

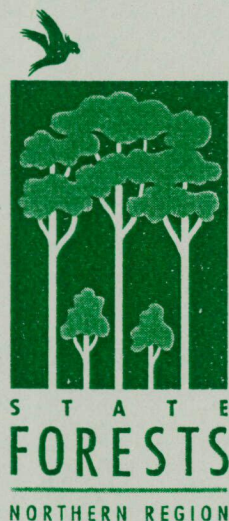
**CASINO MANAGEMENT AREA EIS AND
MURWILLUMBAH MANAGEMENT AREA EIS
SUPPORTING DOCUMENT No. 9**

**REPORT ON RECREATION, SCENIC AND WILDERNESS
ASPECTS OF FOREST MANAGEMENT
NORTHERN REGION
STATE FORESTS OF NEW SOUTH WALES**

by

*Centre for Coastal Management
University of New England, Northern Rivers*

1993



**REPORT ON RECREATION, SCENIC AND WILDERNESS
ASPECTS OF FOREST MANAGEMENT
NORTHERN REGION
STATE FORESTS OF NEW SOUTH WALES**

by

*Centre for Coastal Management
University of New England, Northern Rivers*

for
State Forests of New South Wales

1993

© 1995 Forestry Commission of New South Wales

Published by State Forests of New South Wales
Building 2, 423 Pennant Hills Road, Pennant Hills NSW 2120, Australia.

Bibliography
ISBN 0 7310 6708 8

Available from State Forests New South Wales Northern Regional Office Coffs Harbour,
Phone (066) 528 900 or the Casino District Office, Phone (066) 624 499.

This document has been printed on recycled paper.

DISCLAIMER

The findings of this report are based on the author's analysis and interpretation of the survey results. Views and interpretations presented in the report are those of the author and not necessarily those of the State Forests of New South Wales. The recommendations of the report are the opinion of the author.

Executive Summary

This report, prepared by the Centre for Coastal Management of UNE - Northern Rivers for the New South Wales Forestry Commission's Environmental Impact Study consultants, addresses recreation, scenic/visual and wilderness aspects in relation to the management of the Casino - Murwillumbah Forestry Districts. The study area is located within the Coffs Harbour Forestry Region - which covers the State Forests of the Far North Coast of New South Wales.

The methodology used for this study comprised:

- * a review of related literature including Commission data and other sources deemed relevant;
- * consultations with various forest user groups;
- * field observation and assessment of forest recreational sites/facilities; and
- * analysis of relevant maps.

Recreation Aspects

There were a number of issues raised during the EIS process concerning recreation in State Forests, including:

- * provision of special areas for disabled forest users;
- * consideration for alternate forest uses such as tourism; and
- * the loss of tourism from logging activities.

In addition to these, the following issues were raised by recreationalists during the course of this study:

- * visitor safety in forests with regard to road signage and logging traffic;
- * threats to recreation/tourism activities in forests due to logging activity, resulting in reduced or impaired visual/aesthetic amenity or forest experience; and
- * lack of interaction between various parties with regard to tourism values of forests.

Present estimated visitation levels (Casino 78,000 per year, Murwillumbah 34,000 per year) indicate an overall growth in demand of forests for recreation, this being linked to increasing tourism and inward migration of the North Coast. The relatively high level of recreational use results from:

- * proximity of forests to urban centres;
- * attractions and natural attributes of forests;
- * promotion and local knowledge of forests;
- * proximity of forests to National Parks, beaches and other features of interest; and
- * the provision of (usually) developed facilities.

It is noted that natural, site-based, economic and social/personal factors all can cause fluctuations in visitation.

Some 78 sites in the study area are identified as being of particular value for recreation, and are included in a recreation site inventory which describes and analyses each site according to its class, access, condition of facilities, provision of walking tracks, type, level/type of promotion, aesthetic quality, level of visitor impact, recognition by the Forestry Commission and management requirements.

A wide range of recreational activities is known to occur at these sites including abseiling, art/photography, birdwatching, bushwalking, camping, canoeing/kayaking/rafting, canyoning, caving, commercial operations, cycling, driving, fishing, fossicking, hang-gliding, horseriding, hunting, li-loing, nature education/interpretation, orienteering, picnicking, rallying, rock climbing, sightseeing/lookouts, swimming and trailbike riding.

The study identifies nine distinct forest recreation user types or groupings, distinguishable by their knowledge of forest areas, destination/location and frequency of visits, level of planning and affiliations. The groupings are: schools, tertiary or higher education institutions, scouts and girl guides, conservation groups, bushwalking clubs, watercraft groups, horseriding, motor sports and cyclists.

Recreation resources are managed by the Commission, based on the following plans and policies:

1. Forest Commission Policy on Forest Recreation - which provides specific guidelines to direct the recreational usage of forests as part of the multiple use of all State Forests at a district or forest level;
2. Plans of Management are prepared for each specific forestry district. These aim to maintain existing facilities, and to monitor recreational usage in order to determine whether demands justify further provision of facilities. Casino's plan is generally regarded as outdated and is undergoing review, while Murwillumbah's offers a more comprehensive approach to recreational planning via the use of 'intensive' 'extensive' recreational zones to direct recreational management within the overall management of forests; and
3. Preferred Management Priority (PMP) System - which identifies areas of State Forest which are of value for recreation, (zoning them 'Special Emphasis' Recreation, ..2) and as such directs that management for other uses be constrained to a level commensurate with ensuring the maintenance of recreational value.

The Forestry Commission spends around \$200,000 per annum on recreation and related facilities in the study area, about half of which is spent on roads.

The level of expenditure for each Forestry District is as follows:

	1989/90	1990/91
Casino	\$82,000	\$87,600
Murwillumbah	\$114,000	\$137,500

The report suggests that the level of expenditure/funding in each district is proportional to the extent of recreational facility provision, that is, Murwillumbah district has 28 Commission facilitated sites and Casino has eight. The condition and maintenance of these facilities is considered adequate, and the aesthetic quality of the recreational sites is rated as medium to high. The impact of recreational usage on these sites is considered to be low. Access to forest recreational sites is identified as a major determinant of the type and level of recreation that takes place in a particular area, with both districts offering an ample number of sites with a range of access types including 2WD, 4WD and walk track access. Promotion of the forests, and of sites in the forests of the study area occurs mainly in the form of (in order): maps, signage, brochures.

This report discusses a number of issues related to the management of forest recreation including:

- * future forest related recreational visitation - increasing population and forest visitation levels, along with the importance of the attraction of natural landscapes, and changing user tastes are resulting in demands for increased human resources for effective management;
- * ecotourism - an increasing demand for environmentally-sound alternative tourism, and the potential of State Forests to accommodate this;
- * commercial operations in State Forests - the use of forests made by commercial tourism/recreation operators in relation to their operations;
- * potential usage of State Forests - tourist visitation levels to the region and to the National Parks of the region, highlighting the potential for visitation to forests;
- * conflict - between users of forests may occur;
- * user behaviour - ways in which this can be managed require investigation;
- * user-pays scheme for recreational revenue recovery - costs are incurred in providing recreational opportunities in State Forests, and there is potential for ways of introducing user-pays schemes; and
- * recreational usage of 'old growth' areas of State Forest - the potentially threatening nature of using these areas for recreation, along with the opportunities for such activities already available in areas of 'old growth' managed for such usage.

Based on the findings of the study, this report recommends four main strategies for the management of recreation in the Casino - Murwillumbah Forestry Districts. These recommendations pertain to:

- * adoption of the 'Recreation Opportunity Spectrum' - site management framework - in order to identify the appropriate management requirements for specific sites, based on their various user, management, and site characteristics;
- * on-going management of forest recreational resources - involving appointment of a regionally-based planning officer to co-ordinate the management of future recreation in the region. A wide range of policies and actions is prescribed to support these strategies to ensure continued effective recreational management a part of overall multiple use forestry;
- * site specific management - whereby each recreation site is given a specific recommended option for future forestry use. The categories used for these options (as used in the site inventory) are:
 - continued operations
 - general emphasis (..1) #
 - special emphasis (..2) recreation resource #
 - special emphasis (..6) visual protection #
 - special emphasis (..2) & (..6) combined #
 - widened emphasis
 - site monitoring
 - as per Commission's PMP system;
- * Future forest recreation management- to involve planning for:
 - formulation of activity-based recreation policy
 - community education about forestry operations
 - incorporation of volunteers into recreation management
 - provision of dwelling-based accommodation at sites
 - more efficient use of forest picnic/camp sites
 - development of interpretation strategies for forest areas
 - promotion of responsible recreation behaviour in forests
 - implementation of a 'user-pays' system
 - improvements to forest-user safety information.

The report also notes the high potential for future recreation in the two forestry districts (based on their size and topographic diversity), and identifies potential sites and activities that could be appropriate for those sites (based on the nature/characteristics of the sites).

Visual Aspects

The visual resources of the study area are identified in the report as a readily visible and important forest resource, which is managed by the Commission as part of its multiple use regime to preserve its value as such. The issues of visual impact of forestry activity on users of adjacent protected areas, and the measures for ameliorating those impacts, were raised during the public submission phase of the EIS process.

The report notes that areas of State Forest in the study area which contain resources of visual or scenic significance are classified as Special Emphasis Visual Resource Protection (.6), under the Commission's PMP system. This classification allows for their visual amenity to be retained by modification or exclusion of forestry activity in areas with this zoning. It is noted that some areas may not be included in this zoning, but still have their visual resources protected by either inaccessibility for forestry, or by zoning under another of the 'Special Emphasis' classifications.

In addition to the issues raised in the EIS submissions, the report addresses the following visual resource management related issues:

- site specific disturbance of logging operations; and
- visual disturbance as a result of logging, with regard to weeds, erosion and waste material

The following recommendations for on-going management of visual resources are made:

- * on-going assessment of visual disturbances to sites, and of measures for ameliorating these disturbances;
- * implementation of site specific recommendations (zoning);
- * on-going prioritised monitoring of resources, and of resource protection;
- * clearing/cleaning up of waste materials from recently logged sites; and
- * community education about safeguards and management for visual resources in State Forests.

Further to this, a number of site specific recommendations are made with regard to expansion of visual resource protection .

Wilderness Aspects

Within the forests of the study area there are two areas identified as having values as 'wilderness areas'. These are:

1. the Lost World Wilderness which is presently proposed for areas adjacent to the Mebbin State Forest in the Murwillumbah Forestry District (as per the recently concluded NPWS Wilderness Assessment Report). It is believed that a future proposal also may include the steeper western sections of the Mebbin State Forest in this wilderness; and
2. the Washpool Wilderness, presently being assessed by the NPWS for consideration and possible declaration by State Government under the Wilderness Act 1987 as a wilderness area, would include the Washpool and Billilimbra State Forests of the Casino Forestry District.

Outlined in the report are issues pertaining to the following aspects of wilderness which were raised in the public submissions to the EIS:

- full description of wilderness area needed;
- access limitations as a result of such a declaration;
- reduction of area values by logging of 'old growth' forests;
- compromising of natural area values by forestry operations;
- amount of wilderness already existing in National Parks;
- consideration of European disturbance as grounds for rejection;
- consideration of an area's monetary value; and
- assessment of forestry operation impacts on such areas.

This report also discusses a number of issues identified as being relative to the management of wilderness areas, including:

- * access and transport - restrictions on access and transport that can occur under wilderness declaration;
- * recreation - there is the potential for both provision of unique experiences, and impacts from such usage;
- * research - there is the potential for both provision of opportunities, and impacts from such usage;
- * cultural heritage - there is the potential for compromising of wilderness values as a result of the execution of traditional activities;

- * nature conservation - this is the prime factor in the purpose of any wilderness declaration, and the need for active management to preserve these values is acknowledged;
- * introduced species - the potential threat of these, and the need for active management to preserve wilderness values;
- * fire - the potential threat fire constitutes and identifies the need for active management to preserve wilderness values; and
- * external influences - the potential threat from surrounding landuse practices, and the need for active management to preserve wilderness values.

The report recommends that management strategies for wilderness in the State Forests of the study area include:

- * liaison with NSW National Parks and Wildlife Service on the management of various forest areas pending the findings of the Washpool Wilderness Assessment Report; and
- * areas of State Forest that meet wilderness criteria and are not feasible for forestry operations be included in the Washpool Wilderness under a Wilderness Protection Agreement, or be relinquished and gazetted as National Park.

