style-type: none"> • not head on² • not tail on² • not between two whales within 300m of vessel² 	<ul style="list-style-type: none"> • not head on • not into path • not separate individuals from pod • avoid sudden direction changes

*Conditions are for watching whales from boats only. Other craft (e.g. jet ski), or swimming are not included.

¹ Guidelines Only ² Guidelines during my study period, now Legislation

Chapter Four

Theories of Compliance: Development and Application to Whale Watching

4.1 Introduction

As discussed in Chapter Two, in the last twenty to thirty years an increased interest in seeing whales and dolphins in the wild has encouraged a rapidly spreading whale watch industry. This rapid expansion has created new challenges in wildlife management. Research has found that whales react both positively and negatively to human presence (Watkins 1986; Baker & Herman 1989; Erbe 2002). Furthermore, researchers have recognised the potential for negative interactions to affect whales at the population level (Bannister *et al.* 1996; IWC 2000a). Therefore, environmental laws to regulate whale watching have been developed. It is anticipated that fewer negative interactions between humans and whales will occur through compliance to these laws, therefore reducing the impacts on the populations.

Theories of compliance have largely developed from studies of criminal behaviour and in particular, the payment or avoidance of taxes. Theories of compliance are divided into two broad groups: (1) economic and (2) non-economic (Sirakaya 1997) (Table 4.1). Economic compliance theory is based on the assumption that an individual makes a rational choice after weighing the associated costs and benefits and examining the expected outcomes. In contrast, non-economic compliance assumes that decisions are made by individuals or organizations based on their internalised norms and commitments and influenced by social situations. The application of economic and non-economic theories has largely been confined to studies of deviance and taxation (Heineke 1978; Kohlberg 1984).

Table 4.1 Economic and non-economic paradigms of compliance theory

Economic Paradigm	Non-Economic Paradigm
Rational choice based on: <ul style="list-style-type: none"> • Weighing costs vs. benefits • Assessment of expected outcomes 	Non-rational choice based on: <ul style="list-style-type: none"> • Internalised norms & commitments and influenced by • Social factors

Prior to 1997, when Sirakaya developed a conceptual framework to attempt to explain the reasons for compliance with ecotourism guidelines, studies of compliance in tourism were lacking (Sirakaya 1997). Sirakaya's study, which is based on findings of previous research, now serves as the foundation for further compliance research in the field of tourism, such as this study of the compliance of operators to whale watching regulations and guidelines.

Over the years, new theories have been expanded or developed from previous ideas within either the economic or non-economic paradigms outlined above. Those who developed non-economic theories thought that theories of the economic paradigm were too simple to explain non-compliant behaviour effectively (Sirakaya 1997). Therefore, I will discuss the development of each paradigm chronologically to provide the background to current theories. I will also present variables that have been suggested to affect compliance and the application of these theories to compliance with whale watching regulations and guidelines.

4.2 Developmental History

4.2.1 Economic Paradigm

Studies on criminal and deviant behaviour have ranged from those of minor traffic offences, to tax avoidance and various levels of robbery focusing on such acts as an economically important activity or industry (Becker 1968) (Table 4.2). In response to these ideas, Becker (1968) developed an economic theory of compliance based on three factors. These were: a) the cost of catching and convicting an offender; b) the nature or severity of punishment; or c) the response of the offender to changes in enforcement (Becker 1968; Sirakaya 1997). These factors, measured as levels of what was beneficial or not to a potential offender were factored into mathematical models to predict the chance that an offender would commit a crime. Becker (1968) referred to his theory as the "optimal policy", predicting the probability that an offender would commit a crime based on the optimal amount of energy expended. He also expanded the theory to predict the optimal level of resources that would be required to combat such non-compliance. Becker (1968) believed that an offender would evaluate a situation to determine when it was the optimal or best opportunity to commit the crime, i.e., expending the least amount of energy for the greatest amount of gain. Conversely, he postulated that authorities should be able to spend a minimal amount of energy for the greater gain of crime prevention using the same logic.

Table 4.2 Developmental history of economic compliance theory

Year	Proponent	Theory	Factors affecting Compliance
1968	Becker	Optimal Policy	<ul style="list-style-type: none"> • Cost of catching and convicting an offender • Nature or severity of punishment • Response of the offender to changes in enforcement
1973	Ehrlich	Participation	<ul style="list-style-type: none"> • Costs and benefits • Effectiveness of law enforcement in deterring crime • Response to changes in observable opportunities for non-compliance
1975	Block & Heineke	Criminal Choice	<ul style="list-style-type: none"> • Various attributes specific to each situation
1978	Heineke	Simple Portfolio Model	<ul style="list-style-type: none"> • Proportion of the offender's wealth that would be put at risk by non-compliance
		Portfolio Model of Time Allocation	<ul style="list-style-type: none"> • The amount of time a particular crime would take to commit

In the early to mid-seventies, Ehrlich (1973) and Block and Heineke (1975) extended Becker's economic theory of compliance, which had accounted only for costs and was therefore deemed too simple. Ehrlich (1973) expanded Becker's model by accounting for both costs and benefits (Table 4.2). A focus of Ehrlich's theory was that incentives rather than deterrents produce a better response from potential offenders in the prevention of non-compliance. Applying more complex mathematical models than Becker did, Ehrlich's (1973) theory resulted in an ability to estimate the effectiveness of law enforcement in deterring crime by predicting the direction and magnitude of response to changes in observable opportunities for non-compliance (Ehrlich 1973). In 1975, Block & Heineke expanded on the theory even further by suggesting that non-compliance is a multi-attribute decision problem and added several variables to the models of prediction as discussed in detail later in this chapter (Table 4.2).

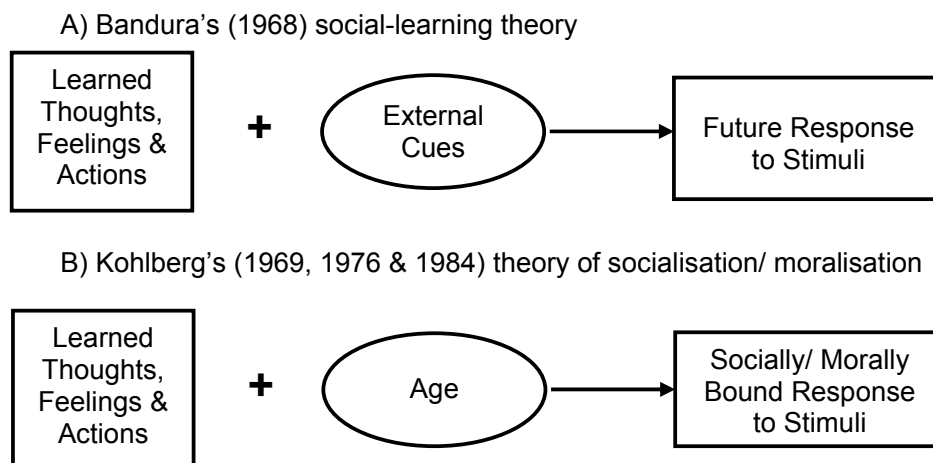
Heineke (1978) considered that all individuals respond to incentives because according to the models of economic choice theory, the decision to commit an illegal act is reached via an egocentric cost-benefit analysis (Table 4.2). Furthermore, if the associated costs and benefits are changed, so do the individual's choices. Therefore, he developed two mathematical models that supported the traditional economic paradigm of gains versus costs (Heineke 1978). The Simple Portfolio model was based on the proportion of the offender's wealth that would be put at risk by non-compliance (Heineke 1978). The Portfolio Model of Time Allocation takes into account the amount of time a particular crime would take to commit (Heineke 1978). Influences

in personal and social backgrounds that determine a “respect for law”, a predisposition to violence and risk taking and other behavioural characteristics that are held to be determinants of criminality were taken as given in Heineke’s models.

4.2.2 Non-Economic Paradigm

Believing that economic theories accounting for costs and benefits were too simple to explain the complexities of compliance, several social researchers started to develop theories of compliance based on a greater number of variables (Table 4.3). In 1969 both Bandura and Kohlberg developed theories of compliance centred on learning from others (Figure 4.1). Bandura (1969), referred to the social-learning theory where an individual’s thoughts, feelings and actions were learned from another. These learned behaviours then interact with external cues, to result in future responses to stimuli (Bandura 1969). Kohlberg (1969), developed the cognitive-developmental approach to socialisation which is based on the premise that as a person becomes older and more educated, they are more likely to make “socially bound” responses to questions i.e., they are more likely to feel a part of and responsible within a society. In 1976 and 1984, Kohlberg reworked his theory of socialisation as a theory of moralisation. The idea that morals are developed over years of experiences is the basis of this theory (Kohlberg 1976 & 1984). Thus according to this theory, the more experienced and older the whale operator, the more likely he or she would be to comply with regulations or guidelines.

Figure 4.1 Diagrammatic representation of:



In the early 1970s, as the environmental movement grew (refer Chapter 2), the basis of attitudes about the environment changed from anthropocentrism and economic

efficiency to ecocentrism, and humans were increasingly viewed as an integral part of, rather than separate from nature (Heberlein 1972). The acceptability of allowing environmental degradation to occur was increasingly rejected because of its potential impact on humans (Heberlein 1972). Views on compliance also moved from the economical to the ethical and were increasingly applied to environmental laws and regulations. Already environmental laws and regulations have extended to include human-cetacean interactions (especially whale watching) as discussed in Chapter Three. Furthermore, Heberlein (1972) believed that the increase in knowledge concerning impacts of human behaviour meant that the decision to act immorally had become one that was made knowingly and willingly, not without information or unintentionally. Accordingly, he concluded that to increase compliance one must invoke moral norms (Heberlein 1972). For example, many whale watch regulations begin as voluntary codes of ethics that utilise the principal of invoking moral norms.

Table 4.3 Developmental history of non-economic compliance theory

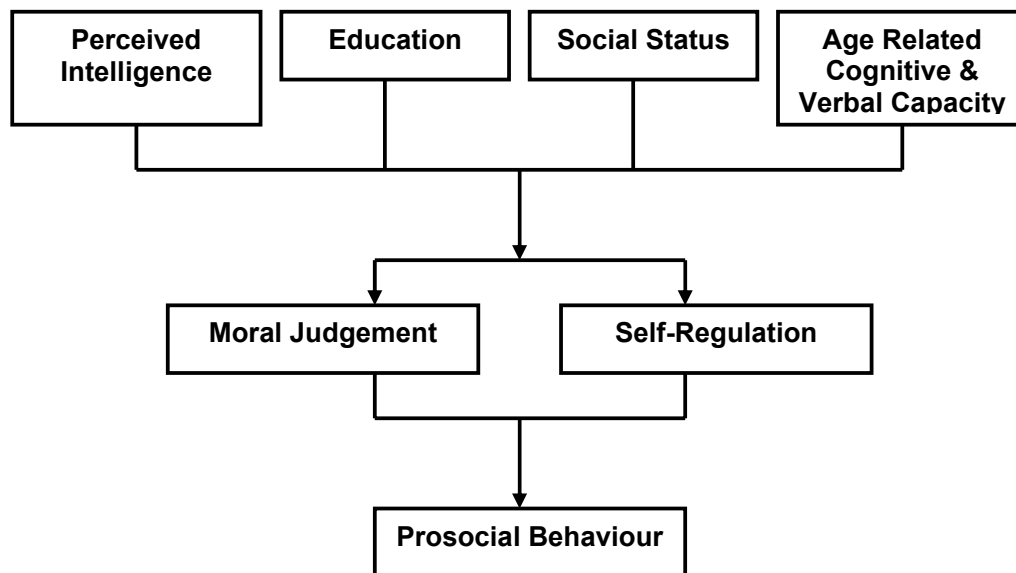
Year	Proponent	Theory	Factors affecting Compliance
1969	Bandura	Social learning	<ul style="list-style-type: none"> • Learning from others • Influence of external cues
1969	Kohlberg	Of socialisation/ moralisation	<ul style="list-style-type: none"> • Learning from others • Influence of age
1972	Heberlein	Moralistic	<ul style="list-style-type: none"> • Invoking moral norms
1976	Mischel & Mischel	Prosocial behaviour	<ul style="list-style-type: none"> • Age related cognitive and verbal capacities • Social-learning variables salient at different points in the life cycle • Increased morality
1982	Lewis	Attitudinal	<ul style="list-style-type: none"> • Attitude • Trust & confidence in government • Perception of probability of detection • Age • Geographical location • Peers • Fiscal knowledge • Education • Occupational factors
1985	Akers	Conflict approach	<ul style="list-style-type: none"> • Behaviour is in conflict with what is accepted as normal
		Labelling perspective	<ul style="list-style-type: none"> • Certain behaviours are labelled as deviant
		Social control	<ul style="list-style-type: none"> • Deviant behaviour is not restricted
		Social learning	<ul style="list-style-type: none"> • Deviant & non-deviant behaviour is learned through social contacts

Table 4.3 (continued) Developmental history of non-economic compliance theory

Year	Proponent	Theory	Factors affecting Compliance
1986	Jackson & Milliron	Prospect	<ul style="list-style-type: none"> • Decisions are influenced by the manner in which they are presented
		Deterrence	<ul style="list-style-type: none"> • Deviant behaviour is deterred by the threat of punishment
		Cognitive structures	<ul style="list-style-type: none"> • Tax compliance attitudes influence tax paying behaviour
		Agency	<ul style="list-style-type: none"> • An agent is engaged to act on behalf of a principal
1989	DiMento	Organisational non-compliance	<ul style="list-style-type: none"> • Larger companies more likely not to comply • Enforcement • Sanctions • Perceptions of fairness • Communications
1987	<ul style="list-style-type: none"> • Gramann & Vander Stoep • Vander Stoep & Gramann • Gramann, Bonifield & Kim 	Unintentional	<ul style="list-style-type: none"> • Aware of restrictions, but unintentionally causes damage
1987		Releasor cue	<ul style="list-style-type: none"> • Prior damage stimulates more damage
1985		Uninformed	<ul style="list-style-type: none"> • No knowledge of restrictions leads to damage
		Responsibility denial	<ul style="list-style-type: none"> • Individual feels that situation allows for non-compliance
		Status-conforming	<ul style="list-style-type: none"> • Act of deviance committed to keep status in group
		Wilful	<ul style="list-style-type: none"> • Knowingly destructive act
1994	Rind & Benjamin		<ul style="list-style-type: none"> • Self-image affecting compliance
1997 1997	<ul style="list-style-type: none"> • Sirakaya • Sirakaya & Uysal 	Attitudinal Compliance	<ul style="list-style-type: none"> • Personal morality • Rationale endorsing non-compliance • Type of sanction • Percentage of business from ecotourism • Gender • Perceived fairness
1998	Godfrey		<ul style="list-style-type: none"> • Attitude of enforcement personnel
1999	Trevino, Weaver, Gibson & Toffler	Values based	<ul style="list-style-type: none"> • Perception of shared organisational values • Program must be in place for effect not merely to impress

Mischel & Mischel (1976) discussed another socially-focused theory that they termed prosocial behaviour (Figure 4.2). The prosocial behaviour theory was based on the interaction of an individual's age-related cognitive and verbal capacities and the salient social-learning variables at different points in the life cycle, which led to increased morality (Mischel & Mischel 1976). They found that as most individuals become older they learn to accept responsibility for their own behaviour (Mischel & Mischel 1976).

Figure 4.2 Diagrammatic representation of Mischel & Mischels' (1976) prosocial behaviour theory



By the early 1980s, sociologists and psychologists were challenging traditional models and theories on the basis that rational behaviour and thus economic theories alone, could not predict non-compliant behaviour (Sirakaya 1997). They ascertained that altruistic behaviours such as heroism were not acts of rational human behaviour and thus could not be explained by the economic paradigm (Sirakaya 1997). By studying the attitudes, perceptions and preferences of taxpayers, Lewis (1982), applied psychology to the assessment of compliance or non-compliance with taxation. He found that the decision to evade tax was primarily based on an individual's perception of sanctions and the chances of being caught, rather than the actual values of these parameters (Lewis 1982). Furthermore, he found that attitudes were based on these myths and misperceptions and therefore were not formed rationally. Thus on the basis of Lewis's work, we might expect that the decision to comply or not with whale watch guidelines or regulations may be based on an operator's perception of factors influencing detection and punishment.

Akers (1985) presented several theories for predicting the sociology of deviance: social disorganisation/ anomie theory; conflict approach; labelling perspective; social control theory; and social learning theory (Table 4.4). His theories are based on social norms and the reactions of individuals and groups to these norms. He discusses the notion that what is perceived as deviant behaviour is based on the social norms of the time. In addition, what one group/ person perceives as deviant is not necessarily viewed as such by others (Akers 1985). As an example, the majority of people once regarded slavery as an acceptable practice, however it is not acceptable today. In addition, some groups perceive being homosexual as deviant while others accept it as a way of life. Furthermore, whaling is still perceived as an appropriate use of cetaceans by the people of some cultures, however, many other people view whaling as inappropriate. Akers (1985) states that one must specify within which system one is discussing deviant behaviour and from whose norms the deviation occurs. He believes that an agreement within society on what constitutes deviance is expressed in one or all of four methods: "1) laws are passed; 2) programs are initiated; 3) money, time and personnel are allocated; and 4) organizations are created to combat or control the occurrence of the specified behaviour". An additional problem however, is that although there may be agreement on what is deviant behaviour, there are likely to be differences on how to deal with it (Akers 1985).

Jackson & Milliron (1986) discussed four theories relating to non-compliance: prospect theory; deterrence theory; cognitive theory and agency theory (Table 4.5). Prospect theory is based on the way in which decisions are presented to an individual i.e., whether compliance is viewed positively or negatively. Deterrence theory is based solely on the effect of threat of punishment. Cognitive structures theory assumes that the attitude-intention-behaviour link is critical in ultimate compliance or non-compliance. Agency theory applies to an owner-operator relationship, where the operator is engaged to apply skills for the benefit of the owner. As discussed below, Jackson & Milliron (1986) also examine fourteen of the variables most frequently linked to non-compliance in taxation. Although Jackson & Milliron's (1986) analyses were limited to the US Federal taxation system, their focus was on the design of behavioural compliance studies.

Table 4.4 Akers (1985): Theories of deviance

Theory	Description
Social Disorganisation/ Anomie Theory	When disorganisation or anomie occur then deviant behaviour is more likely to occur.
Conflict Approach	The interests, values & goals of stronger, more powerful groups become the accepted definitions of what is appropriate. Anything in conflict with these definitions is considered deviant.
Labelling Perspective	Deviance is classified by group definitions and reactions. Labels are then given to those classified as deviant. Similar to Conflict Approach.
Social Control Theory	Motivating factors are not the cause of deviant behaviour, rather deviant behaviours are not prevented. Therefore, increased control leads to decreased deviance.
Social Learning Theory	One learns both deviant and non-deviant behaviours from those with whom one interacts. If the majority of the behaviours of the individual fall outside the definitions of conformance, then their actions are considered deviant.

Table 4.5 Jackson & Milliron (1986): Theories of tax compliance

Theory	Description
Prospect Theory	Decisions (prospects) can be dramatically influenced by the way in which they are presented.
Deterrence Theory	Various levels of punishment act as deterrence for different undesirable behaviour.
Cognitive Structures Theory	Tax compliance attitudes are assumed to influence behaviour through behavioural intentions & these intentions ultimately influence tax-paying behaviour.
Agency Theory	Occurs in management-employee situations where the employee (agent) is engaged to exert effort and apply skills for the benefit of the management (principal).

Many of these studies had focused on the individual. In contrast, DiMento (1989) studied whether or not social science could explain organisational non-compliance with

environmental law. DiMento (1989) theorised that “environmental violations do not always result from the behaviours of individuals but are outcomes of collectivities, small and large, and their interactions”. He defined specific compliance as “the response of the entity (business or individual) targeted by a specified incentive or sanction, when the response is believed consistent with societal objectives or regulations” (DiMento 1989). He reviewed the main bivariate relationships between compliance and independent variables and found that enforcement, sanctions, perceptions of fairness and communications were the most important (DiMento 1989). DiMento (1989) also concluded that large agencies and corporations are predominantly responsible for the environmental degradation caused by non-compliance.

Gramann & Vander Stoep (1987) suggested that moral obligation, a strong desire to please others, and offering rewards, all contribute strongly to prosocial behaviour and thus compliance with regulations and guidelines. They found that when information was provided explaining the reasoning for restrictions (an indirect method of behaviour modification), a higher rate of compliance was achieved than when activities were prohibited or enforced (a direct method of behaviour modification) (Gramann & Vander Stoep 1987). Since whale watching is unlikely to be prohibited in areas where it already exists, a high rate of compliance to whale watch guidelines and regulations may be achieved through the provision of information e.g., why certain conditions or restrictions are required. In the field of ecological psychology, indirect methods of increasing compliance include: 1) managers activating visitors’ “sense of moral responsibility by talking to them about areas of concern”, and 2) visitors being able to identify with staff of the area and the goals they promote through meeting them (Gramann & Vander Stoep 1987).

Gramann & Vander Stoep (1987), Vander Stoep & Gramann (1987) and Gramann, Bonifield & Kim (1995) all discussed the theoretical approaches of indirect and direct management for six categories of non-compliance (Table 4.6): unintentional; releasor cue; uninformed; responsibility-denial; status-confirming; and wilful. Gramann & Vander Stoep (1987), Vander Stoep & Gramann (1987) and Gramann *et al.* (1995) found that indirect methods (e.g., education) achieved greater compliance than direct methods (e.g., punishment) in all situations of non-compliance other than wilful acts.

Table 4.6 Six categories of non-compliance (Gramann & Vander Stoep 1987; Vander Stoep & Gramann 1987; Gramann, Bonifield & Kim 1995)

Category	Description
Unintentional	A person is aware of the restrictions, but unintentionally does something that causes damage
Releasor Cue	Damage has already occurred in the area, therefore, the person feels that it is alright to do a similar act
Uninformed	A person is unaware of the restrictions and is therefore unaware that they are doing something wrong
Responsibility-denial	The person feels that restrictions under certain circumstances are unreasonable
Status-conforming	The person commits the act to keep their status among the group
Wilful	The person knowingly causes a destructive or damaging act

In a study of effects of public or self-image on compliance in males, Rind and Benjamin (1994) found that men bought more raffle tickets in the presence of a female companion than when alone. This finding led them to conclude that in terms of complying with a request, public image was far more important to males than self-image. Therefore, according to this theory, whale watch operators (most of whom are male) should be potentially more likely to be concerned about their image in front of passengers than if they were alone.

Researchers in social science disciplines have criticised earlier economic theories based on rationality of decision-making (Sirakaya 1997). In the fields of sociology, psychology, law and recreation resource management, an individual's intrinsic capacities, as well as the extrinsic influences of the environment are suggested to influence compliance or non-compliance with regulations or guidelines (Sirakaya 1997). This contribution of multiple variables, as well as irrational decision-making is used as an argument by sociologists and psychologists for the individuality of choice of compliance (Sirakaya 1997). Thus compliance will vary with the individual and his/ her surrounding circumstances. However, similar to the economic paradigm, weighing the positives and negatives of compliance, as well as the influence of receiving incentives to encourage conformity are also taken into account.

Using the above as a background, Sirakaya (1997) reviewed previous studies on compliance and then developed a conceptual framework for compliance of ecotour

operators with ecotourism guidelines. Sirakaya (1997) and Sirakaya & Uysal (1997) studied factors that are most likely to be useful as predictors of conformance in this situation. They tested the theory that “individuals or organizations will comply with rules and regulations if offered rewards for compliance and threatened with sanctions for non-compliance” (Sirakaya 1997; Sirakaya & Uysal 1997). Becker (1968), Block & Heineke (1975) and DiMento (1989) had previously tested a similar framework with regards to taxation, but this was the first time that such a theory had been applied to tourism. Sirakaya (1997) and Sirakaya & Uysal (1997) found that compliance levels varied significantly with individuals and circumstances. Furthermore, deterrence factors such as enforcement and sanctions played a minor role in the explanation of compliance behaviour of ecotourism operators. However, education of the ecotourism operators was a significant influence on the compliance scores (Sirakaya 1997; Sirakaya & Uysal 1997). In a study of the necessity for operators to get close to whales, Orams (2000) concluded that educating operators would be a more effective means of controlling minimum distances of approach than reactive enforcement measures.

Godfrey (1998) presents an alternative view of compliance by questioning why companies or individuals are still compliant when enforcement is so ineffective in terms of prosecutions and penalties. He was studying the effect of attitudes of tourism managers to sustainable tourism on the perception of enforcement and found that their attitude affects their approach to implementation and therefore, success of the concept in practice (Godfrey 1998).

In a study of managing ethics and legal compliance in large companies, Trevino *et al.* (1999) tested a theory based on the premise that a values-based cultural approach to compliance management works most effectively. They found that the key to compliance is designing a program that is perceived by employees to be first and foremost about “shared organisational values and guiding employees to act on their ethical aspirations” (Trevino *et al.* 1999). Furthermore, programs that are put in place merely to impress tend to diminish effectiveness of compliance strategies. Finally, they found that an effective compliance management strategy results in reduced illegal behaviour; increased awareness of ethical issues; more ethical advice seeking within the firm; greater willingness to report violations to management; better decision making and an increased employee commitment (Trevino *et al.* 1999).

The above theories of non-compliance differ in whether they attack the problem from an economic i.e., cost-benefit point of view or from a non-economic paradigm i.e., multi-attribute. Most studies have focused on deviant or non-compliant behaviour with regards to taxation, robbery, destructive behaviours (e.g., damaging signs), and environmental degradation. Using past research as a background, Sirakaya (1997) and Sirakaya & Uysal (1997) developed a theory of non-compliance applicable to ecotourism that focussed on rewards and sanctions. The application of Sirakaya's theory to whale watching is a focus of my research and will be discussed later in this Chapter. The multi-attribute, non-economic paradigm has become the predominant model for theories used to explain non-compliance. I will now examine the variables that have been used to measure non-compliance under this concept and discuss examples.

4.3 Measurable Variables and Four Case Studies

Although compliance researchers have used traditional deterrence variables such as sanctions in their models, they have frequently used multi-dimensional models, which have been enhanced by integrating other variables. The list of variables incorporated into such models is extensive and can be broadly grouped into the categories in Table 4.7.

Becker (1968) believed that, holding all other variables constant, an increased probability of conviction or punishment would result in a decreased number of offences. Furthermore, he believed that a change in the probability of conviction would have a greater effect than a change in the type of punishment. In contrast, Lewis (1982) concluded that no single factor could explain compliance behaviour. I present four case studies to explore variables that may affect compliance. These are Lewis (1982) who explored the psychology of taxation, Jackson & Milliron (1986) who summarised tax compliance research to their time of writing, DiMento (1989) who examined whether social science could explain organisational non-compliance and Sirakaya (1997) who conceptualised attitudinal compliance with ecotourism guidelines.

Table 4.7 Variables used in compliance models

Personal Characteristics	Policy Related	Other
<ul style="list-style-type: none"> ▪ Age ^{9;7;5} ▪ Attitude ⁷ ▪ Denial of one's actions ^{13;10} ▪ Education ^{9;7;10} ▪ Ethics ⁹ ▪ Fiscal knowledge ⁷ ▪ Gender ^{9;7} ▪ Income level ⁹ ▪ Knowledge level of expected consequences of ones actions ³ ▪ Level of moral development ^{2;4;8} ▪ Level of patriotism ¹⁴ ▪ Marital status ⁷ ▪ Political preferences ⁷ ▪ Union membership ⁷ 	<ul style="list-style-type: none"> ▪ Ability to have input into policies ⁷ ▪ Clarity of policies ^{9;12} ▪ Fairness of policies ^{9;7;11;12} ▪ Opportunity for non-compliance ⁷ ▪ Perception of policy as benefit vs. burden ⁷ ▪ Previous contact with regulatory body ⁹ ▪ Perception of probability of detection ^{9;7;12} ▪ Perception of probability of sanctions ^{9;7;12} ▪ Trust & confidence in regulatory body ⁷ 	<ul style="list-style-type: none"> ▪ Familiarity with non-compliant peers ^{9;7} ▪ Geographical location ⁹ ▪ Incentives ^{14;6} ▪ Occupational characteristics ⁹ ▪ Peer pressure ¹⁴ ▪ Social class ^{7;5} ▪ Social norms ^{5;1} ▪ Organisational characteristics ¹²

References: ¹ Bandura 1969; ² Kohlberg 1969; ³ Heberlein 1972; ⁴ Kohlberg 1976; ⁵ Mischel & Mischel 1976; ⁶ Heineke 1978; ⁷ Lewis 1982; ⁸ Kohlberg 1984; ⁹ Jackson & Milliron 1986; ¹⁰ Gramann & Vander Stoep 1987; ¹¹ Vander Stoep & Gramann 1987; ¹² DiMento 1989; ¹³ Gramann, Bonifield & Kim 1995; ¹⁴ Sirakaya 1997.

Case Study 1: Lewis (1982)

Introduction:

Lewis applies psychology (by studying attitudes, perceptions and preferences of taxpayers) to the assessment of compliance or non-compliance with taxation. He presents the attitude theory: the link between tax attitudes to tax evasion behaviour and compliance attitudes to non-compliance behaviour. The theory is based on the premise that no single factor could explain compliance behaviour.

Factors affecting compliance with taxation policies:

- Ability to have input into policies
- Attitude based on perception (e.g., perception of unfairness, potential for detection and severity of sanctions)
- Geographical location
- Level of education (specifically level of fiscal knowledge)
- Peers
- Taxpayers trust and confidence in the government

Major Points:

- Attitudes and expressed opinions are dependent on and mirrored by the attitudes and opinions of other people (peers)
- Attitudes are a product of myth and misperception i.e., the decision to evade tax is not based on reality, instead it is based on an individual's perception of the chance of being caught, the size of fines and tax rates.

Conclusions:

- Education is an important factor in increasing compliance.
- Greater compliance with taxation policy could be achieved through appeals to the conscience, moral beliefs and attitudes rather than the use of threats of detection or punishment.
- The greater the input an individual is able to have in contributing to policy, the more likely they are to comply with such policy.

Case Study 2: Jackson & Milliron (1986)

Introduction:

Jackson & Milliron summarise tax compliance theories and research up to the time of writing. They discuss: 1) methodological approaches to conducting compliance research; 2) theoretical areas relating to non-compliance; and 3) the most frequently linked variables to non-compliance. Their focus was on the design of behavioural compliance studies.

Factors affecting compliance with taxation policies:

- Age
- Complexity
- Compliant peers
- Contact with the regulatory body
- Education
- Ethics
- Fairness
- Income level
- Occupation
- Probability of detection
- Sanctions
- Gender
- Tax rates
- Withheld income source

Major Points:

- Fourteen (above) most correlated variables
- Four methodological approaches: 1) Survey research; 2) Experimental research; 3) Analytical research; and 4) Regression modelling
- Four theoretical approaches: 1) Prospect theory; 2) Deterrence theory; 3) Cognitive structures theory; and 4) Agency theory

Conclusions:

- Many variables had both a positive and negative relationship to compliance.
- Rewards are more effective behaviour modifiers than punishment.
- Survey research, which is used to study beliefs, opinions, attitudes, motivations and behaviour is the most commonly used method.
- Theories proposed were based on four themes respectively: 1) influence of presentation of information on decisions; 2) deterrent affect of threat of punishment; 3) influence of attitude on behaviour; and 4) obligation to compliance of an employed individual to an employer.

Case Study 3: DiMento (1989)

Introduction:

DiMento applied social science theories of non-compliance by an individual to organisational non-compliance. That is, he focused on the behaviour of organisations rather than individuals. Furthermore, he applied this concept to the relatively new field of environmental law.

Factors affecting compliance with environmental law:

- Enforcement approach
- Severity of penalty/ sanctions
- Perception of fairness
- Communication by regulatory authority

Major Points:

- The fact that environmental policy is relatively new creates new problems for those who strive for compliance.
- Those concerned with policy on the environment must actively strive to have regulations, acts and judicial opinion reflect their interpretation of the meanings of words that usually have ambiguous and multiple meaning.
- Even enforcement that is fully supported and professional cannot ensure compliance with law.
- Poorly conceptualised, badly drafted, and incompletely articulated regulations counteract positive responses to environmental goals.

Conclusions:

- Compliance usually fails due to a weak enforcement approach.
- A fine line must be drawn between the severity of sanctions that have the potential to cause dissent or sanctions which are too weak to have an effect.
- The behavioural response of a business is influenced by the perception of fairness of the policy, the way it is enforced and who is targeted.
- Policies and sanctions must be communicated clearly and continuously, as well as, being backed by sufficient explanation of reasons for their need, otherwise the enforcement message will lack credibility.
- Large agencies and corporations are predominantly responsible for environmental degradation caused by non-compliance.

Case Study 4: Sirakaya (1997)

Introduction:

Sirakaya reviewed past theories of non-compliance and developed a conceptual framework to explain “compliance attitudes of ecotour operators with industry guidelines”. His was the first study to apply the theories of compliance to the tourism industry.

Factors affecting compliance in Ecotourism:

- Age;
- Level of education;
- Perception of potential benefits;
- Peers;
- Personal morality/ ethics;
- Size of business

Major Points:

- Educational level of the operators was an important factor i.e., if operators were educated about their potential adverse impacts they were more likely to comply with guidelines.
- The results supported the conceptual model that adherence to rules, regulations or guidelines is dependent on a combination of socio-psychological deterrence and situational factors.

