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Ecologically Sustainable Tourism Management

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Abstract:
One of the primary challenges facing ecotourism management is to establish a profitable and ecologically sustainable industry, while simultaneously achieving a satisfying experience for visitors and raising standards of living in the host community. This paper analyses the management practices and challenges faced by two ecotourism attractions on the Gold Coast in Queensland, Australia, namely Couran Cove Island Resort and Boondall Wetlands Reserve. As an ecotourism-based resort on one of the world's few naturally-occurring sand islands, Couran Cove is active in implementing a range of initiatives for sustainable environmental management. This is particularly important as Couran Cove is home to a wide variety of plant communities and one of the largest remnants of the rare *Livistona* rainforest on the Gold Coast. The Boondall Wetlands Reserve is internationally recognized as an important feeding and resting habitat for migratory wading birds from Alaska, China, Japan, Mongolia and Siberia. Through the activities of the Visitor Centre, the Boondall Wetlands Reserve aims to: (i) promote environmental awareness within the local and regional communities; (ii) provide community education and information about wetlands systems within the local, regional and global context; (iii) offer nature-based recreation and tourism services; and (iv) demonstrate how wetlands can diversify the tourism and ecotourism industries.

Keywords: Ecotourism-based resort; Wetlands reserve; Environmental and ecotourism management; Ecologically sustainable tourism; Community partnership; Conservation programs.

1.0 Introduction

Environmental protection became a major issue in the 1990s after the introduction of the concept of sustainable development by the Brundtland Commission (World Commission on Environment and Development) in *Our Common Future* (1987). This report was seen as an expression of the increasing environmental awareness toward the latter part of the 1980s. Tourism as an economic activity has an inevitable effect on the environment of the destination. The environment is often regarded as the major pull factor of tourist movements, contributing to the desirability and attractiveness of a tourist destination. As the environment is an indispensable asset to the tourism industry, the protection and conservation of environmental resources (which include natural, cultural and historic resources) are prime considerations for the tourism industry, upon which it depends as primary inputs in the production of the tourist output.

The internationalization of environmental awareness through organizations such as Green Globe has led to the gradual restructuring of the tourist industry to adopt strategies and policies in support of environmental quality, based on the sustainable use of environmental resources. Ecotourism is often regarded as a form of nature-based tourism and has become an important alternative source of tourists. Ayala (1995, p. 356) defines ecotourism as "tourism that allows for the enjoyment and understanding of the nature and culture of a destination while producing economic benefits and actively promoting environmental conservation." As the world's population becomes increasingly urbanised, the demand for tourist attractions which are environmentally friendly, serene and offer amenities of a unique nature, has been growing rapidly.

For many countries and regions, tourism represents one of the few opportunities for local development, employment and revenue generation. However, when tourism is intensive, particularly on fragile coastal, fresh water and mountain ecosystems, this can have serious repercussions on nature and the environment. Academic experts, consultants from the private sector, and representatives from the International Labour Organisation, United Nations, World Tourism Organisation and the European Commission (Travel Impact Newswire, 2001) contributed to the "Checklist for Tourist Projects on Indicators of Sustainable Tourism" report.

The purpose of the checklist was to identify the tourism industry's positive, as well as its perceived or real negative contributions, using environmental, social and economic indicators. This comprehensive checklist can be used to conceptualize and undertake tourism projects to achieve ecological, social and economic sustainability in the long run. The guidelines for the evaluation of sustainable tourism project planning and development focus on meeting the needs of tourists, as well as raising the living standards and conditions of locals.

Five types of environmental indicators proposed for the detailed and exhaustive checklist include indicators for:

- Fragility of ecosystems and biodiversity
- Waste disposal
- Water consumption
- Intensity of land use and physical impact
- Protection of the atmosphere, noise level and visual impact.

Water use by tourism projects is particularly important, given the severe droughts and water shortages faced in Queensland (and elsewhere in Australia), and the compatibility of the needs of tourists and of the local community. The checklist also refers to the volume of water use compared with the amount of fresh water available (in reservoirs or other types of storage), and the percentage of waste water that is treated compared with the volume of waste water.