Table of Contents

	Page
1.0 Introduction	1
1.1 Overview	1
1.2 Location of Casino - Murwillumbah Forestry Districts	1
1.3 Report Structure	2
2.0 Study Methodology	3
2.1 Literature Review	3
2.2 User Group Consultation	3
2.3 Field Observation and Assessment	3
2.4 Map Analysis	4
3.0 Recreation in the Casino - Murwillumbah Forestry Districts	5
3.1 Introduction	5
3.1.1 Issues Raised in EIS submissions	5
3.1.2 Other Issues	5
3.1.3 Description of Recreation	6
3.1.4 Factors Affecting Visitation	6
3.2 Recreation Management	8
3.2.1 Present Forest Visitation	8
3.2.2 Recreational Site Inventory	13
3.2.3 Recreational Activities in State Forests	17
3.2.4 Benefits of Forest Recreation	23
3.2.5 Recreational User Types	24
3.3 Recreation Management by the Forestry Commission	26
3.3.1 Forestry Commission Policy on Forest Recreation	26
3.3.2 Plans of Management	27
3.3.3 PMP Special Emphasis Zoning of State Forests	28
3.3.4 Recreational Expenditure	29
3.3.5 Recreational Facility Provision and Maintenance	30
3.3.6 Site Quality	31
3.3.7 Impacts on Sites	32
3.3.8 Site Access	33
3.3.9 Promotion	34

3.4	Recreation Management Issues	35
3.4.1	Future Forest Related Recreational Visitation	35
3.4.2	Commercial Operations in State Forests	36
3.4.3	Concerns of Commercial Operators over Forestry Activities	37
3.4.4	Conflict	37
3.4.5	Recreational Usage of 'Old Growth' Areas of State Forests	38
3.4.6	User-Pays Scheme for Recreational Revenue Recovery	38
3.5	Recommended Management Strategies	39
3.5.1	The Recreational Opportunity Spectrum-Site Management Framework	39
3.5.2	General Recommendations for Recreation Management	42
3.5.3	Site Specific Recommendations	45
3.5.4	Other Recommendations and Guidelines for Future Forest Recreation Management	46
3.5.5	Potential Recreation Development	47
4.0	Visual Resource Management	52
4.1	Introduction	52
4.1.1	Overview	52
4.1.2	Issues Raised in Submissions	52
4.2	Classification and Extent of Visual Resources	52
4.3	Visual Resources	53
4.3.1	Definition and Classification	53
4.3.2	Inventory of Sites	53
4.4	Visual Resource Management Issues	55
4.5	Recommended Management Strategies	56
4.5.1	General Recommendations	56
4.5.2	Site Specific Recommendations	56
5.0	Wilderness	58
5.1	Introduction	58
5.1.1	Overview	58
5.1.2	Issues Raised in Submissions	59

5.2	Wilderness Areas	60
5.3	Wilderness Management Issues	60
5.4	Recommended Management Strategies	62
6.0	Conclusion	63
7.0	References	64

Appendices

Appendix A:	Study Team and Acknowledgements	67
Appendix B:	List of People/Organisations Contacted During Study	68

Figures

Figure 1	Conceptual factors contributing to the recreational demand and participation in State Forests	7
Figure 2	Yearly Recreational Visitation to the Casino - Murwillumbah Districts	9
Figure 3	Site Facility Condition at each Forestry District	31
Figure 4	Site Aesthetic Quality in each Forestry District	31
Figure 5	Frequency of impacts on sites from recreational usage	32
Figure 6	Access Types for each Forestry District	33
Figure 7	Promotion of recreational sites in State Forests	35
Figure 8	Indicative Recreational Opportunity Spectrum for Forests of the Casino - Murwillumbah Districts	40

Tables

Table 1	Factors causing fluctuations in forest recreation visitation	8
Table 2	Recreation Visitation Intensities for State Forests	11
Table 3	Department of Planning (1991) Estimates for Resident Populations of Local Government Areas in the Casino - Murwillumbah Forestry Districts	12
Table 4	Casino - Murwillumbah Forestry Districts Recreational Site Inventory	14
Table 5	Recreation Expenditure in each Forestry District	30
Table 6	Promotion of State Forests on the North Coast	34
Table 7	Inventory of Potential Activities in State Forests	48
Table 8	Inventory of Sites under Special Emphasis (Visual Resource Protection)	54

1.0 Introduction

This report has been prepared by the Centre for Coastal Management of UNE - Northern Rivers for Margules Groome Poyry (MGP), consultants to the New South Wales Forestry Commission (FC). It addresses the recreation, scenic and wilderness values of State Forests in the Casino - Murwillumbah Management Districts and how these may be affected by forest use and management. The report is intended to provide background on these aspects for incorporation into the Casino - Murwillumbah Forests EIS being prepared by MGP.

For convenience, each of the components is presented as separate reviews. It should be noted, however, that there is some overlap between each section and that this report overlaps with other EIS sub-consultant studies, notably the socio-economic and public consultation aspects. Such overlap is understandable in the context of the nature of the subject and EIA requirements and desirable in view of the multiple use nature of forest management.

1.1 Overview

This report is a study of Recreational, Visual/Scenic and Wilderness components of forestry management relevant to the Casino - Murwillumbah Forestry Districts' EIS. The recreational usage of forests in these Districts, whilst relatively low compared with other districts, is an important component of multiple use forestry. The recreational opportunities, particularly of the Murwillumbah District, are well known in the region. The visual components of the forests of the Casino - Murwillumbah Districts form often distinguishable scenic backdrops to the Districts that are a recognisable 'signature' for the region, attracting residents and tourists to it.

1.2 Location of Casino - Murwillumbah Forestry Districts

The Casino and Murwillumbah Forestry Districts are located in the Coffs Harbour Forestry Region on the Far North Coast of New South Wales. The Casino Forestry District is bordered to the north by the Murwillumbah and Urbenville Districts and to the west and south by the Tenterfield District and Grafton Forestry Districts respectively. The Casino District includes the Casino West District which now is managed as part of the Casino District. The Casino Forestry District overlaps with the Copmanhurst, Lismore, Casino, Ballina, Kyogle, Maclean and Richmond River Local Government Areas.

The Murwillumbah Forestry District generally is comprised of forests associated with the areas of the Mt Warning Shield Volcano and Caldera.

The study area has a wide range of recreational opportunities and potential recreational opportunities. The area consists of many individual areas of visual/scenic significance as well as two areas of proposed

wilderness: the North Washpool Wilderness in the Casino District and the Lost World Wilderness in the Murwillumbah District.

1.3 Report Structure

Section 2 of this report presents a description of the study methodology for which the information used in the study was gathered.

Section 3 presents an overview of recreational uses of State Forests in the Casino - Murwillumbah Forestry Districts, including details of recreational demand and supply, as well as an inventory and classification of recreational opportunities. This section concludes with recommendations for more effective recreation management in State Forests.

Section 4 sets out an overview of scenic, visual and landscape aspects of State Forests. Because of the extensive provision for visual resource protection under existing FC Operations Plans, this part of the report focuses primarily on the efficacy of existing management provisions. In particular, the section addresses the need and measures for additional visual resource protection.

Section 5 comprises a review of the wilderness values of State Forests in the Casino - Murwillumbah Districts. The wilderness areas of relevance to the Casino - Murwillumbah District Forests are the North Washpool Wilderness and the Lost World Wilderness proposals.

The concluding section presents guidelines for integrated consideration of recreation, scenic and wilderness values in the context of the EIS.

Where available, detailed background material is presented as appendices, or cross referenced to source documents within the body of the report.

2.0 Study Methodology

Information sources for recreational forest usage, facility provision and recreational demand is limited in both Districts as a consequence of the low priority presently accorded to gathering this information. As a consequence of data limitations, cautious assessment should be made of information presented in the report. Data for this study were derived from four main sources: literature review; user group consultation; field observation; and assessment and map analysis. Requirements for further data collection and use/trend monitoring are identified in Section 3.5. Information sources which were used for the study included a review of literature, user group consultation, field observation and assessment and analysis of maps.

2.1 Literature Review

A review of relevant literature was undertaken. This included researching the usage of State Forest by recreationalists and includes archives of bushwalking clubs, analysis of guidebooks, relevant magazine articles, Tourism Commission data, etc. Data from FC recreational returns were utilised as well as relevant correspondence with the FC and interest groups, permits, etc.

2.2 User Group Consultation

Several recreational users of the forests of the Casino and Murwillumbah Districts were contacted and, in some cases, interviewed. This included commercial tour users of forests, organisations such as bushwalking clubs, Scouts, Girl Guides and other recreational interest groups such as the NPWS. Groups contacted in relation to the study are listed in Appendix A. Additional information on public use of State Forests was obtained from concurrent public consultation studies (CCM 1992 a + b).

2.3 Field Observation and Assessment

This part of the information gathering process involved an extensive component of field research and analysis. This involved visiting most recreational sites in State Forests, assessing the characteristics of the site (including assessing the recreational potential of other forest areas for recreational usage) and documenting the sites on slide and/or video film. Most visual resource sites were visited or at least observed.

2.4 Map Analysis

A large component of information on recreational usage of State Forests was derived from map analysis. Maps used include the FC Project Maps for the Casino and Glen Innes areas as well as the Preferred Management Priority (PMP) Mapsheets and relevant topographic maps, Plan of Management mapsheets and forest typing maps. A large component of the assessment of the visual resources and provisions of the district was made using the PMP mapsheets at each forestry district.

3.0 Recreation in the Casino - Murwillumbah Forestry Districts

3.1 Introduction

State Forests of the Casino - Murwillumbah Districts provide a diverse range of natural recreational opportunities for the community. Forests of the two districts contain facilities associated with picnic and camping areas providing for developed recreational opportunities. This section discusses the characteristics of recreation in State Forests and assesses the adequacies of recreational resource protection and management against the possible impacts of forestry operations. This section concludes with recommended management strategies for recreational resources of State Forests.

3.1.1 Issues Raised in EIS submissions

The following is a list of some of the issues relevant to this study that were raised in the public submissions for the Casino - Murwillumbah Forestry Districts. These issues formed the basis for the development of the study methodology and were used in interpretation of findings.

- * Special Area Provision - The provision of special areas set aside for the elderly and the handicapped to enjoy the forest values as well as educating the public in forest issues.
- * Alternate Forest Uses - Consideration should be given to alternate forest uses such as tourism.
- * Loss of Tourism - Account should be made of the loss of tourism caused by logging activities.

3.1.2 Other Issues

Other issues raised by recreationalists included:

- * Concerns were expressed about safety in relation to aspects of logging operations, especially logging trucks in steep areas and oncoming traffic.
- * Signage was identified as being deficient in some forests, causing possible risks to forest visitors who may venture along old or unmarked forestry roads and become lost.
- * The unattractive appearance of active logging sites was a concern to some recreationalists.
- * Dense re-growth present in some areas concerned some recreationalists because of the difficulties involved in traversing such areas and the consequent reduction in recreational and aesthetic appeal of such areas for bushwalking activities.

- * The prevalence of weeds was of concern because areas of infestation often are difficult to penetrate and have a low aesthetic value.
- * The quality of sites for recreation was a concern since some areas may have been altered, detracting from the recreational values of the forest areas.
- * The issue of greater co-ordination and consultation between the FC, Timber and Tourism Industries was raised by some organisations concerned about the tourist value of forests.

3.1.3 Description of Recreation

There is a range of definitions of what constitutes recreational usage of State Forests. This report defines recreational use of the State Forests in the Casino - Murwillumbah Districts simply as the activities people partake in State Forests at their leisure or in their spare time. Under this definition people go into forest areas to partake in a range of recreational activities and subsequently derive benefits from their experiences in these activities. The Resources Assessment Commission (RAC) (1991) describes forest recreation as "voluntary on-site activity, undertaken for pleasure and dependent on a forested setting". In this report recreation activities in forests are considered to be activity based. It is the activity that accounts for recreation, not the intentions of the user or their social affiliations.

3.1.4 Factors Affecting Visitation

The prime determinants involved in recreational participation in forests of the Casino - Murwillumbah Districts are presented conceptually in Figure 1. Changes in these factors may change the level of visitation of a particular forest or group of forests.

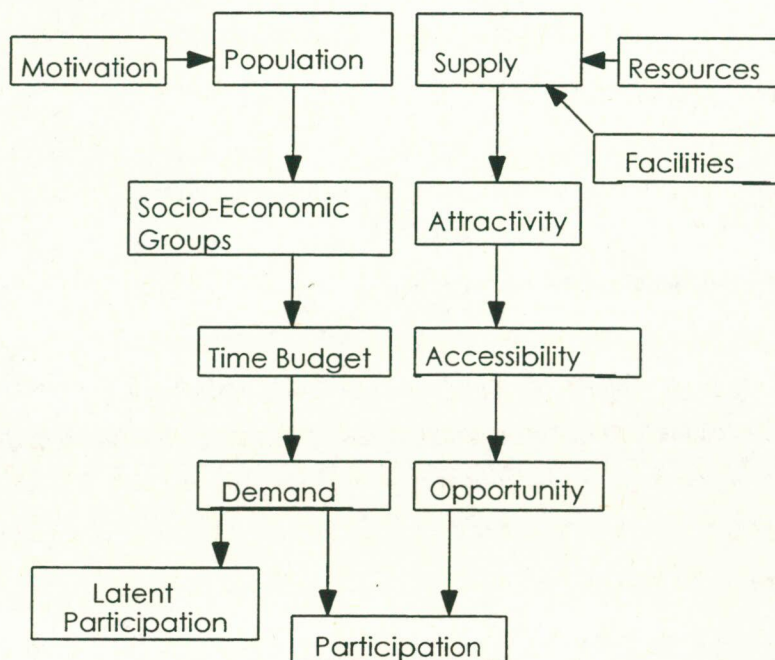


Figure 1

Conceptual factors contributing to the recreational demand and participation in State Forests

Source: Adopted from Kates, Peat, Marwick and Co (1970)

As indicated in Figure 1 there are many factors that contribute to the actual participation in forest related recreation such as the recreational resources and provision of facilities, the time budget and motivation of the recreationalists.

Of particular importance in recreational forest participation is the concept of latent participation, that is, the demand for recreation in forests, that is not met. This is important in regard to the potential for forest sites to be utilised further by the community. The latent demand for forest recreation aids in describing the potential for increased recreational visitation. Latent demand for forest recreation may decrease as the demand for participation is met as a result of the provision or expansion of opportunities for recreational participation.

At a more specific level, recreation utilisation of State Forests of the Casino - Murwillumbah Districts varies between individual forests and between forestry districts. The variation is attributable to many factors. The most important of the factors that lead to a high use of forests on the Casino - Murwillumbah Districts for recreation are:

- * proximity of the forest to urban centres;
- * attractions and natural attributes of the forest;

- * promotion and local knowledge of forests;
- * proximity of forests to National Parks, beaches and other features of interest; and
- * the provision of (usually) developed facilities.

Recreational visitation also is related to many other broader factors. These factors are important in determining general fluctuations in recreational usage given the above set of factors. The factors identified as causing variations in the level of recreational visitation to State Forests are summarised in Table 1. It is important to note that an increase or decrease in any of these factors may cause a similar increase or decrease in recreational visitation.

Table 1
Factors causing fluctuations in forest recreation visitation

Natural	Season, rainfall, flooding, temperature, day length, scenic quality, topography
Site Based	Aesthetic quality, type of facilities, number of activities available at site, access network and standard, signage natural features at site, remoteness, map coverage of site, other promotion, site history, unique features
Economic	Income, economic fluctuations, user employment type, tourism promotion
Social/Personal	Place of residence, day of week, time, club associations, user experience, site knowledge, motivation, expectations and user interests

Source: Author's data collection

3.2 Recreation Management

3.2.1 Present Forest Visitation

The relatively higher abundance of developed recreational sites in the Casino and Murwillumbah Districts as compared with the Grafton District consequently results in a proportionally higher level of recreational visitation. From estimates derived from observations of forest rangers in each District there is a present average recreational visitation to the Casino District of around 78,000 recreational visits. Murwillumbah District receives a present visitation of the order of approximately 34,000 recreational visits per year (44% of the Casino District visitation).

Data from the recreational returns at each forestry district indicate a growth in demand of forests for recreation. This can be seen in Figure 2 which summarises the growth in recreational visitation to State Forest areas over the decade 1981 - 1991.