Conclusion:

- Education is a superior method of achieving compliance than punishment.
- Educating ecotour operators in regards to: (1) the potential adverse impacts of their operations and (2) the potential impact of compliance on the sustainability of their business would greatly increase compliance.
- Explanation and justification of the logic behind each guideline and its application in each specific area would further increase compliance.
- Sirakaya’s study was preliminary, therefore, further studies in specific ecotourism destinations would be required to replicate the findings of his study and subject the constraints he used to more rigorous testing.

The case studies demonstrate some of the major factors that have been shown to affect compliance in various situations. It can be seen that level of education of the individual, perception of fairness of the rules or regulations, and influence of peers have been found to consistently affect compliance across all areas of study. A person's level of education was found to affect their understanding of regulations and therefore their level of compliance. If a person perceived that the regulations were fair, they were more likely to comply with them. Furthermore, if a person's peers were compliant then they were more likely to be compliant. Another significant factor that was found to affect compliance was the amount of contact with the regulatory body. That is, if: 1) the regulatory body consulted with the people that were to be affected by the regulations during the development process and 2) the interactions between the regulatory authorities and the people affected were positive, then the regulations were more likely to be positively received. Overall, a positive, rewarding approach to regulation was more successful than a negative punitive approach. It was found that some factors had both a positive and negative relationship with compliance. Furthermore, no single factor could explain compliance behaviour.

The development of theories of compliance has included many variables and theories have been applied to many areas, including tax evasion and theft. As the environmental movement has grown, more interest in this area has become apparent. Thus it is only reasonable that theories of compliance also be applied to behaviour with regards to the environment. The case studies above illustrate the progression from compliance theories being applied to "traditional" areas such as taxation to newer areas of the environment and tourism. Whale watching is a form of tourism and provides a useful case study of the application of compliance theories.

4.4 Application to Whale Watching

The cost of non-compliance in human-human related crimes is estimated in dollars, but human-animal related non-compliance may be measured by stress on an animal population, population decline, deaths or low birth rate of the animal in question (Becker 1968). Furthermore, the motivation behind punishment and sanctions is usually the belief that other members of human society are harmed by the act of non-compliance (Becker 1968). However, how are these factors measured or motivated when it comes to nature, wild flora or fauna?

Studies on the effect of numbers of vessels, vessel movements and speed on whale movements and behaviour have indicated that whales: 1) change their behavioural state (e.g., feeding to travelling); 2) change direction of movement to avoid or approach whale watching vessels; and 3) stay underwater longer (i.e., change in respiration rates) (Beach & Weinrich 1983; Watkins 1986; Baker & Herman 1989; Blane & Jaakson 1994; Corkeron 1995). There have also been studies that indicate that whale vocalisations are masked by vessel noise (McCauley *et. al.* 1996; Erbe 2002). Although the long-term implications of these changes in behaviour on whale populations are unknown, distance and approach guidelines and regulations have been introduced to reduce these impacts in several countries as discussed in Chapter Five. Many of these regulations and guidelines depend on the capacity of operators to estimate distance between the boat and the whale.

Baird and Burkhart (2000) compared the abilities of: 1) whale watch operators; 2) persons who had boating experience and 3) persons with no experience on the water, to estimate correctly the distance to whales being watched. While asking the person in the study to estimate the distance, Burkhart measured it with a laser rangefinder but did not divulge the actual distance. They found that whale watch operators were better than the other groups at estimating the distance to the focal pod but still tended to underestimate the distance (Baird & Burkhart 2000). This finding may have implications for whale behaviour within certain distances from vessels. On the vessels from which Baird and Burkharts' study was conducted, rangefinders or other distance measuring devices were not normally used to measure the distance between the vessel and focal pods. The whale watch operator estimated all distances to focal pods. The results of Baird and Burkharts' study have implications for the potential of operators to comply with distance guidelines or regulations because of their inability to accurately estimate distance to pods. To my knowledge there are no operators in Australia who use a rangefinder or similar device to measure the distance to whale pods. Therefore, there is the potential for vessels to be brought within recommended distances, with the potential for disturbance to the whales being watched.

As noted previously, Akers (1985) believes that once money, time and personnel are allocated, and programs, organisations and laws are established to control certain behaviour then there is societal agreement on what constitutes deviance. In Australia, ANZECC National Guidelines 2000 have been put in place and individual States have established regulations regarding whale watching as discussed in Chapter Three. The States have also allocated money, time and personnel to monitor whale watching.

Attitudes and perceptions of whale watch operators with respect to whale watch guidelines and regulations have not been studied. Sirakaya (1997) reported a personal communication from the whale watching area off of Vancouver Island, Canada where the whale watch operators “punished” other operators who were engaged in non-compliant behaviour by not informing them about whale sightings. My research is the first to study compliance by whale watch operators and whale watch operators attitudes and perceptions to regulations and guidelines. As explained in Chapter One, I aimed to understand whether operators comply with guidelines and regulations and possible reasons for non-compliance. The component of this research concerned with attitudes and perceptions of regulations and guidelines is a direct application of Sirakaya’s (1997) conceptual model (Case Study 4 - above) to a particular tourism situation.

Chapter Five

Attitudinal Compliance: What do Operators Really Think About the Management Framework?

5.1 Introduction

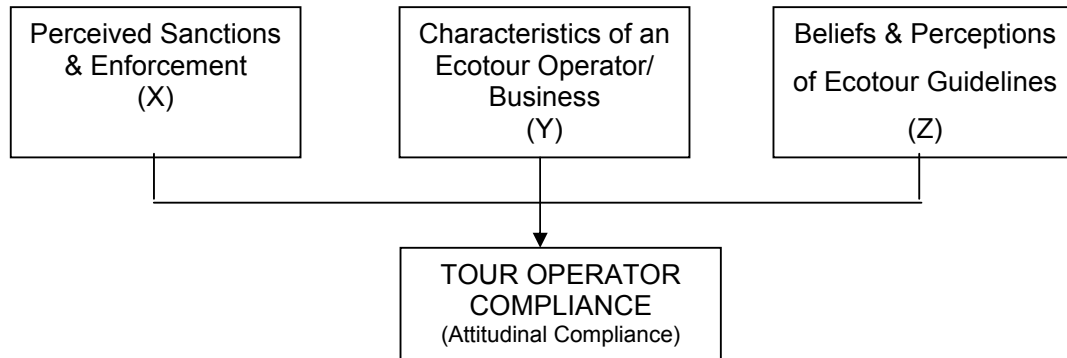
As explained in Chapter 1, this Chapter discusses the survey questionnaire I designed to study operators' attitudes towards the Draft Australian National Guidelines for Cetacean Observation 1999 (from now referred to as the Draft National Guidelines 1999) (i.e., attitudinal compliance). It describes the survey development and design, distribution, data compilation, analysis and results. Results highlight Australian whale watch operator and business characteristics and are discussed with respect to the testing of the compliance model as developed by Sirakaya (1997).

As described in Chapter 3, there is considerable debate as to the effectiveness of guidelines and regulations. "Problems regarding enforcement of regulations" have been identified as one of four major difficulties with the management of whale watching (Malcolm & Duffus 1998). Compliance of ecotour operators with ecotourism principles is dependant on several interacting factors including "the type of social and economic sanctions, gender of the respondents, perceived moral obligations and the revenue obtained from ecotourism" (Sirakaya 1997). Sirakaya (1997) found that of six interacting variables, personal morality or ethics was the most important factor determining compliance by ecotour operators (Sirakaya 1997). Therefore, understanding the perceptions and behaviour of operators is important when trying to promote and encourage the sustainable use of tourism resources.

As explained in chapter 4, Sirakaya (1997) proposed a framework that integrates variables from both economic and non-economic paradigms into a single unified model of compliance. He developed a conceptual model for the prediction of variables that may affect attitudinal compliance by ecotourism operators that incorporated beliefs and perceptions regarding sanctions and enforcement of ecotourism guidelines (Sirakaya 1997) (Figure 5.1). Attitudinal compliance (the dependent variable) was a measure of the beliefs and opinions of eco-tour operators with respect to ecotourism principles (Sirakaya 1997). Sirakaya (1997) proposed that attitudinal compliance was a function of three sets of variables: "perceived enforcement and sanctions; characteristics of an

eco-tour operator and/or business; and beliefs and perceptions about the ecotourism guidelines".

Figure 5.1: Sirakaya's (1997) integrative model of ecotour operator compliance



Although there is debate concerning whether “attitudes are antecedents of behaviour or vice versa”, it is generally assumed that “attitudes combined with other measures of determinants (e.g., habits) may predict behaviour (Jackson & Milliron 1986; Sirakaya 1997). My research contributes to the understanding of operator behaviour through the exploration of both personal attitudes and actual behaviour of whale watch operators in Australia. I tested Sirakaya’s model in a different tourism situation – the compliance attitudes of vessel-based operators to whale watch guidelines and regulations.

5.2 Questionnaire Development, Design and Distribution

The Survey Questionnaire is provided in Appendix 2 for an overview of the questions that were asked to elucidate factors influencing attitudinal compliance. I also explain the design of the questionnaire because: a) some calculations were performed on the data from the questionnaire before being used in the “Test of Compliance Model” analysis (Refer Section 5.3.3), therefore the individual questions in the questionnaire do not reflect the exact information being used to test this model; b) this study does not replicate Sirakaya’s questionnaire exactly, and c) some sections include extra variables particular to whale watching. However, though differences in questions exist, the remainder of this section follows Sirakaya’s (1997) design as closely as possible so that our results may be compared.

5.2.1 Semi-structured Interviews

After the 1998 whale watch season, I conducted one-on-one semi-structured interviews with a sample of six operators (four in Queensland, two in New South Wales) to gain insight into their understanding of current regulations and guidelines with regard to

vessel-based whale watching. One-on-one interviews are used widely in social research to probe specific questions (Kvale 1996; Mason 1996). Semi-structured interviews were chosen to allow operators freedom of expression in their answers. I led the interviews by asking the following ten (10) questions:

- How did you first become involved in whale watching and its management?
- What do you see as your role in whale watching and its regulations?
- Can you explain the regulations/ guidelines for vessel-based whale watching to me?
- Are the regulations/ guidelines, as they stand appropriate?
- What do you think that the regulations/ guidelines are designed to achieve?
- Do you see the necessity for change to the regulations/ guidelines, and if so, in what way?
- Who monitors or enforces the regulations/ guidelines in this area?
- Which groups/ organisations do you think should be involved in the actual formulation of regulations/ guidelines for vessel-based whale watching and to what extent?
- What role does the vessel based public have in relation to the regulations/ guidelines?
- What do you see as the roles of education and research towards the design and implementation of the regulations/ guidelines?

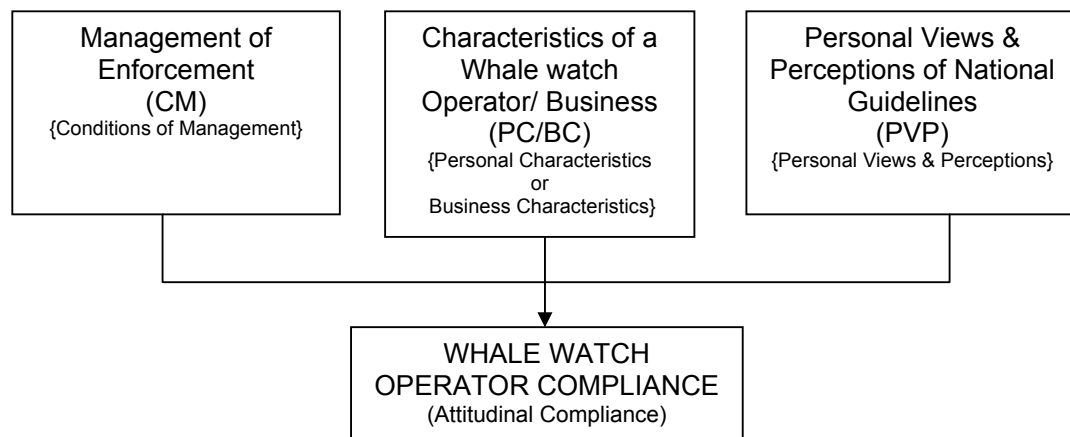
Interviews were taped and later transcribed for content analysis. Following content analysis of the data from the one-on-one interviews, the information was used as the basis for the development of a survey questionnaire to send to all whale watch operators in Australia. I was unable to conduct one-on-one interviews with all operators due to the travel involved.

5.2.2 Developing the Questionnaire

I used knowledge gained from the literature review on compliance (Chapter 4) and the results of the one-on-one interviews in conjunction with the conceptual model developed by Sirakaya (1997)(Refer Figure 5.1) and discussions with him, to develop the questionnaire survey to study "Operator Opinion (Beliefs and Perceptions) of Whale watch Guidelines and Regulations". The socio-demographic variables and the independent variables reflecting perceived sanctions and enforcement in Sirakaya's (1997) study were well constructed based on theory and other studies already published (E. Sirakaya, Department of Recreation, Park & Tourism Sciences, Texas

A&M University, *pers. comm.* 1999; Lewis 1982; Jackson & Milliron 1986; DiMento 1989). Therefore, these variables were applied directly to this study, modified only to the extent that they represented whale watch conditions (Figure 5.2) rather than merely ecotour conditions. Sirakaya (Department of Recreation, Park & Tourism Sciences, Texas A&M University, *pers. comm.* 1999) stated that the construction of beliefs and perception variables could be improved by measuring several aspects of the same construct i.e., having multiple items for the one variable. Therefore, several questions were designed to measure the same variable for this section.

Figure 5.2: Model of whale watch operator attitudinal compliance



A preliminary questionnaire survey was developed using seventy-six (76) questions in four (4) categories as per Sirakaya (1997) with the previously mentioned modifications:

- a) Personal Views on Management Conditions (20 questions) (Attitudinal Compliance - Sirakaya 1997);
- b) Management of Enforcement (9 questions) (CM₁-CM₁₁) (Operationalisation of Perceived Sanctions and Enforcement - X₁-X₁₀ - Sirakaya 1997);
- c) Personal Views and Perceptions of Draft National Guidelines 1999 (31 questions) (PVP₁-PVP₂₀) (Operationalisation of Beliefs and Perceptions - Z₁-Z₁₀ Sirakaya 1997); and
- d) Characteristics of a Whale watch Operator (9 questions) (PC₁-PC₉)/ Business (7 questions) (BC₁-BC₇) (Y₁-Y₁₂ - Sirakaya 1997).

Following Sirakaya (1997), I used a five category Likert scale to measure beliefs and perceptions (1 = Strongly Agree; 2 = Agree; 3 = Undecided; 4 = Disagree; 5 = Strongly Disagree). Likert-scales have been used extensively in qualitative studies and analysis of compliance data (Lewis 1982; Trevino *et al.* 1999; Petts 2000). "Attitudinal

Compliance” (the dependent variable) was designed to measure an operator’s “beliefs and opinions” (*sensu* Sirakaya 1997) about whale watch principles in general by asking them to indicate their level of agreement with a series of statements each of which stated an opinion about the acceptability of a specific behaviour in a range of situations that a whale watch operator might encounter in the course of his job. “Management and Enforcement” consisted of two parts: perceived sanctions and perceived enforcement. Variables reflecting both legal and social restraints were included to extract information regarding perceived sanctions. Questions reflecting perceived chance of detection and penalisation were included to extract information regarding enforcement. Socio-demographic factors about the operators and questions concerning the characteristics of the business were included to gain insight into the characteristics of whale watch operators and businesses. “Personal Views and Perceptions of Draft National Guidelines 1999” (Sirakaya’s Beliefs and Perceptions) were elicited by including variables relating to “beliefs in appropriateness of the guidelines, perception of fairness and perceived non-compliance”. The number of variables in this section was increased from ten to 30 i.e., three variables to test each construct. To evaluate content and face validity the survey was reviewed by Dr. Sirakaya as the developer of the conceptual model, as well as, another social researcher (Dr Mark Fenton of James Cook University), a social research graduate student (Mr Damon Newling) and a psychologist (Mr André Bauer).

Pre-testing the Questionnaire

The questionnaires were sent for a pre-test to 15 operators - five in each of the three states with major whale watch industries i.e., Queensland, New South Wales and Western Australia. Nine of the 15 questionnaires were returned in a usable form, giving a 60% response rate. After the pre-test and because of the estimated relatively small sample size ($n=80$, the total number of operators listed by management agencies in all three states), I decided to remove 10 questions from the "Personal Views and Perceptions of Draft National Guidelines 1999" category. This left the questionnaire using 66 questions in four categories, which are discussed in detail below (Appendix 2):

- a) Personal Views on Acceptable Behaviour (20 questions) (Attitudinal Compliance - Sirakaya 1997);
- b) Management of Enforcement (9 questions) (CM_1 - CM_{11}) (Operationalisation of Perceived Sanctions and Enforcement - X_1 - X_{10} - Sirakaya 1997);

- c) Personal Views and Perceptions of Draft National Guidelines 1999 (21 questions) (PVP₁-PVP₂₀) (Operationalisation of Beliefs and Perceptions - Z₁-Z₁₀ Sirakaya 1997); and
- d) Characteristics of a Whale watch Operator (9 questions) (PC₁-PC₉)/ Business (7 questions) (BC₁-BC₇) (Y₁-Y₁₂ - Sirakaya 1997).

Details of the Questionnaire

Section 1: Attitudinal Compliance - Personal Views on Acceptable Behaviour

Based on the questions from Sirakaya's (1997) survey (Refer Table 2 p.930) this dependent variable consisted of 20 statements to elicit information concerning the acceptability of behaviour in relation to situations which illustrated issues delineated in the Draft National Guidelines 1999. Questions were designed to measure attitudes rather than directly asking about compliance *per se* as an operator's capacity to be candid about his or her actual behaviour is not thought to be reliable (Sirakaya 1997).

Section 2: Perceived Sanctions and Enforcement - Management of Enforcement

An operator's perception of the type of threat that would prevent non-compliance and the perceived chance of either being detected or penalised once detected (Sirakaya 1997) was measured using several calculations explained below. This section was based also on Sirakaya's work (1997) (Refer Table 3 p931), modified to apply to whale watch situations.

Type of Perceived Sanctions (CM1)

Based on my 1998 field experience, compliance theory, and one-on-one interviews with whale watch operators and Sirakaya's (1997) paper, I developed a list of sanctions that may be instrumental in preventing non-compliance. Operators were asked which sanction would be most appropriate to prevent a violation of regulations. This variable was not used in the model.

Perceived Certainty of Legal Sanctions (CM2)

A question pertaining to the likely detection of a non-complaint operator (CM2a) and a further question reflecting the subsequent likelihood of that operator being penalised (CM2b) were asked. A measure of perceived certainty of legal sanctions was the calculated product of the answers to the two questions (Sirakaya 1997).

Perceived Severity of Legal Sanctions (CM3)

Operators were asked to indicate the degree of personal problems (severity) that penalties or sanctions would cause them (Sirakaya 1997).

Perceived Threat of Legal Sanctions (CM4)

The product of (CM2) and (CM3) gave the perceived threat of legal sanctions (Sirakaya 1997).

Perceived Certainty of Self-Imposed Sanctions (CM5)

Certainty of self-imposed sanctions was measured by asking whether the operator would feel guilty if s/he did not comply with the guidelines (Sirakaya 1997).

Perceived Severity of Self-Imposed Sanctions (CM6)

The operator was also asked to what extent he or she would experience personal problems if they did not comply with the guidelines (Sirakaya 1997).

Perceived Threat of Self-Imposed Sanctions (CM7)

The product of (CM5) and (CM6) gave the perceived threat of self-imposed sanctions (Sirakaya 1997).

Perceived Certainty of Peer-Inflicted Sanctions (CM8)

This question was designed to measure how decisions concerning compliance are influenced by the opinions of persons significant to the operator e.g. friends (Sirakaya 1997).

Perceived Severity of Peer-Inflicted Sanctions (CM9)

This question was designed to measure the severity of the problem that would be caused by the potential negative opinions of persons significant to the operator if the operator was non-compliant (Sirakaya 1997).

Perceived Threat of Peer-Inflicted Sanctions (CM10)

The product of (CM8) and (CM9) produced the measurement of this variable (Sirakaya 1997).

Perceived Level of Compliance Monitoring (CM11)

This is a new variable designed to measure the perception of the current level of compliance monitoring.

The factors CM1, CM2, CM3, CM5, CM6, CM8, CM9 and CM11 are raw variables, whereas, CM4, CM7 and CM10 are calculated or composite variables.

Section 3: Beliefs and Perceptions - Personal Views and Perceptions of the Draft National Guidelines 1999

This section was developed to gain specific insight into operator opinions of the then Draft National Guidelines 1999. Following discussions with Dr. Sirakaya, I decided to increase the number of questions referring to each variable in this section to allow for measurement of more than one aspect of each construct. However, because of the small potential total sample size of respondents (80), this section could only be expanded by one extra question reflecting a new aspect of each construct. This approach avoided problems associated with the number of variables being greater than the number of respondents. The first set of questions reflecting one aspect of the construct was subsequently referred to as PVP1-PVP10 and the second set reflecting a second aspect as PVP11-PVP20 respectively.

Following Sirakaya (1997) the ten constructs to be measured were:

- 1) Perception of potential benefits (PVP1 & PVP11);
- 2) Perception of costs versus benefits (PVP2 & PVP12);
- 3) Belief in irrationality of the compliance demand (PVP3 & PVP13);
- 4) Belief in the appropriateness of the guidelines (PVP4 & PVP14);
- 5) Belief in the fairness of the guidelines (PVP5 & PVP15);
- 6) Perceived non-compliance by other eco-tour operators (PVP6 & PVP16);
- 7) Belief in common good (PVP7 & PVP17);
- 8) Endorsement of non-compliance (PVP8 & PVP18);
- 9) Voluntary nature of the guidelines (PVP9 & PVP19); and
- 10) Personal morality/ ethics (PVP10 & PVP20).

Constructs 1, 2, 5, 6, 9 and 10 are self-explanatory, however here I provide some explanation for the other four constructs. An operator's belief in the irrationality of the compliance demand is a measure of whether or not the operator believes that the demands created by the guidelines are unrealistic and impossible to implement. Whether the operators feel that the guidelines are appropriate and applicable to all whale watch operations is a measure of the belief in the appropriateness of the guidelines. A belief in common good is a measure of the belief of complying with the guidelines because it will benefit everyone. Whether an operator believes that it is

appropriate not to comply with some or all of the guidelines because they think this will not harm any one is a measure of the endorsement of non-compliance.

Section 4: Characteristics of a Whale watch Operator / Business

This set of questions was developed from Sirakaya (1997) pages 934-935 - Characteristics of an Ecotour Operator/ Business. Affiliation with the business (PC1); Gender (PC2); Age (PC3); Level of education (PC4); Political orientation (PC5); Familiarity with the guidelines (PC9); Size of the business (BC1); Business membership in a professional organisation (BC6); and Previous experience with a legal agency and/ or organisation (BC7) are taken directly from Sirakaya (1997). Modifications to the categories representing the above variables are explained below.

The choices of level of education were: Year 10; Year 12; Technical and Further Education (TAFE); Undergraduate degree; or Post-graduate degree (Refer Appendix 2). In the Australian school system there is mandatory attendance of school until Year 10 (approximately 15 years of age), but students may continue to Year 12 (approximately 17 years of age). After leaving Year 10 or 12 a person may either: (1) attempt to enter the workforce; (2) attend TAFE (where a technical trade is learnt); or (3) attend a university for a degree. At university in Australia, undergraduate refers to a Bachelors degree, whereas postgraduate refers to a Masters or Doctorate.

All major political parties in Australia during the study period were represented (Democrat; Green; Independent; Labor; Liberal; National; One Nation). Labor reflects a social democratic orientation and Liberal/National reflects a conservative orientation. The other parties are minor parties in the Australian system. Web site addresses of the political parties are provided in Appendix 3.

In this study, the other variables included under Characteristics of an Eco-tour Operator/ Business (Sirakaya 1997) were modified to apply specifically to the whale watch industry. A question regarding the number of years experience an operator has had as a whale watch vessel operator was used to gain information on the level of experience in the whale watch industry and around whales (PC7). This question corresponded to Sirakaya's (1997) question referring to the number of years in the ecotourism business. The percentage of business from ecotourism (Sirakaya 1997) was interpreted in my study as the number of months per year that were spent conducting whale watching (BC3).

To gain additional insight into aspects specific to the whale watch industry, I added five questions: two about personal characteristics and three concerning business characteristics. I asked the number of years of commercial vessel operation as an indication of the level of experience on the water, which may, for example, influence the operator's capacity to estimate distance (PC6). Operators were also asked which management conditions applied to whale watching in their area as an indication of the local management conditions (PC8). Additional business characteristics that were included were: whether the business specifically advertises as a whale watch experience (BC2); any other major activity the operator is involved in (BC4) such as charter fishing; dolphin watching or reef tours; and the length of time the business has held a permit for whale watching (BC5). The first of these variables was designed to elicit information on the degree to which the operation was dedicated to whale watching. A person's occupation has been shown to influence compliance (Lewis 1982); therefore operator occupation in the off-season was thought to be a relevant variable obtained by BC4. Additionally, the business perspective has also been shown to influence its employees (Trevino *et al.* 1999), therefore, the number of years the business has held a permit may increase the employee's dedication to keep it and thus influence the operator's behaviour.

Overall, the questionnaire was designed to measure the following hypotheses with regards to whale watching in Australian waters.

- 1) There is no relationship between the attitudinal compliance of whale watch operators and their perception of sanctions and enforcement (CM).
- 2) There is no relationship between the attitudinal compliance of whale watch operators and the characteristics of a whale watch operator and/or his/her business (PC/BC).
- 3) There is no relationship between the attitudinal compliance of whale watch operators and their beliefs and perceptions of the whale watch guidelines (PVP).

5.2.3 Questionnaire Distribution

The surveys were sent out and returned in the latter half of the year 2000. This was after the ANZECC National Guidelines 2000 had been finalised and the *Environment Protection and Biodiversity Conservation Regulation 2000 (Cwlth)* had come into affect. I sent surveys to every known operator in Queensland (22) and New South Wales (28). In Western Australia, a Conservation and Land Management (CALM) officer sent out the surveys to all operators on their list (30). Because of the low total sample size of

operators, all were surveyed. A response rate of 40% (i.e. 32 questionnaires) was obtained: Queensland (9), New South Wales (10) and Western Australia (13). Five surveys were incompletely filled out i.e., an entire page or section was not complete. Therefore 27 (34%) surveys were usable for analysis. The usable survey response rates for individual states were as follows: Queensland – 33%; New South Wales – 26%; and Western Australia – 41%. In the following results, I discuss only the 27 usable surveys. I could not contact a random sample of non-response operators, as I did not have a complete list of names and addresses because of confidentiality provisions, especially in Western Australia.

5.3 Data Compilation and Analysis

Analysis was performed using Microsoft Excel 2000 and the statistical program SPSS 10. Appropriate statistical tests were selected based on Sirakaya's (1997) study, preliminary testing of the data sets for normality and advice from a professional statistician.

5.3.1 Attitudinal Compliance

A "compliance score" was calculated by summing the responses to the 20 questions (Sirakaya 1997). The total score could range from 20 to 100 points, thus a higher score indicated a higher level of acceptance of behaviour consistent with the whale watch guidelines (management regime).

5.3.2 Operator and Business Characteristics

For the statistical analysis, I pooled the data from operators based in different states because of the small overall sample size. I further justified this approach by testing for differences in the age composition of my sample of whale watch operators from different states as age has been found to be a reliable index of perceptions or mind-set (Kohlberg 1969; Lewis 1982). The mean ages of the whale watch operators were not significantly different amongst the three states (One-way ANOVA: $df = 2, 24$; $F = 1.78$; $P = 0.19$). The descriptive data are presented together to give an overall picture of the characteristics of operators and whale watching businesses in Australia as a whole and separately, to outline the characteristics by State. Characteristics of operators or businesses are described using percentages.

5.3.3 Test of Compliance Model

Following Sirakaya (1997), I used forward multiple regression (Tabachnick & Fidell 1989) to test the compliance model. This method of analysis enabled each independent variable's contribution to the model to be evaluated individually and allowed the factors that may affect compliance of operators with the guidelines to be identified. Because of the low usable number of surveys returned (27), I inserted the mean for any missing values rather than excluding cases. Although the survey questionnaire was modelled on that of Sirakaya (1997), my study had more variables; therefore, several forward multiple regression analyses were performed for a thorough analysis of the data.

Table 5.1 summarises the analysis conducted. I first performed a forward multiple regression (Regression 1) of the data as per Sirakaya (1997)(i.e., only the components Sirakaya included were included here) to enable my results to be compared with those of Sirakaya. This analysis was performed using the individual questions from the management of enforcement (CM)(E. Sirakaya, Department of Recreation, Park & Tourism Sciences, Texas A&M University, *pers. comm.* 2002). Gender and political affiliation were the only variables to be removed from this first analysis, as all operators that returned a usable questionnaire were male and political affiliation was not in the appropriate format to be included in a forward multiple regression. The analyses were conducted to elucidate the influence of whale watch operators' perceptions of sanctions and enforcement, operators' characteristics, business characteristics, and operators' beliefs and perceptions of their attitudinal compliance regarding whale watch regulations and guidelines.

I decided that the calculated or composite independent variables (i.e., CM4; CM7 and CM10) may be a more appropriate measure of the level of management enforcement; therefore, I ran a second forward multiple regression (Regression 2) (Table 5.1) to elucidate the contribution of these variables. The regressions were run again with the addition of the three new variables that had been included in my questionnaire only (Regressions 3 & 4) (Table 5.1).

Table 5.1 Summary of the regression analyses performed to gain an understanding of the independent variables that influence the attitudinal compliance (dependent variable) of the 27 whale watch tour operators from Queensland, New South Wales and Western Australia who returned a questionnaire.

Analysis and Rationale	Independent Variables
Regression 1) As per Sirakaya (1997) to enable comparisons with his results	Perceived Sanctions and Enforcement
	<ul style="list-style-type: none"> ▪ Type of perceived sanction (CM1) ▪ Perceived certainty of legal sanctions (CM2) ▪ Perceived severity of legal sanctions (CM3) ▪ Perceived certainty of self-imposed sanctions (CM5) ▪ Perceived severity of self-imposed sanctions (CM6) ▪ Perceived certainty of peer-inflicted sanctions (CM8) ▪ Perceived severity of peer-inflicted sanctions (CM9)
	Whale watch operator/ business characteristics
	<ul style="list-style-type: none"> ▪ Type of affiliation with the business (PC1) ▪ Age (PC3) ▪ Level of education (PC4) ▪ Years of whale watch operation (PC7) ▪ Familiarity with the guidelines (PC9) ▪ Size of the company (BC1) ▪ Percentage of business from whale watching (BC3) ▪ Business membership in a professional organization (BC6) ▪ Previous experience with a legal agency/organization (BC7)
	Beliefs and perceptions toward whale watch guidelines
	<ul style="list-style-type: none"> ▪ Perception of potential benefits (PVP1x11) ▪ Perception of costs versus benefits (PVP2x12) ▪ Belief in irrationality of the compliance demand (PVP3x13) ▪ Belief in the appropriateness of the guidelines (PVP4x14) ▪ Belief in the fairness of the guidelines (PVP5x15) ▪ Perceived non-compliance by other whale watch operators (PVP6x16) ▪ Belief in common good (PVP7x17) ▪ Rationale endorsing non-compliance (PVP8x18) ▪ Voluntary nature of the guidelines (PVP9x19) ▪ Personal morality/ ethics (PVP10x20)

Table 5.1 (continued) Summary of the regression analyses performed to gain an understanding of the independent variables that influence the attitudinal compliance (dependent variable) of the 27 whale watch tour operators from Queensland, New South Wales and Western Australia who returned a questionnaire.

<p>Regression 2) Revised Analysis using resultant calculations.</p>	<p>In Perceived Sanctions and Enforcement Section only the following were included:</p> <ul style="list-style-type: none"> ▪ Perceived threat of legal sanctions (CM4) ▪ Perceived threat of self-imposed sanctions (CM7) ▪ Perceived threat of peer-inflicted sanctions (CM10)
<p>Regression 3) Regression (1) plus extra variables included in my study.</p>	<p>As per Regression 1, plus</p> <ul style="list-style-type: none"> ▪ State of origin (State) ▪ Perceived level of monitoring (CM11) ▪ Number of years of vessel operation (PC6)
<p>Regression 4) Regression (2) plus extra variables included in my study.</p>	<ul style="list-style-type: none"> ▪ As per Regression 2, plus: ▪ State of origin (State) ▪ Perceived level of monitoring (CM11) ▪ Number of years of vessel operation (PC6)

5.3.4 Limitations and Benefits of the Questionnaire

In evaluating the findings of this research, the following three limitations must be considered. First, it is expected that the sensitive nature of the issue under investigation may have affected the truthful completion of the questionnaire, although the whale-watch operators were assured of complete confidentiality. To alleviate this potential problem, this study used an indirect method of obtaining responses (for example, the dependent variable – attitudinal compliance - was measured by evaluating behavioural intentions). Second, the sampling frame could not be randomised since there were a limited number of operators. A third limitation pertains to the validity of some belief and perception statements. Given the extensive number of independent variables and guidelines to be measured within a limited space available in the survey, no scales were developed and used for obtaining information. Although the independent variables in the set of belief and perception (PVP1-PVP10) were measured using two statements for each variable, the small total number of surveys limited their potential to measure aspects of any one construct; thus, the true validity of the statements (e.g., discriminant and convergent validity) still remain to be established. Since independent variables in the set of belief and perception (Z1-Z10) were measured using only one statement for each construct, it was difficult to measure all potential aspects of any one construct, thus, the true validity of the statements (e.g., discriminant and convergent validity) still remain to be established.