Growth in tourism has generated problems such as the destruction of traditional ways of life. Increased visitor numbers and their needs generate changes within the host community, so that regional tourist development could lose its character. In order to ensure that tourism benefits the local population directly, the social indicators evaluate how tourism projects can be integrated into the lifestyles of the community. Various types of social indicators include tourism pressure, social impact, safety, public health and local population satisfaction. For instance, the social impact indicator assesses tourism development on job skills, education and training, and gender equality. The acceptance of tourism by the local providers, and community participation in tourism projects, serve as social indicators and determine the satisfaction levels of the local

population. Economic indicators which evaluate the linkage between tourism projects, and economic and sustainable development, would include an analysis of control over development, business generated, tax revenue, foreign exchange earnings or losses, and the proportion of local ownership.

The purpose of this paper is to examine critically the management practices, problems and challenges faced by two ecotourist attractions located on the Gold Coast in Queensland, Australia. Couran Cove Island Resort, which is a private organization, is a large integrated ecotourism-based resort located on the Gold Coast (see Figure 1). Boondall Wetlands Reserve, a public enterprise located in Brisbane (the State capital of Queensland), is an internationally important migratory wading bird habitat and part of the East Asian-Australasian Shorebird Reserve Network. As sustainable tourism also involves managed development, conservation and visitor use, the paper will assess the management practices of these ecotourism attractions against the checklist of some of the indicators discussed above.

2.0 Visitors to Queensland

Figure 2 shows the quarterly number of intrastate, interstate and international overnight visitors to Queensland from 1995 to 2000 (Australian Bureau of Statistics and Bureau of Tourism Research). On average, intrastate, interstate and international visitors to Queensland grew by 1.65%, 4.91% and 1.86%, respectively, during this period. As can be seen from Figure 2, intrastate visitors have a significant and positive trend, interstate visitors have a slight positive trend, and international visitors have virtually no trend. The relative share of intrastate visitors in the overall number of visitors to Queensland is around 67%, on average, followed by much lower shares of interstate and international travellers, respectively. Relative to the total number of visitors to Queensland, the number of international visitors has been decreasing. Volatility is evident in the intrastate and interstate visitors, but is barely noticeable in the number of international visitors. For the sample period, the correlation between the number of intrastate visitors and the share of intrastate to total visitors in Queensland is as low as -0.15, while the

correlation between the number of intrastate visitors and total visitors in Queensland is as high as 0.88.

3.0 Couran Cove Resort

More than a century ago, there was only one Stradbroke Island off the Gold Coast of Queensland, and there were at least four Aboriginal tribes (including the Kombamerri, Noonuckle, Goenpul and Quandamooka) living and hunting on the island. ['Couran' to the Kombamerri people means the Moreton Bay ash tree.] Most of the original island dwellers were killed by diseases such as tuberculosis, smallpox and influenza by the end of the 19th Century. The second shipwreck on the island in 1894, the Cambus Wallace, and its subsequent destruction through the explosion of dynamite, caused a large crater in the sandhills on Stradbroke Island. Eventually, the ocean broke through the weakened land form and Stradbroke became two islands.

Couran Cove Island Resort is built on one of the world's few naturally-occurring sand islands, which is home to a wide range of plant communities and one of the largest remnants of the rare *Livistona* rainforest on the Gold Coast. Many mangrove and rainforest areas, and Malaleuca Wetlands on South Stradbroke Island (and elsewhere in Queensland), were cleared, drained or filled for residential, industrial, agricultural or urban development in the first half of the 20th Century. Farmers and graziers eventually abandoned South Stradbroke Island in 1939 because its vegetation and soil conditions were not suitable for agricultural activities.

As an ecotourism-based resort, most of the planning and development of the attraction has been concentrated on the need to co-exist with the fragile natural environment of South Stradbroke Island to achieve sustainable development. Planning initiatives take into account the building of accommodation, water and energy supply, liquid and solid waste disposal, pest management, community involvement and environmental education. In addition to providing the traditional resort-leisure product, it has been argued that ecotourism resort management should have a particular focus on best-practice environmental management, an educational and interpretive

component, and direct and indirect contributions to the conservation of the natural and cultural environment (Ayala, 1996).