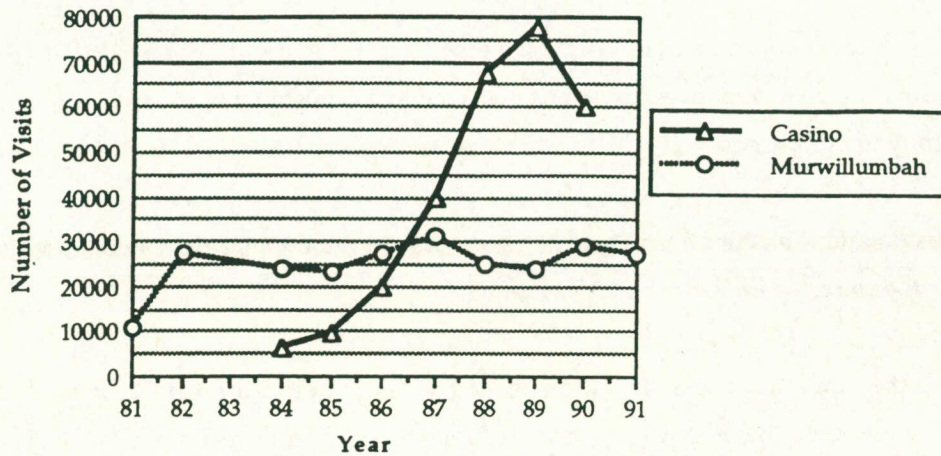


Figure 2:
Yearly Recreational Visitation to the Casino - Murwillumbah Districts
 Source: FCNSW Casino/ Murwillumbah District Recreation Returns

As seen in Figure 2, there is a high level of recreational visitation to the Casino District. It is noticeable that there is a steep rise in the usage of the sites each year until 1990 where visitation decreased on a yearly basis. This trend indicates the possible stabilisation of recreational visitation in the district, but showing an overall increase. The Murwillumbah District has a stable average yearly visitation, seen in Figure 2 by the lack of significant fluctuations in forest visitation. The figure shows that there is a slight increase in the recreational usage of forests over the time frame shown.

The following factors are recognised as contributing to a relatively high visitation to the forests of the Casino/ Murwillumbah Districts and include:

- * wider promotion of forests and recreation sites from maps, tourist offices, published literature and longer established recreational sites;
- * the relatively shorter distance of most State Forests from major transport routes (access network) such as the Pacific Highway and other main roads;
- * the greater number of developed recreational sites in the districts;
- * proportionately higher residential populations and growth rates as well as relatively higher tourist influx to the region;

- * proximity of certain forests with popular natural attractions such as Whian Whian SF to coastal attractions (beaches) and to nearby national parks; and
- * the surrounding populations of residents in the Casino - Murwillumbah Districts result in higher visitation of forests due to access provisions, whereby locals may pass through forests as a means of getting to other areas.

Sites in the Casino and Murwillumbah Districts which are not the popular developed areas are expected to receive a further increase in recreational visitation.

Figure 2 shows the rapid increase in overall recreational visitation to State Forests of the Casino District. At each of the sites where the data was recorded there is a general increase in the level of visitation. The most significant of all the sites in the district is the Braemar Rest area on the Summerland Way south of Casino which receives the majority of the visitation in the District and is the most popular recreational site in the Grafton, Casino and Murwillumbah Districts. This is attributed to the sites' situation on the Summerland Way. The site averages up to 23,000 visitors per quarter, averaging 65-80,000 visitors per year.

Generally for all sites in the Casino District there is an increase in the visitation to the sites over time. As a percentage of the overall visitation to the three (Grafton, Casino, Murwillumbah) Districts, Casino receives approximately 63% of the recreational patronage, with Murwillumbah receiving 28%. Visitation to the Casino District is not perceived as being at saturation levels. At present the demand for Casino District State forests is increasing and will probably continue for the next decade.

As the sites in the Casino District reach a saturation point there may still be an overall increase in the usage of forests but recreational succession and several of the other factors identified for lack of growth in the Murwillumbah District may become present for the Casino District. Contrary to figures for recreational visitation in the Casino District, most sites in the district have the capacity to support a higher recreational usage, taking into account added maintenance of these sites.

It should be noted that visitation is expressed in the number of visits, not the number of people visiting sites, as the same person may visit forests more than once over the yearly period that the data is derived. Annual visitation to forests is impractical to express on a District basis because the areas involved are different.

Casino District consists of approximately 140,000 hectares of forest (FCNSW; 1979, 1983) distributed within 29 forests. Murwillumbah District alternatively comprises six forests over approximately 20,000 hectares. Murwillumbah District has half the recreational visitation of Casino District but in one-seventh of the area, hence has a higher density of recreational usage. The recreational intensity of forest usage can be seen in Table 2 expressing the adjusted visitation intensities to each district.

Table 2 compares the overall recreational visitation with three adjacent State Forest Districts on the North Coast. It can be seen that Casino District receives the highest overall visitation due to the popularity of the Braemar Rest Area on the Summerland Way. The recreational visitation of the Grafton Area is relatively lower than the Murwillumbah and Casino Districts, approximately one-third of Murwillumbah and 14% of that for Casino District.

Table 2
Recreation Visitation Intensities for State Forests

District	Area (ha)	Yearly Visitation	Visitation Intensity
Murwillumbah	20,000	34,000	1.7 people/hectare/year
Casino	140,000	78,000	0.55 people/hectare/year
Grafton	143,000	11,000	0.079 people/hectare/year

Source: Based on Forestry Commission NSW Recreational Returns

Table 2 indicates that Murwillumbah District receives three times the density of recreationalists in forests of the Casino District. The density of recreationalists in forests is even more variable, however, when describing forest based comparisons as opposed to an average regional comparison.

A significant component of the visitation to the forests of the Casino - Murwillumbah Districts is due to the tourist influxes to the North Coast with the Mid North Coast area (Grafton, Coffs Harbour District) attracting over 740,000 visits per year (NSW Tourism Commission, 1989) with the Upper North Coast (Casino - Murwillumbah Districts) attracting around one million tourist visits per year. The majority of visitors to the Upper North Coast are drawn from South-East Queensland.

The level of tourist visitation to Whian Whian SF in peak periods was shown by a survey (FCNSW, 1979) to be of the order of 45% of visitors to the forest being from areas outside of NSW with the majority (37%) of forest visitors being from Queensland. Approximately 54% of forest visitors were from NSW. The numbers of these visitors from various regions in New South Wales was not assessed in the survey.

From the survey, a high proportion of recreational visitors could be classed as tourists due to their place of origin. The number of 'tourist' visitors from outside the local government areas is higher in peak visitation times such as school holidays and during public holidays (Easter). Visitors from further afield such as Western Australia, Victoria and overseas typically do not visit State Forests as their overall destination but incorporate the forests as a 'stop over' destination.

As indicated by the recreationalist survey (FCNSW, 1979) the most significant source of recreational forest visitation comes from the residents of local government area 'population catchments' within or adjacent to present State Forest Districts. Table 3 presents the numbers of people in Local Government Areas in the Casino and Murwillumbah Districts.

Table 3
Department of Planning (1991) Estimates for Resident Populations of Local Government Areas
in the Casino - Murwillumbah Forestry Districts

Local Government Area	Dept of Planning Est 1991	% Estimated Population Growth Rate
Ballina (C) *	28,670	2.75
Byron (M)	21,070	2.1
Casino (C)	10,730	0.2
Copmanhurst (C)	4,570	3.4
Kyogle (C/M)	9,930	0.9
Lismore (C/M)	39,690	2.3
Maclean (C)	13,230	2.8
Richmond River (C)	8,110	1.7
Tweed (M)	54,510	3.7
Total	190,600	Average for Nth Coast = 2.2%

Source: Department of Planning, 1991, North Coast Population Monitor

- * Local Government areas in the Casino and Murwillumbah Forestry Districts are labelled with a (C) or (M) indicating the district which the area covers. Local Government Areas may overlap with other forestry districts due to the differences between forestry and local government boundaries. Growth rates for Local Government Areas have been included as an indicator for possible forest visitation increases in the future.

The Northern Tablelands catchment or statistical subdivision has a population of 63,350 people (ABS, 1986) and lies adjacent to the Richmond Tweed Statistical Division and the Clarence Statistical Subdivision of the Mid North Coast Division. Forests of the Casino and Murwillumbah Districts are known to be visited by people from these areas (CCM, 1992a).

In the Murwillumbah District there is a large population catchment with an estimated 100,000 people living within a half hour drive from the management area (FCNSW, 1984). This factor, combined with the high level of tourist activity in the local and surrounding areas, has meant a high usage of individual forests for recreation by tourists and local residents.

The average recent population growth rate for the North Coast has been 2.2% per annum. With such a large population there is an even greater potential recreational usage of forests in the future than at present. Local government areas such as Tweed Shire have an even higher growth rate (3.7%) which re-emphasises the potential growth in forest visitation due simply to population growth.

Taking into account the relatively high usage of the forests of Casino - Murwillumbah Districts, the visitation to these areas tends to be focussed on specific sites in certain forests. In taking a forest-wide perspective, the Casino - Murwillumbah Districts essentially are under-utilised for recreation in less developed recreational areas with more primitive opportunities such as adventure activities. The potential recreational opportunities identified for both districts is outlined in Section 3.5.

3.2.2 Recreational Site Inventory

A list of the recreational sites in the Casino - Murwillumbah District State Forests is presented in Table 4. This table presents data on the sites identified in State Forests being of particular value for recreation.

A description of codes used in the inventory is given below the table. Interpretation of the Site Inventory overlaps with discussion in later sections.

Table 4: Casino/Murwillumbah Forestry Districts Recreational Site Inventory

No.	Site Name	Site Class	Access Type	Fac. Cond.	Walk Tracks	Site Type	Site Prom	Aest Qual	Use Impact	Site Recog	Site Recom	Monit Priorit
Whian Whian State Forest												
1	Minyon Grass	M	2wd	G	Y	F,RI,H,E	sm	H	Low	NO	SE..2	High
2	Minyon Drive, Quarry Lookout	SP	2wd	-	Y	F,R,RI,C	-	H	Low	NO	GE..1	Low
3	Mongabarra Lookout	SM	2wd	G	Y	F,E	bs	H	Low	NO	SE..2	Low
4	Minyon Falls Reserve/Pic Area	M	2wd/w	G	Y	F,R,S,C	bsmo	H	Med	YES	CONT.	High
5	Minyon Valley and Tracks	P	w	G	Y	F,S,H,C	bsmo	H	Med	YES	CONT.	Med
6	Quandong Falls	P	4wd/w	-	Y	F,S,Ra, C,W	bsmo	H	Low	YES	SE..2	Med
7	Peaches Mountain	SM	2wd/w	G	Y	F,H,RI	bsmo	H	Low	YES	CONT.	Med
8	Peaches Mountain Walking Track	P	2wd	G	Y	F,S	bsm	M	Low	NO	wSE..2	Med
9	Rocky Creek Causeway	P	2wd	-	Y	R,S,W	sm	H	Low	NO	CONT.	High
10	Foremans Cottage Site-Min. Drive	SM	2wd	M	Y	F,R,H,FI	-	M	Med	NO	SE..2	Low
11	Boomerang Falls	SP	w	M	Y	F,R,S,RI Ra,C,W	sm	H	Low	YES	wVE..6	Low
12	Minyon Forest Drive	SM	2wd	G	Y	R,F,S,RI	bsmo	H	Low	NO	CONT.	High
13	Loogarna lookout	SM	w	G	Y	FI,W	bsm	H	Low	NO	CONT.	Low
14	Rummary Park	M	2wd	G	Y	F,R,C	bsmo	H	Med	YES	CONT.	High
15	Big Scrub Flora Reserve & Tracks	P	2wd	G	Y	F,S,H	bsmo	H	Low	NO	CONT.	Low
16	Rocky Creek Dam-	P	w	-	Y	F,S,Dam	m	H	Low	NO	CONT.	Low
17	Gibbergunyah Creek	P	w	-	Y	F,S,RI, Ra,W	m	H	Low	NO	SE..2	Low
18	Gibbergunyah Roadside Reserve	SP	2wd	G	N	F,R,RI	bsm	H	Low	YES	CONT.	Low
19	Lost Valley	P	w	-	N	F,Ra,C,W	-	H	Low	NO	SE..2	Low
20	Steel Bridge-Rocky Creek	SM	2wd	M	N	F,R,S	-	M	Low	YES	SE..2	Low
21	Boggy Creek Walking Track	SP	2wd	G	Y	F,S	bsmo	H	Low	NO	SE..2	Med
22	Eastern Boundary	SP	4wd/w	-	N	F,R,S,Ra H,C,W	sm	M	Low	NO	CONT.	Med
Nullum State Forest												
23	Nullum Forest Drive	SM	2wd	G	N	F,R,S,RI H	sm	M	Low	NO	SE..2	Med
24	South Chowan Picnic Area	SP	2wd	G	Y	F,R,S,Ra W	-	H	Low	YES	SE..2	Med
25	Mount Chowan	P	4wd	-	Y	F,RI,H,C	m	H	Med	YES	SE..2/6	Low
26	Teales Lookout	SP	2wd	G	N	F,r,RI,FI	sm	H	Low	YES	SE..2	Low
27	Nullum Cliffs-Gilwah Road	P	2wd	-	Y	F,R,C,RI	-	H	Low	NO	SE..2	Low
28	Hell Hole Falls	P	2wd	-	Y	F,S,RI,C Ra, W	m	H	Low	YES	CONT.	Med
30	Rockface Lookout	SP	2wd	-	Y	F,RI,C,E	-	H	Low	NO	SE..2/6	Med
31	Boogarem Falls	P	2wd	-	Y	F,S,C,W Ra	sm	H	Low	YES	SE..2	Low
32	Jerusalem Mountain & Tracks	SP	4wd/w	M	Y	F,R,S,C	m	M	Low	NO	SE..2	Low
33	Mt Boogarem Hangliding Point	SP	2wd	G	N	F,C,Esc	-	H	Low	NO	SE..2	Low
34	Nth Chowan Road Lookout	SP	4wd	-	N	F,R,RI,H	-	M	-	NO	CONT.	Low
35	Lookout Track Lookout	SP	4wd	G	N	F,R,C	sm	H	Low	NO	SE..2	Low
36	Black Scrub	P	w	-	N	F,R,RI	-	H	Low	NO	CONT.	Low
37	Koonyum Range Road	SM	2/4wd	M	N	F,R,S,RI H,FI	sm	M	Low	NO	CONT.	Med
38	Koonyum Range Lookout	SP	4wd	-	Y	F,R,RI,C	-	H	Low	YES	SE..2	Low
39	Brunswick Lookout-Chowan Jnr	SP	4wd	-	Y	F,R,RI,H	-	H	Low	NO	CONT.	Low
Mebbin State Forest												
40	Mebbin Forest Camp/ Rec Area	M	2wd	M	Y	F,R,FI	bsmo	H	Med	YES	CONT.	High
41	The Pinnacle	P	w	-	N	F,RI,C	-	H	Low	NO	CONT.	Low
42	Mebbin Lagoons	P	4wd	-	Y	F,Sw	m	H	Low	YES	SE.2/3	Med
43	Ironbark Reserve	SM	2wd	G	Y	F,R,RI	bsmo	H	Low	YES	SE..2	Low
44	Wollumbin Forest Drive	SM	2wd	M	Y	F,R,S,RI FI,H	bsmo	M	Low	NO	CONT.	Med
Wollumbin State Forest												
45	Brummies Lookout	SP	2wd	M	Y	F,H,C,K	bsmo	H	Low	YES	SE..2	Low
46	Amaroo Flora Reserve & Track	P	2wd	M	Y	F,R,S	bsmo	M	Low	YES	SE..2	Low
47	Wollumbin Forest Drive	SM	2wd	M	Y	F,R,S,RI FI, H	bsmo	M	Low	NO	CONT.	Med