The time frame in which the questionnaire was administered must also be taken into account (Young *et al.* 1999). As the questionnaire was sent out during the period when whale watching was not occurring, it may be expected that operators are concentrating on issues other than whale watching. An overall response rate of 40% with a usable survey return of 34% was obtained. Sirakaya (1997) obtained a response rate of 45%, therefore, in comparison the response rate in my study is comparable.

The ability of quantitative research to provide all the answers has been questioned (Walle 1997; Riley & Love 2000). Walle (1997) recommends an “eclectic approach” to choosing research methods when conducting research within the field of tourism. Riley and Love (2000) state that qualitative research provides information that contributes to an *understanding* of situations and phenomena that cannot be provided by purely quantitative methods. Furthermore, they state that using qualitative methodology to supplement information gained through quantitative methods adds insight to the quantitative findings (Riley & Love 2000).

5.4 Results

5.4.1 Attitudinal Compliance

On a 20 to 100 scale the attitudinal compliance scores of the 27 whale watch operators surveyed ranged from 50 to 87 with a mean and standard deviation of 71.3SD±9.11 (mode=75)(Appendix 4). Overall on the scale of 20 to 100, 63% of the operators returned a score of 71 or above indicating a medium level of attitudinal compliance with the management conditions. Operators in New South Wales had both the highest and lowest attitudinal compliance scores. Queensland operators had the highest mean score of 77.2.

5.4.2 Operator Characteristics

Tables 5.2, 5.3, 5.4 and 5.5 display information concerning operator characteristics. As there was no significant difference between the ages of operators in each state (indicating potentially comparable perceptions) and because of the small sample size, results are presented for all surveys together, as well as, any points of difference from the individual states.

Just over half (56%) of the operators had a major stake in the business, as they were either sole owners and operators or partners and operators. An additional 30% responded that they were managers and operators also indicating that they had a

significant input into the business. The rates of sole ownership (57% and 50% respectively) were particularly high in New South Wales and Western Australia and no one from those states that returned a survey was an operator only. In Queensland however, the largest group (44%) were operators only and this group possibly did not have as much of a stake in the actual business as the owner-operators. (Table 5.2)

Table 5.2: The operational status of the of the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned the questionnaire.

Operator Status	%
Not Answered	0
Sole Owner-Operator	41
Partner & Operator	15
Manager & Operator	30
Operator Only	15

N=27

All of the respondents were male (Table 5.3). I am aware of only two female whale watch operators in Australia, one of which incompletely filled out the survey questionnaire making it unusable. The whale watch industry is overwhelmingly male-dominated, as are most vessel operators in Australia. Most of the respondents were middle aged or above, with 66% aged 41 – 60 (Table 5.3). Only 7% of operators were in the 20 – 30 year age group. The overall mean age for operators was 43.3 years (SD=12.8). The mean age in each state was: Queensland – 38.8 (SD=11.0); New South Wales – 50.4 (SD=6.2); and Western Australia – 42.5 (SD=15.8). Queensland had a higher percentage of young operators than the other two states with 22% between 20 and 40 years of age possibly reflecting the high numbers of non-owner operators in that state. New South Wales had no operators in this age group, while Western Australia had only 11%.

Fifty-two percent of operators had at least a Year 12 qualification and a further 37% had at least a TAFE qualification (Table 5.3). One operator in Queensland and one in Western Australia had an undergraduate and post-graduate degree, respectively. Almost half (48%) of the operators who responded stated that their political affiliation was Liberal or rather conservative in nature (Table 5.3). Other major political affiliations were with Labor and Independents. Of all the operators who returned a

survey, the Western Australian operators showed the highest tendency by percentage to associate with political parties of a conservative nature. Their affiliation with Liberals (55% of WA operators) was the highest for the three states.

Table 5.3: The gender, age, educational level and political affiliation of the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned the questionnaire.

Gender	%	Age (Years)	%	Highest Education	%	Political Affiliation	%
N-A	0	N-A	4	N-A	0	N-A	19
Male	100	20-30	7	Year 10	22	Liberal	48
Female	0	31-40	26	Year 12	30	Labor	22
		41-50	33	TAFE	37	National	0
		51-60	30	Undergraduate	4	Democrat	0
		61-70	0	Post-graduate	7	One Nation	0
						Green	0
						Independent	11

N=27; N-A = Not Answered; TAFE = Technical & Further Education

The 27 operators who completed the survey questionnaire had a combined total of 387.5 years of commercial vessel operation and 169 years of whale watch operation experience. Seventy percent of the whale watch operators had operated a commercial vessel for greater than ten years indicating a high degree of experience with vessel operation (Table 5.4). Forty-one percent of the 27 operators had operated a whale watch vessel for seven years or more, which implied that almost half of the operators were very experienced at operating whale watch vessels (Table 5.4). The mean length of time that an operator had operated a commercial vessel was 14.4 years (SD=9.3) or whale watch vessel was 6.3 years (SD=3.8). Queensland had a higher mean time for operators of whale watch vessels (M=7.0; SD=4.6) than both Western Australia (M=6.8; SD=3.8) and New South Wales (M=4.4; SD=2.1).

Table 5.4: The number of years of experience as operators of commercial vessels and whale watch vessels of the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned the questionnaire.

Years of Vessel Operation	%	Years as Whale watch Operator	%
Not Answered	0	Not Answered	4
0-5	19	1-3	26
6-10	22	4-6	30
11-15	19	7-9	15
16-20	19	10-12	26
21-25	15		
25+	17		

N=27

At the time of answering the survey questionnaire (late 2000), it was assumed that whale watch operators should have been familiar with the “Draft National Guidelines for Cetacean Observation 1998” and “Draft Australian National Guidelines for Cetacean Observation 1999” and “Areas of Special Interest for Cetacean Observation 1999” because the drafts had been distributed by Environment Australia to all known operators (G. Larmour, Marine Species Section, Environment Australia, *pers. comm.* 2000). The operators should have also been familiar with the approach guidelines and regulations for the Commonwealth and each relevant state of operation as outlined in Appendix 1.

Although Environment Australia had sent copies of the “Draft Australian National Guidelines for Cetacean Observation 1999” to at least 34 vessel operators in Queensland, 50 in New South Wales and 32 in Western Australia, only 74% of the operators who returned usable survey questionnaires considered that they were familiar or very familiar with the Draft National Guidelines 1999 (Table 5.5). A further two operators from Western Australia stated that they were not aware of the Draft National Guidelines 1999 (one per telephone, one per survey, which was unusable as it was incomplete). Although both State regulations or guidelines and the ANZECC Australian National Guidelines for Cetacean Observation 2000 had been introduced in each state at the time of this study, only 26% of all operators who completed the questionnaire correctly stated that both State and Commonwealth whale watch policies applied to their areas of operation (Table 5.5).

Of the nine Queensland operators who returned a usable survey, six (66%) stated that only the Queensland regulations applied to their area. Similar sentiment was reflected in New South Wales and Western Australia with 43% and 55% of the operators stating that only New South Wales' or Western Australian regulations, respectively applied to their area of operation. During my field research, some operators and a management officer told me that because regulations were in place in their state that the Draft National Guidelines 1999 were not relevant to them since regulations are theoretically more enforceable than guidelines (Refer Chapter 2 and Appendix 1). This was reinforced when two operators from Western Australia stated on their surveys that they were more than happy with the Conservation and Land Management (CALM) regulations for whale watching and were not concerned with the Draft National Guidelines 1999 because they were only guidelines. However, 36% of the Western Australian operators stated that only the Draft National Guidelines 1999 applied to their area of operation indicating that not all were aware of the Western Australian regulations.

Table 5.5: The level of familiarity with the Draft National Guidelines 1999 and applicable management conditions for each state for the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned a questionnaire.

Applicable Management Conditions	%	Familiarity with Draft National Guidelines 1999	%
Not Answered	0	Not Answered	0
Draft National Guidelines 1999	19	Very Familiar	33
Queensland Regulations	22	Familiar	41
New South Wales Regulations	11	Moderately Familiar	22
Western Australian Regulations	22	Unfamiliar	4
DNG & QLD	11	Not at all Familiar	0
DNG & NSW	11		
DNG & WA	4		

N=27; DNG = Draft National Guidelines 1999

5.4.3 Business Characteristics

Tables 5.6, 5.7 and 5.8 display information regarding characteristics of the businesses operated by the 27 operators from Queensland, New South Wales and Western Australia who completed the questionnaire. Most of the whale watch operations were small with almost 60% of vessels carrying 30 passengers or less. Queensland had the highest percentage (15%) of businesses that carried over 90 passengers (Table 5.6) however, the only significant difference was between Queensland and New South Wales. Almost 72% of the businesses specifically advertised that they conducted whale watching. In Queensland, 100% of the businesses specifically advertised whale watching. In New South Wales and Western Australia, the figures were 86% and 50% respectively. Due to the fact that the majority of the whale watching occurred along the migration route, (therefore took advantage of the northern and southern migration), almost 63% of businesses operated up to three months of the year, while the majority of the businesses operated no longer than six months (Total = 91%) (Table 5.6).

Table 5.6: Passenger numbers, advertisement and length of operation characteristics of the whale watch businesses operated by the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned a questionnaire.

No. of Passengers	%	Specifically Advertise Whale Watch	%	Months of Whale Watch Operation	%
Not Answered	0	Not Answered	0	Not Answered	0
1-30	56	Yes	74	0-3	63
31-60	15	No	26	4-6	30
61-90	11			7-9	7
>90	19				

N=27

At the time of the survey, Queensland and Western Australia were the only states requiring permits specifically for “whale watching”, although permits for whale watching in the Solitary Islands Marine Park, NSW were required shortly afterwards. However, 28% of operators from New South Wales stated that they had been permitted for whale watching from one to six years (Table 5.7). This finding may be because general permits were issued to those who could then “approach a marine mammal closer than the distance prescribed in the regulations” under Part 6, Section 120 of the *Threatened Species Conservation Act 1995 (NSW)* (Refer Appendix 1). Queensland and Western Australian businesses contributed 30% and 26% of operations respectively that had

been permitted to operate for whale watching for four or more years. This result is not surprising as whale watching based on humpback whales began in 1987 in Queensland and 1988 in Western Australia which was earlier than New South Wales which began in the early 1990s (Anderson *et al.* 1996).

Table 5.7: The number of years that the businesses employing the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned a questionnaire have held a permit to whale watch.

No. of Years Permitted to Whale Watch	%
Not Answered	0
1-3	11
4-6	33
7-9	15
9-11	15
12+	7
Not Applicable	19

N=27

A high percentage (33%) of businesses conducted a range of other activities (not including those activities listed) such as dive operations, wildlife and island cruises, transfers and aquarium work during the non-whale watching season (Table 5.8). Charter fishing was the most frequent alternative activity conducted by 37% of the businesses (Table 5.8). Almost half of the businesses from all 27 surveys are members of a professional organisation. Six businesses (22%) are members of the Ecotourism Association. An organisation or authority (such as the NSW Commercial Vessels Section; Queensland Parks & Wildlife – Marine Parks Section; Queensland Transport or WA Department of Transport) inspected 81.25% of businesses indicating a high level of contact with authorities (Table 5.8). This is an indication of the level of contact with authorities although the authorities may not be in contact in relation to whale watching issues.

Table 5.8: Alternative major activities undertaken during the non-whale watch season by the 27 whale watch operators from Queensland, New South Wales and Western Australia who returned a questionnaire and the amount of contact these operators had with a professional organisation or inspection agency.

Other Major Activity	%	Professional Organisation	%	Inspected	%
Not Answered	0	Not Answered	0	Not Answered	0
Charter Fishing	37	Yes	48	Yes	85
Commercial Fishing	0	No	52	No	15
Dolphin Watching	26				
Reef Tours	4				
Other	33				

N=27

5.4.4 Attitudes to regulations and their likely effectiveness

The respondents strongly preferred regulations to guidelines as the means of influencing the behaviour of whale watch operators. No respondent supported 'no regulation', 22% self regulation by the industry, and 15% National Guidelines only. The remaining 63% supported some form of regulation by the State and/or Commonwealth with 22% supporting National Regulations only, 15% a combination of National Guidelines and State Regulations, 15% a combination of National and State Regulations and 11% State Regulations only.

Almost half the respondents (48%) considered that suspension of the operating license would be the most effective deterrent to non-compliance; while 37% advocated a fine, the level of which depended on the severity of the breach. There was little or no support for the other alternatives suggested by the questionnaire (publication of name of non-complier in state newspaper (zero support) or threat of non-co-operation by other operators (7% support).

5.4.5 Test of Compliance Model

Regression 1

Of the four models tested, the model produced by Regression 1 explained the highest percentage of the variation (64%) in whale watch operator attitudinal compliance toward the Draft National Guidelines for Cetacean Observation 1999 (Table 5.9). This model was significant at the <0.001 probability level, with an F-value of 9.65. It indicated that the four most important variables affecting attitudinal compliance with

whale watching guidelines were: (1) perceived certainty of legal sanctions (CM2), (2) endorsement of non-compliance (PVP8x18), (3) voluntary nature of guidelines (PVP9x19) and (4) belief in the fairness of the guidelines (PVP5x15). The greater the perceived certainty of legal sanctions, the more the operators were inclined to have a positive attitude towards complying with the whale watching guidelines ($\beta=1.154$).

The endorsement of non-compliance score results from the composite score from two questions ('Not following the National Guidelines is acceptable' and 'It is acceptable to not follow the National Guidelines because not everyone will comply with the National Guidelines'). The endorsement of non-compliance score varied positively with the score for attitudinal compliance ($\beta=1.414$). This finding indicates that although operators have a positive attitude towards complying with the management conditions they feel that it is acceptable not to comply, to some extent. This result is not surprising, given that compliance with guidelines is voluntary.

The score for 'voluntary nature of guidelines' was a composite of the responses to two questions, which explored the acceptability, and inevitability of breaching voluntary guidelines. Not surprisingly, respondents who endorsed these limitations of guidelines were more inclined to have an overall low attitudinal compliance score ($\beta=-0.645$).

The negative relationship between an operator's score for attitudinal compliance and his belief in the fairness of the guidelines ($\beta=-0.515$) was surprising. The two questions that tested the operators' attitudes to 'fairness of the guidelines' were 'Larger whale-watch operations benefit more from the National Guidelines than small operations' and 'The National Guidelines are fair to all to all whale watch operations'. This result suggests that the mostly small operators who responded to the survey are prepared to do the right thing, despite their concerns about the fairness of the guidelines.

Regression 2

Regression 2, which explained 36.6% of the variation in whale watch operator attitudinal compliance toward the Draft National Guidelines 1999 indicated that the most important variable was the perceived threat of legal sanctions (the product of the potential likelihood of detection and the perceived severity of legal sanctions) (Table 5.9). This model was significant at the 0.05 probability level, with an F-value of 6.92. As the operators' perception of the threat of legal sanctions increased they were more

inclined to have a positive attitude towards complying with the guidelines ($\beta=0.189$). The model also indicated that sole owner/ operators were less inclined than other operators to have a positive attitude towards complying with the guidelines ($\beta=-7.097$).

Regression 3 and Regression 4

In my study, I included questions designed to reflect factors that were not covered in Sirakaya's study (Refer Section 5.2). Of these additional variables, the perceived level of monitoring (CM11), the number of years of commercial vessel operation (PC6) and state of origin (State) were added into the forward multiple regressions as described in Regression 1 and 2 to assess their contribution to the attitudinal compliance model. Regressions 3 and 4, explained 32.4% of the variation in whale watch operator attitudinal compliance toward the Draft National Guidelines 1999 (Table 5.9). They indicated that the most important variable affecting attitudinal compliance was the perceived level of monitoring (CM11). The respondents' perceptions of 'current levels of monitoring of adherence to the regulations' were positively related to their level of attitudinal compliance ($\beta=4.349$). Taken together these models indicate that the threat of being caught and punished is the greatest incentive for compliance with whale watching guidelines. The full statistical details of the regression models are presented in Appendix 5.

Table 5.9: Results of the four forward multiple regressions that tested for the independent variables that significantly affect the dependent variable attitudinal compliance towards whale watch guidelines.

Regression 1: $r^2 = 0.637$

Independent Variables Tested	Significant Independent Variables	df	t-value	P
1. Perceived sanctions & enforcement;	▪ Perceived certainty of legal sanctions (CM2)	1,25	4.408	<0.001
2. Whale watch operator/ business characteristics;	▪ Endorsement of non-compliance (PVP8x18)	2,24	4.285	<0.001
3. Beliefs & perceptions toward whale watch guidelines	▪ Voluntary nature of the guidelines (PVP9x19)	3,23	-2.714	0.013
All as per Sirakaya 1997	▪ Belief in the fairness of the guidelines (PVP5x15)	4,22	-2.213	0.038

Table 5.9 (continued): Results of the four forward multiple regressions that tested for the independent variables that significantly affect the dependent variable attitudinal compliance towards whale watch guidelines.

Regression 2: $r^2 = 0.366$

Independent Variables Tested	Significant Independent Variables	df	t-value	P
1. Perceived sanctions & enforcement – only CM4, CM7 & CM10;	<ul style="list-style-type: none"> ▪ Perceived threat of legal sanctions (CM4) ▪ Sole owner-operator (PC1.1) 	1,25	2.675	0.013
2. Whale watch operator/ business characteristics;		2,24	-2.393	0.025
3. Beliefs & perceptions toward whale watch guidelines				
2 & 3 - as per Sirakaya 1997				

Regression 3: $r^2 = 0.324$

Independent Variables Tested	Significant Independent Variables	df	t-value	P
As per Regression 1, plus: State of Origin (State); Perceived level of monitoring (CM11); & Number of years of vessel operation (PC6)	<ul style="list-style-type: none"> ▪ Perceived level of monitoring (CM11) 	1,25	3.459	0.002

Regression 4 $r^2 = 0.324$

Independent Variables Tested	Significant Independent Variables	df	t-value	P
As per Regression 2, plus Added 3 variables (refer Regression 3)	<ul style="list-style-type: none"> ▪ Perceived level of monitoring (CM11) 	1,25	3.459	0.002

5.5 Discussion

This questionnaire was administered during a time when the Commonwealth government was consulting with stakeholders about the Draft National Guidelines 1999. Thus the respondents should have been aware of these guidelines. Nonetheless, the results indicate that the operators were confused by the complexity of the operating environment. Therefore, it is likely that although the questionnaire aimed to measure the factors influencing the operators' attitude to complying with the Draft National Guidelines 1999 *per se*, it instead measured their generic attitude to their local management conditions.

5.5.1 Operator Characteristics

Approximately 86% of the operators were sole owner-operators, partner-operators or manager-operators, indicating that they had a major stake and significant input into the business and therefore potentially a greater requirement to be aware of the guidelines/regulations and to comply with them. Operators tended to be middle-aged or older which may indicate a greater level of experience but also possibly a greater tendency to be "set in their ways". There are a high percentage of young operators in Queensland compared with the other two states.

A high level of commercial vessel experience together with an overall mean of 6.3 years for whale watch vessel operation indicates that on average the operators should have the experience to conduct appropriate behaviour (i.e., manipulation of the vessel) around whales. Nonetheless, there was a poor level of knowledge with regards to which management conditions were relevant in each state, as well as, a low level of familiarity with the Draft National Guidelines for Cetacean Observation 1999. One potential reason for this is the seemingly high turnover of vessel-based operations. Several operators told me that they disregarded the guidelines because regulations are in place in the state in which they operate and these regulations were theoretically more enforceable than the National Guidelines.

The number of businesses in Western Australia and New South Wales, as well as the high percentage of small whale watch businesses may be attributed to the dispersed structure of the industry, particularly along the coasts of these states. The whale watch season was restricted in each state by the length of the migration, which was no longer than six months for those businesses at the beginning and end of the migration route e.g., those in southern NSW. Although whale watching has been in both Queensland and Western Australia since 1987, only 26-30% of operators in these states have been

permitted to operate for four or more years. Therefore, at the time of survey during a possible 13 years of operation less than 30% of operators in each state had operated for longer than four years.

There was a moderate level of agreement with the guidelines indicating that the operators did not fully agree with the restrictions outlined in them. Several operators told me that they felt that guidelines or regulations for whale watching should be flexible and different for different areas (especially “resting” areas such as Hervey bay versus “travelling” areas such as Coffs Harbour). Queensland operators showed the highest mean attitudinal compliance score, indicating that they were more in agreement with the guidelines than operators from other states. This finding may be attributed to the fact that there is a higher proportion of large operators in Queensland where the whale watch industry has been established for longer (since 1987) than the other states, and was regulated soon after its inception. Thus Queensland operators have had more time to get used to similar guidelines. The overall relatively high positive attitudinal compliance scores obtained in this study may partly be attributed to the possibility that operators with a positive attitude towards the guidelines were more likely to return the questionnaire than operators with a negative attitudinal compliance.

5.5.2 Testing the Hypotheses

Taken together the regression results support the proposed model in Figure 5.2: that the attitudinal compliance of Australian whale watch operators is influenced by the conditions of management, their personal and business characteristics and their personal perceptions of the management conditions. The regression results indicate that deterrence factors are the most important in influencing such compliance. Variables within the perceived sanctions vector were found to be a major influence on attitudinal compliance in each of the four regressions. The perceived level of monitoring explained the highest percentage of variation in attitudinal compliance with the whale watch guidelines. Deterrence is a component of two aspects of the model - the conditions of management *per se* and the operators’ views about those conditions.

The respondents also expressed a strong preference for regulations rather than guidelines as the means of influencing their behaviour as whale watch operators. They indicated that suspension of the operating license and fines would be effective deterrents to non-compliance. These results suggest that the guidelines should become the basis of regulations that are enforceable and enforced.

Although operators perceived that non-compliance to the guidelines did not negatively affect anyone or the whales and was therefore acceptable (endorsement of non-compliance), they still showed a positive attitude towards complying with the guidelines. This finding may be due to several factors such as: 1) they may perceive that it is acceptable not to comply with only some of the guidelines and therefore have an overall positive attitude towards compliance; 2) the operators may perceive that it is acceptable not to comply with certain guidelines but still support the principle that guidelines are needed; or 3) although they feel that it is acceptable not to comply with some of the guidelines they do so because they understand that approaching the whales appropriately will give the best viewing experience to their customers and therefore have a positive attitude towards complying with the guidelines.

The negative correlation between the perceived fairness of the guidelines and attitude towards complying with them is surprising. Possible influences on this result include the perception that restricting the movement of a pod is impossible, therefore, restricting the proximity of vessels to whales was unnecessary. However, given that most of the responses were from small operators, I think this result may have been influenced by the answers to the question 'Larger whale-watch operations benefit more from the National Guidelines than small operations'. The appropriateness of the guidelines for both large and small operators warrants further investigation.

The only demographic factor that influenced attitudinal compliance with the guidelines was whether the operator was a sole owner-operator. The model as tested by Regression 2 indicated that sole owner-operators were less inclined to have a positive attitude towards complying with the guidelines. In some respects this finding is counter intuitive. Sole owner-operators might be expected to have a greater vested interest in their business than employees and therefore have a positive attitude towards guidelines aimed at the sustainability of the industry through appropriate protection of the whales. Possible explanations for the negative attitude are that sole owner-operators: 1) have a negative attitude towards guidelines, as they prefer regulations; 2) consider that the guidelines in place are unfair towards them (because they favour larger operations); or 3) consider that the short-term goals of their business revenue may be negatively affected by the guidelines. This aspect is considered in the context of other studies below.

The hypotheses my research planned to test were:

- 1) There is no relationship between the attitudinal compliance of whale watch operators and their perception of sanctions and enforcement (CM)
- 2) There is no relationship between the attitudinal compliance of whale watch operators and the characteristics of a whale watch operator and/or his/her business (PC/BC)
- 3) There is no relationship between the attitudinal compliance of whale watch operators and the beliefs and perceptions of the whale watch guidelines (PVP)

From the discussion above it can be seen that because a relationship was found between at least one variable within each vector of the hypotheses, all three hypotheses can be rejected but only for a limited number of variables. Thus in broad terms my results supported Sirakaya's model (see Figure 5.2).

5.5.3 Comparison of Results with Previous Studies

I found that the deterrence effect was the most important factor influencing the attitudinal compliance of whale watch operators with whale watch guidelines in this study. DiMento (1989) found that the perception of sanctions influenced compliance and Ehrlich (1973), Lewis (1982) and DiMento (1989) all found that the perceived level of monitoring (e.g., effectiveness of law enforcement or the perception of the probability of detection) was an important factor in the level of compliance.

Several operators told me that they knew when the parks and wildlife vessel was out on patrol (usually because they could see the vessel berth was vacant) and therefore they would be more likely to be cautious when approaching the whales. Operators also mentioned that they had a negative opinion of covert compliance checks, which made them less trusting of authorities and gave them a negative perception of the level of monitoring. However, they also felt that if they did not comply with certain regulations it would be extremely difficult for a compliance officer to document the event well enough to gain a successful prosecution (see Chapter 6).

Although this study suggests that the risk of being caught doing the wrong thing, is the major method for deterring non-compliance, other studies indicate that education and rewards may be a more positive method of achieving the same goal (Lewis 1982; Jackson & Milliron 1986; Sirakaya 1997). A combination of deterrence methods and education of operators may contribute to greater compliance.

Occupational characteristics, such as the level of the position occupied had a significant relationship with compliance to taxation regulations (Jackson and Milliron 1986). The higher the position the person occupied, the greater the opportunity for non-compliance and the higher the likelihood that the person would not comply. Sole owner-occupiers are in the highest position in their business. They also do not have to be concerned about being reprimanded by a person in a higher position if they are caught not complying. Jackson and Milliron (1986) suggested a link between the occupational characteristic and peer influence. If peers in the same occupational group were not complying, it was more likely that an individual had a negative attitude towards complying. As discussed above, owner-operators have a vested interest in their business, which provides them with the opportunity to either comply or not depending on their perception of how the guidelines or regulations affect them. Education regarding the positive effects of complying has been suggested to increase the compliance level of such individuals (Sirakaya 1997). Involving operators in the development of guidelines or regulations and educating them with regards to why certain guidelines are implemented should increase the positive perception of the guidelines and positive attitude towards compliance. In support of this conclusion, two operators thanked me for the opportunity to have input into opinions on the guidelines through the questionnaire.

Lewis (1982), Jackson and Milliron (1986), Gramann and Van Der Stoep (1987) and Sirakaya (1997) all found links between the rationale endorsing non-compliance and attitudinal compliance. In particular, Gramann and Van Der Stoep (1987) found that if an individual considered that the situation allowed for non-compliance, they were more likely to have a negative attitude towards compliance. Similarly, if it were felt that non-compliance would not harm any person (or whale) then the individual was less likely to have a positive attitude towards complying (Sirakaya 1997). During my field research, operators stated that they thought that an increase in the number of approaches by whales to vessels over the years was further evidence that close approaches were not affecting the whales. This assessment fails to take into account the fact that the numbers of whales migrating along the coast had increased because of population recovery after the cessation of whaling. Although a proportion of the migrating whales actively approach vessels (See Chapter 6), there is the potential for stress on those whales that are being approached by vessels even though the whale may then move away. In addition, an unknown number of whales that may have previously utilized an area may now avoid it due to the presence of vessels. I agree with Sirakaya (1997) that education should be used to make operators aware of the ramifications of non-

compliance, especially regarding the negative impacts that may be felt by other individuals (operator or other), the environment or wildlife. An explanation of the rationale behind each guideline or regulation in the context of the biology and population status of the whales is required. Additionally, education about the potential stress of vessel traffic on animals that do not actively approach vessels would be useful for operators to gain an understanding of the potential negative impacts of the whale watch industry.

Previous compliance studies have mainly focused on the regulation of taxation, therefore the voluntary nature of guidelines has not been studied in detail. Sirakaya (1997) did not find a relationship between the voluntary nature of guidelines and compliance. Sirakaya (1997) did suggest, however, that some of the results gained by his study may have been different if he had been asking about regulations rather than guidelines because operators may not have perceived the relevance of deterrence strategies when discussing guidelines only. My study strongly suggests that operators prefer regulations to guidelines. Some operators also suggested that, due to the low level of monitoring, a high degree of self-regulation was occurring. Thus “punishment” for non-compliance was most likely to be in the form of ostracizing the offender from other operators and not informing them of the position of whales. However, the respondents also indicated that they preferred the revocation of vessel licenses or fines as punishment.

In contrast to my study, a positive relationship between compliance and belief in fairness of guidelines has been reported by Lewis (1982), Jackson & Milliron (1986), Van Der Stoep and Gramann (1987), DiMento (1989) and Sirakaya (1997). When they completed the questionnaire, two operators noted that there was a necessity for flexible rules and a further three stated a fear of too much restriction by regulation implying that fairness is important to them. The issue of fairness could also be addressed through education regarding the guidelines/ regulations, especially with regards to providing explanations for why such management conditions have been put in place (Jackson & Milliron 1986; Sirakaya 1997).

5.5.4 Consultation, Education and Enforcement increase the Effectiveness of Guidelines and Regulations

Timing of surveys with respect to political atmosphere (such as just before an election) and tourist seasons (i.e., peak or off-peak) has been shown to influence results (Young *et al.* 1999). This survey was conducted during the off-season as the operators had

very little time during the season to do anything else except run their businesses. This timing may have influenced the manner in which the questionnaire was completed since many operators were involved in other activities during the whale watch off-season and therefore not fully concentrating on whale watch guidelines or regulations.

In a study that summarized past compliance research, Jackson and Milliron (1986) found that many variables had both a positive and negative relationship with compliance. Additionally, no single factor can explain compliance (Jackson & Milliron 1986; Sirakaya 1997). My study indicates that sociopsychological, deterrence and situational factors all may influence whale watch operators' attitudes towards compliance with the management conditions. To increase the potential for whale watch operators to have a positive attitude towards compliance, thus increasing the effectiveness of guidelines or regulations and based on the compliance literature (Chapter 4), I consider that consultation with and education of operators is necessary. Explanation of why particular management conditions are implemented is required to address any misperceptions concerning the inequity of such conditions. It is also desirable to provide operators with information that allows them to form an understanding of the potential negative consequences that non-compliance may have on both other individuals and the whales. This understanding may increase the likelihood of operators holding a positive attitude towards compliance to the whale watch guidelines. Therefore, operators who are more likely to have a positive attitude towards complying with the guidelines may also be more likely to complete and return questionnaires, have greater input into the development, review and refinement of guidelines and be more likely to comply with the guidelines.

It may have been more constructive to conduct concentrated consultation in each area or state to ensure that a greater number of operators were aware of the Draft National Guidelines 1999, rather than the national approach used. Operators showed a preference for regulations already implemented in their state.

5.6 Conclusion

The major finding of this study is that it is important to have regulations rather than guidelines in place to manage whale watching in Australia. It is pleasing to note that since my fieldwork was conducted, the Draft National Guidelines for Cetacean Observation 1999 (later the ANZECC Australian National Guidelines for Cetacean Observation 2000) have been integrated into the *Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)*. However, these regulations are

only enforceable in the Australian Whale Sanctuary, but not in the State/Territory coastal waters (to 3nm) where most whale watching occurs. In addition, regulations must be supported by a capacity to implement legal sanctions and an increased level of monitoring and it is doubtful that the Commonwealth regulations are effectively enforced.

Chapter Six

Operator Compliance: What is Occurring on the Water?

6.1 Introduction

As outlined in Chapter One, this chapter presents the vessel-based research I undertook to quantify operator compliance with the Draft National Guidelines for Cetacean Observation 1999 in Australia. Compliance by whale watch operators with the minimum approach distance and speed guidelines and factors that potentially affect compliance with these aspects of the guidelines are discussed.

An increase in the general public's positive perception of whales and dolphins over the last twenty to thirty years has encouraged a rapidly spreading whale watch industry (Stevens *et al.*, 1996; Hoyt 2000)(Refer Chapter 2). The rapid development of an industry that in many areas is based on threatened species has created new challenges in wildlife management. Most guidelines or regulations for whale watching are implemented as precautionary approaches without any data on the response of the operators to the regulatory measures (IFAW/Tethys Research Institute/Europe Conservation 1996). The behaviour of a whale watch vessel operator is crucial to the success or failure of implemented regulatory measures, and contributes in turn to the sustainability of the industry. My research contributes to an understanding of the behaviour of whale watch vessel operators through the exploration of the behaviour of operating whale watch vessels along the east coast of Australia.

I conducted research over two whale watch seasons (1998 and 1999) and in two Australian states (Queensland and New South Wales) allowing me to: (1) compare areas under different regulatory regimes, (2) access vessels adequately, (3) gather representative data and (4) amass a comprehensive data set.

6.2 Description of Research Sites

6.2.1 Airlie Beach/ Whitsunday Region, Queensland

The Airlie Beach/ Whitsunday District is in the Great Barrier Reef Region, Queensland. Airlie Beach is located at approximately 20°16'S 148°43'E (Figure 6.1) and is adjacent

to the Whitsunday Islands. It is part of the Great Barrier Reef World Heritage Area. The largest two islands, Hook and Whitsunday bound the Whitsunday passage to the west. The Great Barrier Reef and the islands shelter the waters of the Whitsunday region, offering relatively calm sea conditions.

Humpback whales have been observed in the area between July and September (Malcolm & Duggan 1998). A major portion of the humpback whale population in this area is made up of females and young calves (Anderson *et al.* 1996).