3.1 Conservation

European settlement of almost 200 years has depleted many plant and animal species on South Stradbroke Island. Its ecosystems have already been modified substantially through cattle grazing, agriculture, fire, logging and extensive sand mining. Couran Cove Island Resort has implemented an extensive re-vegetation and rehabilitation program to help restore and preserve a wide range of valuable plant species, such as the many varieties of ferns, swamp orchids, epiphytes and rainforest trees (see Figure 3). This program is also intended for bringing awareness to the community of the essential role played by these habitats in the ecosystem of the island.

After its construction, native vegetation was replanted around the resort to blend in aesthetically with the environment. For instance, all accommodation construction (eco-cabins), designs, materials used and colours have been chosen to blend in with the existing landscape of the environment. Given the warm and humid climate for nine months of the year, the eco-cabins are built on stumps which allow the free circulation of air under the buildings, and the verandahs are screened off against insects. This type of construction is built throughout the eucalypt woodlands, which allows visitors to view the habitats of the woodlands undisturbed from their eco-cabins. Accommodation has also been built on the lagoon overlooking the water.

Walkways have been installed for conservation purposes. While not restricting access to view the natural environment, these walkways quarantine visitors from the more fragile areas. The walkways through the Livistona rainforest are raised above the ground to protect the delicate forest floor so that the cycle of decomposition, which is vital for their rejuvenation in a relatively nutrient poor sand, is not interrupted. Part of the walkways includes a raised tower for visitors to view and appreciate the entire Livistona community from the canopy to the forest floor.

3.2 Water and Energy Management

South Stradbroke Island has groundwater at the centre of the island, which has a maximum height of three metres above sea level. This water supply is recharged by rainfall, and is commonly known as an unconfined freshwater aquifer. Couran Cove Island Resort obtains its water supply by tapping into this aquifer and extracting it via a bore system. Some of the problems which have threatened the island's freshwater supply include pollution, contamination and over-consumption. In order to minimise some of these problems, cleaning of laundry is carried out on the mainland. Washing machines are onerous to the island's freshwater supply as detergents contain a high level of phosphates, which comprise a major source of water pollution.

The resort uses LPG-power generation rather than a diesel-powered plant for its energy supply, supplemented by wind turbine. Combined, these have reduced greenhouse emissions by 70% of diesel-equivalent generation methods. Excess heat recovered from the generator is used to heat the swimming pool and hot water in the eco-cabins, some of the resort's vehicles are solar-powered, and water-efficient fittings are installed in showers and toilets. However, not all the appliances used by the resort are energy efficient, such as refrigerators. Visitors who stay at the resort are encouraged to monitor their water and energy usage via the in-house television system, and are rewarded with prizes (such as a free return trip to the resort) accordingly if their usage level is low. Such facilities and incentives are intended to encourage guests to be responsible visitors and tourists.

3.3 Waste Management

Couran Cove has incorporated the waste management hierarchy into practical applications to minimise the impact of waste on the environment, namely avoid, re-use, re-cycle and disposal of waste appropriately. In order to 'avoid' waste, the resort tries to bulk purchase in order to reduce excessive packaging. Organic waste, such as food scraps and cuttings, go through a much longer recycling process, whereby it is sorted, weighed, pureed, aerated, composted, and finally fed to worms. A vermiculture processing plant (also known as worm farming) has been established to re-use organic waste and the by-product, known as vermicast or worm castings, are used as soil

conditioner and fertiliser in the resort's landscaping and re-vegetation projects. Treated waste water is re-injected into the natural environment through a specially-built artesian system.

Recycling is achieved through an extensive program which ensures that all recyclable materials are collected, sorted, compacted and shipped to the mainland for recycling. Non-recyclable wastes are also sent to the mainland for disposal. Around the resort, including the eco-cabins, three different types of bin are installed for the disposal of organic, recyclable and non-recyclable wastes.

State-of-the-art techniques are used for sewage treatment by the Couran Cove Island Resort to ensure maximum treatment and minimum impact of waste. Couran Cove uses the following processes in its sewage treatment:

- Collection of sewage - vacuum sewer pipes are used to collect and transport sewage from housing to central collection areas along shallow trenches (the latter minimises the potential negative environmental impacts on the forest and bushland areas);
- Treatment of sewage – from primary to tertiary, with an added polishing stage which involves ultraviolet disinfection;
- Disposal of sewage – involves the treated effluent being used for irrigation, as well as being injected into the ground via a series of underground drippers.