No.	Site Name	Site Class	Access Type	Fac. Cond.	Walk Tracks	Site Type	Site Prom	Aest Qual	Use Impact	Site Recog	Site Recom	Monit Priorit
Mooball State Forest												
48	Burringbar Trig & Track	SP	w	-	Y	F,Ri,H	m	H	Low	NO	SE..2	Low
49	Cooraldilla Road Lookout	SP	2wd	-	N	F,H	sm	M	Low	NO	SE..2	Low
Goonengerry State Forest												
50	Blackbutt Rec Site	SP	4wd	-	N	F,R	-	-	-	NO	CONT	Low
51	Coopers Creek	P	w	-	-	F,S,Es	-	H	Low	NO	SE..2	Low
Casino Forestry District												
Richmond Range State Forest												
52	Peacock Creek	M	2wd	M	N	F,R,S, Fi,Sw	bsm	M	Med	YES	CONT.	High
53	Richmond Range Forest Drive	SM	2wd	M	Y	F,R,S,Ri H,Fi	bsmo	M	Med	YES	CONT.	Med
54	Cambridge Plateau Picnic Area	M	2wd	M	Y	F,R,H,E	bsm	M	Low	YES	CONT	High
55	Culmaran Creek Falls & Tracks	P	w	-	Y	F,S,Ra, C,W,Ca	sm	H	Low	YES	SE..2	Med
Cherry Tree State Forest												
56	Cherry Tree Picnic Area	M	2wd	G	Y	F,R	sm	M	Low	YES	CONT.	High
57	Mallangane Flora Reserve	P	2wd/w	-	Y	F,S,R,	sm	H	Low	NO	CONT.	Low
Mt Pikapene State Forest												
58	Mt Pikapene Picnic/ Camp Area	M	2wd	M	N	F,R,S,Fi	sm	M	Low	YES	SE..2	High
59	Mt Pikapene	SP	4wd/w	-	-	F,H,C	m	H	Low	NO	SE..2	Low
Ewingar State Forest												
60	Ewingar Forestry Camp	M	2wd	M	N	F,R,H,Fi	sm	M	Low	YES	SE..2	Med
61	Sunday Creek and Tributaries	P	w	-	N	F,S,Ri, Ra,W	-	H	-	NO	SE..2	Low
62	Bulldog Diggings	SP	4wd	-	-	F,Fi	m	-	-	NO	CONT.	Low
63	Sulferino	SP	4wd/w	-	N	F,S	mo	-	-	NO	CONT.	Low
Billilimbra State Forest												
64	Lunch Falls-Berry Road	P	4wd	-	Y	F,S,Ra, C,W	-	H	Low	NO	SE..2	Med
65	Billilimbra Tops	P	w	-	-	F,Ri,Ra	-	H	-	NO	SE..2	Low
66	Malara Tops	SP	4wd/w	-	N	F,Fi	m	H	-	NO	CONT.	Low
Washpool State Forest												
67	Desert Spur Fire Trail	SP	4wd/w	-	Y	F,R,Ri,H	-	H	Low	NO	SE..2	Med
68	Desert Creek/ Plevna Falls	P	w	-	N	F,S, Ri, Ra, W	m	H	-	NO	SE..2	Low
Bungawalbyn State Forest												
69	Bungawalbyn State Forest Gen.	SP	2/4wd	-	N	F,Fi,Sw	sm	M	-	NO	GE..1	Low
Ellangowan State Forest												
70	Braemar Rest Area/ Picnic Area	M	2wd	G	N	F,R,Fi	smo	M	Low	YES	CONT.	High
71	Ellangowan State Forest General	SP	2/4wd	-	N	F,Fi	m	M	Low	NO	GE..1	Low
Doubleduke State Forest												
72	Bungawalbyn Creek-Glencoe Rd	SP	2wd	-	-	F,R,S,Fi	-	H	Low	YES	CONT.	Low
Gibberagee State Forest												
73	Gibberagee Firetower	M	2wd	-	N	R,H	m	H	-	NO	CONT.	Low
74	Bungawalbyn Creek-Gibberagee	SP	2wd	-	N	F,R,S,Fi Sw	m	H	Low	NO	CONT.	Low
Tabbimoble State Forest												
75	Tabbimoble Trig & Firetower (old)	SP	4wd/w	-	Y	F,H,C,Ri Es,	m	H	Low	NO	SE..2	Low
Devils Pulpit State Forest												
76	Devils Pulpit	P	w	-	Y	F,H,C,Es	m	H	-	NO	SE..2	Low
Bungabee State Forest												
77	Bungabee State Forest-General	SP	4wd	-	N	F,R,H,S	m	M	Med	YES	CONT.	Low
Royal Camp State Forest												
78	Walking Track-Dept of Lands	SP	2wd	-	Y	F,Fi	bsm	M	Low	YES	SE..2	Low

(Description of column variables over page)

Inventory Description and Analysis

This subsection describes the coding of the inventory and comments on information relevant to each site.

Site Number - Each site is given a number in simple numerical order. At present there are 51 sites in the Murwillumbah district, (64% of sites in the Casino - Murwillumbah Districts) and 27 sites in the Casino District (5% of sites). Each site has a name that the site is typically referred to and, in some cases, the names of sites without a formally recognised name have been given one for ease of identification.

Site Class - refers to the site classification within the Recreational Opportunity Spectrum for each site. Each site identified in the inventory is classified within the ROS framework(see Section 5) so to recognise the various attributes that determine its recreational opportunities. A description of each site class is given in Section 3.5.1.

Access Type - describes the access mode by which recreationalists get to the site. This refers to the access means used to get to the site from the nearest major access node. For example Minyon Falls is accessed by 2-wheel drive however the Minyon Valley is accessed only by walking into it from a point where the car (another form of access) is left at the nearest access node (car park) where the track (access to the valley) starts. In some cases the access type is not simple to ascertain as many areas have several major access means.

Facility Condition - Describes the general state of the facilities provided by the FC (G = Good/High standard, M = Medium, L = Low/poor facility condition). This column also indirectly indicates whether facilities are present at the site. Sites left blank have no facilities.

Walking Tracks - This column refers to whether the site contains identified walking tracks (Y = Yes, N = No). Generally this excludes tracks that could class as 'routes', however consideration is given to individual site and track characteristics.

Site Type - This refers to the natural features or topography that are present at the site and include the following categories: F = Forest-All types, R = Roadside or near a roaded area, S = Stream including all creeks, rivers, etc, Ri = Ridge-steep, broad, of any length, H = Hill, knoll or mountain peak-area elevated above its surrounds, C = Cliffed area or extremely steep terrain, may include escarpments and sub features such as caves, overhangs, pinnacles, slabs and boulders, W = waterfalls, may include wet cliffines, cascades, canyons,etc, Ra = Ravine-steep creeks or gullies, Fl = Flat area, broad open site, low vertical relief, undulating, Sw = Swamp, low flat wet areas, E/Esc = Escarpments or cliffed areas.

Promotion of Site - Refers to the form of promotion the site receives. Promotion is classed under the following criteria: B = Brochure - small leaflets or descriptions of sites, giving a brief guide to the site/s. S = Signs - these include all types of forestry signs that may direct users to recreational sites, M = Maps - Maps include all forms of maps in particular the FC Project Maps, Plan of Management Maps and the CMA 1:25,000 Topographic maps but includes generally all map sources and types, O = Other or any different forms of promotion of a site including; video promotion, displays, Tourist Information Centres, guides to cycling, bushwalking, canoeing, related information.

Aesthetic Quality - The attractiveness or aesthetic quality of the site is given a rating H = High Quality, M = Medium Quality and L = Low Quality site aesthetics.

Use Impact - The use impact of the recreational activities on the site is given a rating from Low to High indicating the visible damage to the site from usage of it.

Site Recognition - Describes whether the site is recognised as a recreational site by the FC: either Yes or No.

Site Recommendation and Site Monitoring Priority - These columns are part of the individual site specific recommendations and are discussed in detail in later sections.

3.2.3 Recreational Activities in State Forests

Forests fulfil an important role in providing a wider range of recreational opportunities than those presently available on Crown or private lands, and particularly National Parks which are the main competing outdoor recreation destinations. Acceptable forest activities are not always commensurate with acceptable National Park activities as both land use types are managed for different purposes besides recreation.

Forests cater for activities not acceptable or physically impossible in National Parks and other areas such as horse /endurance riding, trailbike riding, rallying, camping, commercial operations, four-wheel driving, fishing, fossicking and hunting. These activities are not necessarily 'acceptable' in all forests but are allowed depending on the characteristics of the use and the sites in which it is done.

The following is a list of activities occurring in State Forests of the Casino - Murwillumbah Districts. This description is included to aid interpretation of the Site Inventory (Table 4) and to give an understanding of the actual activities undertaken in forests so to better predict the management needs and characteristics of individual activities. An inventory of activities undertaken in individual State Forests of the North Coast is presented in Table 5.

In understanding recreational activities it is important to recognise that activities overlap with others or, alternatively, are done for their own sake. Examples include rock climbing, abseiling, bushwalking and swimming. One person may incorporate abseiling, climbing or swimming as part of a bushwalk whereas another person may simply undertake a single activity with no intention to participate in other activities.

Recreational activities known to occur in the Casino - Murwillumbah Forestry Districts include (in alphabetical order):

* **Abseiling** - involves the controlled descent of a rope, usually down a cliff. This activity is an extension of bushwalking skills but is frequently done as an individual. All areas of cliff or steep terrain are potential or presently utilised clifflines for abseiling. This activity is expected to increase in popularity in the future as the potential areas for these activities become better known.

* **Art/Photography** - Inspiration derived from natural settings is the basis for the artistic use of forests for activities such as painting and photography. This is a passive recreational activity with many associated activities.

* **Birdwatching** - is a passive activity, difficult to distinguish from other associated activities. Groups such as naturalists, students and bushwalkers regularly undertake birdwatching. This form of activity often focuses on areas such as heaths, creeks and rainforests which are likely to support a diverse range of bird species.

* **Bushwalking** - is essentially 'walking through the bush'. This activity includes any form of distance walking in the State Forests along tracks, routes (ridges, streams, etc.) or roads. This variable activity overlaps with many other recreational activities. Bushwalking is complex in that user needs and expectations vary widely amongst participants.

* **Camping** - involves staying overnight in the forest, usually incorporating tent based accommodation but including any form of accommodation in forest settings such as bush cabins, caravans, cars etc. Camping is one of the most popular forest recreational activities occurring in areas set aside as camping areas or in more remote areas such as the sides of creeks, lookouts or areas of particular recreational interest. User conflict arises from this activity when campers occupy areas set aside as picnic areas.

* **Canoeing/Kayaking/Rafting** - This group of related activities is practised adjacent to forests with larger stream systems. The difference between the three activities is essentially the type of craft that is used. Whilst the activities are similar, the design of individual craft limits the areas in which the equipment can be used.

Canoeing is restricted to areas of wide, deep and gently flowing water. Canoes use rivers for 'easy' kayaking which have lower and easier rapid sections. Generally streams suitable for rafting are less suitable for kayaking.

Associated activities with water based recreation include swimming, camping, walking, li-loing and fishing. Guides on canoeing, kayaking and rafting are published widely in Australian adventure recreational literature with rivers such as the Nymboida being nationally recognised for its whitewater qualities.

* **Canyoning** - This activity is restricted in the Casino - Murwillumbah Districts State Forests but is known to occur where steep stream gradients occur. In order to understand canyoning areas and activities, the following definition by Brown, 1984 is used. Canyoning involves the "traversing of a stream through a canyon or by using specialist canyoning techniques".

The activity often involves remote trips which follow streams over waterfalls and within the confines of often steep bedrock. Associated activities include abseiling, waterjumping, scrambling, swimming and bushwalking.

There is limited potential for such activities in forests of the North Coast due to the limited extent of suitable environments as compared with the Blue Mountains, for example.

* **Caving** - is generally absent in the Casino - Murwillumbah Districts. The definition of caving may describe the underground exploration of caves or deep overhangs or similar features incorporating specialist caving techniques to explore such areas.

Some minor caving is possible in the Richmond Range State Forest in the Casino District. Other suitable areas for caving activities have not been discovered or have not had their locations revealed. Caving is usually associated with activities such as walking and abseiling. Some canyoning areas often support caving related activities. Caving areas often are sensitive environments needing close management to preserve the values of these areas.

* **Commercial Operations** - These are activities run by commercial tour operators into (amongst other areas) State Forests. For such activities in forests the operators need a permit which sets out conditions and general code of conduct that operators should follow. Commercial operators undertake a wide variety of activities such as scenic drives, picnics, walks, rafting, horse riding, camping, swimming, etc. Many operators are flexible enough to vary the location and types of activities they conduct in forests. Operators also incorporate visits to areas of National Park as part of their tours.