In 1998, the Great Barrier Reef Marine Park Authority released a “Whitsundays Plan of Management”, (Great Barrier Reef Marine Park Authority 1998) a regulatory instrument under the *Great Barrier Reef Marine Park Act 1975 (Cwlth)*. It has been regularly updated (1999 & 2002), however the only change with regard to the protection of whales has been the banning of commercial swimming with whales. Within the Whitsunday Planning Area a “Whale Protection Area” was designated to protect and conserve “an important calving ground for whales that migrate north from the Southern Ocean during winter” (Great Barrier Reef Marine Park Authority 1998) (Figure 6.2). The “Whitsundays Plan of Management” stipulates that a vessel must not approach closer than 300 m of a whale within the “Whale Protection Area”.

The Whitsunday Region is a developed resort area and commercial and private vessels frequently traverse the waters around the islands. The majority of tourism on the Great Barrier Reef occurs within the Cairns and Whitsunday areas, hence these are high use areas. During the period of my study, there were two licensed whale watch vessels in the Whitsundays, of which only one went out every day of the season, weather permitting. The other vessel went out rarely because it did not have scheduled tours.

Figure 6.1: Location of research areas

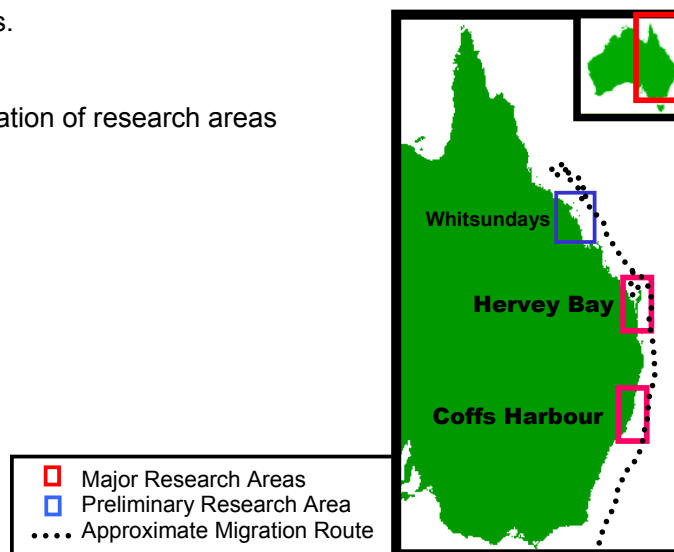
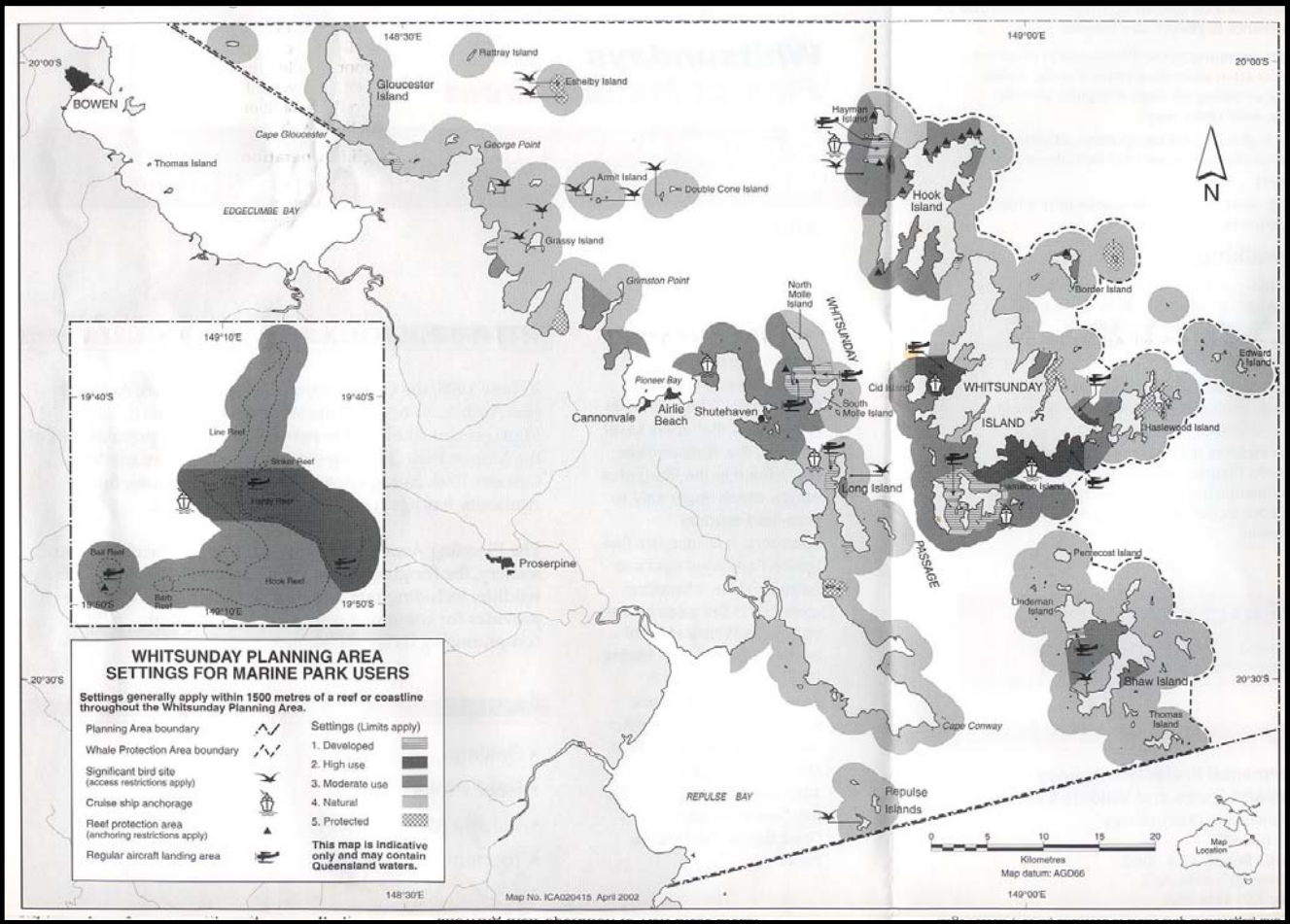


Figure 6.2: Whitsundays Planning Area showing the Whale Protection Area (taken from: Great Barrier Reef Marine Park Authority, Whitsundays Amended Plan of Management – October 1999 Information Leaflet)



6.2.2 Hervey Bay, Queensland

Hervey Bay is in south-east Queensland at approximately 152°5'S 25°2'E (Figure 6.1). Fraser Island to the east and south-east and the Australian coastline to the west form the limits to the bay (Corkeron 1995). To the north, Hervey Bay opens to the South Pacific Ocean (Corkeron 1995). The Great Sandy Strait, between the southern part of Fraser Island and the Queensland coast, enters the bay from the south. At the northern end of Fraser Island is Platypus Bay, a sub-area of Hervey Bay. The waters of both Hervey and Platypus Bays are shielded from the prevailing south-east trade winds by Fraser Island.

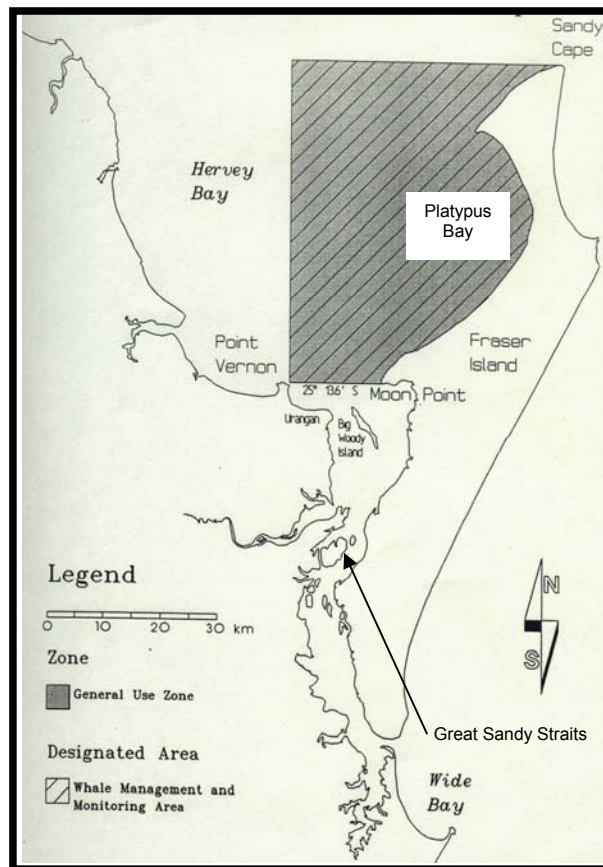
Whales enter the bay between July and October with a peak in August and September (Corkeron *et al.* 1994). Hervey and Platypus Bays provide sheltered areas that are considered important for mothers and calves on their southward migration (Anderson *et al.* 1996).

Hervey Bay Marine Park is bounded in the east by the coastline of Fraser Island north of Moon Point and extends out to the "meridian passing through the easternmost point of Point Vernon at the highest astronomical tide" (25° 136' S) as described in the Hervey Bay Marine Park Zoning Plan (Department of Environment and Conservation 1989). A Whale Management and Monitoring Area designated under the Queensland-regulated *Marine Parks (Hervey Bay) Zoning Plan 1989* includes most of Hervey Bay and Platypus Bay (Figure 6.2). Conditions of use in the Whale Management and Monitoring Area are in force each year, from 1 August to 30 November.

Fraser Island is a World Heritage listed national park. The Cooloola coast, which stretches from Noosa Heads in the south to Tin Can Bay in the north and Fraser Island are known for their long beaches, fishing and four-wheel drive opportunities. They are popular tourist destinations therefore vessel traffic in the area is relatively high. Several commercial fishing and ecotours, barges and ferries take visitors to Fraser Island. In addition many personal motorboats and watercraft traverse the Hervey Bay waters, especially on weekends. In Queensland, commercial whale watching is permitted under the *Nature Conservation (Wildlife) Regulation 1994 (Qld)* or under the *Marine Parks Act 1982 (Qld)*, if undertaken in a Marine Park. Whale watching in Hervey Bay is permitted only within the Hervey Bay Marine Park. In Hervey Bay the number of permits issued by the Queensland Parks and Wildlife Service for whale watching is limited to twenty (P. Corkeron, James Cook University, *pers. comm.* 1998). During the 1989 and 1990 whale watch seasons these twenty permits were all viable.

However, only 16 and 12 permits in each season respectively were active commercial operations. The number of active permits has been decreasing over the years due to the purchasing of competing vessels by other operators (K. Wortel, Queensland Parks and Wildlife Service, *pers. comm.* 1999). Of the remaining viable permits, two were assigned to research vessels and one to the Queensland Parks and Wildlife Service vessel. The other permits were not in use during the time of my study.

Figure 6.3: Hervey Bay Marine Park and Monitoring Area (taken from the Hervey Bay Marine Park Zoning Plan September 1989. Department of Environment and Conservation)

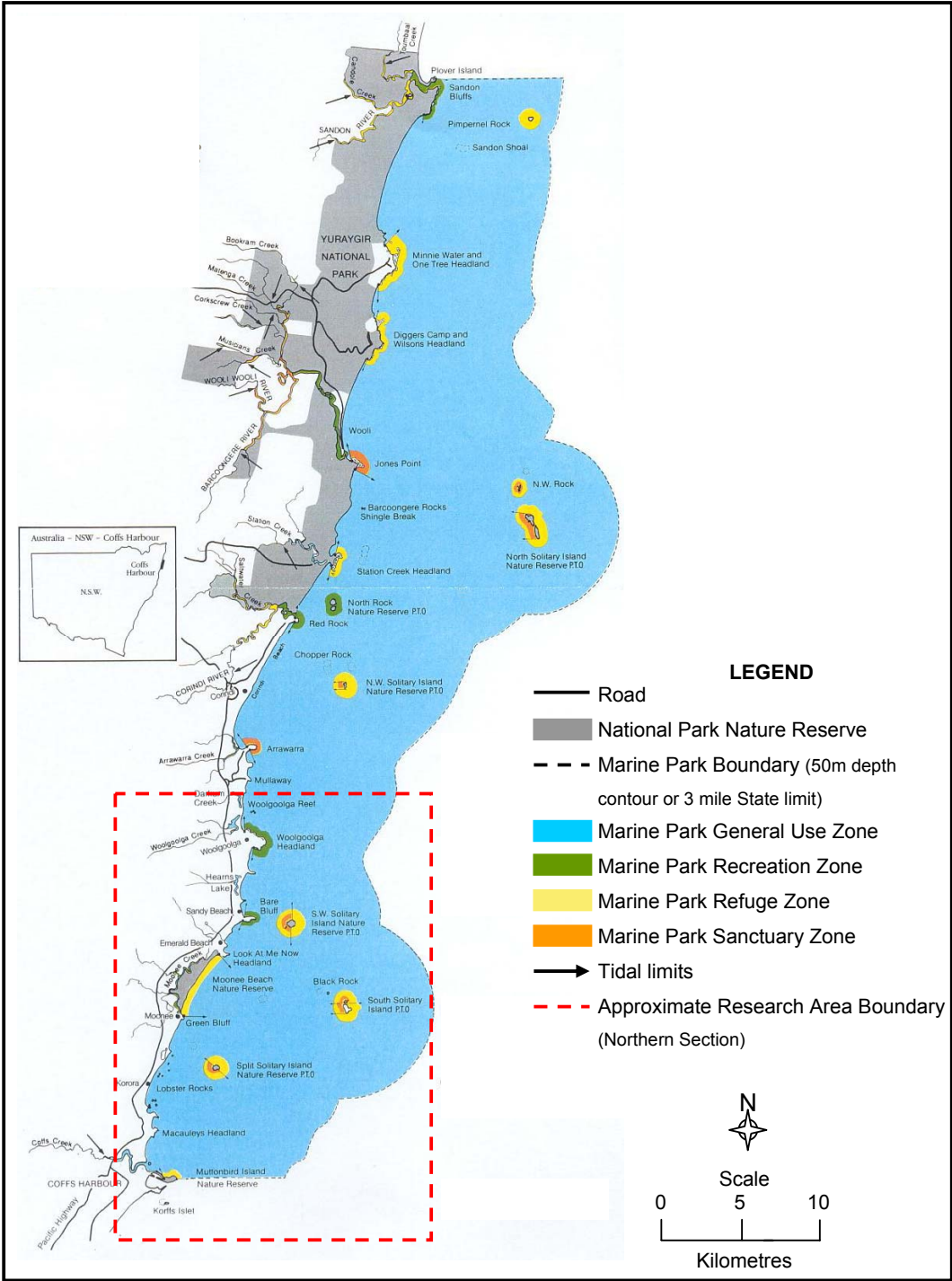


6.2.3 Coffs Harbour, New South Wales

Coffs Harbour is on the northern New South Wales coast at approximately 30°1'S 152°9'E (Figure 6.1). Its waters are unsheltered. There are no shallow reefs or islands to protect the coastline from the prevailing easterly winds. The Solitary Islands Marine Park protects the waters to the north of Coffs Harbour. The Solitary Islands Marine Park starts from the northern coastline of Muttonbird Island (30° 186' S), which forms the northern boundary of the vessel harbour for Coffs Harbour and stretches 75 km to

the north (Figure 6.4). The waters to the south are not protected under any legislation other than that which applies to state waters.

Figure 6.4: A map of the Solitary Islands Marine Park (taken from the Solitary Islands Marine Park Zoning Scheme Map, NSW Marine Parks Authority) and location of the northern section of the data collection area out of Coffs Harbour



Humpback whales are watched both on their northern and southern migrations as they pass within 10nm of shore. Thus whale watching occurs from May until November.

As discussed in Chapter Three, legislation which applies to whale watching in New South Wales, includes: the *National Parks and Wildlife Act 1974 (NSW)*; *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)*. The latter of this legislation came into force after the field component of my research was complete. The NSW National Parks and Wildlife Service manages this legislation.

The NSW Marine Parks Authority has issued permits for approximately 24 commercial vessels as permission to whale watch in the Solitary Islands Marine Park although there is no regulated limit on the number that may be issued (L. Sterling, New South Wales Parks and Wildlife Service, *pers. comm.* 1999). Furthermore, these permits were mandatory for operation within Solitary Islands Marine Park only. Permits for whale watching outside of Marine Park boundaries in New South Wales were not required during the 1998 and 1999 field seasons. In both 1998 and 1999, two vessels concentrating on whale watching operated out of Coffs Harbour. In the same years, two other vessels conducted opportunistic whale watching.

6.3 Field Documentation of Operators' Compliance

Prior to my study, I contacted whale watch operators to gain permission to conduct research from their vessels. I also contacted the relevant staff of the Queensland Parks and Wildlife Service in the Whitsundays, Maryborough and the New South Wales National Parks and Wildlife Service in Coffs Harbour for logistical support.

6.3.1 Field Time and Vessel Access

I conducted a pilot study over a four-day period in Airlie Beach, Queensland in July 1998 to test and refine the methodology and refine the use of equipment.

Most of my research was conducted during the southern migration of humpback whales in Hervey Bay, Queensland and out of Coffs Harbour, New South Wales. A minimum 25-day period was allowed in each major research location (Table 6.1). This relatively long period allowed me to gather data that were representative of the behaviour of the whale watch operators and to reduce possible effects of my presence on the operators' behaviour. There was a maximum of sixteen full- or half- day-tour whale watch vessels operating in Hervey Bay, thus the 25-day period was chosen to

provide me with enough time to access all vessels. Nonetheless, only fourteen vessels (12 in 1998/ 11 in 1999) were accessed in Hervey Bay and two in Coffs Harbour because some vessels were not operating during this time or because the operator refused access.

Table 6.1: Summary of field time

Year	Hervey Bay	# of Days	Coffs Harbour	# of Days
1998	13 August - 30 August 10 September - 20 September	27	23 September - 21 October	29
1999	26 July - 10 September	40	20 September - 05 November	26

6.3.2 Equipment

Vessels: The vessels I boarded were commercial whale watch vessels. They ranged in size from a 10m sail and motor powered catamaran that carried a maximum of 20 passengers to a 30m double viewing level catamaran that carried up to 265 passengers.

The difference in height off the water of my viewing platform on these vessels ranged from 2m to 5m. When measuring the distance from the viewing platform to a pod of whales this height difference contributed to less than 1m deviation in the measurement.

Laser Rangefinder¹: I used a Bushnell Yardage Pro 800 laser rangefinder [precise to 1.0m] to measure the distance from my viewing platform to the focal whale or 2° vessel. This device uses an invisible eye-safe infrared energy pulse (laser) to track the distance of the target. The reading is presented in a digital liquid crystal display. The Yardage Pro 800 has a maximum range to highly reflective targets of 999 metres. It has several modes including scan (which provides continuous distance measurements as multiple targets move through the field of view) and rain (which permits distance measurement in inclement weather). I used scan mode most of the time, but switched to rain mode when required.

I verified rangefinder accuracy using two methods. Firstly, I measured out 100m and 150m along the ground to a tree and a caravan (different reflective surfaces) and

¹ Information sourced from: <http://www.yardagepro.com>; <http://telescopesandbinoculars.com> and <http://outdoorelectronics.com>

measured the distance with the rangefinder. I also went out on the Townsville Volunteer Coastguard vessel and checked the rangefinder measurement to marker buoys and other vessels against the Coastguard vessel's radar. The measurement was always within $\pm 1\text{m}$.

Acquiring a measurement using the laser rangefinder was dependent on weather conditions. Overcast days made it more difficult because of low reflection. Rough water conditions made it more difficult to take a measurement because it was harder to get a fix on the whale. "Dead flat" or "glassy" water conditions also made measurement more difficult because of excessive reflection.

Previous studies have established the effectiveness of the use of laser rangefinders for distance measurements from vessels to whales (Notarbartolo di Sciara *et al.* 1997; Biassoni *et al.* 1998; Baird and Burkhardt 2000; Jahoda *et al.* 2003).

Garmin GPS12XL²: I used a GPS to plot the location and speed of the 1° vessel at two-minute intervals. This instrument features a 12 parallel channel receiver for fast satellite acquisition and tight satellite lock. The GPS 12XL is loaded with navigation information including 106 map datums and seven grid formats, plus user datum/UTM and user grid formats to define map parameters. It has the ability to store 500 waypoints and 20 routes. Because of its parallel multi-channel design, a Garmin GPS12XL is accurate to within 15 metres on average. A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. With four or more satellites in view, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance and distance to destination. Some atmospheric conditions can interfere with the accuracy of the GPS position.

The position on the Garmin GPS12XL was checked regularly throughout trips against the GPS of the vessel I was travelling on at the time. I also checked regularly on the number of satellites that the GPS had locked, ensuring that most of the time there were three or more locked for the reading.

² Information sourced from: <http://www.garmin.com>

Autohelm Hand-bearing Digital Compass³: I used the compass to plot the heading of the 1° vessel and the bearing to the focal pod and 2° vessels. This personal compass uses fluxgate compass technology and microprocessor control. Because it has no fragile moving parts, there are no delays while the compass card settles, giving reliable bearings in any kind of weather. The operator lines up the object of interest through the, zero-parallax pistol sights, clicks the red button, and reads the bearing off the digital display. Basic accuracy is to within $\pm 3^\circ$ and it stores up to nine bearings.

Timer: An Indiglo watch with timer function was used to count down two-minute intervals at which time data was recorded. The timer function can be set to countdown up to 60 minutes, emit a signal and continue counting down.

6.3.3 Data Collection

To evaluate operator compliance, I boarded commercial whale watch vessels for normal whale watch tours. Whale watch tour vessels operated either half-day or full-day tours therefore allowing me to make two trips on the same or different vessels on some days. I boarded vessels only when customer numbers did not fill the vessel. As much as possible, these trips were booked the evening prior to the whale watch trip. I gave vessels and operators arbitrary numbers to allow for analysis and provide for anonymity (Appendix 6).

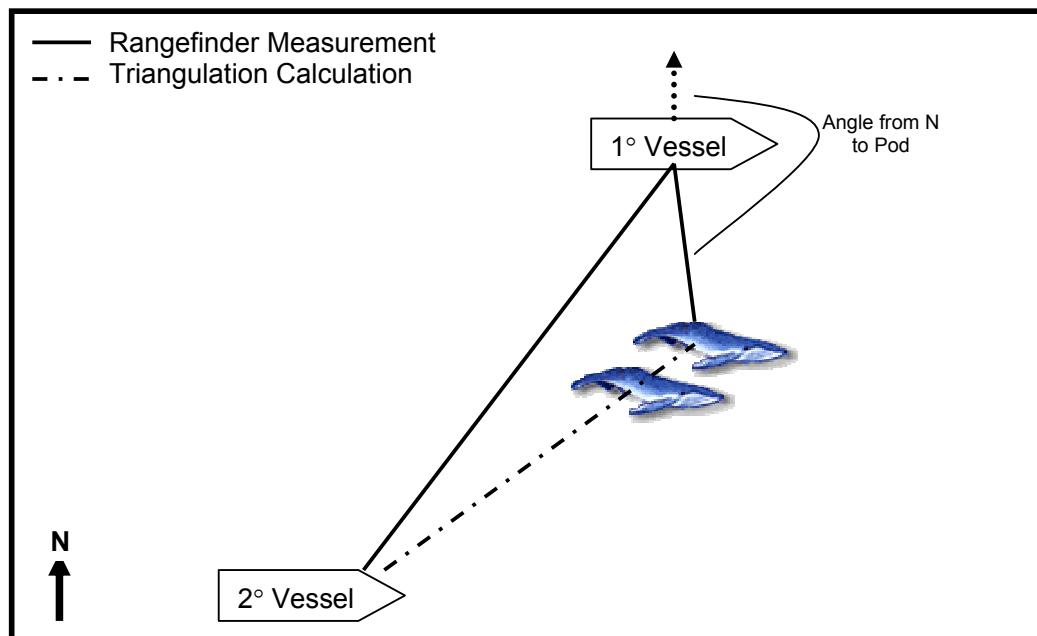
When a whale pod (one or more whales) was sighted, I decided whether or not to start recording. An assistant and I stood on the highest point possible on the vessel within safety limitations. This position was usually out of the vessel operator's hearing range. Recording was initiated when the whale pod was within 1000 metres of the vessel that I was on (1° vessel). The timer was started and emitted a signal every two minutes at which time, I measured the distance (metres) using a laser rangefinder and compass bearings (°) using the Autohelm digital compass to any pods and vessels within approximately 1000 metres of the 1° vessel. I also measured the bearing of the 1° vessel to give an indication its of direction. To standardise the measurement process, I took all distance measurements and bearings. Using past measurements obtained with the laser rangefinder and experience, I estimated the distance if I was unable to obtain a measurement using the laser rangefinder. Measurements were coded to record whether or not the laser rangefinder was used (RF1 – laser rangefinder; RF2 – estimations).

³ Information sourced from: <http://www.ahoycaptain.com>

An assistant saved the time of day and vessel position and speed as a waypoint into the Garmin GPS12XL and recorded the distance and bearing measurements every two minutes (Appendix 6). Vessel position was recorded in Eastings and Northings to simplify calculations to be performed at a later time in Excel 5.0 and speed was recorded in knots. The data collected for the 1° vessel also allowed for the plotting of the vessel path. Compass bearings and distance measurements taken to focal and 2° pods and 2° vessels allowed for the calculation of their positions and plotting respectively. Using the program Arcview, this information was then plotted to show the actual movement of the 1° vessel, whale pod(s) and 2° vessel(s) in relation to each other (Refer Section 6.4.5). A diagrammatic representation of the measurements that were taken is shown in Figure 6.5.

The engine status was also recorded at two-minute intervals as one of three categories: a) motoring - the vessel was actively moving forward; b) neutral - the vessel had been put in neutral and c) off - the engine had been turned off. Other information recorded included: cue – how the pod was sighted (i.e., by personnel on the 1° vessel or as information supplied by another vessel); and pod composition – number of whales in the pod. A comments column allowed for any extra notations such as whale pod behaviour, however behaviour was not taken in detail.

Figure 6.5: A visual representation of compliance measurements taken to allow for compliance calculations and plotting of paths of vessels and whale pods with respect to each other.



Note Angle from North to 2° Vessel was also measured

Unique numbers were given to each whale pod, which were recorded as required to record pods joining or splitting. If the pod was not at the surface at the time the two-minute signal was emitted, only the position, speed and direction of the 1° vessel was recorded. The pod that was the major focus of the 1° vessel was coded as the focal pod. When the focal pod moved away or was deemed “less interesting” than a 2° pod by the vessel operator, the 2° pod then became the focal pod. When the vessel operator decided to move to another pod that had been sighted by another person (operator, private or Parks Service ranger) or to look for another pod, I stopped recording data when the 1° vessel was more than 500m away from the focal pod until the 1° vessel was within approximately 1000m of the next pod. Measurements to 2° vessels commenced and ended when they were within 1000m of the 1° vessel.

The following environmental data were also recorded at half hourly intervals throughout each trip: percent cloud cover (in gradations of 5%); Beaufort Sea State; wind direction and wave height (in gradations of 0.5m) (Appendix 7). These data were recorded as an index of the weather conditions that may affect an operator’s ability to comply with the regulations. Loss of data through power failure, no sightings of whales and other associated problems contributed to some trip data being unusable. Furthermore, two trips made on a third vessel from Coffs Harbour in 1999 were discarded because there were too few measurements for analysis.

The data collected were used to test the following hypotheses with regards to whale watch operator compliance to the approach distance regulations and guidelines:

- 1) Whale watch operators comply with the minimum approach distance regulations.
- 2) There is no correlation between an operator’s level of vessel operation experience and percent level of distance compliance.
- 3) There is no correlation between environmental factors and percent level of distance compliance.
- 4) There is no correlation between attitudinal compliance and actual percent level of distance compliance.
- 5) Whale watch operators comply with the speed conditions when within 300m of a whale pod.

6.3.4 Justification of Field Methodology

Observations from the whale watch vessels were made because there was no appropriate land based observation point. It is my opinion that observation from whale watch vessels for the study of compliance is more accurate than a land based position because of the short distances involved. The use of whale watch vessels as observation platforms for compliance research has its advantages and disadvantages. Firstly, it is possible to conduct research on a regular basis (i.e. every day that a whale watch vessel goes out to sea), secondly, it reduces the potential stress on observed whales that another vessel may cause, thirdly, the researcher is on the vessel from which measurements are required, increasing the accuracy and fourthly, the whale watch tourists are able to observe research and have the possibility to ask questions. Furthermore, if a researcher can build a positive relationship with vessel operators during their research and follow this up by providing feedback regarding the results of their study to the operators then this feedback may prove to be a significant contribution to future cooperation to ensure sustainability of the industry.

The main disadvantage of this approach is that the presence of an observer on board may increase the likelihood of unrepresentative data if operators are more likely to comply when they know they are being observed. However, my data indicated that for pods focal to both the 1° and 2° vessels, the 1° vessel (which I was on) was consistently closer to the focal pod, which is the opposite to the result expected if my presence was causing the operator to reduce his approach distance. Furthermore, if I was to affect the operators' manoeuvres it would occur for the entire period I was at the study site. My observations led me to believe that although operators may have been slightly more cautious when I was on their vessel there were no great changes in their usual operation of the vessel. Finally, operators were assured that my data collection was confidential therefore, there should have been no fear of sanctions. Unfortunately, I was unable to conduct research on some vessels if they were full of paying passengers and some operators did not allow compliance research on their vessels. However, I consider that this limitation did not significantly affect my study.

6.4 Data Compilation and Analysis

Data were entered directly from the field data sheets and from the memorised waypoints in the Garmin GPS12XL into Microsoft Excel 5.0 at the end of each day. Analysis was performed using Microsoft Excel 2000 and SPSS 10. Selection of the appropriate statistical test was based upon preliminary testing of the data sets for normality and advice from a professional statistician.

The distance at which a vessel operator must slow his vessel to a “no wake” speed when approaching a whale pod is 300m, while the minimum approach distance is 100m. Using the position data (Easting and Northing) obtained for the position of the 1° vessel and the distances and bearings to focal pods, 2° pods and 2° vessels, a triangulation calculation was performed in Excel 2000 to obtain the position of each respectively. It then became possible to calculate the distance between focal pods and 2° vessels allowing the determination of overall compliance by 2° vessel operators. The total number of rangefinder and estimated measurements was counted, as well as the total number of rangefinder only values. The number of rangefinder only values that were below 100m as a proportion of the total rangefinder values when the pod was less than 300m from the 1° vessel was then used to calculate the percentage distance compliance. I calculated this percentage as a crude index of compliance for each operator on each trip on which I was able to obtain four or more rangefinder readings to the focal pod (Appendix 6). I was then able to investigate the influence of the modal Beaufort scale measure for each trip and the average percent cloud cover for each trip on distance compliance. Results from Hervey Bay and Coffs Harbour will be discussed separately because of the difference in the number of operators making it inappropriate to compare results between the two areas.

When within 300m of the focal whale, vessels should travel no faster than 4 knots. Using the speed recorded at two-minute intervals by the GPS, I was able to calculate the percentage of time that vessels were travelling at greater than 4 knots when they were closer than 300m to a whale pod. This metric was my index of speed compliance.

6.5 Results

6.5.1 Overall Operator Compliance to the Distance Condition

Hervey Bay

Of a planned 67 days in Hervey Bay, the conditions (weather conditions and vessel availability) to conduct vessel observations occurred on 51 days. I went out on a total of 57 whale watching trips and collected four or more rangefinder measurements to the same pod (allowing them to be used for distance compliance calculations) on 43 trips. I encountered 214 pods and obtained four or more rangefinder recordings on 94 pods (Table 6.2).

Of the two-minute recordings from the 1° vessel to a focal pod when the vessel was within 300m of the pod, 38% were less than the 100m minimum allowed distance. Secondary vessels were measured within the 100m minimum allowed distance in 27% of the two-minute recordings that were within 300m of the pod. In many instances, the 1° vessel was the first vessel to be in contact with a focal pod, therefore it is likely that this vessel had priority. At other times the 2° vessel was not focused on the same focal pod as the 1° vessel but was still close enough to be included in the measurements.

Coffs Harbour

Of a planned 55 days in Coffs Harbour, the conditions (weather conditions and vessel availability) to conduct vessel observations occurred on 44 days. I went out on a total of 60 whale watching trips and collected four or more rangefinder measurements to the same pod (allowing them to be used for compliance calculations) on 40 trips. I encountered 85 pods and obtained four or more rangefinder recordings on 49 pods (Table 6.2).

Of the two-minute recordings from the 1° vessel to a focal pod when the vessel was within 300m of the pod, 25% were less than the 100m minimum distance (Table 6.2). Secondary vessels were measured within the 100m minimum distance for 16% of the two-minute recordings that were within 300m of the pod. The two major operators did not cooperate or associate with each other on or off the water. They were seldom near the same pod, therefore, 2° vessels were mostly vessels not dedicated to whale watching.

6.5.2 Overall Operator Compliance to the Speed Condition

Hervey Bay

I was able to obtain 1446 speed readings when the range-finder distance was 300m or less. Of these 196 readings indicated that the vessel was going faster than 4 knots i.e., 14% of the time. Furthermore, although vessels should not be within 100m of a whale pod, I found that of the 581 readings where the vessel was within the 100m, the vessel was travelling at >0 knots 52% of the time and >4 knots 8% of the time.

Coffs Harbour

I was able to obtain 574 speed readings when the range-finder distance was 300m or less. Of these 76 readings indicated that the vessel was going faster than 4 knots i.e., 13% of the time. Furthermore, although vessels should not be within 100m of a whale pod, I found that of the 141 readings where the vessel was within the 100m, the vessel was travelling >0 knots 94% of the time and >4 knots 13% of the time. The greater percentage of time at more than 4 knots for Coffs Harbour may be explained by the fact that because whales are being watched in the open ocean and often are moving in one direction, it would be unsafe for the vessels watching whales off Coffs Harbour to shut down their engines. The vessel operators off Coffs Harbour did tend to put the vessel into neutral when the pod was within 100m.