3.4 Pest Management and Other Challenges

Pest management is an important part of conservation. Couran Cove has adopted a holistic approach to pest management (for example, mosquito and cane toad management), which includes identifying pest species, researching the availability of natural predators, and investigating environment-friendly solutions. This approach was widely practised at the beginning, but the added pressures of increased visitors have resulted in the use of short-term expensive chemical treatments. However, the resort has incurred high financial and environmental costs through the use of fertilizers and pesticides.

Acid sulphate soils are common on the south-east coastal region of Queensland, and contain pyrites (or iron sulfide). When the soil is exposed to the air, sulphuric acid is produced, which can pollute watertables, waterways and wetlands, and damage aquatic life. At the Couran Cove Island Resort, the acid sulphate soils have been found in the seabed of the proposed site for the resort's dock. The construction of Couran Cove has been challenged by this problem, which is overcome by separating the pyrites from the dredged sand. An airtight piping system is used to transport the sand to the soil treatment site, where the sand is washed out and the acidic silt sinks to the bottom of the settling ponds. Eventually, the pyrites are buried underwater.

3.5 Educational Initiatives and Interpretation

Couran Cove has implemented a range of environmental and cultural educational initiatives. The interpretive centre at the resort serves as a hub for information on all activities, including educational information. Development and human settlement have had negative impacts on some wildlife. For instance, there is evidence that wallabies have become accustomed to being fed by island visitors, which has caused the potentially fatal "lumpy jaws" syndrome. Consequently, signage and verbal education are used throughout the resort to discourage the feeding of native animals.

In addition, the centre is an environmental hub for learning about the natural environmental systems of South Stradbroke Island, its rich, diverse and delicate ecosystem, the island's maritime history, original occupants, and fauna communities. A careful presentation and interpretation of the indigenous elements are provided by the resort. Guided nocturnal and rainfall walks, interpretative beach walks and astronomy tours are conducted by the centre. The Aboriginal bush tucker walk enables visitors to explore the cultural heritage of South Stradbroke Island. Throughout the walk, there are interpretive signs which focus on Aboriginal history and culture (dance and folklore), and recent European colonisation. Such proactive measures taken by Couran Cove are intended to enrich the experience of visitors.

Ecotourism management strategies of Couran Cove Island Resort also include encouraging visitors to play an active role in contributing to the health and viability of the environment. With an increasing number of visitors involved in planting native seedlings on the resort, the arduous task of reforestation and conservation is lightened. As a contribution towards building the resort's environmental culture, employees are provided with training to increase their awareness of the resort's natural and cultural heritage, and its eco-initiatives. However, the proposed training has been reduced from two weeks to three days due to staffing pressures since the opening of the resort. Couran Cove Island Resort also organises special educational activities for schools as part of its community education on sustainable tourism

4.0 Boondall Wetlands Reserve – A Unique Heritage Attraction

Before the arrival of Europeans, the Wetlands were occupied by the Turrbul indigenous people. The Boondall Wetlands were not inhabited by the early European settlers because of its reputation as a mosquito-infested swamp. Instead, the Wetlands have been used primarily as a rifle range, dumping ground, grazing land, a source of timber for fences, building materials and firewood, and a popular fishing ground for the local population.

As part of the wetland and bushland protection initiatives, the Boondall Wetlands were one of the six major natural reserves purchased in 1990 by the local government, namely the Brisbane City Council, and was declared a Conservation Area. The Boondall Wetlands Reserve is home to a diverse range of plants and animal communities such as mangroves, salt marshes, melaleuca woodlands, casuarinas and eucalypt forests. During the summer months in the Southern Hemishpere, the migratory wading birds fly to the Boondall Wetlands from Alaska, China, Japan, Mongolia and Siberia, to feed and rest before returning to their breeding grounds in the Northern Hemisphere.

The Ramsar Convention on Wetlands of International Importance aims to stop the worldwide loss of wetlands, and to conserve those that remain through wise use and management. According to the Ramsar criteria based on the numbers of rare, vulnerable or endangered species,

ecological diversity, special habitat for species at critical life stages, or presence of endemic species, the Boondall Wetlands Reserve has been selected as a significant component of the Moreton Bay Ramsar site. Many of the shorebird species which visit the mudflats of Boondall and Moreton Bay are migratory species which are protected by the Japan Australia Migratory Bird Agreement (JAMBA) and the China Australia Migratory Bird Agreement (CAMBA).