There is a great potential for increased commercial opportunities or wider usage in State Forests however, at present, commercial operations in forests are not as profitable as they potentially might be giving little incentive to explore new areas or expand operations.

A form of related commercial operations is that of guest houses/homesteads/holiday farms adjacent to forest areas which incorporate related activities such as bushwalking and horseriding in State Forests. These operations are common in the Murwillumbah District with new operations recently commenced in the Casino District and potential for expanded operations in the future.

* **Cycling** - involves touring of forest areas on a pushbike. Mountain Bikes and Touring Bikes are the most popular vehicles for this type of recreation. Cycling can be done along nearly any type or grade of forest road. Forests often provide a greater amenity for cycling than that available in National Parks because of the extensive roading network and greater acceptability of this form of recreation in these areas.

Cycling tours in forests, however, may incorporate visiting surrounding forests, National Parks and other reserves. Many activities are associated with cycling such as bushwalking, abseiling, picnicking, camping, swimming, etc.

* **Driving** - This is a very popular form of recreational forest usage. The access network in many State Forests, combined with the natural attractions that forests have result in driving in these areas. There are two main forms of driving in forests: two-wheel and four-wheel driving. Two-wheel driving usually involves the sightseeing of forests and more passive forms of driving whilst four-wheel driving may involve more adventurous travel in difficult terrain.

There is a very wide range of activities related to driving as it is the primary transport means in forest areas and it is consequently used as a means to undertake many other activities. There are specific driving clubs and organisations that use State Forests and National Parks on a regular basis especially four-wheel drive clubs. State Forests will continue to be popular for such activities as this form of motorised recreation becomes increasingly less acceptable in National Parks.

* **Fishing** - is a relatively minor activity in the study area because of the low incidence of forests adjacent to major waterways and with access to these waterways. Areas popular for fishing usually are those easily accessed from road transport provided by the forest roading network.

Activities associated with the fishing include driving, picnicking, camping, canoeing, rafting, kayaking, walking and swimming.

* **Fossicking** - is the searching for minerals, rocks, fossils etc. and is limited to few State Forests such as the Nullum S.F. (Thunder eggs/agate) in the Murwillumbah District. Such areas usually are degraded from such activities and these activities generally are unacceptable due to their high levels of disturbance (I. Robertson. Pers. Comm.).

* **Hangliding** - is one of the air-based forms of recreation using State Forests. Hangliding is associated with driving, walking, gear transport, etc. There are only two regularly used hang-gliding platforms in or adjacent to areas of State Forest.

* **Horse Riding** - involves the travel through forests on horseback. This usually is done in organised events such as endurance rides or through events organised by commercial operators or lodge/bush cabin operators as part of their activities. Private horseriding in State Forests is widespread and common to nearly all forests where it is generally an acceptable activity and one of the oldest or traditional forest activities.

This activity is associated with many other activities, some common ones being camping, walking, picnicking and swimming. Horseriding in forests typically is restricted to areas of open forest or to access networks (roads).

* **Hunting** - This activity is done mostly by adjacent landowners to forests hunting animals, particularly ferals such as pigs and foxes. Hunting is known to be done by either rifle or with bow and arrow and is usually a forest wide activity not being restricted to any particular site.

* **Li-loing** - is a part of the bushwalking experience to an area with sizeable streams of flowing water. This activity greatly enriches the bushwalking experience by offering exciting water related adventure and different challenges and obstacles. Li-loing is essentially the 'floating' downstream on an air mattress or tyre tube and is known to occur in several forests of the Casino - Murwillumbah Districts.

* **Nature Education/Interpretation** - is undertaken by a range of forest users such as school groups, naturalists etc. The educational/interpretive facilities in State Forests have a large potential for expansion, several further recommendations for this activity are given in Section 3.5.7 discussing potential activities in State Forests.

* **Orienteering** - this activity common in the forests of the Casino and Murwillumbah Districts. Orienteering is an activity whereby the participants navigate their way to a series of control points or stations to complete a course using skillful navigation techniques. Groups who use forests for orienteering activities include mostly the Orienteering Associations, scouting organisations and, to a lesser degree, the bushwalking clubs.

* **Picnicking** - is a popular activity in State Forests. There is a range of settings that are suitable for picnicking such as natural areas (waterfalls, streams, lookouts, etc) that do not need formal facility provision. Alternatively there is a range of picnic locations with various developed facilities such as barbecues, tables and toilets. These are the most popularly used recreational resources in State Forests of the Casino/Murwillumbah District.

* **Rallying** - is an occasional activity in the forests of the Casino - Murwillumbah Districts. This activity requires the sectioning off of the various roads of the forest pending permission from the FC. Forests of the Casino, and particularly the Murwillumbah District, are used on a regular basis for rallying. The sport has increased in popularity over the last four years (G. Hewson, pers. comm.). This activity is dependent on State Forests for its events and organised groups usually conform to conditions of this usage set by the FC.

* **Rock Climbing** - this is a relatively uncommon activity in the Casino - Murwillumbah Districts. The wide occurrence of naturally based opportunities for rock climbing are widespread in the State Forests of both Districts. Rock climbing is associated with activities such as bushwalking, abseiling and camping. The activity of rockclimbing may increase in the future as areas suitable for such pursuits become wider known and recognised.

* **Sightseeing/Lookouts** - Sightseeing is the touring of State Forests visiting and seeing places and sites of interest. A focus of sightseeing activities usually is lookouts which are the natural vantage points in forest areas used for looking out to areas beyond the immediate local vicinity. Lookouts include nearly all scenic areas which allow the recreationalist to view other areas including ridgelines, pinnacles, hills, cliffs, waterfalls, open areas, plateaus, etc. Lookouts are provided by the FC in popular and suitable areas, for example, the Minyon Valley.

* **Swimming** - in State Forests on the North Coast is very popular in the warmer, summer months of the year. The specific locations of waterholes in State Forests usually are known only by, and consequently visited by, local residents. Opportunities for swimming exist in areas wherever there is a suitable body of water. Most areas used for swimming often are popular with visitors because of the combination of swimming opportunities with other activities and high quality surrounds of such areas.

* **Trailbike Riding** - is widespread in many State Forests and is done by private individuals and, to a lesser degree, by bike clubs. Most users of forests for trailbike riding are adjacent landowners who may have less opportunity for such activities in areas of different land ownership, including their own properties. This activity can lead to conflict between the FC and other recreational visitors. Impacts of this activity include the loosening and erosion of fragile soils and bedrock on roads and tracks.

3.2.4 Benefits of Forest Recreation

The benefits of recreation in State Forests generally can be classed under three types: economic, social and personal. The economic benefits of forest recreation usually accrue to mostly local people who own businesses such as service stations, shops (food, camping equipment) and tourist related businesses including commercial operators. The personal benefits of recreation in forests include the physical and mental health of the visitor derived from an experience in a natural setting, whilst the social benefits of forest recreation are far reaching on a societal basis. The benefits that may arise from the recreational usage of State Forests include:

Economic Benefits

- * increased financial returns to local and regional businesses and related services
- * financial returns to commercial tourist operators
- * financial returns to the FC from rental of facilities, permits, map sales etc
- * financial returns to tourism promoters/publishers of related information
- * indirect financial returns to artists, photographers (sale of artwork, posters, etc)

Social Benefits

- * increased awareness and understanding of forest management issues (reducing conflict)
- * enhanced public relations and community support
- * greater awareness of forest user needs
- * vicarious benefits from knowledge of recreational amenity

Personal Benefits

- * relaxation, escapism, freedom from commitment, 'time out'
- * greater self confidence and self esteem
- * development and extension of communication skills, organisational skills
- * an increased sense of achievement
- * increased understanding, appreciation and interest in the natural forest dynamics
- * heightened sense of adventure, exploration and discovery, a sense of pioneering
- * development of teamwork, leadership, group identity and problem solving skills
- * spiritual development

Management Benefits

Forest management may benefit recreational usage of State Forests specifically by providing:

- * extensive and high quality access networks
- * increased opportunities for vantage points/lookouts
- * indirect facility provision for activities such as huts, camp areas, tracks, signage, etc.
- * direct facility provision from forestry operations
- * protection of recreational and scenic resources in State Forest areas

3.2.5 Recreational User Types

Clubs, Organisations and Other Interest Groups

Significant user groups of State Forests are the various recreational user clubs and organisations. These groups form regular forest users who have an interest in forest areas due to the recreational resources that the areas provide to such groups. These user groups can be identified from other forest recreationalists by the following characteristics:

- * belonging to some form of institution or identifiable community group
- * regular returns to forests and usually specific sites
- * planned trips to forest areas often done in consultation with the FC
- * longer planning time for activities than private users
- * relatively wider knowledge of forests areas.

The following discussion describes the sub-groups of recreational forest users.

Schools

Schools are regular users of State Forest areas, often of forests close to the schools. Activities incorporate a variety of sites and the duration of visits range from short day trips to extended camps up to a week. State Forests provide an important amenity for school camps in areas such as Rummery Park which offer comprehensive facilities for such uses. Forests are used by schools for any number of the following activities:

- * bushwalking activities as part of sport curriculum
- * interpretation activities/environmental education
- * school activities in forest settings (activities weeks, excursions)

Tertiary and Higher Education Institutions

This includes user groups such as Universities, TAFE, Adult Education, etc. who use forests for a range of activities, mostly educational activities, such as environmental education and field trips, involving either camping or day trips. These institutions also visit forest areas for art/photography related activities. Whian Whian SF is a particularly important focus for these activities.

Though these users do not fall formally into the classification as recreationalists, many of their activities in the forests consist of recreation-type activities such as driving, walking, camping, picnicking, sightseeing, etc.

State Forests allow for the provision of activities such as large scale education and field research that may not necessarily be acceptable activities in National Parks.

Bushwalking Clubs

These are specific users of forests areas for recreational activities such as rock climbing, abseiling, kayaking, canyoning, cycling, etc. There are several bushwalking clubs inside and outside the region that use State Forests of the Casino - Murwillumbah Districts for recreational activities.

Scout, Girl Guides and related groups

Significant recreational users of State Forests are scout and guide associations or related groups. All these groups are consistent users of forest areas. Scouting organisations have a wide range of activities in various locations in State Forests. Forests account for a range of activities that may not be acceptable in National Parks. Such activities include bushcraft - a large component of the scouting programme.

Similarly, Girl Guides have used forest areas as a resource for their organisations activities. Activities include bushwalks, camps, environmental education, etc. Similar to the scouts, such groups also visit several forests for a range of activities. Both the scouting and girl guides groups are active in forest usage in the Casino - Murwillumbah Districts.

Other related groups include the Boys Brigade, Christian youth groups, Queen's Rangers, Duke of Edinburgh Award Scheme and other similar youth groups as regular forest users.

Conservation Groups

Conservation groups regularly undertake recreational activities in areas of State Forest mostly for the purposes of broadening their knowledge of areas in conflict, potential wilderness areas and also for meetings/outdoor conferences. These are part of clubs' normal activities and groups often travel very long distances to visit areas.

Canoeing/Rafting/Kayaking Groups

There are several canoeing clubs on the North Coast which visit the Casino - Murwillumbah Forestry Districts. These clubs run regular events to sections of rivers that often are adjacent to areas of State Forest.

Horseriding Groups

These groups are associated with endurance riding events which are run predominantly in State Forests of the Casino District. This form of user group is often dependent on areas of State Forest for their events as opposed to the areas of National Park, for which their activities are not acceptable.

Motorsports Groups

These users include motor cycle clubs, four-wheel driving clubs and rally organisations. These groups are frequent forest users as their activities usually are acceptable in these areas. To conduct events in forests, these groups need to obtain a permit which outlines the conditions of such privileges. Generally there is compliance with the regulations set out for such groups by the FC.

Cyclists

There is one known cycling group based in the Coffs Harbour which regularly has cycle trips into areas of State Forest in the Casino District.

3.3 Recreation Management by the Forestry Commission

There are three major elements which guide the management of recreational resources by the FC and include provisions under the FC Policy Statement on Recreation, the District Plans of Management and the Preferred Management Priority (PMP) planning system. These are discussed below.

3.3.1 Forestry Commission Policy on Forest Recreation

The FC Policy Statement on Recreation in State Forests (1980) states that the Objectives under the Forestry Act "require the FC, inter alia, consistent with the use of State Forests for the purposes of forestry, to promote and encourage their use for recreation".

To achieve this objective of the policy on forest recreation the FC aims to:

- (a) *make State Forests as freely and safely available as possible to the Public Generally,*
- (b) *provide in a properly planned manner, facilities and services to satisfy the reasonable needs of those members of the public wishing to use State Forests as a recreation,*
- (c) *develop an awareness and appreciation among the public of the value, beauty and interest of forests, and an appreciation of forestry.* (FCNSW, 1980).

Specific policy guidelines for forest recreation are covered in the FC Policy statement addressing a whole range of issues. These specific guidelines direct the recreational usage of forests as a part of the multiple use of the forests throughout the State. The policy states that forests must be recognised as areas of multiple benefits to the community besides the primary benefit of timber production. The FC recreation statement policy allows for consistent recreational planning and management of forest based recreation at a district (or forest) level.

Forest recreation also is guided by the recommendations provided in the Forestry Operations Manual. The manual describes the planning approaches and considerations essential for effective recreation management in State Forests addressing, in particular, the developed recreational facilities in forests. The manual also outlines standards in signage and furniture for recreational facilities so as to maintain consistency and more importantly, suitability, in recreational site management.

3.3.2 Plans of Management

At present the Casino Forestry District Plan of Management is in the process of review. This plan of management is involved in the joining of the Casino and Casino West sub-districts into the Casino Forestry District. The provisions for recreational management in the two existing Plans of Management for both sub-districts are outdated. The management policies for the Casino and Casino West management plans (FCNSW; 1979, 1983) relevant to recreation state that:

"the existing facilities shall be maintained. The level of recreational demand shall be monitored and further facilities constructed as and if a requirement is established and justified against construction and maintenance costs".

Naturally based recreational sites generally need no formal facility provision because the recreational usage is primarily for primitive or sub primitive nature based opportunities which do not require facilities. An example of such a site is the Minyon Valley. There is no policy at a district level for Casino/Casino West Districts on the management of natural-area based recreational opportunities.

Murwillumbah Districts recreation management, as stated in the Murwillumbah District Forestry Plan of Management (FCNSW, 1984) is similar to that of the Casino District and aims to:

maintain existing facilities and to monitor the level of recreational usage with facilities being further developed if justified by demand against construction and maintenance costs.