Table 6.2: A summary of the data collected about whale watch activities in Hervey Bay and Coffs Harbour in 1998 and 1999.

Description	Total Hervey Bay	Total Coffs Harbour
Total # of Days	67	55
Total # of Research Days	51	44
Total # of Trips	57	60
Total # of Usable Trips	49	45
Total # of Trips used for % Compliance Calculations	43	40
Total # of Pods Encountered	214	85
Total # of Pods Encountered with ≥ 4 RF Measurements [for plotting data]	94	49
Total # of measurements from 1° vessel at <300m to the focal pod	2078	1076
Total # of RF measurements from 1° vessel to the focal pod	1502	609
Percentage of measurements from 1° vessel at <300m to the focal pod under 100m	38%	25%
Total # of measurements from 2° vessel at <300m to the focal pod	1608	405
Total # of RF measurements from 2° vessel to the focal pod	972	180
Percentage of measurements from 2° vessel at <300m to the focal pod under 100m	25%	16%
Percentage of speed recordings at <300m, >4knots	14%	13%
Percentage of speed recordings at <100m, >4knots	8%	13%
Percentage of speed recordings at <100m, >0 knots	94%	94%

6.5.3 Visual Representation of Actual Operator Compliance

The plotting of the path of the 1° vessel and whale pods and 2° vessels with which the 1° vessel comes into contact with, provides a visual representation of how an interaction occurred. By being able to see the position of each (vessel or pod) at a specific time, it can be determined whether the vessel or the pod made the approach. This provides a visual perspective on the actual compliance by the operator that can not be shown by the statistical data. I present a case study (following pages 130-135), as there are too many plots to include them all here.

Introduction: The position at two-minute intervals of a 1° vessel and those of pods and 2° vessels that it came into contact with over a 66-minute period were plotted to give a visual representation of compliance by operators (Figures 6.6 – 6.10). An interaction that involved several 2° vessels and the merging and splitting of pods was chosen to show the complexity of some interactions and the difficulty with proving the non-compliance or otherwise of an operator.

Major Points:

- The individual positions of the 1° vessel, whale pods and 2° vessels at two-minute intervals were plotted to give an indication of positions over the entire 66-minute period (Figure 6.6).
- During the 66-minute period, the focal pod changed composition five times (resulting in pods 1, 2, 3, 4, 5 & 6)(Figure 6.6). Four 2° vessels came within 1000m of the 1° vessel throughout the 66-minute period.
- The path, including direction of movement, of the 1° vessel and the focal pod(s) were plotted over the entire 66-minute period to show the interaction between these two major variables (Figure 6.7).
- The focal pod was first sighted and recording of data began at 1117 hours. At 1223 hours the 1° vessel operator was informed of the location of another pod, therefore this vessel left the area and recording was stopped (Figure 6.7).
- Based on the splitting and joining of the focal pod, I divided the plot into three time periods to show the interaction of the 1° vessel, pods and 2° vessels in more detail (Figures 6.8; 6.9 and 6.10).

Conclusions:

- To interpret the plot, one must also have the background information that creates the plot (i.e., time, distances measured, distances calculated).
- To determine whether there has been a breach in compliance one must look at the position of each of the interacting variables (vessels & whales) in relation to time and the distance from each other at these times.
- It can be seen from the times and relative positions of the vessels and the whales that the operators of the 1° and 2° vessels never manoeuvred their vessels to within 100m of a whale at the surface.
- The overall conclusion is that of compliance by the 1° and 2° vessel operators during this 66-minute period.

Figure 6.6: The positions of the focal pod(s) and 2° vessels in relation to the 1° vessel during a 66-minute period. The complexity of interactions during one recording period can lead to confusion, therefore must be divided into shorter time periods (Refer Figures 6.7-6.10).

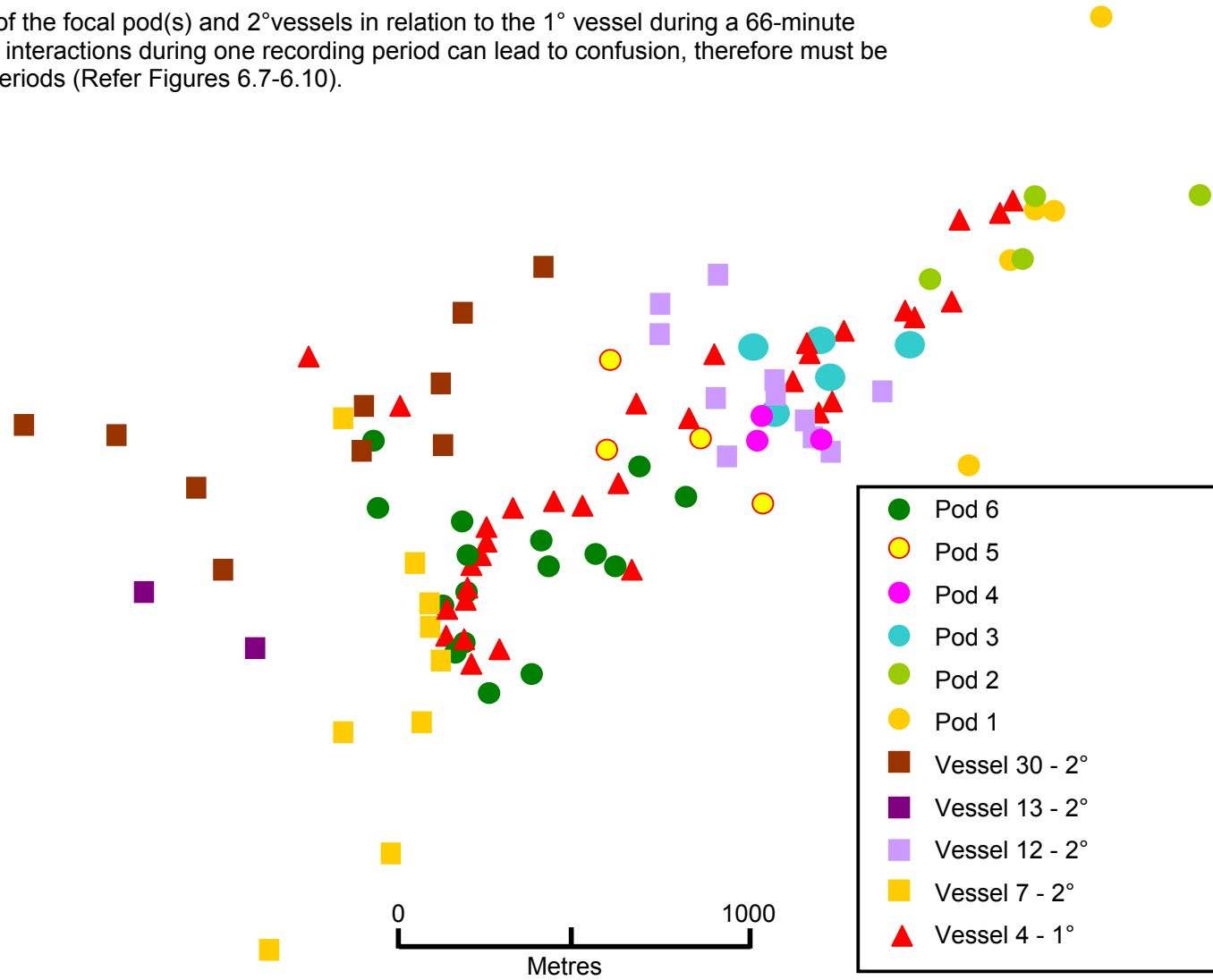


Figure 6.7: The path of the 1° vessel and the focal pods during a 66-minute period. When pods 1 and 2 are initially detected the 1° vessel moves towards them (towards the upper right), then turns around and continues to move with the pod(s) as they converge and diverge (towards the bottom left).

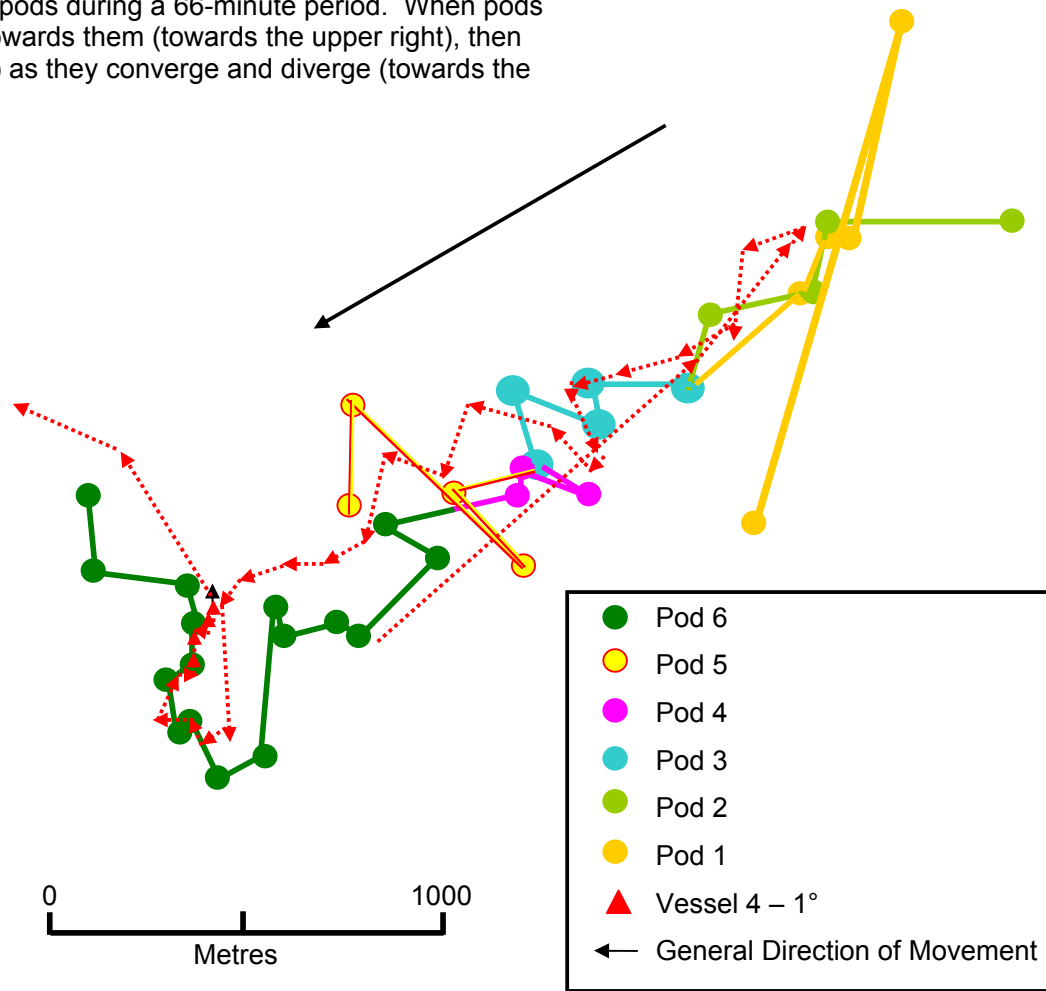


Figure 6.8: Time Period 1117 hours – 1125 hours. The paths of the 1° vessel and focal pods 1 and 2. 1° vessel 4 initially moves toward pods 1 and 2 (towards the top right), which were at least 1000m away. 1° vessel 4 then turns around and moves with the pods (towards the bottom left). At 1123 hours Pods 1 and 2 were 60m and 155m from the 1 vessel respectively, however, vessel speed was noted as 0.0knots indicating that the pods had moved toward the vessel. Between 1125 hours and 1127 hours pods 1 and 2 joined to form pod 3 (Refer Figure 6.9).

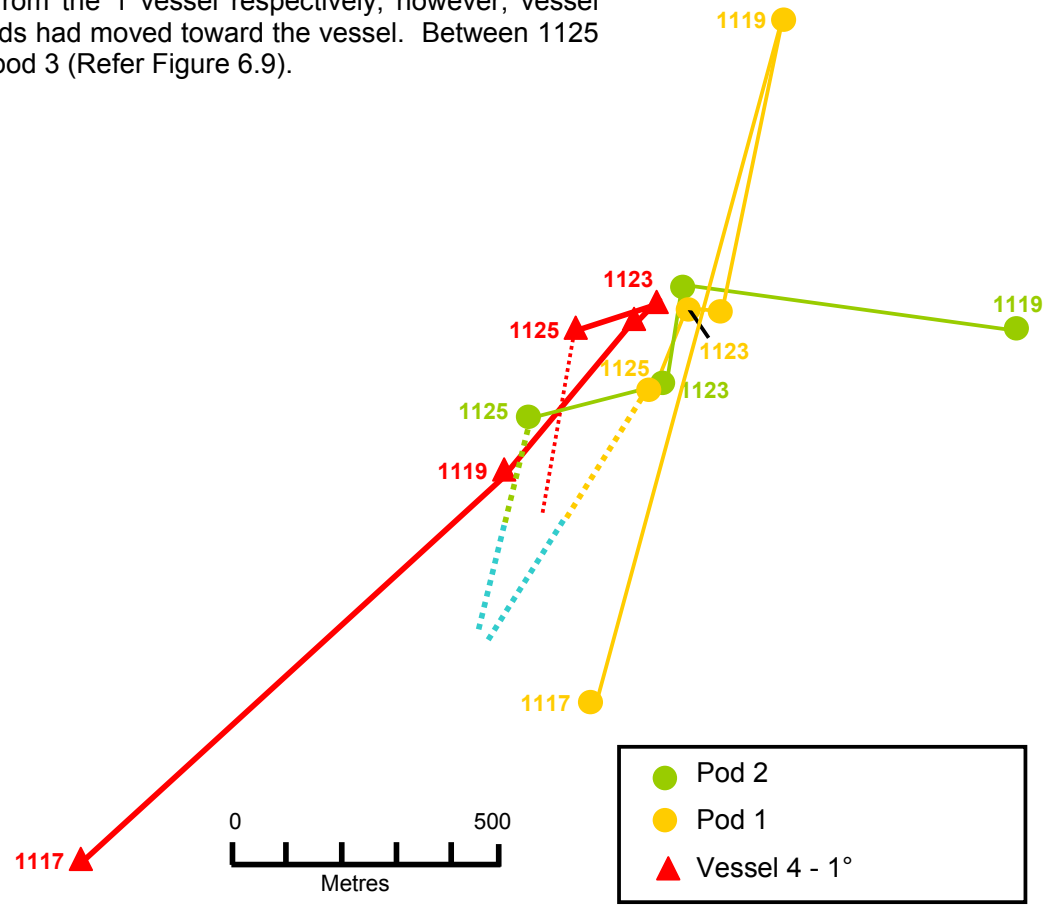


Figure 6.9: Time Period 1127 hours – 1145 hours. The paths of the 1° vessel, focal pods 3, 4 and 5 and 2° vessel 12. 1° vessel 4 moves with pod 3 (towards the bottom left) and then with pod 4 when pod 3 splits (between 1137 hours and 1139 hours) into pods 4 and 6. 2° vessel 12 first comes within 1000m of the 1° vessel at 1129 hours and moves quite erratically while trying to view pods 3 and 4. 2° Vessel 12 leaves the area after 20 minutes.

At 1137 hours vessels 4 and 12 are 168m and 186m from focal pod 3 respectively. However, between 1137 hours and 1139 hours the vessels and pod 4 moved towards each other, which resulted in vessels 4 and 12 being only 80m and 15m from pod 4 respectively.

Between 1145 hours and 1147 hours a single whale joins pod 4 to form pod 6. (Refer Figure 6.10). Pod 5 is not seen after 1145 hours.

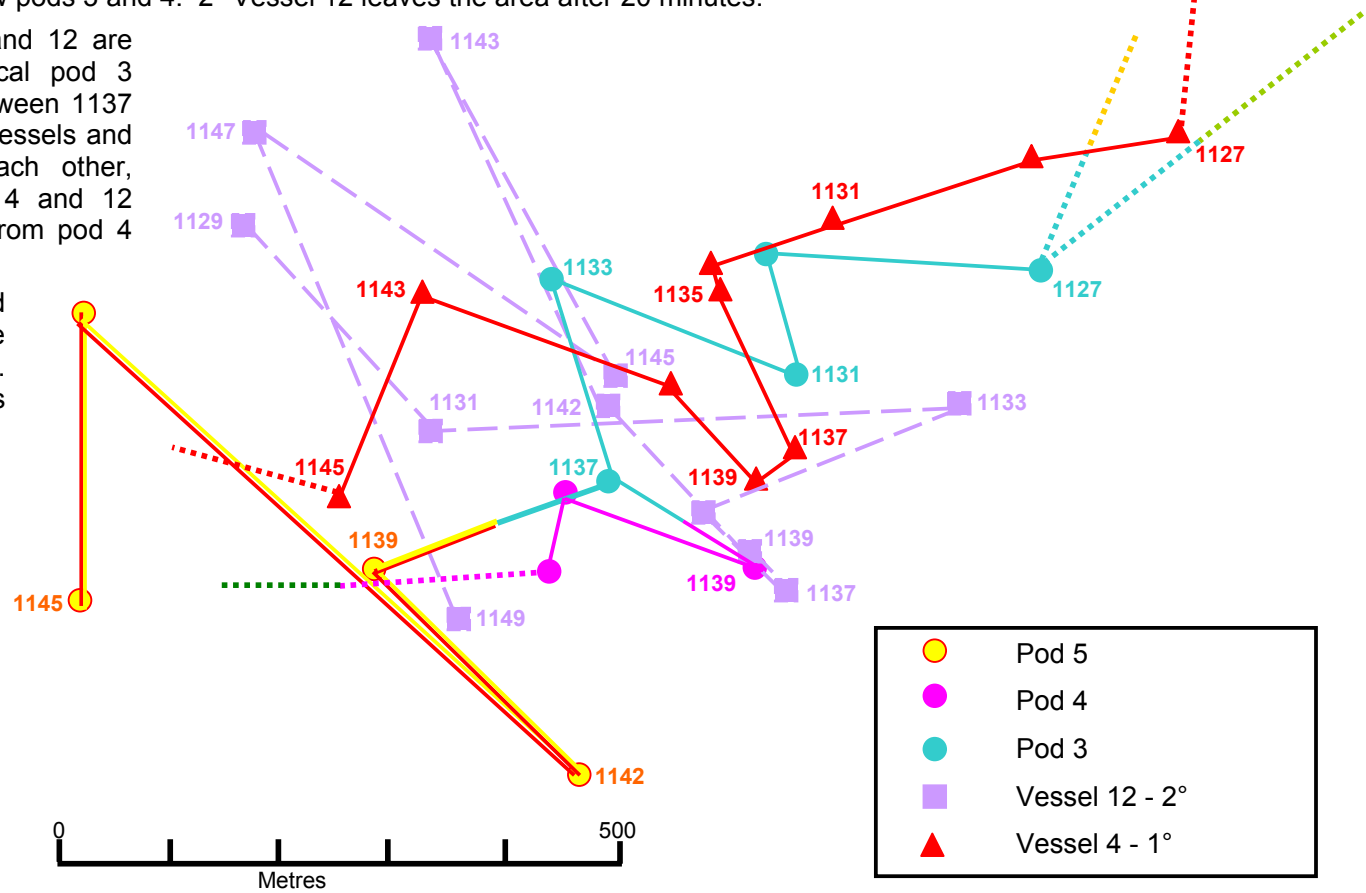
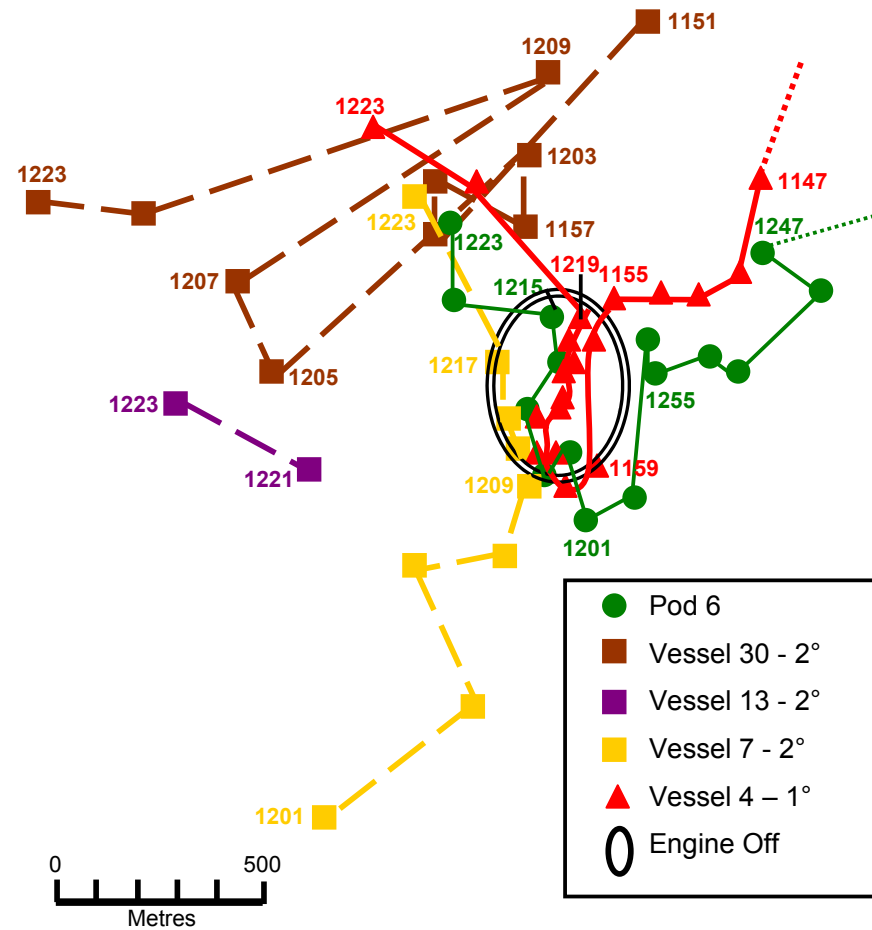


Figure 6.10: Time Period 1147 hours – 1223 hours. The paths of the 1° vessel, focal pod 6 and 2° vessels 7, 13 and 30. 1° vessel 4 moves with pod 6 that was formed by a sole whale joining pod 5 (Refer Figure 6.9). 2° vessel 13 traversed the area within 1000m of the 1° vessel between 1221 hours and 1223 hours. 2° vessels 7 and 30 first came within 1000m of the 1° vessel at 1201 hours and 1151 hours respectively. Vessel 30 was never closer than 350m to pod 6, therefore must have been focusing on a different pod. Vessel 7 did not approach any closer than 104m to pod 6. At 1203 hours the operator of 1° vessel 4 turned off the engine. It remained off for 14 minutes (circled). During this time pod 6 was between 5m and 60m from the 1° vessel indicating a “mugging” of the vessel by the pod. At 1223 hours the operator of the 1° vessel was informed of another pod and left the area.



6.5.4 Compliance of Individual Operators

I was able to conduct observations on three or more occasions for only eight operators (Table 6.3). Mean percentage non-compliance with the distance criterion for these operators ranged from 17% to 59%. Individual operators had greatly variable rates of non-compliance that did not correlate with the number of years of general vessel ($P=0.686$) or whale watch vessel ($P=0.117$) operation experience. Percentage non-compliance may have been influenced by the behaviour of the focal pod i.e., whether the pod actively approaches the vessel or not. My observations suggest that both experienced and inexperienced operators complied with the distance criterion because they understood that a wrong approach would not give the viewing public the result that they wanted i.e., a close encounter with a whale pod.

Table 6.3: Levels of commercial vessel and whale watch vessel experience and percentage non-compliance with the distance criterion as defined above of eight operators from Hervey Bay and Coffs Harbour in 1998 and 1999.

Operator Number	# Years Vessel Operator	# Years Whale Watch Operator	# of Usable Trips	Mean % Non-Compliance [using RF values only] (Range)
1	16	6	4	43 (0-71)
6	10	4	3	32 (27-41)
9	6	5	3	59 (40-93)
14	8	8	3	23 (5-33)
17	20	12	5	45 (15-90)
19	10	9	6	41 (25-61)
25	30	4	37	17 (0-47)
26	10	3	10	17 (0-36)

6.5.5 Effect of Environmental Factors on Overall Operator Compliance

Hervey Bay

I combined the data from trips by the same operator on the same day, therefore, 43 trip data sets were used for these calculations. Modal sea state and modal percent cloud cover were used as indices of the weather conditions. The likelihood of an operator complying with the distance regulation requiring the vessel to be at least 100m from the focal whale was independent of sea state or cloud cover (Table 6.4). This statement

holds true for (1) only rangefinder measurements or (2) all measurements (rangefinder and estimated). Scatter plots representing these results are presented in Appendix 8.

Table 6.4: The relationship between percentage non-compliance and Beaufort sea state or percentage cloud cover for 43 trips in Hervey Bay.

		Beaufort Sea State	Percent Cloud Cover
% Compliance Using: Rangefinder Values	Correlation Coefficient	0.020	0.010
	Sig. (2-tailed)	0.899	0.948
	N	43	43
% Compliance Using: Rangefinder & Estimated Values	Correlation Coefficient	0.088	-0.030
	Sig. (2-tailed)	0.574	0.849
	N	43	43

Coffs Harbour

I combined the data from trips by the same operator on the same day, therefore, 40 trip data sets were used for these calculations. The likelihood of an operator complying with the distance regulation requiring the vessel to be at least 100m from the focal pod was independent of sea state or cloud cover (Table 6.5). This statement holds true for (1) only rangefinder measurements or (2) all measurements (rangefinder and estimated). Scatter plots representing these results are presented in Appendix 8.

Table 6.5: The relationship between percentage non-compliance and Beaufort sea state or percentage cloud cover for 40 trips in Coffs Harbour.

		Beaufort Sea State	Percent Cloud Cover
% Compliance Using: Rangefinder Values	Correlation Coefficient	0.143	0.014
	Sig. (2-tailed)	0.380	0.931
	N	40	40
% Compliance Using: Rangefinder & Estimated Values	Correlation Coefficient	0.137	0.155
	Sig. (2-tailed)	0.401	0.340
	N	40	40

6.5.6 Relationship between Attitudinal and Actual Distance Compliance

I had both vessel and questionnaire data for eight operators. Of these, I had data for two or more trips with seven operators (Table 6.6). The seven operators made 53 trips that could be used for analysis. On a 20 to 100 scale (100 being more agreeable) the

attitudinal compliance scores ranged from 64 to 85 with a mean and standard deviation of $76.5SD\pm 6.0$. All except one of the operators returned a score of 71 or above indicating a medium level of agreement with the guidelines. There was no relationship between the attitudinal compliance score and the mean actual percentage non-compliance ($P=0.162$).

Table 6.6: Attitudinal compliance score and actual percentage of non-compliance with the distance regulation for seven operators who had been observed by me and had answered the questionnaire.

Operator Number	Attitudinal Compliance Score	Mean Actual Percentage of Non-Compliance (Range)
1	85	43 (0-71)
9	77	59 (40-93)
10	75	25 (16-34)
16	81	51 (37-65)
24	78	32 (25-38)
25	77	17 (0 – 47)
26	64	17 (0-36)

6.6 Anecdotal Observations Contributing to Compliance Research

During my observations on the whale watch vessels, I recognised three categories of whales with respect to their behaviour around vessels:

- (1) Whales that apparently avoid vessels. The percentage of whales in this category is impossible to quantify from vessel studies because they are not seen, except possibly at extreme distances ($>2\text{nm}$). Such whales may be observed from land-based field sites;
- (2) Whales with high site fidelity, whether for rest (such as a bay) or on the migratory path and therefore tolerate the presence of vessels. These whales can be divided again into two groups:
 - a) those that tolerate vessels to a certain distance and then move off; or
 - b) those that tolerate vessels and allow the close approach or approach the vessel when it is within a certain distance. This distance can be different for individual whales;
- (3) Whales that actively approach vessels, such as those that may have become habituated to vessels or curious juvenile whales. In my opinion, this third

category is the primary focus of the whale watch industry. Further research would be required to define the proportion of the population in each of these categories.

A “mugging” of a whale watch vessel occurs when a whale or pod of whales continually surface within 50m of a vessel (most often within 10m), sometimes circling the vessel or going under the vessel and from side to side. Although the whale or pod is within the 100m minimum limit, the operator could not be considered to be in violation of the regulations as the whale had approached the vessel. Direct violations of the approach regulations occurred in these instances however, as the operator of the vessel being mugged would often call another vessel in to “take the whales off his vessel” so that he could return to port. When called in, the second operator would often approach closer than the 100m minimum approach limit. The whales would then approach the second vessel and the first vessel (after starting the engine at least 100m away) would slowly leave the area.

Furthermore, vessels within the 300m caution zone sometimes went faster than the recommended four knots to “keep up with” the whales, especially on the migration route where the whales were travelling at a greater speed. In these cases, if the operator had remained at the recommended four knots, he would not have been able to have an extended encounter with the pod.

6.7 Discussion

The hypotheses as stated previously were:

- 1) Whale watch operators comply with the minimum approach distance regulations.
- 2) There is no correlation between an operator’s level of vessel operation experience and percent level of compliance.
- 3) There is no correlation between environmental factors and percent level of compliance.
- 4) There is no correlation between attitudinal compliance and actual percent level of compliance.
- 5) Whale watch operators comply with the speed conditions when within 300m of a whale pod.

The 100m minimum approach distance was breached by the 1° vessel 38% of the time in Hervey Bay and 25% of the time in Coffs Harbour. However, it appears that the behaviour of the whales has an important role in this interaction. Plotting of the vessel-whale interactions indicated that whales often approached the vessels rather than vessel approaching the whales. Exact statistical values cannot be obtained from the plots as they only provide a visual interpretation of the vessel-whale interaction.

I estimated that a much lower percentages of 2° vessels within the 100m minimum approach distance i.e., 27% for Hervey Bay and 16% in Coffs Harbour. This may only be a reflection of the fact that the 1° vessel was the only vessel with a focal pod for extended periods of time or that the 2° vessel was focussing on a different pod.

Environmental factors such as Beaufort sea state or percentage cloud cover apparently had no influence on my index of operator distance compliance. There was also no correlation between the number of years an operator was experienced in operating a commercial or whale watch vessel and his compliance with the distance guidelines. This may be a true reflection of the situation since whale watch excursions are usually restricted to days with calmer weather. However my anecdotal observations suggest that experienced operators can manoeuvre their vessels in the appropriate manner, while less experienced operators are more cautious while manoeuvring their vessels. Small sample sizes of 43 and 40 cases in Hervey Bay and Coffs Harbour respectively for the effects of environmental factors give the result weak power. This is also true for the extremely small sample size of eight for the effect of the number of years of vessel operation. Nonetheless, the behaviour of the whales being observed can not be ruled out as a factor influencing compliance.

There was no correlation between an operator's attitudinal compliance and their actual compliance with the distance regulations. Again, I had only a small sample size (seven) to investigate this link therefore this may not be a true reflection of the situation. However, as discussed in Chapter Five, operators were found to have a positive attitude towards complying with the guidelines but did not perceive that non-compliance to the guidelines could negatively affect anyone or the whales. It is doubtful whether this perception extends to potential affects on whales. Since the operators in this group had a medium level of agreement with the guidelines and they have relatively good levels of compliance (i.e., low levels of non-compliance or non-compliance due to approach by the pod) I suggest that the behaviour of the whales is an important influence in the compliance of operators with the guidelines.

I estimated that the 4knot speed condition was breached 14% of the time in Hervey Bay and 13% of the time in Coffs Harbour. The whale pods being observed from Coffs Harbour were often travelling (versus resting in Hervey Bay), therefore, the operators may have been “keeping up with” the whales. The fact that operators from Coffs Harbour were also travelling at greater than 0knots when within 100m of a pod somewhat confirms that they are trying to stay with the pod. One operator stated that he thought that it was more important to stay at a steady speed than move away to at least 100m. Therefore, once the vessel was in parallel with a pod he would most likely remain at a constant speed regardless of the distance to the pod. I consider that it is more of a concern, however, that for 8% of the time in Hervey Bay and 13% of the time off Coffs Harbour, vessels were travelling at greater than 4 knots when within 100m of a pod.

Although the behaviour of whales can't be “controlled,” a precautionary approach to continued sustainable whale watching would preclude reducing or removing the 300m precautionary zone and 100m minimum limit. These limits, as well as other guidelines or regulations already in place (e.g., speed limits) should remain in place as we may never be able to fully understand the short or long term impacts on individual whales and whale populations potentially caused by whale watching. However, my research shows that infringements of the distance regulations will be difficult if not impossible to detect and therefore enforce. I suggest that operators should be required to use a pair of Laser Rangefinders onboard their vessel to assure that they remain outside the minimum distance limit when this is within their control.

Chapter Seven

Whale Watch Operator Perceptions of and Actual Compliance with the Australian National Guidelines: Management Implications

"In its ideal form, marine ecotourism involves a symbiotic relationship between tourism and the natural marine and coastal environment. As such, a particular challenge lies in addressing the planning problems that stand in the path of genuinely sustainable marine ecotourism operations."

Wilson (2003)

7.1 Introduction

Guidelines and regulations are expressions of one of the management strategies used to address the challenge described in the above quote. Operator perceptions of and compliance with such strategies can influence their success and thus the ability for an ecotourism industry, in this case the whale watch industry, to be truly sustainable.