4.1 Community Involvement

In 1992, the Boondall Wetlands Management Committee, comprising local residents, Australian Marine Conservation Society, Queensland Wader Study Group, Nudgee Beach Environmental Education Centre, Queensland Conservation Council, and Greening Australia, was formed to advise the local government on the planning and management of the reserve. Environmental Management Plans, and Fire Management and Vegetation Protection Orders, have been established by the local government in order to decrease the rate of bushland clearance.

Located at the western entrance to the reserve, the Boondall Wetlands Visitors Centre was opened in 1996. It provides a unique tourism service to the community and visitors to the Reserve. Monthly visitor arrivals to the Wetlands increased from 1996 to 2001 at an average annual rate of 10.4% (see Figure 4), reaching a maximum of 4005 visitors in July 2000. As shown in Figure 5, most visitors to the Wetlands arrive on weekends. Using the ratio-to-moving average method to calculate monthly seasonal indices for visitor arrivals in levels (see Table 1), the most popular month is June, while the least popular month is clearly February. High seasons also include January, April, and July to September. These months are popular because of school holidays, the New Year vacation and the Australia Day public holidays in January, and the pleasant winter months through to the start of spring in September.

The interpretation of both the natural and cultural heritage enhances understanding, which in turn encourages visitors to be more sensitive towards local people, local lifestyles, and natural features and habitats. In addition to minimizing negative impacts on the environment, visitors to the wetlands are encouraged to make an ‘active’ contribution to the sustainability of attractions.

Being recognised as one of Australia's leading Wetlands interpretive centres, the Boondall Wetlands Visitor Centre is dedicated to environmental awareness and community education on the Wetlands ecosystems within the local and global context. A take-home information sheet, display and meeting rooms, and interpretive materials to introduce visitors to the reserve are available at the Centre.

4.2 Management Commitments

In addition, the Centre coordinates a range of interpretive, educational, nature-based recreational, cultural, and ecotourism activities within the Reserve. Recreational activities such as hiking, fishing, canoeing and boating are all based on natural environmental features, so that these activities fall under the category of ecotourism. A range of special interest group activities is also provided in the Boondall Wetlands, including bird watching, canoeing, bushwalking and cycling. Numerous family and children's programs are available during the school holidays and for significant events such as World Environment Day. All activities are monitored closely by the Visitor Centre to ensure a balance between sustainability of, and accessibility to, the wetlands ecosystem.

The Boondall Wetlands Visitor Centre also invites community participation through appointing interpretive volunteers to work on weekends, as well as to engage in regeneration activities within the Reserve. Training is provided for volunteers. A growing emphasis on, and challenge for, wetlands management is to move from being service providers to being experience managers, particularly those who are involved in the interpretation of a destination's natural and cultural heritage. As part of its vision for 2002, the Centre developed initiatives in support of the partnership agreement with the sister-wetlands centre, namely the Yatsu Tideland Environmental Centre in the City of Narashimo on Tokyo Bay, Japan.

It has been argued that leisure choice of destinations for tourists has shifted toward the provision of participatory, experiential, educational and conservation-enhancing vacations, with an increasing preference for high quality natural and cultural heritage experiences. By forming

close ties with selected tour operators, the Boondall Wetlands has become a destination for interstate and international ecotourists. Through this partnership, the role of the Boondall Wetlands Visitor Centre as an educational centre for ecotourism in the community has been expanded. As it is funded on a limited and declining budget by the local government, the Centre conducts its marketing activities in partnership with other environmental centres in Brisbane, as well as with the Queensland Department of Education, to promote their educational package activities, and to provide activity-based educational programs for school groups.

5.0 Conclusion

This paper examined two case studies of best practice ecotourism management and a pro-active sustainable tourism stance of an eco-resort and wetlands reserve. Sustainable tourism could make significant contributions to the quality of the environment, economic development, and the well-being of the host community while providing a high-quality experience for the visitor and/or tourist. Both Boondall Wetlands and Couran Cove have demonstrated a commitment to the environment of the communities in which they operate, through tree-planting, creation of conservation programs and facilities for local schools, and other socially responsible activities.