The plan also makes allowances for potential recreational sites that already are identified in the Plan of Management to be protected against adverse influences (forestry operations).

The Murwillumbah management plan is more comprehensive in terms of its recreational planning than the plans for the Casino Forestry District. This is a result of a different recreational zoning scheme for the Management area at a district level. The two zones that are provided are the intensive and extensive recreation zones. The intensive recreation zoning includes the popular, heavily used and well recognised recreational areas and roads such as Minyon Falls and Mebbin Recreation areas and Rummery Road, Cadell Road, for example. Management for intensive recreation zones is aimed specifically at maintaining the recreational values of such areas as a priority over general forestry activities.

Extensive recreation areas are those not included in the intensive recreation zone and intensive recreational uses of such areas are discouraged in these zones. Extensive recreation in these zones is permitted to the extent compatible with management objectives for the forest area generally.

3.3.3 PMP Special Emphasis Zoning of State Forests

Areas of State Forest in the Casino and Murwillumbah Districts, identified by the FC as being of value for recreation, are zoned under the Preferred Management Priority (PMP) system as Special Emphasis (Recreation) and are represented accordingly on FC PMP mapsheets.

The Special Emphasis (Recreation) includes areas such as walking trails, picnic areas, camping areas, scenic forest drives, etc. The Special Emphasis Recreation zoning of State Forests is defined as being:

"areas which have natural features of direct significance to forest recreation. Such features include proximity to waterways, waterfalls, scenic vantage points, aesthetic or interesting timber stands or vegetation features or areas which, by virtue of location or attraction, have significant social meanings unique to a particular site. Management for other uses is constrained to the levels necessary to ensure maintenance of the recreational value".

The areas of State Forest zoned as Special Emphasis (Recreation) is actually quite small, but there is often overlap with other areas of special emphasis, notably those of Visual Resource Protection, flora/fauna protection, catchment protection and Flora Reserves. In areas of State Forest areas zoned Special Emphasis, forestry activity is excluded or operations are modified in the vicinity of the area concerned.

Deficiencies in the PMP system exist with respect to the management of sites with a specific value for recreation, for example, suitable sites not recognised by the FC as being of value for recreational purposes. This study identifies the areas of value for recreation of which the FC presently may be unaware, or has not considered in the PMP zoning of areas, or in the Plan of Management. The inventory of sites (Table 4) in State Forests of the Casino - Murwillumbah Districts identifies the sites known at present to be of value for recreational purposes. Ongoing monitoring of new sites used for recreation is required to plan for such areas so as to preserve their values for recreation. Other deficiencies include the amount of land designated e.g. areas which may not be wide enough for, or insensitive to, the recreational needs of the site.

The PMP planning system of management of recreational sites should ensure the general preservation of the values of recreational sites in State Forests. There are limitations of this system and recommendations for the recreational management of forests are made in the relevant latter sections of this report.

3.3.4 Recreational Expenditure

State

The FC of New South Wales traditionally has provided for funding of expenditure on recreation with some \$3.6 million dollars being provided in 1988/89 (RAC 1991).

Regional

The Grafton, Casino and Murwillumbah Districts in the Coffs Harbour Forestry Region currently outlay, on average, between \$140,000 - \$230,000 per year for the provision, service, construction, maintenance, etc, of recreational facilities (FCNSW 1992). A large percentage of this (approximately 50% on average) is spent on roads which receive the majority of their usage from recreationalists.

District

A breakdown of the funding for each District over 1989/90 to 1990/91 is presented in Table 5.

Table 5
Recreation Expenditure in each Forestry District

Recreation Project	District Expenditure (\$ 000's)					
	Grafton		Casino		Murwillumbah	
	1989/90	1990/91	1989/90	1990/91	1989/90	1990/91
Construction	0	0	2.2	13.9	0	0
Servicing	0.4	0	19.5	23.0	27.8	28.9
Maintenance	0	0	1.1	6.3	16.0	22.6
Signs	4.5	0.2	0	3.0	1.8	7.5
Roads	0	0	0	41.4	68.5	78.5
TOTAL	4.9	0.2	22.8	87.6	114.1	137.5

Source: FCNSW, 1992. Recreation Files

As seen in Table 5, Grafton District receives very low funding for recreation, which is consistent with the level of facilities provided in the District. Low funding may be the result of a low demand for recreation which, in itself, may result from inadequate funding and provision of recreational facilities. The Murwillumbah District receives in excess of \$100,000 per annum on average due to the greater number of recreational sites and usage of these sites on a per capita basis. Casino District recreational expenditure is significantly lower than that of the Murwillumbah District.

3.3.5 Recreational Facility Provision and Maintenance

Developed facilities (including forest drives and walking tracks) are provided by the FC at several of the more popular forests in each district. The majority of developed facilities occur in the forests of the Murwillumbah District with 28 sites containing facilities provided by the FC. This level of facility provision is comparable with the Casino District which provides developed facilities at eight sites. The provision of developed recreational facilities usually is proportional to the funding (seen in Table 5) that such areas receive on a District basis.

There is a demand justifying expansion of facilities in the Murwillumbah District, in particular in Whian Whian State Forest (I. Robertson, *pers comm.*) in order to manage the 'overflow' of visitors in peak periods. Popular areas such as Rummery Park have been identified at saturation levels for over a decade (FCNSW, 1980).

Generally site facilities provided by the FC are kept in adequate condition due to regular maintenance by Forestry staff. The Site Inventory (Table 4) indicates approximately 60% of sites in the Casino - Murwillumbah Districts with facilities were assessed as being in a good condition with the remainder (approximately 40%) of site facilities being in medium condition. A visual representation of site facility condition for each District is presented in Figure 3.

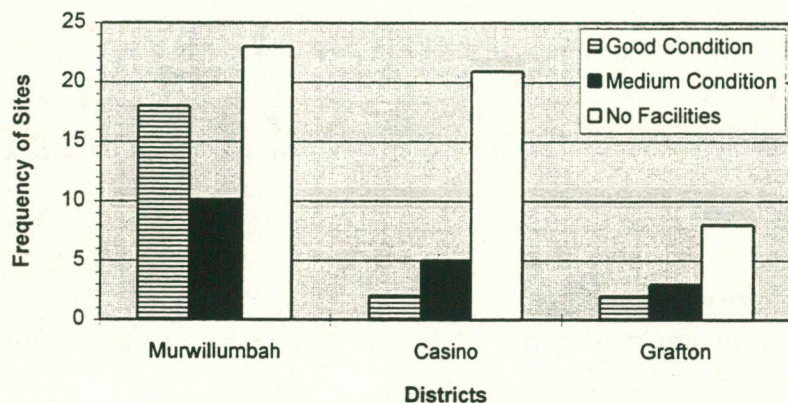


Figure 3

Site Facility Condition at each Forestry District

Source: Author's data collection

3.3.6 Site Quality

The quality of a site is important because areas which are not attractive are not visited and often not respected by forest users. The majority of forest recreational sites were assessed as being high quality sites, as represented in Figure 4. High quality sites generally have interesting, appealing surrounds, a tidy appearance and are well maintained. Primitive or semi-primitive sites generally have a high site quality because of the naturalness of the site and have fewer impacts from lower visitation. The sites of medium site quality have generally lower quality surrounds possibly due to past land use, the presence of weeds and normally having relatively lower quality environmental settings.

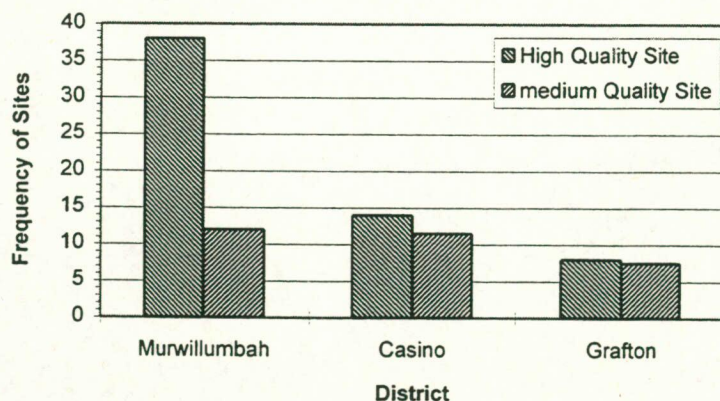


Figure 4

Site Aesthetic Quality in each Forestry District

Source: Author's fieldwork

In general it can be seen that sites in all districts are of a medium to high aesthetic quality. This is often due to the high aesthetic value of the surrounding forest areas. No sites in the Casino - Murwillumbah Districts were assessed as being of low aesthetic quality.

3.3.7 Impacts on Sites

As presented in Figure 5, recreational sites typically incur low impact from recreational usage. Sites which have a medium level of impact are those in which are more heavily used such as the Minyon Reserve. Medium level impacts include the presence of litter, soil compaction and erosion, vegetation trampling and damage, dust, medium water quality, vandalism, etc.

Sites with low impacts do not necessarily indicate that they receive a lower usage level but may have low impacts as a result of effective maintenance of sites by the FC and the 'hardening' of sites against impacts.

Low impacts are factors present at the site such as minor track erosion and soil disturbance, high aesthetic quality, less plant trampling, a low incidence of litter, retained vegetation. Water quality is frequently high at such sites. Monitoring of impacts is important to prevent degradation of the site values.

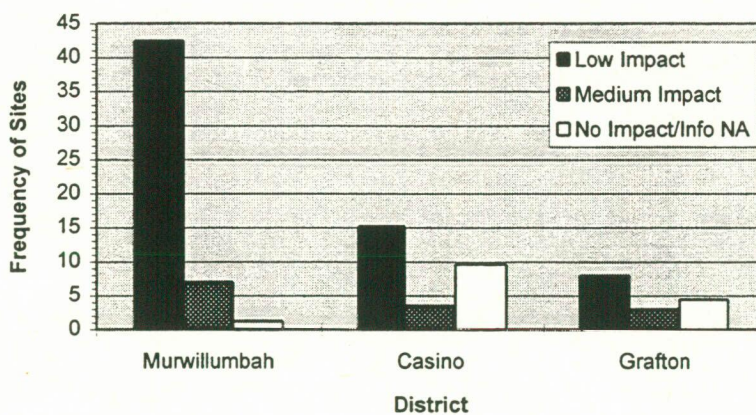


Figure 5

Frequency of impacts on sites from recreational usage

Source: Author's fieldwork

3.3.8 Site Access

Access to recreational areas or sites in State Forests usually is provided as an indirect consequence of forestry operations. The access system is generally more extensive than similar areas of National Park where, as part of the management policy, public access may be limited in order to reduce environment degradation (NPWS, 1988). Recreational areas of State Forest generally are widely accessible and, in the majority, by two-wheel drive transport. State forests generally are unrestricted regarding recreational access provisions.

There is a range of access types in State Forest areas. The three main types of forest access include two-wheel drive, four-wheel drive and walking track access. The distinction between two-wheel and four-wheel drive access is fairly subjective and depends largely on individual site characteristics. The majority of roads in forests zoned as Special Emphasis (Recreation) are for two-wheel drive vehicle access. This is a general trend for all recreational zoned/emphasised areas as these roads are used mainly by recreationalists.

The range of access types in each forestry district is presented below in Figure 6. The most common form of access in the Murwillumbah and Casino Districts is for two-wheel drive vehicles, although Murwillumbah also has a relatively high number of walking trails.

Casino District has a more uniform range of access types. This trend indicates the range of access opportunities available for the recreationalists who use these forests. Whilst Murwillumbah District has a range of access opportunities, there is a greater orientation towards two-wheel drive vehicle access which gives practically no limitation to the type of recreationalists who may use them. Maintenance of two-wheel drive vehicle access networks is a large and ongoing expense for the FC.

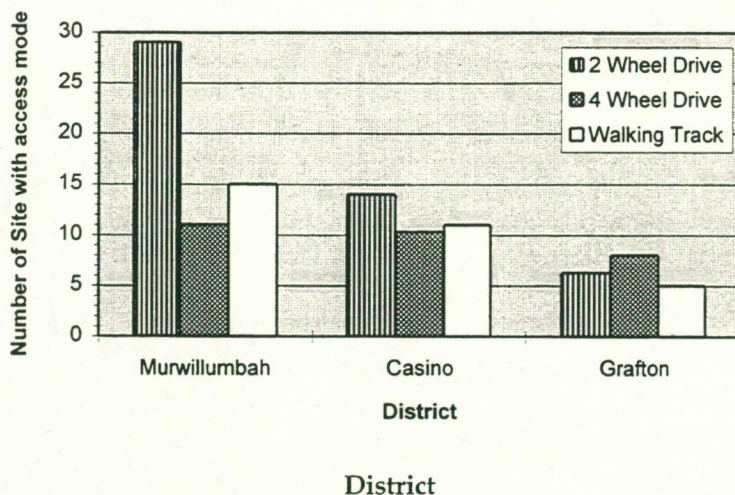


Figure 6
Access Types for each Forestry District

Source: Author's data collection

Importance of Access in Site Based Recreational Opportunities

Access to forest recreational sites is one of the primary determinants of the recreational opportunities available in a particular area. The influence of access can be seen in the Recreational Opportunity Spectrum (see Figure 8) indicating that primitive sites are generally accessed by walking tracks whilst at the other end of the spectrum the developed or modern sites and semi-modern sites are accessed by (usually) well maintained roads.

The provision of access in developed sites and the combination of several other factors will result in a changed degree of popularity and user experience at that site. A change in the access provisions may lead to a recreational succession from the original user types different user groups discouraging traditional visitors from using a particular site.

3.3.9 Site Promotion

State forests of the North Coast are promoted by a variety of means. Table 6 presents the levels of promotion of recreational resources in State Forests, as derived from the Site Inventory (Table 4).

Table 6
Promotion of State Forests on the North Coast

Type and Frequency of Site Promotion				
District	Maps	Signs	Brochure	Other
Casino	22	11	4	13
Murwillumbah	33	30	18	14
Grafton	11	9	0	0

Source: Site Inventory (Table 4)

A visual representation of this data is presented in Figure 7 showing the wide promotion that recreational sites receive from mapping and signage media. There is a range of sites in State Forests that are widely promoted such as the developed sites, or in the case of primitive sites are not promoted at all. Certain forms of promotion may result in negative impacts on the site from increased usage which may reduce the opportunities (and quality of opportunities) available at the site.