This chapter discusses the results of this thesis in the context of the conceptual framework outlined in the early chapters. I review the significant findings of my research, discuss the practical value of the conceptual and practical components of my findings for Australian whale watching, and provide recommendations for future research and management of whale watching in Australia and other areas where whale watching is being developed as sustainable ecotourism.

7.2 Whale Watching, Compliance and Sustainability

The rapid pace at which the whale watch industry has developed since its beginning in the USA in the early 1950s (Hoyt 2000) has played a major role in the complexity of implementation of appropriate guidelines or regulations. The pace of development of the industry in various jurisdictions in countries such as Australia has made coordination across jurisdictions difficult and has outpaced the capacity of research to inform management. As far as I am aware there is not an area in the world where whale watch guidelines have been set up simultaneously with the onset of the industry,

although in some areas guidelines have been developed shortly afterwards. In some areas, especially in undeveloped countries, whale watching is still taking place in a completely unregulated manner.

As a relatively new industry in Australia, whale watching provides new challenges for management as a result of the constraints of the marine environment and potential impacts on the species being observed. Furthermore, there is arguably no species of whale for which we have the background knowledge (life history, behavioural ecology, distribution and abundance) to understand fully the potential impacts of whale watching as a basis for developing appropriate management strategies. Furthermore, many populations that are the focus of whale watching are in the recovery phase after excessive whaling caused severe decreases in their numbers. This leads to a further challenge in determining the short and long-term effects of whale watching on these recovering populations because their recovery rate in the absence of whale watching is unknown: there are no controls for the “whale watching experiment”.

The management of whale watching developed with the shift in Western values of whales from “commodities” to “lovelies” (sensu Caughley 1985). Countries such as Japan and Norway still consider that both uses of whales are legitimate although the IWC did not recognise whale watching as a legitimate use of whales until 1993.

Management tools for whale watching throughout the world may include guidelines, regulations and policies that limit numbers, type, size and speed of vessels, approach distances and speeds, approach methods/ directions etc. Individual states and countries have implemented guidelines or codes of conduct since the onset of whale watching in the early 1950s (Refer Section 2.9.4). Regulations have been introduced in some jurisdictions. Some management strategies have been designed specifically for certain species (Ritter 1996) e.g., the humpback whale, which was taken to the brink of extinction by whaling and must be managed sensitively. Other regulations are more generic (Refer Appendix 1).

The implementation of a management framework is indicative of the fact that society perceives such a framework as defining acceptable behaviour. Most research on whale watching has focused on the behaviour of the whales rather than the behaviour of operators even though it is the operators that are being managed. However, some non-compliance by operators has been demonstrated (e.g., Bryden *et al.* 1988; Smith

1997). Knowledge is required regarding reasons for operator non-compliance. In this thesis, I have aimed to address this gap.

7.3 Legislation, Attitudes and Compliance

As stated in Chapter One, the overall aim of my research was to examine the effectiveness of the management measures implemented to reduce impacts on whales that are the focus of the whale watching industry. This was achieved by:

- (i) reviewing current regulations and guidelines implemented throughout Australia;
- (ii) evaluating Australian whale watch operators attitudinal compliance with the National whale watch guidelines; and
- (iii) documenting the actual compliance of whale watch operators with the guidelines/ regulations on approach distance and speed.

I document how I addressed each of these aims below.

7.3.1 Review of the Australian Whale Watch Management Framework

Implementation of a management framework is usually initiated by a particular interest group (e.g., NGO). Input is then sought from other groups (e.g., government, industry). Guidelines or Codes of Conduct tend to be the starting point for management intervention as they are easy to implement and modify and may set the foundation for acts or regulations. Without appropriate consultation stakeholders usually question the appropriateness of such a framework. The management of whale watching lends itself to the implementation of strategies that aim for sustainability, however the path to achieve this desirable end seems to be littered with disagreement on the definition of ecological sustainability (See Chapter 2).

The development of management has moved from strictly preventative (e.g., restricting movement or access etc.) to educational (i.e., providing the rationale for such initiatives; refer Chapters 2 and 4). A combination of proactive (i.e., inspections) and reactive (i.e., prosecution) enforcement has been suggested as the most effective means of implementing management (Duffus & Dearden 1993; Orams 2000; Reynolds & Braithwaite 2001). The effectiveness of guidelines has been questioned (Davis 1999) and regulations have been suggested for appropriate management (Parsons & Woods-Ballard 2003), as there has been a failure by some operators to adhere to non-enforceable guidelines.

The decision to regulate the minimum distance that a vessel may approach a whale has attracted considerable debate. Many argue that due to potential detrimental impacts on the whales, vessels should not be allowed to approach the whales closer than 100m. However, this is an arbitrary distance without scientific justification. There is disagreement over whether or not whale watch tourists want to get closer to whales than already permitted (Muloin 1998; Orams 2000) but it can be seen from advertising brochures (Refer Section 3.3) that operators perceive a marketing advantage in positioning their passengers close to whales. It has also been suggested that different management strategies are required for commercial versus private whale watchers. Licensing of commercial operators is feasible due to the low number that deliberately approach whales on a regular basis while education is viewed as a more appropriate method of indirect control of the far greater number of private operators each of whom approaches whales opportunistically.

As described in Chapter Three, guidelines or regulations on operation of commercial vessels are implemented because of their potential impacts on whales, most of which are yet unmeasured. Some may not be quantifiable. Australian legislation and policy development mirrored what was occurring in the USA (refer Chapter 2), mainly progressing from management of consumptive uses of whales (i.e., whaling) to non-consumptive interactions with whales. However with regard to the development of specific legislation for whale watching, Australia is ahead of most other countries.

In Australia, at the Commonwealth level, the *Whale Protection Act 1980 (Cwlth)* was enacted in 1980 and simultaneously repealed the *Whaling Act 1960 (Cwlth)*. The *Whale Protection Act 1980 (Cwlth)*, as well as other Commonwealth acts, such as the *National Parks and Wildlife Conservation Act 1975 (Cwlth)* and the *Endangered Species Protection Act 1992 (Cwlth)* provided protection to cetaceans as a group, but no specific protection with regard to whale watching. The Draft National Guidelines for Cetacean Observation 1999 (later the ANZECC Australian National Guidelines for Cetacean Observation 2000) were developed in the late 1990s and these were the only national management policies specifically aimed at whale and dolphin observation until 2000. They were then integrated into the *Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)* thus becoming enforceable in the Australian Whale Sanctuary, but excluded the State/Territory coastal waters (to 3nm) where most commercial whale watching occurs.

Regulations were implemented in the relevant Australian states fairly quickly after the onset of whale watching. Furthermore, these regulations have been amended as deficiencies have been identified e.g. originally there were no specific provisions for the protection of marine mammals within the *National Parks and Wildlife Act 1974 (NSW)*, however, amendments were made by the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1986 (NSW)* and the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1989 (NSW)*.

Strengths and Weaknesses of the Management Framework in Australia

Australian whale watching management is progressive in that there is already a framework for state (up to 3nm offshore) and national (3-200nm offshore) levels of management. The government management agencies, industry and other stakeholders should be commended for implementing such strategies within a short time after the initiation of the industry. Furthermore, the fact the Commonwealth and most states have now implemented regulations rather than guidelines only is significant because my research shows that regulations are supported by most whale watch operators. Regulations are also more enforceable than guidelines and require more work to implement. There has been some consistency across jurisdictions with implementing the 100m and 300m minimum distances of approach, the method of approach and approximate speed of approach (Refer Appendix 1), which is beneficial to the success of the management policies. Consistency allows for people who cross jurisdictions to still be aware of the appropriate regulations and increases enforcement capacity when the exact boundary is debatable. There is also a tendency toward flexibility in state management policies allowing for the regulation of special areas (e.g. Hervey Bay Marine Park). A reduction in the number of acts due to consolidation of several Commonwealth acts into the *Environment Protection and Biodiversity Act 1999 (Cwlth)* (Refer Appendix 1) has also been a positive step.

However, these strengths should not lead to complacency or the perception that there is nothing that may be improved within the Australian whale watching management framework.

The main weaknesses of the Australian whale watching management framework are that:

- 1) there is some inconsistency across jurisdictions with respect to distances of approach (e.g., Queensland, New South Wales and Western Australia have a 100m minimum approach distance stipulation but South Australia prohibits commercial whale watch vessels from approaching closer than 300m);

- 2) there is inconsistency across jurisdictions with respect to definitions of terms (e.g., approach speed within 300m is listed as either slow wake speed, no wake speed or four knots);
- 3) some terms (e.g., harass or herd) are inadequately defined; and
- 4) the number of legislative documents (35)(Refer Appendix 1) is daunting and confusing.

My recommendations to address these management deficiencies are outlined in Section 7.4.

7.3.2 Evaluation of Australian Whale Watch Operators' Attitudinal Compliance with Draft National Guidelines 1999

Although, the IWC Whale Watching Sub Committee (2000) recommended that research on compliance with and effectiveness of guidelines and regulations be conducted, previous research is limited. Studies reviewed by the IWC Whale Watching Committee for "Effectiveness and Compliance with Whalewatching Guidelines and Regulations" have investigated only the effects of operator compliance on cetacean behaviour. One study (IWC Whale Watching Sub-Committee 2001; Parsons & Woods-Ballard 2003) asked operators to list which guidelines or codes of conduct they followed and found that 86% stated that they referred to a code of conduct. However, Parsons and Woods-Ballard (2003) also noted that one operator who stated that he followed a code of conduct during his normal operations had been implicated by a previous study participating in the harassment of northern bottlenose whales. This suggests that operators are not always accurate in reporting their own activity. This research is the first to report attitudes towards guidelines and regulations (attitudinal compliance) that may affect compliance and on-water compliance.

Australian Whale Watch Operator Characteristics

It is important to have data on and understand the implications of whale watch operator demographics in any area. The data collected in Chapter Five indicate that, in general, Australian whale watch operators have a high stake in their business, have a great deal of commercial and whale watch vessel experience, are generally middle-aged and rather conservative. Many of Australian whale watch business are small and operate only up to three months per year. Unfortunately, these operators have a poor level of knowledge with regards to which management conditions were relevant in each state, as well as, a low familiarity with the Draft National Guidelines 1999 or ANZECC National Guidelines 2000.

Factors Affecting the Attitudinal Compliance of Whale Watch Operators

As in other sectors such as taxation (Refer Chapter 4), the perceived certainty or threat of legal sanctions, and the perceived level of monitoring had a major influence on attitudinal compliance within the whale watch industry. Generally, an increase in the operator's perception that he would be caught if not complying led to a more positive attitude towards compliance. Furthermore, an increase in the operator's perception that non-compliance would result in legal sanctions also meant he was more likely to comply.

Sole owner-operators were less likely than other operators to have a positive attitude towards compliance. These people are generally owning and running small businesses. Possible reasons for their attitude include a negative attitude towards guidelines (they prefer regulations), a perception that some guidelines are unfair, and a perception that the guidelines negatively affect their own business revenue directly. Endorsement of non-compliance, voluntary nature of the guidelines and the belief in the fairness of the guidelines were all found to have an influence on the attitudinal compliance of whale watch operators. Endorsement of non-compliance and belief in the fairness of the guidelines were also found to contribute significantly to attitudinal compliance in Sirakaya's (1997) study.

Operators had a generally positive attitude towards compliance with the management conditions despite their perception that non-compliance did not negatively affect anyone (including the focal whale) and was therefore acceptable. This outcome may result from one or more of the following: (1) an overall positive attitude towards compliance, (2) support for the principle of managing commercial whale watching, (3) an understanding that compliance enables the best viewing experience, and (4) a belief that it was necessary to comply with all of the management conditions. Some operators stated that they did not believe that approaches closer than the minimum 100m detrimentally affected the whales, especially those whales that then "mugged" the vessel. Guidelines were perceived to be less effective than regulations.

Although statistical data indicated that "a perception that guidelines were unfair" led to a positive attitude towards compliance, I believe that this result was mainly due to the fact that the respondents were mainly small operators who thought that the guidelines favoured larger operators. Some of the qualitative data supported a more intuitive result that "a perception that guidelines were unfair" led to a negative attitude towards compliance. For example, I have anecdotal evidence that the guideline restricting the

number of vessels within 300m of a whale is contentious because it includes non-commercial vessels. Some commercial operators stated that they believe that they should have priority access because of the number of passengers they carry.

Thus, the overall results of my study support the proposed model of Sirakaya (1997) who proposes that a combination of socio-psychological, deterrence and situational factors influence ecotourism operators' attitudinal compliance to guidelines (Block & Heineke 1975; DiMento 1989; Trevino *et al.* 1999).

7.3.3 Documentation of Actual Compliance of Whale Watch Operators with Implemented Guidelines and Regulations

Actual Distance Compliance

My visual representation of actual operator compliance with the distance restrictions, as well as, calculations of the percentage of two-minute intervals during which operators were not complying indicated that whale watch operators complied with the regulations in their area most of the time. The visual representation further showed that non-compliance by an operator on at least some occasions was due to the movement of the whale pod being observed, i.e., the behaviour of the pod rather than behaviour of the vessel.

My visual representation of actual operator compliance also provided insight into the difficulty of proving non-compliance by an operator. An enforcement officer would need to take all the appropriate measurements, perform the calculations and provide a printout of the paths of the vessel and focal pod during or shortly after the actual event. Detailed information about and expert assessment of the actual behaviour of the focal pod would also be required to make a definitive decision on whether or not an operator had complied with the regulations. From a practical point of view, proving distance non-compliance may be impossible.

No correlation was found between the percent level of distance compliance and: (1) environmental factors, (2) an operator's level of vessel operation experience, or (3) his attitudinal compliance (Refer Chapter 6). The behaviour and movement of the focal pod appears to be a potentially major influence on compliance (Refer Chapter 6). However, this result must be interpreted with caution because of: (1) my very small data set and (2) the limited range of values for the various variables. For example, the range of weather conditions was limited because the operators were rarely out in extremely rough weather conditions, the operators tested for attitudinal compliance all

had a medium level of agreement with the guidelines, and the responses to the questionnaire may have been biased in favour of operators who support the guidelines.

Actual Speed Compliance

Although proving non-compliance will be difficult because of the need to allow for environmental and safety factors and the whales' behaviour, operators should be able to slow down to less than 4 knots within 300m of a pod. More disturbing is the percentage of time that vessels were travelling at over 4 knots when within 100m of a whale pod.

Operators' Compliance with Whale Watch Guidelines and Regulations

The level of compliance with the existing guidelines and regulations I observed was generally reasonable. As stated above at least some "non-compliance" is the result of the behaviour and movement of the observed pod. This result is positive for the industry and the whales. Nonetheless, complacency is not warranted as incidences of non-compliance by operators were observed in this study and others have been documented (Corkeron 1995; Smith 1997; IWC 2003). However, I know of no successful prosecutions for infringements of the approach regulations. Factors other than minimum distance, such as, speed of approach, inconsistent changes in direction by vessels, or knowledge of whale behaviour, may be more important in reducing potential impacts of whale watching and be more enforceable.

7.4 Overall Recommendations

I consider that if whale watching is to be sustainable ecotourism, appropriate management of whale watching is required to reduce the potential costs of the industry on whales to such a level as they are outweighed by the benefits. The use of both qualitative and quantitative methodology in this study revealed new information that may be used in future management of whale watching and assist in achieving sustainability for the industry. I discuss my recommendations for improving the Australian whale watch management strategies and implications for other areas of whale watching.

Recommendations for Australian Whale Watch Legislation

All states should adopt the same base regulations as the Commonwealth. This would decrease confusion and make it more likely that operators and general whale watching public will know the management recommendations. It would also provide consistency,

which tends to indicate that the regulations are based on the most current knowledge available rather than being arbitrary. Additional specific regulations could still be implemented for special areas (e.g., Hervey Bay) or circumstances (e.g., observation of mother-calf pairs).

Terms used in the regulations need to be expressed in layman's language and clearly defined to aid in the process of prosecution. For example, the definition of interfere includes "harass, chase, herd, tag, mark or brand" but "harass, chase and herd" have not been defined. Terms need to be defined in an unambiguous manner that can be considered by the legal system.

I consider that it would be preferable to amend existing acts and regulations rather than creating new ones to ensure that there is less confusion with regards to whale watching policies. These recommendations for enhancing the current regulations and upgrading the guidelines to regulations set a framework for future sustainable management of whale watching.

Recommendations for Improving Attitudinal Compliance – Operator Characteristics and Attitudes

Commercial vessels should require a permit i.e., meet certain requirements (as per Queensland and Western Australian regulations). In addition, individual operators should be licensed for whale watching. The requirement for vessel permits should be based on factors including but not limited to, vessel size, type and noise production, to decrease the potential impacts on whale behaviour. Requiring operators (as well as vessels) to be licensed would increase the fairness of the system, especially if operators were required to complete an accreditation course that included information on the management framework and cetacean behavioural ecology before gaining the license. This course could be based on the Endangered Species Awareness Course developed for commercial fishermen in Queensland (Marsh *et al.* 2002) and has the potential to improve the interpretive skills of operators. Such a licensing system would also allow a record of operator demographics to be kept which could be used to gain an understanding into the factors that may affect attitudinal compliance. This information should be updated through the use of an obligatory postal survey at least once a year because of the frequent turnover of operators and vessel crew within the whale watch industry.

The knowledge base of the whale watch operators is a significant resource and needs to be respected. Face-to-face consultation between operators and managers should occur when implementing or modifying guidelines or regulations to ensure that operators know of, understand and have input into any changes. Such practice should also ensure greater compliance: those who have input are more likely to comply. Consultation by post alone is not enough. Discussions with operators to find the best time (pre- or post-season) for workshops should occur.

Operators should be encouraged to be active members of a positive organisation (e.g. Ecotourism Association). A reward system for appropriate vessel operation as suggested by Sirakaya (1997) may also contribute to a more positive attitude towards compliance.

Recommendations to increase Operator Compliance to Whale Watch Regulations

The current regulations are generally appropriate for whale watching in Australian waters. Most operators agree with the regulations: drastic changes to the regulations would be detrimental. Modifications should generally be limited to reducing inconsistencies between jurisdictions as stated above. In addition, I have several other suggestions.

- (1) Past studies have indicated that even skilled operators were unable to accurately estimate the distance to focal pods. I recommend that all operators be required to use rangefinders to improve both their distance and speed compliance.
- (2) Operators should be educated as to the reasons particular management strategies are in place and the potential impact of non-compliance on the whales.
- (3) The common sense practice of not going out to sea in extremely rough weather is beneficial to all – in calmer weather operators have greater manoeuvrability and visibility, tourists are more likely to enjoy the trip, there is less likelihood of an accidental collision with a whale, and the whales “get a break” from intentionally close approaches. Regulations could put a ceiling on the weather conditions for whale watching to reduce pressure on operators to go out in severe weather.
- (4) Policies should be actively implemented for both commercial and recreational vessels with education as a support. Commercial operators require some assurance that they are not the only ones that are regulated. Currently,

recreational vessel operators are informed only through signs at boat ramps and by direct contact with Marine Park Rangers. Whale watch material (e.g., management and educational leaflet) could also be provided when recreational vessels are registered. Recreational boat owners could also be encouraged to use rangefinders and GPS to comply with regulations.

Relevance to Other Whale Watch Areas

The development of regulations in areas where whale watching is just developing can only be beneficial. It is understood however that regulations can take considerable time to implement, therefore it may be expedient to introduce guidelines or codes of conduct initially. Consistency across jurisdictions (including those of other countries) would serve to decrease confusion. Involving all stakeholders in the development of a management framework is of utmost importance. Licensing of operators and education of operators and recreational vessel users provides an opportunity for vessel operators to gain knowledge about the whales they are watching and for management authorities to gather demographic information to aid in the process of implementing a management framework that is perceived as fair by most.

7.5 Conclusion

Management of whale watching is about regulating vessel operators not whales. If management is to be effective, influences on human compliance behaviour need to be investigated. If whale watching is to be a component of sustainable ecotourism, research on the human dimensions of the interaction between people and whales should have equal priority to research on the whales themselves. Effectiveness of management policies also depends on their enforceability. Although, initial management may be through guidelines or codes of ethics, they should be progressed as efficiently as possible to regulations.

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Appendix 1: Review of Australian Whale Watching Legislation and Policy

A review of all policy documents with regards to whale watching in Australia and its states and territories is presented below.

Commonwealth Management Framework

Except for the *Great Barrier Reef Marine Park Act 1975 (Cwlth)*, the Whitsundays Plan of Management 1999 and the Cairns Area Plan of Management 1999 which are managed by the Great Barrier Reef Marine Park Authority, all Commonwealth acts listed here were or are managed by the Department of the Environment and Heritage or its predecessors. The Department of the Environment and Heritage is the Commonwealth management agency for the environment. Commonwealth legislation and policy only apply to the waters from three nautical miles to 200 nautical miles off the Australian coast except under the *Great Barrier Reef Marine Park Act 1975 (Cwlth)*, the Whitsundays Plan of Management 1999 and the Cairns Area Plan of Management 1999 which apply from mean low water.

❖ *Great Barrier Reef Marine Park Act 1975 (Cwlth)*

The *Great Barrier Reef Marine Park Act 1975 (Cwlth)* “makes provision for the establishment, control, care and development of a marine park in the Great Barrier Reef region”. Cetaceans are protected under the act through Plans of Management, whereby, the objectives of these Plans include ensuring management for the recovery and continued protection and conservation of species and ecological communities that are or may become “(i) extinct; (ii) extinct in the wild; (iii) critically endangered; (iv) endangered; (v) vulnerable; or (vi) conservation dependent.” Furthermore, ecologically sustainable use must be applied as a basis for management of activities within the Marine Park. Therefore, this act gives indirect protection to cetaceans as a group, but no specific protection with regard to whale watching.

❖ *Great Barrier Reef Marine Park Authority Whale and Dolphin Conservation Policy 2000*

Released in April 2000, the Great Barrier Reef Marine Park Authority Whale and Dolphin Conservation Policy’s objective is to provide a basis for managing human interactions with cetaceans in the Great Barrier Reef Marine Park, to ensure their conservation. The policy covers eight major sections: Improvement of Information; Educational Program Development; Codes of Practice; Management of Vessels and Aircraft; Management of Whale-Watching and Swim-with programs; Management of

Other Human Activities, Protection of Key Habitats and Identification of Priority Species. I focus on the sections pertaining to the management of vessels and management of whale watching. The policy observes the meaning of whale watching as per the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*, however, also includes dolphins.

Under Section D.1 of the Whale and Dolphin Policy vessel and aircraft regulations, the Great Barrier Reef Marine Park Authority has made a commitment to the development of regulations concerning the operation of such craft around whales and dolphins. The regulations must include minimum distances of approach. Section E.4 commits the Authority to the development of a long-term strategy for the management of commercial whale watching. No commercial whale watching permits will be granted within the area from the southern boundary of the Great Barrier Reef Marine Park to the southern boundary of the area covered by the Whitsundays Plan of Management until the long-term strategy is in place.

❖ Whitsundays Plan of Management Draft - 1998 and Whitsundays Plan of Management 1999/2002

Declared in 1987, the Townsville-Whitsunday Marine Park covers 600 km of coastline from Clump Point in the north to Midge Point in the south. It includes 200 continental islands, including the Whitsunday Islands, where the Whitsundays Plan of Management (Refer Chapter 6) now applies. Drafting of the Whitsundays Plan of Management started with the Whitsundays Plan of Management for Public Review in 1997. By 1998, the year I began my study, the Whitsundays Plan of Management 1998 was in its second draft. It has been updated in 1999 and 2002. However, the general intent of both the draft and final Plans of Management were the same, thus I will only discuss the final Plan. The general intent included ensuring that the management enables the recovery, protection and conservation of species and ecological communities that have the potential to become vulnerable or endangered. It also intends to ensure that management of activities within the Marine Park is based on ecological sustainable principles and use.

The Plan of Management identified several conservation values and issues that then served as the background for conservation strategies within the Plan. Conservation values and issues relating to marine mammals identified in Division 2 of the Plan included the fact that “whales, dugongs, dolphins and turtles are an integral part of the Marine Park and the Great Barrier Reef World Heritage Area” and that “The Whitsundays is an important calving ground for whales which migrate north from the

Southern Ocean during winter”. The above underlying conservation values serve to identify the following conservation issues within the plans. Firstly, the humpback whale was identified as a species that has the potential to become vulnerable or endangered. Secondly, vessels and aircraft at close range were identified as potentially disturbing to adult whales and calves.

Given the above conservation values and issues, the Plan of Management designated an approach limit for any vessels and aircraft to a whale of 300 metres within a designated whale protection area and 100 metres outside the area. Furthermore, commercial whale-watch vessels are not allowed in the designated whale protection area. The designated Whale Protection Area is located in the southern portion of the Whitsunday Planning Area (Refer to Figure 6.2). The boundary commences at Cape Gloucester, following the same boundary line as the Whitsunday Planning Area until it is at a 90 degree angle to Hayman Island and continues south one nautical mile from land until the southern boundary of the Whitsunday Planning Area back to the mainland coastline. In October 1999, the one nautical mile boundary east of Whitsunday Island was amended so that commercial whale watching could occur in the waters to the east of Whitsunday Island which is south of Border Island and west of Edward Island (Great Barrier Reef Marine Park Authority 1999) (Refer to Figure 6.2). Part 2 - Enforcement Provisions of the Whitsunday Management Plans allows for the legal enforcement of the above conservation strategies.

❖ **Cairns Area Plan of Management 1999**

Part 1, Division 2, Subdivision 3, Section 1.8 “Whales: values, issues and strategies addressed in this plan” of the Cairns Area Plan of Management 1999 discusses the values and issues of concern to conservation of whales in the Cairns Area Plan of Management and strategies to address those concerns. In respect to protection, the Plan recognises the potential detrimental effects on whales of disturbance by tourist programs. The plan states that permits for commercial whale watching will only be granted if the level is sustained at or below that permitted when the Plan commenced i.e., October 1999. Legitimate research projects are the only additional activity that will be given a whale-watch permit according to the Great Barrier Reef Marine Park Amended Cairns Area Plan of Management (October 1999). A precautionary approach is the basis of whale conservation in the Plan, Swimming-with-Whales permit numbers are limited by the Plan to a maximum of ten, taking into account all “genuine historic operators” operating at the time of the amendment in 2001 (Cairns Area Plan of

Management Amendments 2001). Therefore, this Plan gives protection to cetaceans and allows for a limited number of whale-watch and swim-with permits.

❖ **Great Australian Bight Marine Park (Commonwealth Waters) Plan of Management 2000**

In the Commonwealth of Australia's Gazette NoS172 on Wednesday 22 April 1998, the Great Australian Bight Marine Park (Commonwealth Waters) was proclaimed under subsection 7(2) of the *National Parks and Wildlife Conservation Act 1975 (Cwlth)*. "To protect the southern right whale during yearly aggregation in the waters of the Bight, and to protect its habitat on a year-round basis" is one of the six "Strategic Objectives" of the Plan of Management. The southern right whale has been acknowledged as one of the conservation values for which the Marine Park was declared. Female southern right whales use near-shore areas to give birth and the mother and calf remain in the area for a period afterwards (Great Australian Bight Marine Park (Commonwealth Waters) Plan of Management 2000). The Plan of Management lists among other things, acoustic disturbance, entanglement in fishing gear and loss of critical habitat as pressures on southern right whales in the Great Australian Bight. Under the Plan of Management "the Marine Mammal Protection Zone of the Marine Park will be closed to all vessels (other than right of innocent passage) from 1 May to 31 October every year to allow the undisturbed calving of the southern right whales".

❖ ***National Parks and Wildlife Conservation Act 1975 (Cwlth)***

Repealed by the *Environmental Reform (Consequential Provisions) Act 1999 (Cwlth)*, because of its revision and consolidation into the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*, the *National Parks and Wildlife Conservation Act 1975 (Cwlth)* was in force for over twenty years and was current during the time of my research. The provision of "protection, conservation and management of wildlife within the park or reserve" under Section 11 (8) (d) of the act provided indirect protection to marine mammals. Wildlife was defined in this act as those "animals and plants that are indigenous to" or "those migratory animals that periodically or occasionally visit....Australia, the Australian coastal sea, the Australian fishing zone or the sea over the continental shelf of Australia". Therefore, this act gave indirect protection to cetaceans as a group but no specific protection with regard to whale watching.

❖ ***Whale Protection Act 1980 (Cwlth)***

This act was also repealed by the *Environmental Reform (Consequential Provisions) Act 1999 (Cwlth)*, because of its revision and consolidation into the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. The *Whale Protection Act 1980 (Cwlth)* repealed the *Whaling Act 1960 (Cwlth)* and was in force during the time of my research. It set in place conditions that outlined the preservation, conservation and protection of whales. 'Whale' was defined as "any member of the sub-order Mysticeti or Odontoceti of the Order Cetacea, and except in subsection 9(2), includes a part of a whale or any product derived from a whale". Subsection 9(2) is in respect to indigenous use. The act applies to all Australian citizens, including those residing outside Australia, any Australian aircraft or vessel and all waters of the Australian Exclusive Economic Zone and Australian External Territories.

Part II, Section 9 stated that a person should not kill, injure, take or interfere with any whale in Australian waters. In this act, 'interfere with' in relation to a whale included "harass, chase, herd, tag, mark or brand" and 'take' included "catch or capture". Furthermore, a person was not permitted to cut up or extract any product from a whale. If a person did any of the above by accident, they were obliged to notify the Minister by telephone, telegraph or radio, as soon as possible after the incident. Furthermore, foreign whaling vessels were not allowed into an Australian or Australian External Territory without written consent from the Minister. Therefore, this act gave direct protection to cetaceans as a group, however, it gave no specific protection with regard to whale watching.

❖ ***Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)***

This act was repealed by the *Environmental Reform (Consequential Provisions) Act 1999 (Cwlth)*, because of its revision and consolidation into the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. The *Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)* was in force during my research. Aimed at furthering the protection and conservation of Australian wild fauna and flora the *Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)* was enacted under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) signed in Washington, USA in 1973. The act prevented the import or export of any specimens of the order Cetacea unless in accordance with a permit or authority. Therefore, this act gave indirect protection to cetaceans as a group against import and export but no specific protection with regard to whale watching.

❖ **Endangered Species Protection Act 1992 (Cwlth)**

This act was repealed by the *Environmental Reform (Consequential Provisions) Act 1999 (Cwlth)*, because of its revision and consolidation into the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. The blue whale (*Balaenoptera musculus*), southern right whale (*Eubalaena australis*) and humpback whale (*Megaptera novaeangliae*) were listed as endangered under the *Endangered Species Protection Act 1992 (Cwlth)*. The act provided for the protection of these listed species, as well as, obliging the Commonwealth to prepare and implement recovery plans for any listed species. Therefore, this act afforded protection only to the above three listed cetaceans and no specific protection was provided with regard to whale watching.

❖ **Draft National Guidelines for Cetacean Observation 1998 and Draft Australian National Guidelines for Cetacean Observation and Areas of Special Interest for Cetacean Observation 1999**

In 1998 what was then Environment Australia, the Australian Commonwealth Government's environmental department drafted National Guidelines for Cetacean Observation (from now referred to as the "Draft Australian Guidelines") with the object of providing "clearly defined standards for all activity around cetaceans". The Draft Australian Guidelines (Environment Australia 1998a) aimed to minimise harmful impacts on all cetacean populations and ensure sustainable interactions with cetaceans. The type of craft that could be used for interactions with cetaceans and the manner in which these craft could manoeuvre with respect to the cetaceans they were interacting with was outlined in the Draft Australian Guidelines. The Draft Australian Guidelines also dealt with feeding and touching cetaceans, noise restrictions around cetaceans and swimming and SCUBA diving with cetaceans, which will not be dealt with here.

The Draft Australian Guidelines were very specific with respect to methods of approaching cetaceans thus affording protection during dedicated and opportunistic whale watching. No approach was to be closer than 100m. Within 300m, approach was to be at a constant, 'no wake' speed. Additionally, an approach was to be made from slightly to the rear and parallel to the cetacean or pod of cetaceans. Leaving a cetacean or pod of cetaceans was also to be done at 'no wake' speed. Furthermore, the number of vessels within 100m of a pod or single cetacean was limited to three.

Identifying areas where cetaceans are watched which are also considered to be areas of significant use by cetaceans, Environment Australia (1998b) also drafted “Areas of Special Interest for Cetacean Observation” in 1998 to allow for sustainable planning of the development of tourism in the areas. Areas of Special Interest were listed as the Head of Bight in South Australia; Hervey Bay and the area off the north-east coast north of Whitsundays in Queensland; the area off the north-west coast north of Cape Leveque, coastal areas from Albany to the Bight and Perth waters in Western Australia; and Cape Byron in New South Wales. These sites were highlighted to ensure that management agencies and industry operators recognised their importance and put in place strategies to develop the appropriate level of tourism.

Attachment 1 – Supporting Document (Environment Australia 1998c) to the Draft Australian Guidelines also outlined points for discussion, such as restrictions around pods with calves, approach distances for dolphins and the use of helicopters. The Draft Australian Guidelines for Cetacean Observation and Areas of Special Interest for Cetacean Observation were sent out to management agencies, researchers, whale-watch industry operators and interested parties for comment (M. Rafic, Environment Australia pers. comm. 2002). Bringing the above documents together, the Draft Australian National Guidelines for Cetacean Observation and Areas of Special Interest for Cetacean Observation 1999 were released for a final review in August 1999. Finally, after two years of consultation Environment Australia submitted the Draft Australian Guidelines to the Australian and New Zealand Environment and Conservation Council (ANZECC). The council accepted the majority of the Guidelines as they were or with only slight modification and they became the ANZECC Guidelines for Cetacean Observation 2000 (Commonwealth of Australia 2000; M. Rafic, Environment Australia pers. comm. 2002).