Couran Cove is an environmentally sensitive resort which attempts to minimize the strain on the environment by refining its equipment, policies and practices in the areas of water, energy, waste and pest management, and conservation. The resort has placed great importance on the utilization of ‘ecotechniques’ (such as solar energy and the recycling of waste) to upgrade its environmental performance. Environmental education and experience are also extended to visitors, although the resort does not limit visits to the attraction. In three years of operation, Couran Cove Island Resort has won 23 international and national awards, including the 2001 Australian Tourism Award in the 4-Star Accommodation category. This resort has embraced and implemented contemporary environmental management practices efficiently. The successful implementation of the principles of sustainability should promote long-term social, economic and environmental benefits, while ensuring and enhancing the prospects of continued viability for the tourism enterprise (Brown and Essex, 1997).

With the principal visitor markets comprising locals and residents from nearby towns and the Gold Coast region, the number of interstate and international tourists visiting the resort is small. Couran Cove has taken the approach, as advocated by Ayala (1995, p. 354) that "designing the resort in a manner that presents and interprets the site's heritage resources, or those in its vicinity, would give the resort a strong sense of place and convey to the guests a commitment to conserve these resources." The carrying capacity of Couran Cove does not seem to be of major concern to the Resort management. An attraction that receives more visitors than it can accommodate will deliver a lower quality of experience than expected. As it is a private commercial ecotourist enterprise, regulating the number of visitors to the resort to minimize damage to the natural environment on South Stradbroke Island is not a binding constraint. However, the Resort's growth will eventually be constrained by its carrying capacity, and quantity control should be incorporated in its management strategy.

Wetlands contribute to tourism and recreation directly through visitor use and indirectly through interactions with other coastal ecosystems enjoyed by visitors. According to Bacon (1987), recreational use of wetlands need not conflict with their conservation objectives, but decisions concerning the protection of wetlands should precede recreational planning. Orams (1995) argues that ecotourism management strategies should attempt to move ecotourism experiences beyond mere enjoyment to a more active role which incorporates learning, attitude and behavioural change. Through these desired objectives, the activities of visitors would actually contribute to the health and viability of the natural environment. The Boondall Wetlands Reserve has adopted such management strategies through the facilitation of education at the Visitor Centre. By providing financial support and labour through community involvement, visitors are assisting directly in the maintenance and protection of the natural environment. However, the behavioural objective is more complex and difficult to measure, and is recognized as being a somewhat idealistic objective.

Tourism has become an important service sector, and typically provides new opportunities for local and regional economic development. Moreover, an increasing share of the discretionary income of tourists is spent in this sector. The importance of tourism to the Queensland economy

is indisputable as tourism is the State's second largest export earner. For Queensland to remain competitive as a national as well as an international holiday destination, the challenge is for the State to build a profitable and ecologically sustainable tourism industry that offers quality ecotourism products. This will further enhance 'Brand Australia', an international image for Australia as a unique travel destination that was launched by the Australian Tourist Commission in 1995. Brand Australia focuses on visitors experiencing a combination of Australia's spectacular natural environment, free-spirited nature, lifestyle and culture.

6.0 Acknowledgements

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Table 1

Seasonal Indices for Monthly Visitor Arrivals at the Boondall Wetlands Reserve, Using Ratio-to-Moving Averages, 1996-2001

Month	Seasonal Indices
January	1.18
February	0.65
March	0.96
April	1.13
May	1.09
June	1.29
July	1.23
August	1.19
September	1.11
October	0.85
November	0.82
December	0.75