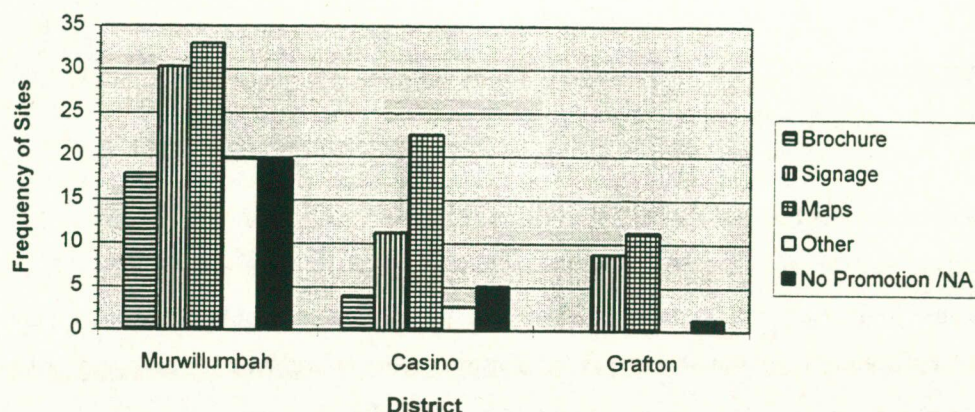


Figure 7

Promotion of recreational sites in State Forests

3.4 Recreation Management Issues

3.4.1 Future Forest Related Recreational Visitation

The recreational usage of State Forests on the North Coast in some Districts has increased markedly over the last ten years. ANUTECH (1991) states that forest related recreation has expanded 'enormously' over the past 25 years and is expected to increase further, especially since the population of the region is growing. Recreational visitation also will increase due to various other factors such as the increase in tourism to the region, increased interest from recent forest related conflicts, continued increases in adventure recreation/eco-tourism, changed community interests and motivation and the general increase in outdoor recreation/leisure.

Tourism visitation to the North Coast of NSW is stated by the NSW Tourism Commission (1987) as being more than 700 - 900,000 for the Mid North Coast and between 900,000 and one million visits for the Upper North Coast. Whilst these figures are high and indicate the strength of tourism industry in the area, only a small proportion of these tourists visit a State Forest. It is generally considered that tourist visitation to the North Coast will increase. This means that usage of forests for recreation also may increase although there is no basis, as yet, on which to estimate the implications of this.

There is a high usage of all natural areas on the North Coast, such as beaches, rainforests, waterholes, rivers, etc., for recreational activities. The National Parks and Nature Reserves of the Lismore District receive an annual visitation of the order of 450,000 - 605,000 visitors per year (NPWS, 1992). It has been noted also that the number of visitors to the Tweed has increased exponentially over the past decade (NPWS, 1992). Shire Councils and the tourism industry recognise the importance of the natural landscape, and particularly State Forests, as a tourism drawcard (Tweed Shire Council, 1991).

There is considerable potential for State Forests of all districts to increase their recreational visitation to similar levels to that of National Parks. Recreational data at each forestry district indicates a growth in demand for State Forest recreation. Visitation at these levels, however, would require extra human and financial resources from the FC to manage such an increase.

Over the last ten years there has been a large increase in the level of tourism which could be called 'eco-tourism', 'green tourism' and/or 'adventure tourism' and this growth is expected to continue (Hall, 1989, 1991). This is a response to the increased demand for the traditionally less conventional forms of tourism. The term eco-tourism in relation to the forests of the Casino - Murwillumbah Districts describes the nature based use of the forests for tourism in a manner consistent with the conservation of the values of sites. This usage still is essentially a recreational usage of the forests. There is a large potential for an increase in 'eco-tourism' activities from present indications.

Increases in visitation may arise from changed user preferences or 'tastes' for recreational pursuits and experiences such as demands for adventure recreation, eco-tourism and nature education. This also indicates an increase in the complexity of recreation types that may be expected in the future and is supported by comments from the RAC (1991) which states that "*planning of the recreational use of forests will become more complex as different perceptions and attitudes of groups and individuals manifest themselves in the future*". It is likely, therefore, that greater human resources will be required to manage the future forest recreation visitation to the Casino/Murwillumbah Districts and the region generally.

3.4.2 Commercial Operations in State Forests

The commercial tourism/recreational operators presently utilise sites in both forest districts on a regular basis. For whole forest areas to be used exclusively for tourism instead of forestry would be impractical in the Casino - Murwillumbah Districts, due to the lack of patronage of operations at present and during times of lower demand. Certain forest areas have little to offer in regard to commercial tourism operations. National Parks already may cater for such a demand.

According to tour operators in the Districts, there is a general perception that commercial recreation in State Forests is very profitable. However, some of the expenses commercial operators have to cover include insurance, access permit from the FC, fuel costs, wages for guides, promotional material/advertising, vehicle purchase and maintenance, equipment purchase and maintenance, tax, etc. After these costs are met there is often little profit for commercial operators. These factors, combined with periods of economic recession, pilot strikes, and seasonality often result in low profitability in the region for such activities.

Essentially, commercial tourism/recreation usage of State Forest is demand driven. Operators have to work around the many factors which can cause a fluctuation in recreational patronage. Operators conduct

trips in response to the participation of an adequate number of clients to make the trip economically viable. Some operators organise trips solely in response to client demand, not in advance.

Generally forests cater for commercial recreation operations irrespective of whether the forests are being worked or not. Some tour operators use areas of active forestry operations to educate visitors about the differing roles of State forests and National Parks.

Some operators need forest areas for their business as their activities may be incompatible or unacceptable with National Parks uses (e.g. four-wheel drive use). Generally there is a need for a range of areas with different attractions, management and facilities so to provide a range of opportunities for commercial operators to meet the demands of the client and to provide a contingency setting in times of variable weather patterns, access difficulties, other natural factors (floods, drought, fire, etc.), or other competing resource uses (rallies, other groups, peak seasons, etc).

3.4.3 Concerns of Commercial Operators over Forestry Activities

There is a general acceptance of forestry operations in the Casino - Murwillumbah Districts by commercial operators. Land based commercial operators do not use forests exclusively but can take tours to National Parks and other areas of interest for which they have permission to access. Forests are not the sole focus of opportunities for commercial recreation activities. Forests are, however, a very significant resource for the commercial operators where they can essentially operate with less restrictions than those available in National Parks or in areas on the coast.

Few concerns were raised in consultation with commercial operators. This results from the adequacies of the present PMP (Section 3.3.3) classification and management of the areas that are of significance to commercial operators such as the popular picnic sites, walks, drives, lookouts and rivers. The majority of areas used for commercial operators are zoned as Special Emphasis (Recreation) in the PMP system.

3.4.4 Conflict

The usage of forest sites, areas or facilities by various recreational activities may cause conflict. For example, nearly any activity and trailbike riding involve some degree of conflict or incompatibility. The use of sites or areas of forest for recreational activities such as rallying, endurance riding, etc. may conflict with forestry activities from the leaving of tags, signage, road damage, etc. Other activities may cause conflict or be an inconvenience to the FC or the users themselves, such as getting bogged in remote areas, causing soil disturbance and erosion, etc. Generally, however, there is a low incidence of conflict between recreational use activities and the FC.

The FC encourages appropriate user behaviour in State Forests through:

- * community relations and liaison with field staff, particularly forest rangers;

- * the 'Countryside Code of Behaviour' listed on project maps ; and
- * signage in forests.

3.4.5 Recreational Usage of 'Old Growth' Areas of State Forests

Areas of 'old growth' forest exist throughout the northern and western parts of the State Forests of the Casino and Murwillumbah Districts. Recreational usage of such environments actually may threaten ecological values of such areas, particularly in relatively remote areas such as the Blackbutt Plateau in the Murwillumbah District. Opportunities for recreation in areas of 'old growth' presently are available in some National Parks and areas of State Forest already managed for recreational usage such as the Gibbergunyah Roadside Reserve in the Whian Whian State Forest.

Generally areas of 'old growth' forest, particularly in remote areas, are not perceived by many recreationalists as being an identified recreational resource and attraction in State Forests due to lack of promotion, access and knowledge of such areas. Alternative locations in National Parks (e.g. Border Ranges) are used more heavily.

3.4.6 User-Pays Scheme for Recreational Revenue Recovery

The high cost of providing and maintaining recreational facilities and the low return on these facilities has encouraged the FC to explore options for making a financial return on expenditure for recreation.

There is presently a large potential for the implementation of a 'user pays' approach to recreational usage of forestry facilities. This would involve approaches, presently being explored, to charge the users of picnic or camping facilities for that use. From present observations there is a general willingness to pay for the use of such facilities (Lyons, *pers. comm.*). The system may be readily accepted in North Coast State Forests, as many users are from Queensland where fees are payable for camping in National Parks. From indications worldwide, the user-pays approach appears to be a feasible and successful approach to recreational cost recovery (Aukerman, 1987).

A user pays scheme for forests of the North Coast, as described by Lyons (*pers. comm.*) could possibly incorporate a car permit system available for 3, 6 12 months, etc.) whereby users would display a car sticker which could be purchased from a variety of places such as service stations, local shops, etc. The system may be similar to that of the NPWS annual permits. The permit would apply only to users of facilities such as barbecue/picnic areas and campsites where there is a financial cost to the FC to provide such facilities.

A user pays system presently operates in the Queensland Forest Areas such as Brisbane Forest Park, west of Brisbane, where a range of schemes such as paid ranger guided tours, walks, displays and more

commercially oriented activities such as souvenir shops and tea rooms exist. The potential for similar revenue raising activities in State Forests is high.

In order for the system to be equitable it would be necessary for costs to be borne by those who gain an added benefit in some way from their recreation such as the use of picnic and camping facilities as opposed to a walking track which is of lesser cost to the FC to maintain.

It would be necessary for the FC to employ additional staff to implement and administer the system. Funding from a user pays system also may fund increased facility development at other sites and in other forests.

3.5 Recommended Management Strategies

3.5.1 The Recreational Opportunity Spectrum-Site Management Framework

The Recreation Opportunity Spectrum (ROS) is a tool which can be used to show the effect of manipulating environmental and situational attributes or factors to produce different recreational opportunity settings (Pigram, 1983). The ROS system can be used so as to maintain these opportunities effectively preserving a range of recreational opportunities in the State Forests of the Casino - Murwillumbah Forestry Districts.

The Recreational Opportunity Spectrum (ROS) for the Casino - Murwillumbah Districts Forests

Figure 8 is an indicative ROS for the forests of the Casino - Murwillumbah Districts showing the components that account for the recreational opportunities available at each recreation site.

The need for a site class approach, such as the ROS, to recreational planning and management is necessary because of the various user, management and sitebased characteristics that determine the opportunities that are present at the site. These factors give the opportunity to manage a spectrum of sites for a range of user types, which allows for the identification of what management of the site is more likely to be 'accepted' by recreationalists at that site. By managing a site according to the most acceptable characteristics of that site, many of the negative effects of recreational site management can be avoided.

The ROS has considerable potential for integration with the PMP system as a future approach to recreational resource management in State Forests of the Casino - Murwillumbah Districts.

Figure 8

Indicative Recreational Opportunity Spectrum for Forests of the Casino - Murwillumbah Districts

Casino/ Murwillumbah Forestry District-Recreational Opportunity Spectrum				
Site Factor	Primitive Sites	Infrequent Sites	Semi-Modern Sites	Modern Sites
Facilities Present	Seldom Present		Usually Present, Wide Range	
Site Usage Level	Low		Medium	High
Promotion of Site	No or little promotion		Multi-Medial Promotion	
Potential For User Conflict	Low		Medium to High Potential	
Degree of Site Modification	Low or None		Medium to High Development	
Site Access	Routes/ Tracks		Sealed/ Unsealed Roads	
Site Remoteness	High	Medium	Low- Not Remote	
Site Activities	Active/ Specialist Activities (Abseiling, Bushwalking, Rafting, 4WD, etc)		Passive/ General Activities; Driving, Picnicking, Walking, Sightseeing, etc	
Degree of Acceptable Forestry Presence	Low Acceptability	General Acceptability-Low Conflict Site Dependent		
Degree of Site Regulation/ Visitor Guidance	Self Guided/ Autonomous Experience		Focussed/ Regulated Experience	
Recreational Impact on Site	Low Impact	Medium Site Impact	High Impact Usage	
Acceptability of Site Modification/ Development	Low acceptability		General Acceptability depending on scale and site	
Example of site class	Lost Valley (Whian Whian), Sunday Creek (Ewingar)	Boomerang Falls (Whian Whian), Tabbimoble Trig (Tabbimoble)	Peaches Mt (Whian Whian), Richmond Range Forest Drive	Rummery Park, Braemar Rest Area

Site Classification

The following is a description of the four ROS based site classes on which each recreational site is classified and subsequently as it should be managed. The Recreational Opportunity Spectrum (Figure 8) displays the range of factors that generally are suitable for the management of the recreational opportunities available for each such class. The individual classifications given for each site are listed in the Site Inventory in Table 4.

Primitive Sites

These sites are the less disturbed, low use sites in high quality natural settings with little or no evidence of human disturbance. As seen in the ROS (Figure 8), access to such sites usually is restricted to foot access and occasionally four-wheel drive access. Access has been stated (Clark and Stankey, 1979) as being one of the prime determinants of the recreational opportunities of a site or more importantly the type of user of the site. Difficult access to a site deters the spectrum of users seeking activities such as picnicking and sightseeing to other areas where such activities are more suitable. Primitive sites are remote and give the user a naturally based experience. Site conflict is infrequent at these sites. Other names for primitive sites include remote or undeveloped sites.

Examples of primitive sites in the Casino - Murwillumbah Districts include Lost Valley (Whian Whian), Hell Hole Falls and Rolands Creek (Nullum), Desert Creek (Washpool) and Sunday Creek (Ewingar).

Semi-Primitive Sites

These are sites with a certain degree of noticeable human modification or disturbance to the site such as with walking trails. These sites are characterised by 'low-key' development which still gives the recreationalist to these sites a feeling of remoteness. Access to these sites is by walking or four-wheel drive transport and occasionally from two-wheel drive transport. Site types that usually are classified as Semi-Primitive include walking tracks and areas accessed by these tracks. Again, it is the access that is important in the classification of these sites.