❖ **ANZECC Guidelines for Cetacean Observation 2000**

Because the focus of this research is compliance of whale-watch operators with regulations and guidelines; “Section 2 Guidelines – Part 2.1 Vessels” of the ANZECC Guidelines for Cetacean Observation 2000 is reproduced here in its entirety.

Section 2 Guidelines

2.1 Vessels

Careful vessel design and care in operation can reduce the effect boats have on cetaceans. Some of the possible impacts of vessel presence are the introduction of underwater noise, pollution, and physical injury. These factors are particularly important when the boat is used for wildlife viewing and is intentionally brought in close to the animals. As the number of vessels around a pod of cetaceans increases, the possibility of disturbing the animals rises. As with all activities

which may disturb cetaceans, especially those for which the full effects of disturbance are unknown, it is important to minimise the level of interference. There are some simple ways to reduce the impacts of vessel use on cetaceans.

1) Vessel types

- a. Vessels include all motorised, paddle and/or sail craft (e.g., motorboats, yachts, kayaks, canoes, surfskis, inflatable craft, hovercraft).
- b. Craft prohibited for whale and dolphin interactions are: personal motorised watercraft (e.g., jetskis and similar craft), parasails, and hovercraft.
- c. A person on a surfboard should not approach cetaceans within 30m for safety reasons.

2) Operation of vessels

Prohibited craft

- a. If a person using a prohibited craft finds her/ himself in the vicinity of a cetacean she/he should slow down and avoid the cetacean, giving at least 300m distance between the vessel and the cetacean.

Approach distances for permitted craft (distances may also be regulated under State legislation and may differ from those given here)

- b. When within the caution zone of a cetacean, move at a constant, slow ('no wake') speed.
- c. The caution zone is the areas within 300m of a whale and 150m of a dolphin
- d. Do not approach closer than 100m to any whale.
- e. Do not approach closer than 50m to any dolphin.
- f. Allowing a vessel to drift within the approach limits specified for cetaceans due to wind, currents or forward momentum constitutes an approach and should not occur.
- g. If cetaceans show disturbance activities, withdraw immediately at a constant slow 'no wake' speed to the outside of the caution zone.
- h. Please exercise additional caution when observing pods containing calves. It is advisable not to approach within the caution zone when observing calves or pods containing calves.
- i. Do not approach very young calves or pods containing very young calves (i.e., Foetal fold calves). Foetal fold calves can be identified by the presence of pale lines on the sides of the body. Use binoculars to determine whether foetal fold calves are present.
- j. Should you mistakenly approach such a pod, withdraw immediately at a constant 'no wake' speed to the outside of the caution zone.

How to approach cetaceans

- k. Where possible, post a dedicated lookout in addition to the skipper, when approaching within the caution zone of a cetacean.
- l. Approach cetaceans from parallel to and slightly to the rear. Do not approach from directly behind. Alternatively, position your vessel outside the caution zone ahead of and to the side of the animals' path of travel, and allow them to approach you. Do not intercept the path of travel or approach from head-on.
- m. Try to position your vessel downwind of whales to avoid engine fumes wafting over them.
- n. Avoid sudden or repeated changes in direction or speed when within the caution zone. This will decrease noise and the risk of collisions.

While watching cetaceans

- o. When stopping to watch cetaceans, place your gear selector in neutral, and allow the motor to idle without turning off; or allow the motor to idle for a minute or two before turning off. This prevents abrupt reductions in noise which can startle the animals.
- p. Avoid excess engine use, gear changes, manoeuvring or backing up to cetaceans. These produce sudden, large changes in underwater noise levels which may startle, annoy or drive cetaceans away.
- q. Avoid the use of bow or stern lateral thrusters to maintain position. Thrusters produce intense cavitation (air bubble implosion) noise underwater.
- r. Avoid having more than three boats within the caution zone at one time to prevent crowding of the cetaceans.
- s. Do not box cetaceans in, cut off their path or prevent them from leaving. This is particularly important when more than one vessel is present. Vessels should position themselves adjacent to each other to ensure the cetaceans have large open avenues to leave the area. Be sure not to box cetaceans in against the shore. Vessel operators should coordinate their movements around cetaceans by radio contact where possible.
- t. Cetaceans should not be pursued. Do not drive into or through a group of cetaceans.

When leaving cetaceans

- u. When leaving cetaceans, move off at a slow 'no wake' speed to the outer limit of the caution zone for the closest animal before gradually increasing speed. Avoid engaging propellers within the minimum approach distance, but if necessary to do so, take extreme care.

If a cetacean approaches you

- v. Cetaceans will sometimes approach a vessel more closely than the specified approach distance of their own accord. Except in the case of dolphins or other small cetaceans which may approach the vessel to bow ride, place the engines in neutral and let the animal(s) come to you; or slow down and continue on course, avoiding potential collisions; or steer a straight course away from them.
- w. When dolphins or other small cetaceans approach a vessel to bow ride, vessels should not change course or speed suddenly. A vessel should not be brought within the caution zone for dolphins, faster than a 'no wake' speed, in an attempt to encourage bow riding.

Other

- x. If a cetacean surfaces in the vicinity of your vessel when you are in transit for a purpose other than watching cetaceans, take all care necessary to avoid collisions. This may include stopping, slowing down, and/or steering away from the animal.
- y. Obey any additional restrictions on approach distances or other requirements for particular species or areas.

Areas of special interest were expanded to include the Encounter Coast (Victor Harbor) in South Australia; Moreton Bay to Fraser Island, the Gold Coast to Moreton Island and Cairns and Ribbon Reefs in Queensland; Perth waters in Western Australia; coastal

waters in the vicinity of Coffs Harbour, waters within and adjacent to Port Stephens and Twofold Bay in NSW, as well as, Logan's Beach – Warrnambool in Victoria; and Great Oyster Bay and Mercury Passage and Adventure Bay, Bruny Island in Tasmania. Offshore western Victoria was also recognised as an area of special interest within Commonwealth jurisdiction.

❖ ***Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)***

In 1998, the Commonwealth (Commonwealth of Australia 1998) put forward a proposal that five of the most important Commonwealth environmental statutes, four of which referred in some way to marine mammal conservation, required revision and amalgamation. In 1999 the *Environment, Protection and Biodiversity Conservation Act 1999 (Cwlth)* updated and amalgamated the *Environment Protection (Impact of Proposals) Act 1974 (Cwlth)*, the *National Parks and Wildlife Conservation Act 1975 (Cwlth)*, the *Whale Protection Act 1980 (Cwlth)*, the *Wildlife Protection (Regulation of Exports and Imports) Act 1982 (Cwlth)* and the *Endangered Species Protection Act 1992 (Cwlth)*. This revision was also an attempt to disseminate more of the legislative powers to the States (*Bannister et al. 1996*). However, *Bannister et al. (1996)* stated that most “commentators” are opposed to this direction of dissemination of power for the protection and conservation of whales because they consider that protection of cetaceans should be a Commonwealth initiative and consistent across borders. The act provides for the Australian Whale Sanctuary that comprises the waters of the Australian Exclusive Economic Zone, prescribed waters of the States and Territory and “any marine or tidal waters that are inside the baseline of the territorial sea adjacent to an external Territory, whether or not within the limits of an external Territory”. It provides protection for all cetaceans.

In Division 3 of the act (Whales & Other Cetaceans), protection against killing, injuring, taking or importation is provided for all cetaceans. It applies to all citizens and residents of Australia, Australian vessels and aircraft. Foreign whaling vessels are not permitted into an Australian or external Territory port without written permission from the Minister. Under Subdivision F – Permit System, a permit may be issued to perform any of the above actions after review by the Minister and only if the Minister is satisfied that a significant contribution to the conservation of cetaceans will be made. Permits may also be issued for whale watching which must be carried out in accordance with any regulations in regards to this section. Whale watching is defined under the act as “any activity conducted for the purpose of observing a whale, including but not limited to being in the water for the purposes of observing or swimming with a whale, or

otherwise interacting with a whale”. The provision for the development of regulations in regards to Division 3 is under Subdivision G of the act.

❖ ***Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)***

Part 8 of the *Environment Protection and Biodiversity Conservation Regulations 2000* refers to human-cetacean interactions, including whale watching within the Australian Whale Sanctuary. The Australian Whale Sanctuary as defined by the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* comprises “(a) the waters of the exclusive economic zone (other than the coastal waters of a State of the Northern Territory); and (b) so much of the coastal waters of a State or the Northern Territory as are prescribed waters; and (c) any marine or tidal waters that are inside the baseline of the territorial sea adjacent to an external Territory, whether or not within the limits of an external Territory.” Division 8.1 refers to all aspects of human-cetacean interaction (e.g., swimming, aircraft) other than commercial whale watching. Division 8.2 refers specifically to whale watching. However, Regulation 8.12 (of Division 8.2) “How whale-watching is to be carried out” refers back to Regulations 8.04, 8.05, 8.06, 8.07, 8.08 and 8.09 of Division 8.1. Regulation 8.04 specifically outlines how a whale-watch vessel must be operated in the presence of whales, dolphins or porpoises. These Commonwealth regulations stipulated a 300m caution zone around whales and a minimum of 100m approach to a whale or pod of whales. A 300m minimum is stipulated with respect to the approach of a whale calf or a pod of whales with a whale calf present. Within the 300m minimum caution zone, a “slow wake speed” must be used and a vessel must move away from any whale if it becomes disturbed or distressed. Essentially, the ANZECC Guidelines for Cetacean Observation 2000 have been integrated into these regulations.

Queensland's Management Framework

The management agency in Queensland is the Environmental Protection Agency – Queensland Parks and Wildlife Service. Legislation that applies to the protection of whales in regards to interactions with whale-watch vessels and specifically for whale watching are: the *Nature Conservation Act 1992 (Qld)*; the *Nature Conservation (Wildlife) Regulation 1994 (Qld)*; the *Nature Conservation (Whales and Dolphins) Conservation Plan 1997*; the *Marine Parks Act 1982 (Qld)*; the *Marine Parks Regulation 1990 (Qld)*; the *Marine Parks Act (Hervey Bay) Zoning Plan 1989* and the *Marine Parks Act (Moreton Bay) Zoning Plan 1997*.

Nature Conservation Act 1992 (Qld)

Section 73 of the *Nature Conservation Act 1992 (Qld)* states that "Protected wildlife is to be managed to: (a) conserve the wildlife and its values and, in particular to - (iii) identify, and reduce or remove, the effects of threatening processes relating to the wildlife and (b) ensure that any use of the wildlife - (ii) for education, recreational, commercial and authorised purposes is ecologically sustainable." Whale watching is recognised as a commercial or sometimes recreational (in the case of private vessels) "use" of whales, which may include an educational component, therefore, under the *Nature Conservation Act 1992 (Qld)* it should be managed so that it is ecologically sustainable.

The *Nature Conservation Act 1992 (Qld)*, Section 88 states that "Subject to Section 93 (Aboriginal & Torres Strait Islander rights), a person must not take, use or keep a protected animal, other than under: (a) a conservation plan applicable to the animal; or (b) a licence, permit or other authority issued or given under a regulation; (c) an exemption under a regulation." There is a maximum penalty of 3000 penalty units or two years imprisonment if a person is in contradiction to this Section. Whale watching is a form of use and therefore a person requires a permit to conduct whale watching within Queensland waters.

❖ *Nature Conservation (Wildlife) Regulation 1994 (Qld)*

The *Nature Conservation (Wildlife) Regulation 1994 (Qld)* was enacted under Part 11 – Miscellaneous, Section 175(1) of the *Nature Conservation Act 1992 (Qld)*. Humpback whales are listed as vulnerable under this regulation. Regulation 16 (Schedule 3) states that the proposed management intent in regards to vulnerable wildlife includes "(b) to put into effect recovery plans or conservation plans for the wildlife and its habitat and (h) to encourage scientific research programs likely to contribute to an understanding of the wildlife, its habitat and management requirements". Regulation 16(b) allows for the development of the Nature Conservation (Whales and Dolphins) Conservation Plan 1997. Regulation 17 (Schedule 3) of the *Nature Conservation (Wildlife) Conservation Regulation 1994 (Qld)* refers to the taking and use of vulnerable wildlife under a licence, permit or other authority under the act. The taking and use of wildlife for another purpose (other than exhibition) may be permitted only if it is consistent with the management principles for the wildlife and if it will not reduce the ability of the wildlife's population to expand.

❖ **The Nature Conservation (Whales & Dolphins) Conservation Plan 1997**

The Nature Conservation (Whales & Dolphins) Conservation Plan 1997 was enacted under Section 112(1) of the *Nature Conservation Act 1992 (Qld)* and Part 3, Section 16 – Proposed Management Intent of the *Nature Conservation (Wildlife) Regulation 1994 (Qld)*. Under Section 2 of the Nature Conservation (Whales & Dolphins) Conservation Plan 1997 a “boat” includes a dedicated platform, but does not include a jet ski; a “cetacean” denotes a mammal of the order Cetacea; “commercial whale watching business” represents a business involving carrying people in a boat or aircraft to watch whales; a “person in control”, of a boat or aircraft, includes “(a) the person in command of the boat or aircraft; and (b) the person who appears to be in control or command of the boat or aircraft”; and a “whale” denotes a cetacean of the family Balaenidae, Balaenopteridae, Kogiidae, Physeteridae or Ziphiidae.

The management intent of the Plan includes the minimisation of harm and distress caused directly or indirectly to whales and dolphins by human activities. In keeping with this, Part 3 “taking, using, keeping and protecting whales and dolphins” places conditions on the proximity that a person or boat may come to whales or dolphins, the protection of whales and dolphins, commercial whale watching and special interest whales.

Conditions of approach to a whale apply to all persons in control of a boat, whether commercial or private. The limit of approach to a whale is 100 metres and moving a boat in such a manner as to cause the whale to come closer than 100 metres to the boat if the whale continued on its direction of travel is in contradiction to the Plan. Furthermore, if there are already three or more boats closer than 300 metres to the whale, a person in control of a fourth boat may not bring that boat any closer than 300 metres. The 300-metre limit also applies if the boat is moving in a similar direction to, and behind, the whale or if the boat is moving at more than four knots. A person must not cause a whale to alter its direction or speed of travel or its behaviour or bring a boat between members of a pod of whales. Additionally, if a whale surfaces closer than 100 metres to a boat the person in control must not move the boat at more than four knots until the whale has moved at least 300 metres away from the boat.

All whales and dolphins are protected by the ban on depositing rubbish in their proximity, or the making of noise that is likely to disturb or attract them. Additionally a person may not intentionally feed or touch a whale or dolphin. Commercial whale watching businesses can not operate without a permit granted under the regulation or if

the business is carried out in a marine park, without a permit granted under the *Marine Parks Act 1982 (Qld)*.

Section 11 of the Nature Conservation (Whales & Dolphins) Conservation Plan 1997, proclaims an area of special interest for whales or a Whale Protection Area within the Whitsunday Management Area of the Townsville/Whitsunday Marine Park. A person in charge of a vessel (commercial or private) must not bring a boat closer than 300 metres to a whale in this special interest area. The Minister may also class a whale or group of whales as a special interest whale or group of whales. A humpback whale that is entirely white and migrates along the east coast of Australia, has been classed as a special interest whale to protect it from increased attention. A person in control of a boat must not bring the boat any closer than 500 metres to this special interest whale or group of whales.

Within Queensland three areas have received special attention because of their identified importance to humpback whales, which are the focus of whale watching in the State. As previously noted, the Whitsundays Plan of Management 1999, a Commonwealth document, encompasses the most northerly area identified as important to humpback whales. In the south of the State, Hervey and Moreton Bays are managed under State legislation via the Marine Parks (Hervey Bay) Zoning Plan 1989 and the Marine Parks (Moreton Bay) Zoning Plan 1997 respectively.

❖ **Marine Parks Act 1982 (Qld)**

Section 16 of the *Marine Parks Act 1982 (Qld)* provides for the setting apart of tidal lands and tidal waters as a marine park. Zoning Plans are allowed for under Sections 17 and 30. These marine parks and zoning plans then provide for direct protection of cetaceans within Australian waters.

❖ **Marine Parks Regulation 1990 (Qld)**

Under Part 1A, 2 and 3 respectively, the *Marine Parks Regulation 1990 (Qld)* provides for the declaration of Marine Parks, Zoning Plans and permission to "Enter and Use a Marine Park". Again these marine parks, zoning plans and permits provide for protection of cetaceans and the management of human interactions with cetaceans.

❖ **Marine Parks (Hervey Bay) Zoning Plan 1989**

Declared in 1989, Hervey Bay Marine Park is bounded in the east by the coastline of Fraser Island north of Moon Point and extends out to the "meridian passing through the

easternmost point of Point Vernon at highest astronomical tide" (25° 136' S) as described in the Hervey Bay Marine Park Zoning Plan (1989 p12). The use and entry of Hervey Bay Marine Park includes recreational or educational activities that do not involve the taking of plants, animals, or marine products or the operation of tourist programs and any associated use of vessels.

A Whale Management and Monitoring Area designated under the Marine Parks (Hervey Bay) Zoning Plan 1989 includes most of Hervey Bay and Platypus Bay (Refer to Figure 6.3) and has the same boundaries as Hervey Bay Marine Park. The objective of the Whale Management and Monitoring Area is to manage human activities in the vicinity of humpback whales and monitor the effects of such activities to ensure the protection of whales. Conditions of use in regards to the Whale Management and Monitoring Area are in force each year, from 1 August to 30 November of the same year. These conditions include the requirement for written permission for the conduct of a tourist program based on humpback whales, and associated vessel use, as well as, the same approach restrictions as in the Nature Conservation (Whales & Dolphins) Conservation Plan 1997. Furthermore, a person must not cause or allow the vessel to approach a humpback whale head on or to herd, chase or otherwise prevent the free movement of humpback whales.

When moving within 300 metres of a whale, a person in charge of a vessel shall manoeuvre the vessel at a constant speed of not more than four knots and avoid sudden changes in direction. When stopping within 300 metres of any humpback whale motors must be allowed to idle for one minute prior to turning off, and outboard motors must be raised. Motors must be idled for a short time before moving off, which must be at no more than four knots until the vessel is 300 metres distant from any humpback whale. Finally, one must abandon contact with a humpback whale at any sign that it or the pod is becoming disturbed or alarmed.

❖ **Marine Parks (Moreton Bay) Zoning Plan 1997**

Declared in 1993 and extended in 1998, Moreton Bay Marine Park covers an area that includes most of Moreton Bay's tidal lands and tidal waters seawards to the limit of Queensland waters (Marine Parks (Moreton Bay) Amendment Zoning Plan (No.1) 1998 (Qld); Marine Parks (Moreton Bay) Amendment Zoning Plan (No.2) 1998 (Qld); Marine Parks (Moreton Bay) Order 1993 (Qld)). The boundary of the Marine Park is generally three nautical miles off the east coast of Bribie, Moreton, North Stradbroke and South Stradbroke Islands. Along the mainland and around the islands, the boundary is the

line of the highest astronomical tide. The most northerly boundary extends seaward from Caloundra Head to three nautical miles off Flinders Reef (26°58.80' south, 153°29.00' east). The southern limit is the southern tip of South Stradbroke Island. Under the Marine Parks (Moreton Bay) Zoning Plan 1997, the Marine Park is divided into the following five zones of use: general use; habitat; conservation; buffer and protection. Under Part 3 – Zones, Sections 13, 17 and 21, permission may be granted by the chief executive for a person to enter or use a general use, habitat or conservation zones respectively for the purposes of commercial whale watching programs.

New South Wales' Management Framework

The New South Wales National Parks and Wildlife Service (part of the Department of Environment and Conservation) administers the management of the environment in this State. Legislation that applies to the protection of whales in regards to interactions with whale-watch vessels and specifically for whale watching are: the *National Parks and Wildlife Act 1974 (NSW)*; the *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)*; and the *Threatened Species Conservation Act 1995 (NSW)*. The *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)* replaced the *National Parks and Wildlife (Fauna Protection) Regulation 1994 (NSW)*. Amendments to the *National Parks and Wildlife Act 1974 (NSW)* were made by the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1986 (NSW)* and the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1989 (NSW)*.

❖ *National Parks and Wildlife Act 1974 (NSW)*

Originally there were no specific provisions for the protection of marine mammals within the *National Parks and Wildlife Act 1974 (NSW)*. However, amendments were made by the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1986 (NSW)* and the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1989 (NSW)*. A further amendment was made by the *Threatened Species Conservation Act 1995 (NSW)*.

"Marine Mammal Special Provisions", Sections 112A to 112F were added by the *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1986 (NSW)*. These sections allowed for the formation of a marine mammals' advisory committee, development and implementation of plans of management and restricting licences for the take of marine mammals. Schedule 8A outlining the conditions of the

Marine Mammals Advisory Committee was added in conjunction with Section 112A. The 1986 amendment act also broadened the definition of marine mammal, from the few that were listed [*Dugong dugon* - Dugong; *Arctocephalus forsteri* - New Zealand Fur-seal; *Balaena glacialis* - Right whale; *Balaenoptera musculus* - Blue whale; *Megaptera novaeangliae* - Humpback whale] to include all relevant marine mammals [Cetacea - Whales, dolphins, porpoises; Pinnipedia – Seals & sea lions; Sirenia - Dugongs]. These were listed under Schedule 12 - Endangered fauna, Part 5.

The *National Parks and Wildlife (Marine Mammals Protection) Amendment Act 1989 (NSW) No.21* made a further amendment to the *National Parks and Wildlife Act 1974 (NSW)*. Section 99, "Taking or killing etc. endangered fauna", was amended to include the limitation that no marine mammal may be interfered with or approached closer than the limits outlined in the regulations. Furthermore, approaching or interfering with marine mammals was referred to as being the same as the taking or killing of any other fauna.

A further section, 112G - Approaching marine mammals, was added by the *Threatened Species Conservation Act 1995 (NSW)*, Schedule 4. It states that no marine mammal is to be interfered with or approached closer than the distance prescribed in the regulations. Exceptions to this may occur when a person has permission conferred by a general licence under Section 120 or Part 6 of the *Threatened Species Conservation Act 1995 (NSW)* or the provisions under the *Rural Fires Act 1997 (NSW)* or the *State Emergency and Rescue Management Act 1989 (NSW)*. "Interfere with" under Section 112G includes "harass, chase, herd, tag, mark and brand." Therefore, by 1995 the *National Parks and Wildlife Act 1974 (NSW)* gave general protection to marine mammals and referred specific rules of protection to the regulations.

National Parks and Wildlife (Fauna Protection) Regulation 1994 & 2001 (NSW)

In 1994, the *National Parks and Wildlife (Fauna Protection) Regulation (NSW)* was enacted under Section 154 of the *National Parks and Wildlife Act 1974 (NSW)*. It was replaced by the *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)*. The *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)* was repealed under Section 10 (2) of the Subordinate Legislation Act 1989.

Part 3, Regulation 16 of the *National Parks and Wildlife (Fauna Protection) Regulation 1994 (NSW)* outlined the minimum approach distances to certain marine mammals. Originally only "members of the families Balaenopteridae, Balaenidae, Physeteridae

and Ziphiidae as are described in Part 3 of Schedule 12 to the Act” as well as “the following species of the family Delphinidae: *Pseudorca crassidens* (False killer whale); *Orcinus orca* (Killer whale); *Globicephala macrorhynchus* (Short-finned pilot whales); *Peponocephala electra* (melon-headed whale)”. However, the *National Parks and Wildlife (Fauna Protection) Amendment (Marine Mammals) Regulation 1997 (NSW)* amended this list so that Regulation 16 applied to all marine mammals other than the common dolphin (*Delphinus delphus*) and the bottlenose dolphin (*Tursiops truncatus*). The minimum distance of approach, outlined by the *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)* in regards to vessel based whale watching is 300 metres unless the vessel is making a slow speed approach. A slow speed approach is defined as “an approach at a constant, slow, no wake speed that is no faster than the speed of the mammal (or slowest mammal) being approached”. During a slow speed approach the minimum approach distance is 200 metres if the marine mammal is a calf or accompanying a calf and 100 metres for any other marine mammal. There is no stipulation regarding the method of approach. Under this regulation “vessel based whale watching” includes watching whales using any water-borne craft except personal motorised watercraft (jet-skis).

❖ ***National Parks and Wildlife Regulation 2002 (NSW)***

This regulation replaced the *National Parks and Wildlife (Fauna Protection) Regulation 2001 (NSW)*. The stipulations in the *National Parks and Wildlife (Fauna Protection) Regulation 2001* are now in Part 5 Fauna Protection, Division 3 Care and Protection of Fauna, Section 57 Minimum approach distances to certain marine mammals. There were no changes to the restrictions of the regulation with respect to the conservation and protection of marine mammals.

❖ ***Threatened Species Conservation Act 1995 (NSW)***

The *Threatened Species Conservation Act 1995 (NSW)* lists the blue whale as endangered and the humpback whale, sperm whale (*Physeter catodon*), sei whale (*Balaenoptera borealis*), southern right whale (*Eubalaena australis*), long-snouted spinner dolphin (*Stenella longirostris*) and Indo-Pacific humpbacked dolphin (*Sousa chinensis*) as vulnerable therefore affording them protection under the “Objects of the Act”. The objects include the conservation of the biological diversity, prevention of extinction and protection of critical habitat of threatened species. Furthermore, under the *Threatened Species Conservation Act 1995 (NSW)* potential impacts on threatened species are to be assessed and threatening processes are to be managed or eliminated.

Western Australia's Management Framework

The conservation of Western Australia's biodiversity is managed by the Department for Conservation and Land Management (CALM) via the *Wildlife Conservation Act 1950 (WA)*, the *Wildlife Conservation Regulations 1970 (WA)* the *Conservation and Land Management Act 1984 (WA)*, and the Wildlife Conservation (Close Season for Marine Mammals) Notice 1998.

❖ *Wildlife Conservation Act 1950 (WA)*

Under Section 14 (1) of the *Wildlife Conservation Act 1950 (WA)*, all fauna is “wholly protected throughout the whole of the State at all times” except in instances published in the Government Gazette by the Minister. Fauna includes “any animal that periodically migrates to and lives in any State or Territory or the Commonwealth or the territorial waters of the Commonwealth”. Therefore, cetacean populations that have their home range within Western Australian waters, as well as migratory cetaceans whose paths take them into Western Australian waters are protected. Licences for interaction with cetaceans are issued under Section 15 of the act.

❖ *Wildlife Conservation Regulations 1970 (WA)*

Under Part 2 Licences, Regulation 15 (1) of the *Wildlife Conservation Regulations 1970 (WA)*, the Minister may issue licences to authorise the taking of fauna for educational or other approved public purposes. Approach distances and methods of approach are the same as those set out in the Close Season Notice (below) (P.Mawson pers. comm.).

❖ *Conservation and Land Management Act 1984 (WA)*

Under this act protection is afforded to all fauna within Marine Parks and Marine Nature Reserves.

❖ *Conservation and Land Management Regulations 2002 (WA)*

Part 2 – Protection of the environment, Division 1 – Protection of flora and fauna, Section 11 – Restrictions on approaching certain marine fauna states, “(1) A person in a vessel or aircraft must not, without lawful authority, herd, chase, interfere with the movement of, or otherwise prevent the free movement of, a whale, dolphin, dugong, seal, sealion, whale shark, manta ray, marine turtle or any other marine fauna in a marine reserve”. There were no definitions of “herd, chase or interfere” provided in the

Conservation and Land Management Act 1984 or in the *Conservation and Land Management Regulations 2002*.

❖ ***Wildlife Conservation (Close Season for Marine Mammals) Notice 1998***

A close season was declared in 1998 in respect to all marine mammals and disturbance of any marine mammal was prohibited unless permitted by the Notice or under Section 16 of the *Wildlife Conservation Act 1950 (WA)*. The Close Season Notice remains in effect until such time as the Minister revokes it (P. Mawson, Wildlife Branch, Department of Conservation and Land Management, pers. comm. 2000). Marine Mammals were defined as including a dolphin (families Phocoenidae and Delphinidae), dugong or whale, where whale means any fauna in the suborder Mysticeti (baleen whales) or families Kogiidae, Physeteridae or Ziphiidae (Peter Mawson, Wildlife Branch, Department of Conservation and Land Management, pers. comm. 2000). Disturb was not defined in the Notice.

Under Part 4, a person in charge of a vessel may allow the vessel to approach a whale no closer than 300 m if the vessel is within an arc of 30 degrees either side of the whale's direction of travel or to a minimum of 100 m in any other case. However, if a whale approaches a vessel leading to an instance where the person in charge is now in breach of the above condition, then the person must either switch off or put the vessel's motor in neutral or move the vessel away from the whale at less than five knots until they are no longer in breach of the condition. Furthermore, under Part 7, a person in charge of a vessel must also move the vessel away from any marine mammal that appears to be visibly disturbed. "Visibly disturbed" is not defined and this applies whether or not the vessel is the cause of the disturbance. A vessel was defined as a water craft of any sort "(a) whether propelled by a motor, sails, paddles or any other means, and (b) whether underway, drifting or anchored and, to avoid any doubt, includes hovercraft, personal watercraft, kayak, surfski, surfboard or sailboard". Commercial activities that involve the disturbance of marine mammals may only be conducted in accordance with a licence under section 16 of the act.

Victoria's Management Framework

Victoria's environmental policies are managed by the Victorian Environmental Protection Agency (previously the Department of Natural Resources and Environment) and include the *Wildlife Act 1975 (Vic)* and the *Wildlife (Whales) Regulations 1998 (Vic)* and the *Wildlife (Whales) (Amendment) Regulations 2002 (Vic)*.

❖ *The Wildlife Act 1975 (Vic)*

In Victoria, a whale has been defined by the *Wildlife Act 1975 (Vic)* as “any member of the sub-order Mysticeti or the sub-order Odontoceti of the order Cetacea.” Protection is provided for whales under Part X (2) within the limits of waters of the State of Victoria and any parts of the territorial sea of Australia adjacent to the State of Victoria. However, if at any stage the limit of Australian waters is determined to be greater than 3 nautical miles then protection will only be provided under this act to the 3 nautical mile limit. A person may not interfere, kill or take whales. Under the *Wildlife Act 1975* “interfere” has been defined as including “harass, chase, herd, tag, mark or brand or approach a whale at a distance that is less than the prescribed minimum distance.” The Secretary has the power to grant permits for a prescribed fee allowing for the conduct of tourist activities to interfere with whales to the extent of approaching them at less than the prescribed minimum distance. The permit specifies the class or classes of whales, number of whales or number of each class and remains in force for a period specified on the permit, but not longer than twelve months. Other conditions prescribed by regulations made under section 85A of this act or determined by the Secretary may be included on the permit.

❖ *Wildlife (Whales) Regulations 1997 & 1998 (Vic); Wildlife (Whales) (Logans Beach) Regulations 2001 (Vic); Wildlife (Whales) (Further Amendment) Regulations 2001 (Vic); and Wildlife (Whales) (Amendment) Regulations 2002 (Vic)*

Wildlife (Whales) Regulations 1997 was enacted 16 December 1997 and expired 30 November 1998. Under Sections 85A and 87 of the *Wildlife Act 1975 (Vic)*, the *Wildlife (Whales) Regulations 1998 (Vic)* apply to all whales as defined under the *Wildlife Act 1975 (Vic)* but particularly apply to dolphin swim and sightseeing activities. Although previously whale watching of Southern right whales was conducted from Warrnambool there are currently no activities focused on Mysticeti in Victoria (P. Corkeron, Norwegian Institute of Fisheries & Aquaculture Research & P. Gill, Deakin University, Australia – pers. comm. 2002). The major dolphin swim and sightseeing activities in the state focus on bottlenose dolphins (*Tursiops truncatus*)(Scarpaci *et al.* 2000).

However, general distances of approach, conditions of permits and limitations on approach to all whales have been included in the regulations. Furthermore, the 1998 version of the regulations stated all restrictions in terms of “dolphin sightseeing” and “dolphin swim”. The *Wildlife (Whales) (Amendment) Regulations 2002* revoked all instances where the term “dolphin” was used and substituted it with “whale”.

The prescribed minimum distance that a person may approach a stranded whale is 50 metres. Persons operating a vessel non-commercially may approach any whale, other than those stranded, to a minimum distance of 100 metres, however, commercial operators are restricted to a minimum approach distance of 150 metres outside the waters of Ticonderoga Bay Sanctuary Zone and 200 metres inside the waters of this Sanctuary Zone. Additionally, vessels are excluded from approaching whales within the Logans Beach Exclusion Zone between 1 June and 31 October in any year.

Holders of permits i.e., commercial operators with interest in whale swims and sightseeing must ensure that motorised diving or swimming aids are not used within 100 metres of a whale, must not touch or attempt to touch a whale and must not feed or attempt to feed a whale. During the operation of a tour vessel the operator must ensure that a whale is not approached head on, the vessel is not placed in their path, and that it doesn't separate any individual from a group or a mother from a calf. Within 300 metres of a whale, a vessel must not exceed five knots, avoid sudden changes in direction and move away to at least 200 metres if there is any sign of disturbance. Non-commercial operators of vessels must also abide by the same restrictions. Furthermore, playing back any underwater sound or recording, or making loud or sudden noises is not permitted within 300 metres of a whale.

South Australia's Management Framework

Managed by the South Australian Department for Environment, Heritage and Aboriginal Affairs, South Australian environmental policies include the *National Parks and Wildlife Act 1972 (SA)*, the *National Parks and Wildlife (Whales and Dolphins) Regulations 2000 (SA)* and the Great Australian Bight Marine Park Management Plan 1998. South Australia declared the Great Australian Bight Marine National Park in 1996 as a management tool for the protection of marine species.