Figure 1. Location of Brisbane and the Gold Coast in Queensland, Australia

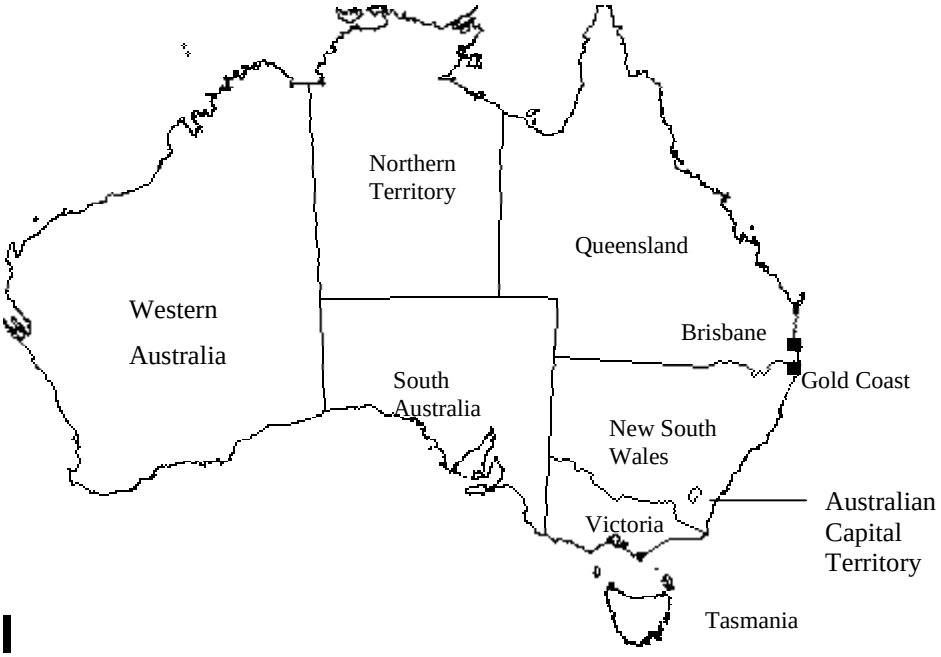

Figure 2. Quarterly Intrastate, Interstate and International Visitor Arrivals in Queensland, 1995-2000

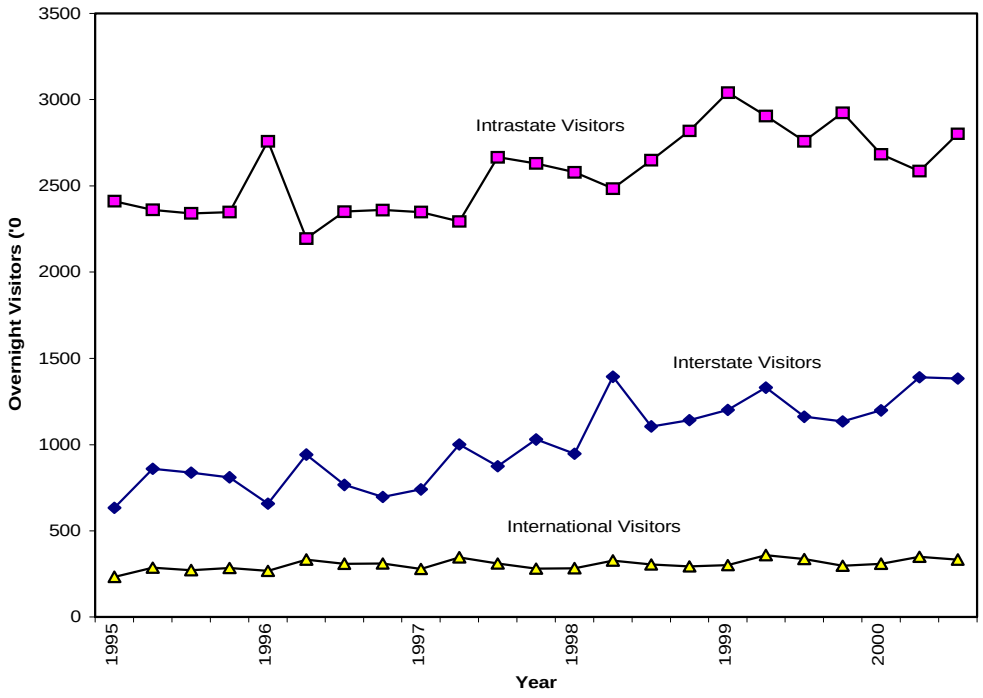

Figure 3. Vegetation Within the Couran Cove Area.