❖ *National Parks and Wildlife Act 1972 (Vic)*

Within Section 5 of the *National Parks and Wildlife Act 1972 (SA)* "marine mammal" is defined as a seal or sea lion (Order Pinnipedia) or a dolphin or whale (Order Cetacea),

however, protected animals are only those which are indigenous to Australia, periodically or occasionally migrate to and live in Australia and any animal of a species referred to in schedule 7 (Endangered Species), 8 (Vulnerable Species) or 9 (Rare Species). In the order Cetacea, the following species are considered as protected under the *National Parks and Wildlife Act 1972*: blue whale (*Balaenoptera musculus*); fin whale (*Balaenoptera physalus*); humpback whale (*Megaptera novaeangliae*); minke whale (*Balaenoptera acutorostrata*); southern right whale (*Eubalaena australis*); pygmy right whale (*Caperea marginata*); sperm whale (*Physeter macrocephalus*); short-finned pilot whale (*Globicephala macrorhynchus*); Risso's dolphin (*Grampus griseus*); dusky dolphin (*Lagenorhynchus obscurus*); false killer whale (*Pseudorca crassidens*); pygmy sperm whale (*Kogia breviceps*); dwarf sperm whale (*Kogia simus*); Arnoux's beaked whale (*Berardius arnuxii*); southern bottlenose whale (*Hyperoodon planifrons*); Andrew's beaked whale (*Mesoplodon bowdoini*); Gray's beaked whale (*Mesoplodon grayi*); Hector's beaked whale (*Mesoplodon hectori*); Shepherd's beaked whale (*Tasmacetus shepherdi*) and Cuvier's beaked whale (*Ziphius cavirostris*).

Under Sections 51 and 68, taking of and interfering with protected wildlife is prohibited. This includes harassing or molesting them. Furthermore, to undertake any activity that is or has the potential to be detrimental to the welfare of a protected animal is in contradiction to the regulations. A person may be imprisoned for up to two years for committing any of these acts against a marine mammal. However, the Minister may give permission under a permit to conduct such activities.

Under the *National Parks and Wildlife Act 1972*, the Great Australian Bight Marine National Park was proclaimed on 26 September 1996. It consists of two zones: the conservation zone and the sanctuary zone and extends to the three nautical mile limit of State waters (Great Australian Bight Marine Park Management Plan 1998). In the Management Plan, the primary management goal of The Great Australian Bight Marine National Park was "to provide for the protection, wise use, understanding and enjoyment of the biodiversity of the Great Australian Bight Marine Park through the integrated management of resources, habitats and ecosystems and through the sustainable use of those resources and the marine environment". The management objectives include the protection and assisted recovery of "depleted, threatened, rare, endangered or endemic species ... including the Southern Right Whale" (Great Australian Bight Marine Park Management Plan 1998). Whale watching has been recognised as a threat or disturbance factor in the management plan. Managing or excluding activities within southern right whale calving, nursery and breeding areas and

within the migratory routes between these areas have been put forward in the management plan as strategies to achieve the management goals.

❖ ***National Parks and Wildlife (Whales and Dolphins) Regulations 2000 (Vic)***

Until December 2000, there were guidelines for whale watching within South Australian waters but no statutory provisions. Gazetted on 7 December 2000 to come into operation on 1 January 2001, the *National Parks and Wildlife (Whales and Dolphins) Regulations 2000 (SA)* is now the regulatory framework for protection of whales and dolphins in South Australian waters. They were made under Section 68(1)(C) of the *National Parks and Wildlife Act 1972 (SA)* and were based on the former guidelines. Affording protection to all marine mammals, defined as “a mammal of a species whose natural habitat is a marine environment” the regulations set out procedures for interactions between vessels and whales, dolphins and porpoises, or swimming with whales, dolphins and porpoises and interactions between aircraft and whales. They also encompass special restrictions on commercial operations and noise in the vicinity of whales and interactions with marine mammals other than whales, dolphins or porpoises.

The *National Parks and Wildlife (Whales and Dolphins) Regulations 2000 (SA)* are divided into three parts with respect to marine mammals: Part 2 describes interactions with whales; Part 3 describes interactions with dolphins and porpoises and Part 4 describes interactions with other marine mammals. Only those interactions regarding whale watching will be discussed here. Part 2, Division 1 outlines allowable interactions of private vessels and whales. Prescribed vessels such as personal watercraft (jet-skis) or hovercraft are not allowed within 300 metres of any whale or 150 metres of any dolphin or porpoise. A person in control of a vessel other than a prescribed vessel may approach whales (other than those that appear to be distressed) or a whale calf to a minimum distance of 100 metres. Distressed whales or whale calves cannot be approached closer than 300 metres. When within 300 metres the vessel may not be driven at a speed exceeding five knots. A restriction of a minimum 300-metre approach distance also applies in the Encounter Bay Restricted Area as described in the Regulations. Commercial operations using vessels or aircraft to watch or swim-with whales are prohibited under the *National Parks and Wildlife (Whales and Dolphins) Regulations 2000 (SA)*. The minimum approach distances for dolphins and porpoises are less than those for whales, being 150 metres for prescribed vessels and 50 metres for other vessels.

Tasmania's Management Framework

The Tasmanian Department of Environment and Land Management, Parks and Wildlife Service is the regulatory body for Tasmania (Department of Environment & Heritage. 1998 & 1999b). There is no legislation specific to whale watching in this state, although there is at least one commercial whale-watch operator (Department of Environment & Heritage. 1998 & 1999; Hoyt 2000). The management framework includes the *Whales Protection Act 1988 (Tas)*, the *Threatened Species Protection Act 1995 (Tas)* and the *Wildlife Regulations 1999 (Tas)*.

❖ *Whales Protection Act 1988 (Tas)*

Under the *Whales Protection Act 1988 (Tas)* whale is defined as including any member of the order Cetacea, therefore, under this act, in respect to whale watching, all whales are protected. Taking of whales is prohibited except under special permits, such as for scientific purposes, approved by the Director of the National Parks and Wildlife. Take under the act includes “catch, attract, tranquillize, injure, poison, or kill”. To interfere with a whale is also prohibited under the *Whales Protection Act 1988 (Tas)*. Interfere in relation to a whale includes “(a) chase, disturb, harass, or herd; and (b) brand, tag, or mark.”

❖ *Threatened Species Protection Act 1995 (Tas)*

Part 3, Section 10 of the *Threatened Species Protection Act 1995 (Tas)* provides for the preparation of conservation strategies for threatened native flora and fauna, as defined under Schedules 3, 4 or 5 of the act. Schedule 3 lists the blue whale, the southern right whale and the humpback whale as endangered fauna. These three species are the focus of many commercial whale watching operations, mostly in other states, however this act also provides protection for them within Tasmanian waters. The conservation strategies must, among other things, include proposals to “(a) ensure the survival, and conditions for evolutionary development in the wild, of threatened native flora and fauna; and (b) ensure the identification, and proper management of, threatening processes”

❖ *Wildlife Regulations 1999 (Tas)*

The *Wildlife Regulations 1999 (Tas)* were made under the *National Parks and Wildlife Act 1970 (Tas)*. By classifying the sei whale, blue whale, fin whale, southern right whale and humpback whale as “Specially Protected Wildlife”, the *Wildlife Regulations 1999 (Tas)* prevents the taking, buying, selling or having possession of any form of the

wildlife or the products of such wildlife. This provision is made under Division 2, Regulation 15(1).

Northern Territory's Management Framework

The Department of Infrastructure, Planning and Environment (previously the Parks and Wildlife Commission) of the Northern Territory manages Northern Territory environmental management policies. The only legislation in respect to protection for cetaceans is the *Territory Parks and Wildlife Conservation Act 1980 (NT)*, which has been amended, in some form, almost once a year since then.

❖ *Territory Parks and Wildlife Conservation Act 1993 (NT)*

Whale watching is not a recognised commercial or recreational activity in the Northern Territory and there are no provisions for regulating the activity (ANZECC 1999). The *Territory Parks and Wildlife Conservation Act (NT)* in force at 25 March 1998 provided protection for all cetacean species under Section 26 – Protected Animals. This is now provided under *Territory Parks and Wildlife Conservation Act (NT)*, as in force at 11 December 2001, Part IV – Animals and Plants, Division 3 – Protected Wildlife, Section 43 – Protected Wildlife. A protected animal includes those mammals that are indigenous to Australian coastal seas or migratory mammals that periodically visit the Australian coastal seas.

Appendix 2: The questionnaire sent to 80 whale watch operators in Queensland, New South Wales and Western Australia to gain an understanding of operators' attitudinal compliance to whale watch guidelines.

OPERATOR COMPLIANCE TO HUMPBACK WHALE-WATCH GUIDELINES AND REGULATIONS

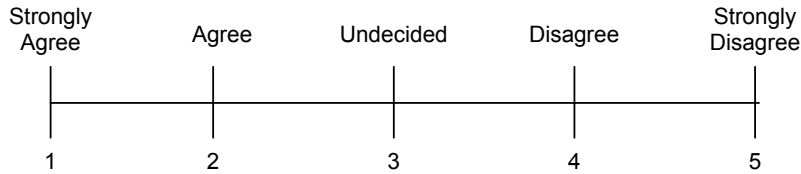
WHALE-WATCH VESSEL OPERATOR SURVEY

This Research is Supported by:

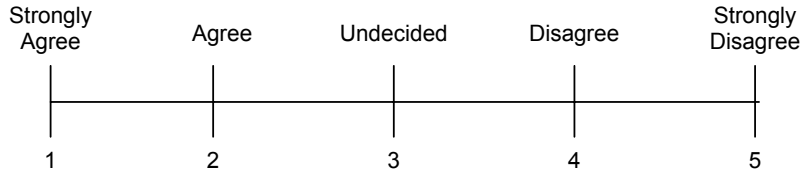


Section 1 Personal Views on Management Conditions

Listed below are a range of statements that have been developed to obtain an understanding of your personal attitudes towards certain situations as defined by the **Australian National Guidelines and some State Regulations in relation to whale (not dolphin) watching**. Please circle the number that best reflects how you feel about each statement.



It is acceptable to travel at speeds higher than 6 knots when within 300m of cetaceans	1	2	3	4	5
It is alright for private non-commercial vessels to approach closer than 300 m	1	2	3	4	5
It is sufficient for an operator to use their individual judgement as to how close they can approach cetaceans	1	2	3	4	5
It is all right to approach a pod with a calf as close as a pod of adult whales	1	2	3	4	5
It is acceptable for staff and tourists to touch cetaceans if the cetaceans are close enough to the vessel	1	2	3	4	5
Manoeuvring the vessel to increase the chance of very close encounters with cetaceans is acceptable	1	2	3	4	5
It is fair to position the vessel in such a way that would allow the tide, wind or current to move the vessel closer to cetaceans	1	2	3	4	5
Positioning the vessel in the path of a cetacean is tolerable	1	2	3	4	5
It is ok to constantly change direction to keep up with cetaceans	1	2	3	4	5
It is acceptable to have more than three vessels around a single pod at any one time	1	2	3	4	5

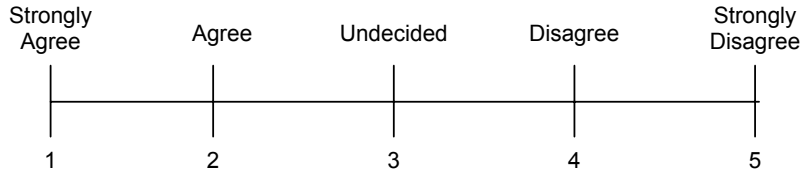


It is satisfactory to keep the engines running when within the minimum distance of a pod of whales	1	2	3	4	5
There is nothing wrong with visiting pods of whales for an unlimited period of time	1	2	3	4	5
It is ok to position vessels around a pod restricting their movement to improve viewing opportunities for the tourist	1	2	3	4	5
It is acceptable to use auto-pilot to stay on a parallel course once the vessel is at the minimum distance from a pod	1	2	3	4	5
Manoeuvring within the minimum distance if it is time to leave the pod to return to harbour is all right	1	2	3	4	5
It is fair to not follow unreasonable state regulations that restrict operator activities	1	2	3	4	5
It is alright to have an unrestricted number of commercial whale-watch vessels in any one area	1	2	3	4	5
It is satisfactory to dispose of organic material overboard	1	2	3	4	5
It is acceptable to operate noisy engines in marine environments	1	2	3	4	5
Advertisement of higher than realistic expectations of interactions with cetaceans is all right	1	2	3	4	5

Section 2 Management of Enforcement

Which of the following possible sanctions do you feel are most appropriate to prevent whale-watch operators from violating regulations? (Please choose only one)

- Suspension of Operating License
- Threat of Fine (level dependent on breach)
- Publication in State Newspaper of Non-complier Name
- Threat of Non-co-operation by other Operators

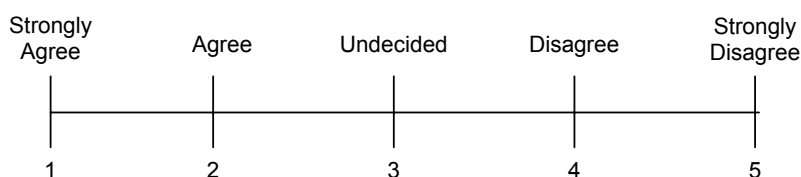


Please circle the number that best reflects how you feel about each statement.

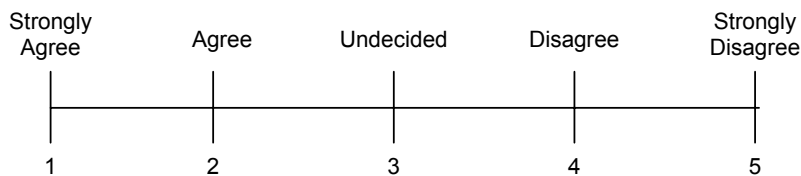
There is a high likelihood that a non-compliant operator will be detected	1	2	3	4	5
There is a high likelihood that once a non-compliant operator has been detected they will be penalised	1	2	3	4	5
Large penalties or sanctions on a non-compliant operator would cause them personal problems (e.g. Feelings of guilt)	1	2	3	4	5
I would feel guilty if I did not follow the whale-watch guidelines as outlined	1	2	3	4	5
Non-compliance on my part would cause me personal problems (e.g. Feelings of guilt)	1	2	3	4	5
Most of the people or business associates, whose opinions I most value, would lose respect for me if I did not follow the guidelines	1	2	3	4	5
Losing the respect of those whose opinion I value most would cause problems for me	1	2	3	4	5
Current levels of monitoring adherence to the regulations are effective	1	2	3	4	5

Section 3 Personal Views and Perceptions of National Guidelines

Although some states have regulations, the National Guidelines are applicable to waters outside the 3nm limit in all states. Therefore, the statements listed below have been developed to describe the preferences that individuals may have when deciding to comply with **National Guidelines** as they pertain to the **watching of whales** not dolphins. The questions have been designed to contain some similarities, however it is extremely important that every question is answered. Please circle the number that best reflects how you feel about each statement.



Following the National Guidelines would increase my business	1	2	3	4	5
The cost of following the National Guidelines would exceed the potential rewards for being in the business	1	2	3	4	5
The National Guidelines are unrealistic because they create excessive requirements	1	2	3	4	5
The National Guidelines are not appropriate for all whale-watch operations	1	2	3	4	5
Larger whale-watch operations benefit more from the National Guidelines than smaller operations	1	2	3	4	5
Failure to comply with <u>some</u> sections of the National Guidelines can not be avoided	1	2	3	4	5
It is an operator's duty to follow all National Guidelines since they are meant to benefit the whale-watch industry	1	2	3	4	5
Not following the National Guidelines is acceptable	1	2	3	4	5
Failing to comply with the National Guidelines is acceptable since compliance is voluntary	1	2	3	4	5
The National Guidelines should be obeyed under any circumstances	1	2	3	4	5



Adherence to the National Guidelines is beneficial to my business	1	2	3	4	5
The benefits to the business of following the National Guidelines outweigh the costs	1	2	3	4	5
Effective implementation of all the National Guidelines is impossible	1	2	3	4	5
The requirements of the National Guidelines are suitable for all whale-watch operations	1	2	3	4	5
The National Guidelines are fair to all whale-watch operations	1	2	3	4	5
It is extremely difficult to follow the <u>majority</u> of the National Guidelines	1	2	3	4	5
Complying to the National Guidelines benefits everyone	1	2	3	4	5
It is acceptable to not follow some of the National Guidelines because not everyone will comply with all the Guidelines	1	2	3	4	5
Due to the voluntary nature of the National Guidelines, it is reasonable to expect that they will sometimes be broken	1	2	3	4	5
It would be against my better judgement not to comply with the National Guidelines	1	2	3	4	5

Based on your experiences so far, what would you prefer to see Australia move towards? Please choose only one.

- No Regulation
- Self Regulation by the whale-watch industry
- National Guidelines Only
- National Regulations Only
- National Guidelines & State Regulations
- National & State Regulations
- State Regulations Only

Section 4 Personal Characteristics

Information concerning individuals' personal and business characteristics is important because previous studies have indicated that they strongly influence the decisions made by a particular person. This first section includes questions relating to you personally to allow for demographics to be included in the study.

1. Which one of the following options **best** describes your position:

Sole Owner & Operator	<input type="checkbox"/>	
Partner & Operator	<input type="checkbox"/>	
Manager & Operator	<input type="checkbox"/>	
Operator	<input type="checkbox"/>	

2. Gender (Please circle one)

	Male	Female
--	------	--------

3. Year of Birth (Please insert year)

4. Please indicate the **highest** level of formal education you have attained.

Year 10	<input type="checkbox"/>
Year 12	<input type="checkbox"/>
TAFE Education	<input type="checkbox"/>
Undergraduate University Degree	<input type="checkbox"/>
Postgraduate University Degree	<input type="checkbox"/>

5. In general terms, which one of the following political parties do you support?

Liberal	<input type="checkbox"/>
Labour	<input type="checkbox"/>
National	<input type="checkbox"/>
Democrat	<input type="checkbox"/>
One Nation	<input type="checkbox"/>
Green	<input type="checkbox"/>
Independent	<input type="checkbox"/>

6. How many years have you operated a commercial vessel of any sort?

7. How many years have you operated a Whale-watch vessel?

8. Which management conditions relate to whale-watching in your area? You may choose two, if applicable.

Australian National Guidelines	<input type="checkbox"/>	
QLD Regulations	<input type="checkbox"/>	
NSW Regulations	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
	<input type="checkbox"/>	Please List: _____

8. How familiar do you consider yourself with the National and State management conditions relating to whale-watching in your State?

Very Familiar
 Familiar
 Moderately Familiar
 Unfamiliar
 Not at all Familiar

Section 5 Business Characteristics

The second section relates to your business or the business you work for and is also used for demographics only.

A. What is the Maximum Number of Passengers that the Vessel you Operated in 1999 is licensed to carry? If you operate two vessels, please give the largest vessel capacity.

B. Does your business/ the business you work for, specifically advertise as a whale-watch experience or is whale-watching conducted when the opportunity presents itself while performing usual business activities?
 Specifically Advertise Opportunistic Observations

C. How many months of the year do you work in the whale-watch industry?

- 0 - 3 months
- 4 - 6 months
- 7 - 9 months

D. What is the major activity or business that you are involved in for the rest of the year outside of whale-watch season? Please choose only **one**.

- Charter Fishing
- Commercial Fishing
- Dolphin Watching
- Reef Tours
- Other Please list: _____

E. How long has your business/ the business you work for operated under a whale-watch **permit**? Please leave blank or insert N/A if permits do not apply in your area.

F. Does your business/ the business you work for belong to a professional organisation? (e.g. Ecotourism Association) **Please list**.

G. Does an agency or organisation regularly inspect your vessel/ the operation of your vessel?

Yes/ No

Please list each agency, how often and the reason for inspection

Agency/ Organisation (e.g. QPWS; Qld Transport)	Frequency of Inspection (Fortnightly; Monthly; Yearly)	Reason for Inspection (e.g. routine safety; compliance; interpretation assessment)

Appendix 3: Web site addresses for Australian political parties

Australian Labor Party: <http://www.alp.org.au>

National Party: <http://www.nationalparty.org>

Liberal Party of Australia: <http://www.liberal.org.au>

Australian Democrats: <http://www.democrats.org.au>

The Australian Greens: <http://www.greens.org.au>

One Nation: <http://www.onenation.com.au> (possibly no longer available as party has disbanded. See also: <http://www.gwb.com.au/onenationa/hanson>)

Independent Politicians have their own individual websites that are too numerous to list.

Appendix 4: Attitudinal compliance scores for the 27 whale watch operators from Queensland (QLD), New South Wales (NSW) and Western Australia (WA) who returned a questionnaire.

State	Indiv. Score	State	Indiv. Score	State	Indiv. Score
QLD	70	NSW	75	WA	70
QLD	75	NSW	77	WA	53
QLD	78	NSW	87	WA	72
QLD	75	NSW	61	WA	63
QLD	81	NSW	73	WA	70
QLD	85	NSW	64	WA	74
QLD	79	NSW	50	WA	73
QLD	77			WA	65
QLD	75			WA	54
				WA	71
				WA	77
Mean	77.2	Mean	69.6	Mean	67.5

Appendix 5: Complete forward multiple regression models testing attitudinal compliance to the whale watch guidelines.

Regression 1 - Multiple regression model for whale watch operators' attitudinal compliance (based on Sirakaya 1997)

Forward Regression Summary

Model	Variable Entered	R-squared	F-value	P
1	Perceived certainty of legal sanctions	0.263	8.910	0.006
2	Endorsement of non-compliance	0.428	8.974	0.001
3	Perceived non-compliance by other operators	0.556	9.612	<0.001
4	Belief in the fairness of the guidelines	0.637	9.654	<0.001

Regression Coefficients

Variable	Regression Coefficients	Standard Error	T-value	P
Perceived certainty of legal sanctions (CM2)	1.154	0.262	4.408	<0.001
Endorsement of non-compliance (PVP8#18)	1.414	0.330	4.285	<0.001
Perceived non-compliance by other operators (PVP9#19)	-0.645	0.238	-2.714	0.013
Belief in the fairness of the guidelines (PVP5#15)	-0.515	0.233	-2.213	0.038

Regression 2 - Multiple regression model for whale watch operators attitudinal compliance (using calculated variables CM4, CM7 and CM10)

Forward Regression Summary

Model	Variable Entered	R-squared	F-value	P
1	Perceived Threat of Legal Sanctions	0.214	6.820	0.015
2	Sole Owner/ Operator	0.366	6.197	0.004

Regression Coefficients

Variable	Regression Coefficients	Standard Error	T-value	P
Perceived Threat of Legal Sanctions (CM4)	0.189	0.071	2.675	0.013
Sole Owner/ Operator (PC1.1)	-7.097	2.966	-2.393	0.025

Regressions 3 and 4 - Multiple regression model for whale watch operators' attitudinal compliance (as per Regression 1 and 2, plus three added variables)

Forward Regression Summary

Model	Variable Entered	R-squared	F-value	P
1	Perceived level of Monitoring	0.324	11.968	0.002

Regression Coefficients

Variable	Regression Coefficients	Standard Error	T-value	P
Perceived level of Monitoring	4.349	1.257	3.459	0.002

Appendix 6: Example of a Data Sheet (date and vessel deleted to ensure confidentiality)

TIME	EASTING	NORTHING	VSSL SPD	DIRN VSSL	CUE	FOCAL	POD#	POD COM B	POD CMP	RF-1 EST-2	DIST POD	ANG POD	VSSL #	VSSL TYPE	RF-1 EST-2	VSSL DIST	ANG VSSL	COMMENTS
9:24	46		6.4	327	0	*				1					1	394	327	
						*	1		3									Engine Off
:26	47		0.6	227		*	1			1	25	312			1	3130	328	
:27	49		0.0	302		*	1			1	29	246			1	126	303	
:28	49		0.0	317		*	1			1					1	124	278	
:30	50		0.6	311		*	1			1	22	219			1	119	245	
:32	51		0.0	293		*	1			1	164	213			1	146	247	
:34	52		0.4	313		*	1			1					1	326	222	Started up engines
10:00	54		15.9	344		*	1											Neutral
:02	55		14.3	27		*	1			2	600	49						Gear
:04	56		0.0	117														
:06	57		6.0	123		*	1		2	1	199	26						Neutral
:07	58		2.2	153		*	1		2	1	89	72						Engines off
:09	59		0.0	170														"
:09	60		1.4	184		*	1		2	1	22	134						
:10	61		1.0	89		*	1		2		15	165						

Easting and Northing – Data was saved as a Way Point on the GPS, therefore the waypoint number was recorded; Vssl Spd – Vessel Speed (knots); Dirn Vssl – Bearing of Bow of the Vessel; Cue – An indication of how the pod was sighted; Focal – an * indicates that the pod was the focal pod; Pod Comb – to indicate when two pods combined into one; Pod Cmp – Number of individuals in a pod; RF1/ Est2 – A measurement taken with the laser rangefinder was scored as 1, while an estimate was scored as 2; Dist Pod – Distance to the pod; Ang Pod – Compass bearing to the pod; Vssl # - Number assigned to other vessels in the area (deleted for confidentiality); Vssl Type – Record of vessel type other than whale watching e.g., fishing vessel; Vssl Dist – Distance to other vessel; Ang Vssl – Compass bearing to other vessel.

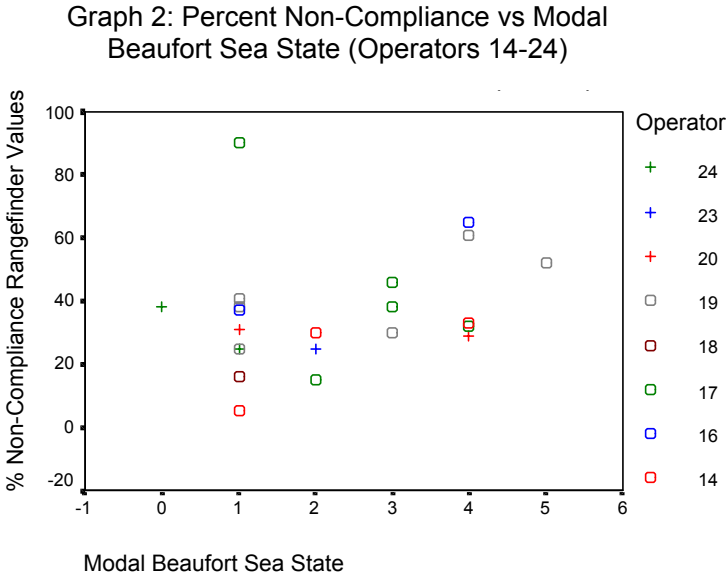
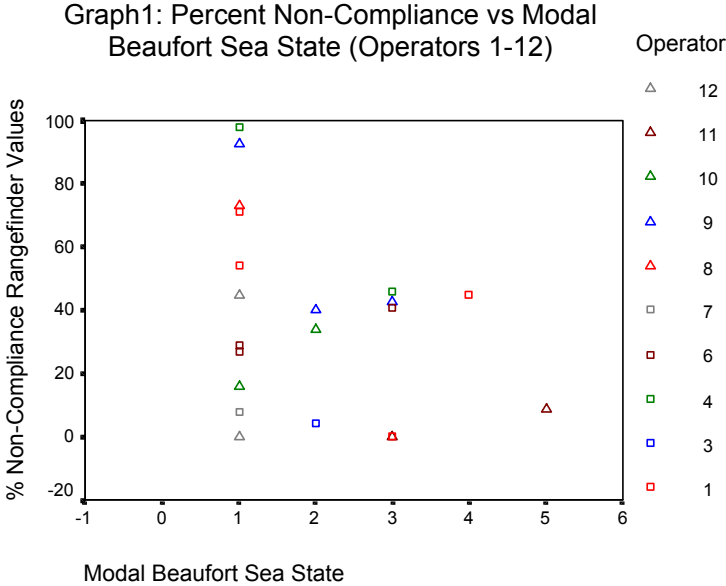
Appendix 7: Example of Weather Data Sheet (date and vessel deleted to ensure confidentiality)

TIME	WP POSITION	% CLOUD COVER	BEAUFORT	WIND DIRECTION	WAVE HEIGHT	ODOMETER READING	comments
10:00	01	40	3	SE	0	0	Harbour
10:59	02	30	2	SE	0	14.7	close to Moon Pt
11:18							
11:53	19	50	4	SE	0.5	20.8	Before southern arch
12:36	35	40	5	NE	0.5	23.3	under cloud
12:58	49	40	5	NE	0.5	24.0	off southern arch
13:52	80	40	5	E	0.5	26.2	off mid arch
14:17	1						
14:33	89	40	5	E	0.5	33.9	heading towards northern arch
15:04	90	50	4	S	0.5	41.9	heading towards Moon pt
15:56	91	100	4	SE	0	56.4	BW Moon + BWT
16:25	92	100	4	SE	0	58.9	Harbour

Time – time in 24 hour format; WP Position – Position was saved as a way point in the GPS, therefore the waypoint number was recorded; % Cloud Cover – Sunny = 0, Completely Cloudy = 100; Beaufort – Wind speed; Wind Direction – direction wind was coming from; Wave height – approximate height of the waves in 0.5m increments; Odometer Reading – distance travelled from the harbour, with last position being the total distance travelled on the whale watch tour; Comments – any information relevant at the time.

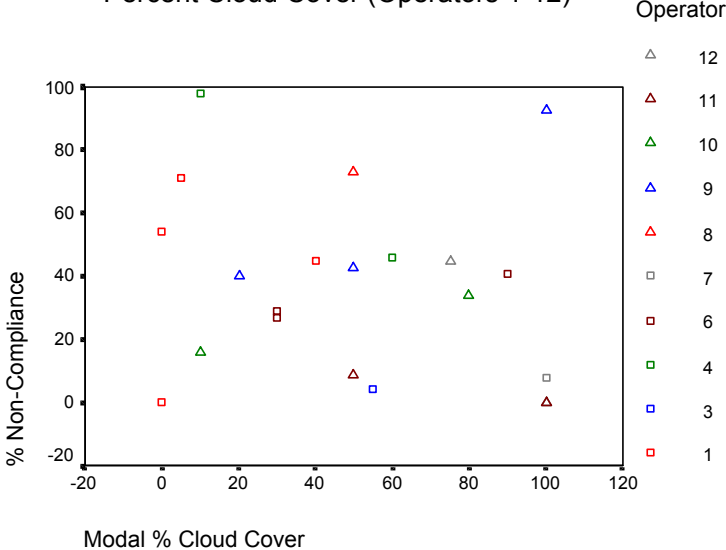
Appendix 8: Effect of Beaufort Sea State and Percent Cloud Cover on Overall Operator Compliance using Rangefinder Values only

Hervey Bay

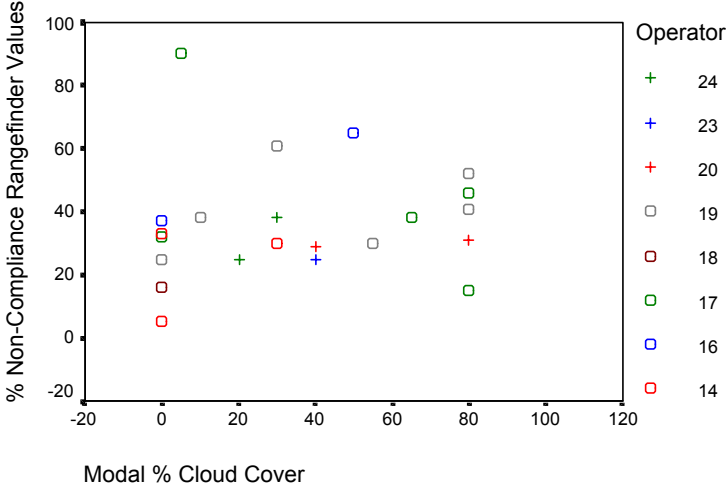


Hervey Bay (continued)

Graph 3: Percent Non-Compliance vs Modal Percent Cloud Cover (Operators 1-12)

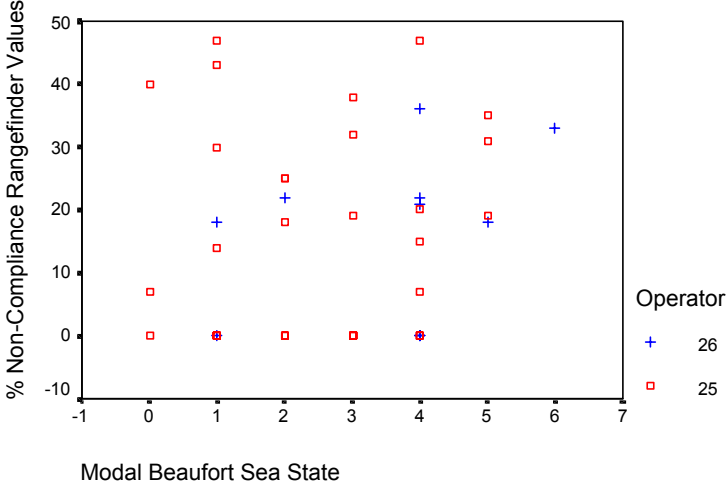


Graph 4: Percent Non-Compliance vs Modal Percent Cloud Cover (Operators 14-24)



Coffs Harbour

Graph 1: Percent Non-Compliance vs Modal Beaufort Sea State



Graph 2: Percent Non-Compliance vs Modal Percent Cloud Cover