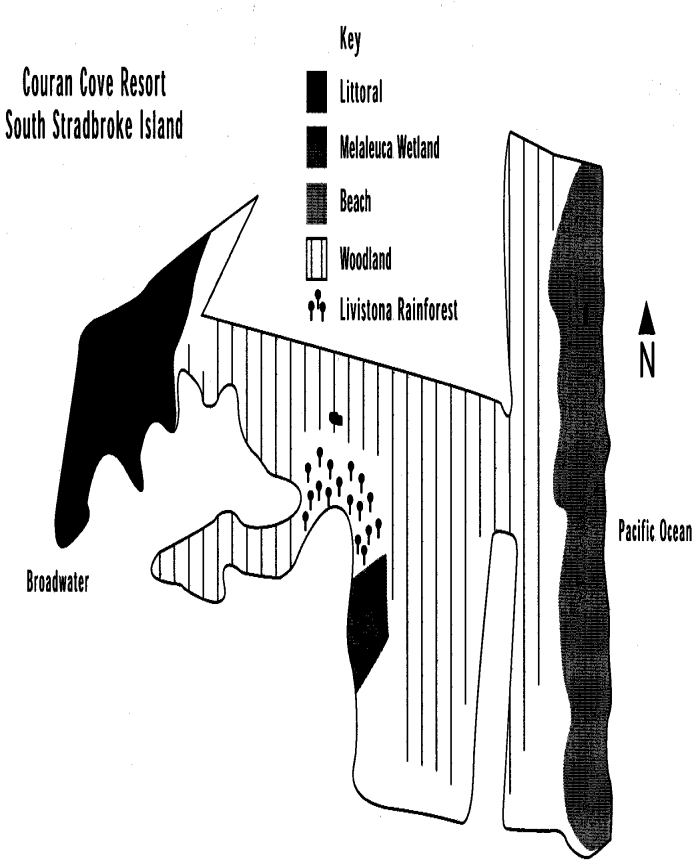

Figure 4. Monthly Visitor Arrivals to Boondall Wetlands Reserve, 1996-2001

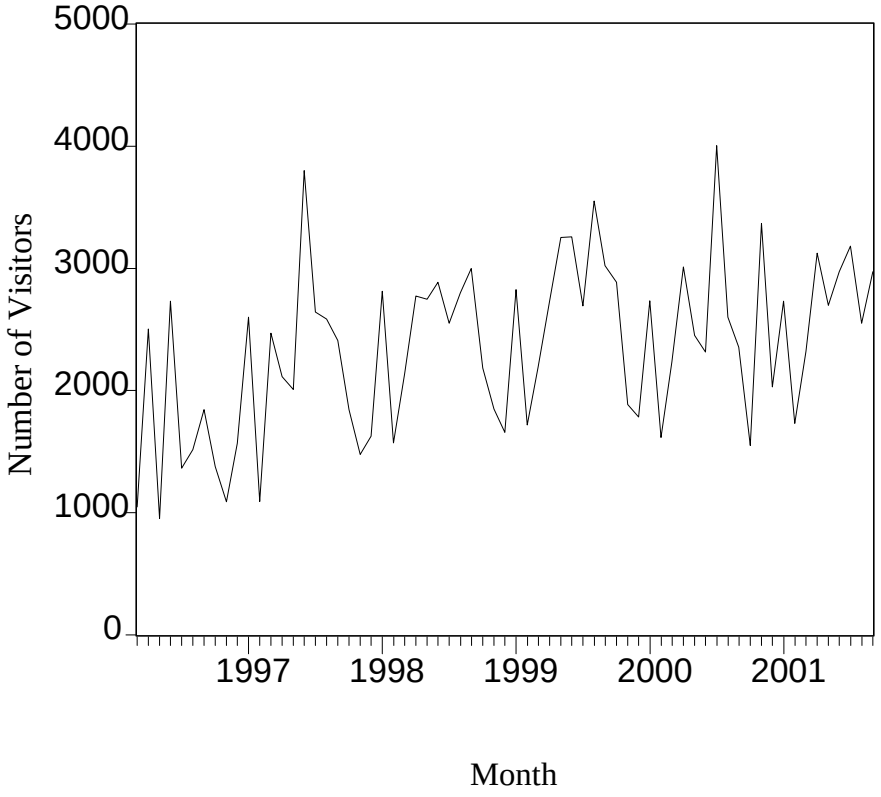

Figure 5. Week-day and Week-end Average Attendance Figures, 1996-97