Examples of Semi Primitive sites in the Casino - Murwillumbah Districts include Boomerang Falls in Whian Whian State Forest and the Tabbimoble Trig, Tabbimoble State Forest.

Semi-Modern Sites

These are the sites with a noticeable 'intensive' level of facilities or development. Such areas often contain forestry provided facilities but which are not at a scale of development so as to justify their classification as a modern or highly developed site. Many of the low key picnic areas fall into this category. Access is typically by two-wheel drive transport. Often these areas can be linked to semi-primitive or modern sites.

Semi-Modern sites are often the 'intensive' recreational areas that are maintained by the FC and are associated with the more passive forms of recreation such as picnicking, bushwalking and sightseeing. These areas often are publicised in several forms of media. Semi-Modern sites still maintain their natural characteristics but have a moderate level of human modification imposed upon this natural setting.

Semi-Modern sites in the Casino - Murwillumbah Districts include Peaches Mountain in Whian Whian SF and the Richmond Range Forest Drive in the Richmond Range SF.

Modern Sites

These are the few sites in State Forests where there is usually good access by two-wheel drive, high usage and a wide provision of facilities. These sites are promoted widely by a variety of means. Modern sites also are referred to as developed or highly impacted sites or "tourist" sites. These areas as well as Semi-Modern sites tend also to have a greater FC staff presence than other classes of site.

Examples of Modern Sites include Rummery Park and Braemar Rest Area, for example.

3.5.2 General Recommendations for Recreation Management

From the assessment of the recreational usage of the forests in the three districts, there are several recommendations for the future management of areas of recreational value including the following policies and actions to ensure continued effective recreational management as part of overall multiple use forestry.

Non Zoning Recommendations:

- * The appointment of a regionally-based recreation planning officer to manage the future recreational forest usage on the North Coast (Coffs Harbour Region). The aim of the position would be to co-ordinate the management of recreation in the region. Many forest recreation management objectives in the region would be achieved from this position. The following recommendations would ensure the effective management of forest recreation in the future, particularly if the recreation planning officer has the opportunity to involve District staff and the public in implementation of the proposals.
- * Assessment of potential site facility developments in liaison with other FC staff.
- * Increased liaison with commercial operators, user groups, community groups and any other forest users, i.e. the representation of both recreationalists and the FC.
- * Further research and technical advice on the recreational usage and trends in forests.
- * Monitoring of recreational facilities and sites, usage patterns and user groups.
- * Regular surveying of forest usage patterns.
- * Implementation of a user-pays system towards facility usage and recreational expenditure recovery.
- * Promotion of forest recreation consistent with the ROS for forests.
- * Resolution of recreational and other user conflicts at sites and preventive measures.
- * Expanded recreational emphasis zoning under the PMP system.
- * Management of visual resources of forests.
- * Long term identification and planning of forest recreational needs.
- * Continued inventorying of recreational sites and potential.
- * Management and recommendations for the amelioration of the negative environmental impacts of recreational usage on forest.

- * Liaison with other interested/relevant departments and organisations related to recreation, forest management, tourism and sport.
- * Processing and review of recreational permits.
- * Annual report statements on recreation management achievements.
- * Input to recreation sections in plans of management for each forestry district.
- * Organisation of potential Seasonal Forest Rangers and interpretation programmes and other similar potential forestry education extension programmes.
- * The monitoring of user behaviour and collation of a set of guidelines for user behaviour, with possible addition to the present countryside code on Forestry Project Maps.

Other Recommendations:

- * Management of recreational sites under an integrated ROS and PMP approach.
- * The regular revision of recreational sites inventoried and the updating, assessment and inclusion of new sites into the recreational site inventory.
- * Continued recreational management consistent with the FC Recreational Statement Policy.
- * The notification to the public of possible road closures (including locked gates) or active logging sites involving short newspaper descriptions of the areas that may be affected.
- * The adoption of more specific recreational zoning in the Casino District, similar to that of the Murwillumbah District, of incorporating 'extensive' and 'intensive' recreational zones or by simply adapting the ROS framework for recreational site based management.
- * Managing a range of suitable opportunities for commercial based tourism in State Forests (the Tourism Opportunity Spectrum [TOS]).
- * Formulation of a policy and management strategy for nature based recreational opportunities in forests of the Casino District.
- * Implementation of the specific site based recommendations listed below.

- * Consideration of potential recreation areas listed in Section 3.5.7.
- * Zoning/Identification of potential recreation areas and incorporation into the PMP system.

3.5.3 Site Specific Recommendations

Recommendations for each site are shown in Table 4 (last column 'Site Recomm'). The various site management options that are recommended are explained below.

Continued Operations (CONT.): Unchanged usage of the site is recommended. In this case the individual site already has adequate safeguards in place, or the site is of the type whereby forestry activities would not threaten the recreational values of such areas.

General Emphasis (G.E.): Management of the site be carried out under the General Emphasis provisions that already are in operation at the site. In this case the site may actually not be of value for forestry activities in which case future zoning of the site for recreational emphasis may be feasible.

Special Emphasis - Recreation (SE.): The site should be zoned and subsequently managed under special emphasis as a recreational site. Potential forestry activities in these sites may threaten the recreational values of these sites, hence the need for special emphasis of them to preserve their values.

Special Emphasis - Visual Resource Protection: Sites at present in forests often have an overlap in their recreational and scenic resources, such as a prominent peak with a lookout at the top. In this case it may be more suitable to preserve the visual resources of the area as a priority over recreation. Sites recommended for Special Emphasis -Visual Resource Protection are those whose visual value may be higher than the recreational value. In this case the zoning of an area with Visual Resource Protection emphasis also will ensure the recreational values of the site will be preserved.

Special Emphasis Recreation/Visual Resource Protection: Further assessment or management under the combined guidelines for both Special Emphasis (Recreation) and Special Emphasis (Visual Resource) required.

Widened Emphasis (EE.): Widening of the area under special emphasis required in order to preserve the values of that area that may not already be adequately protected.

Site Monitoring (SM.): Regular monitoring for changes in patterns of usage, conflicts, adequacy of facilities, necessity of facilities, options for site improvement and notably the possible impacts that forestry activities may be having on the site or associated usage of the site is recommended.

Monitoring of sites in Table 4 is prioritised from high priority to low priority. High priority involves regular observation and monitoring of sites which are frequently of higher recreational value. Low priority sites require low monitoring incorporating only occasional observation.

3.5.4 Other Recommendations and Guidelines for Future Forest Recreation Management

- * Recreation site planning should be commensurate with the recommendations for site planning in the FC Operations Manual. Site planning and development should take social, economic and environmental factors into account before construction. The effect that site development may have on the site based opportunities should also be assessed prior to development.
- * An activity based recreation policy which should strive to separate conflicting activities should be formulated. This policy also could outline areas of suitability for certain activities that may cause conflict with others or those which may be physically damaging to the forest. The policy then can be promoted to recreationalists.
- * The signage of State Forest roads should incorporate information indicating whether they are 'through' access or whether they are essentially 'no through roads' so to better direct forest visitors.
- * There is potential for sites in State Forests to be set aside for the purposes of public education about the management of forests particularly at active logging areas. The programme could show adjacent areas and how the forest structure, habitat, etc. changes after logging and could include a large component of interpretation material such as signage and activities.
- * Volunteers could be included in the management of recreation such as in guided walks and bush related activities. This may include forest 'seasonal' rangers similar to those of the NPWS who conduct guided walks and a range of activities in peak visitation times such as school holidays.
- * Existing accommodation in forests should be upgraded. This may justify an increase in fees charged for the use of these facilities. Specific reference is made here to the cabin at Rummery Park.
- * Newly developed campsites could become more focussed on smaller sub-sites which then could be booked in peak visitation periods. A range of site sizes could be provided. Larger sites used by

larger groups also would incur a larger fee. A system of advance payment should be investigated for campsites, such as the coupon purchase of camping permits used in Queensland National Parks.

- * An interpretation strategy for key district forests (especially Whian Whian) should be developed.
- * The 'Minimum Impact Bushwalking' ideal should be promoted in heavily used forest areas to preserve recreational value of such areas.
- * Improved warning of the hazards associated with visitation to particular areas such roads becoming slippery or inaccessible in wet weather.

3.5.5 Potential Recreation Development

The following section discusses the potential of the forests of the Casino - Murwillumbah Districts for recreation development and expansion. The large extent of forests in the Casino District and the diverse topography of the Murwillumbah Districts Forests results in a high potential for recreation. It is important to recognise the significance of all State Forest areas as being of potential recreational value, in particular to bushwalkers.

Table 7 lists potential site and suitable activities in State Forests of the study area. Potential activities in nearly all forest areas include Art/Photography, Bushwalking, Cycling, Horseriding and Trailbike riding. The Casino - Murwillumbah Forestry Districts contain approximately 160,000 hectares of forest estate. This, combined with an increasing demand for forest recreation, will mean not only increasing demand on present sites but also a need for additional recreational sites in forests. Potential recreation sites involve two types: natural sites with no or very little facilities provided and those with more extensively modified areas providing facilities. Natural sites with specialist recreational opportunities essentially require no direct facility provision. Indirect facility provision such as a parking space next to access roads or maintenance of formed tracks to the site, signage, etc. may be more acceptable for such sites.

Primitive sites should not be modified if they are of a particular recreational value. However, all decisions should be site based and evaluated according to site characteristics and opportunities.

Table 7
Inventory of Potential Activities in State Forests

Forest	Potential Activities in Forests
Murwillumbah District	
Bom Bom	Cam, Pic
Goonengerry	Abs,Roc,Look,Art
Mooball	Abs,Pic
Nullum	Edu
Wollumbin	Abs,Roc
Casino District	
Banyabba	Hor,Tra,Can,
Billilimbra	Abs,Cam
Bungabee	Abs,Look,
Bungawalbyn	Tra,Ral
Camira	Bus,Cam,Hor
Cherry Tree	Cyc
Devils Pulpit	Cam
Doubleduke	Cyc,Ral
Ewingar	Abs,Roc,Cany
Gibberagee	Cam,Ral,Cyc
Mororo	Bus
Mount Belmore	Ab,Roc,Bus,Cany
Mount Marsh	Ab,Bus,Cam,Cany,Roc
Mt Pikapene	Abs,Bus,Roc,
Royal Camp	Pic
Tabbimoble	Abs,Cyc,Roc

Code for potential activities:

Abs	=	Abseiling
Art	=	Art/Photography
Bus	=	Bushwalking
Cam	=	Camping
Can	=	Canoeing
Cany	=	Canyoning
Cyc	=	Cycling
Edu	=	Education/Interpretation Activities
Hor	=	Horseriding; recreational rides, endurance competitions, commercial operations/ tours
Look	=	Lookouts, sightseeing or vantage points of scenic interest
Pic	=	Picnicking
Ral	=	Rallying
Roc	=	Rockclimbing and bouldering/scrambling, technical rockclimbing
Tra	=	Trailbike riding

Potential recreational opportunities for areas of State Forests in the Casino - Murwillumbah Districts include:

Murwillumbah District

- * Mebbin Lagoons Area - extension/expansion
- * Mebbin Recreation Area - upgrading of the facilities including interpretation.
- * Amaroo track - extension and upgrading of track to a round trip.
- * North Rocks Road Forest Drive - possible link to Nullum Forest Drive/Uki - Murwillumbah Road incorporating Rockface Lookout (needs inventory).
- * North Chowan Rd Lookout - expansion, promotion, lookout tower.
- * Cooraldilla Rd - Lookout-upgrade, expansion.
- * The cliffed escarpments of the Goonengerry, Nullum, Wollumbin and Whian Whian State Forests - all have the potential for specialist rock related activities such as canyoning, abseiling and rockclimbing. Most of these areas also have potential as lookout sites connected by walking tracks to various access points.
- * Blackscrub - walking tracks and picnic area/lookout over the Tweed.
- * Koonyum Range Forest Drive - incorporating existing and potential recreational sites and opportunities, including minor interpretation.
- * Lost World - low key walking tracks to or adjacent to area.
- * Goonengerry SF - expansion /provision of further facilities at the present zoned Recreation Area.
- * Foremans Cottage on Minyon Drive - expansion as camping area/overflow area for Rummery Park.
- * Rocky Creek - causeway/creek picnic area, walking track - causeway area or upstream.
- * Lower Rocky Creek Causeway - steel bridge.

- * Gibbergunyah Roadside Reserve - interpretation.
- * Big Box Rd/Area - remote Picnic Site/Camping Area. Attractions are various and can relate to nearby opportunities in National Parks.
- * Promotion of forests and recreation sites/opportunities consistent with the site ROS classification.

Casino District

- * Bungawalbyn Creek in Doubleduke and Tabbimobile SFs. - adjacent campsites.
- * Braemar Firetower - potential picnic area/ short forest drive or a lookout.
- * Mororo/Devils Pulpit SFs - roadside rest areas alongside the Pacific Highway with similar scale of development to Braemar.
- * Bungabee SF- low key camping facilities at various potential sites.
- * Gibberagee Firetower - Lookouts.
- * Forest Drive from Casino to Mallanganee Via Royal Camp, Mt Pikapene, Sugarloaf (Tabulam) or Cherry Tree (Mallanganee) SFs.
- * Bulldog Rock - Picnic Spot/Walking Track/Lookout.
- * Keybarbin SF - Lookouts over the Clarence Valley from vantage points.
- * Berry Road - Picnic Spot, low key promotion.
- * Timbara River - walks from adjacent forest areas.
- * Waterfall Lookout over the Ewingar Creek - potential for promotion (signage).
- * Richmond Range State Forest on Cambridge Plateau - walking tracks, with interpretation, in rainforest along present roads.
- * Culmaran Creek Falls in Richmond Range SF - new walking track.

- * Areas of the Western Side of the Richmond Range in the Gorge Creek Area, originating from Gorge Creek Station (Holiday Farm) presently are being promoted for recreational usage. Track systems possibly may be incorporated into formalised forest trail system. Recommended liaison with the Station manager.
- * Mt Babyl in Richmond Range SF. - walking track.
- * Mt Pikapene - Lookout/Picnic Area, short walks.
- * Malara Tops - interpretation, access.
- * Mt Marsh - 4wd routes and low key camp sites/areas near local streams.
- * Ewingar/ Billilimbra State Forests - incorporation of sections into side tours of the 'National Trail' system presently running to the west of the forests.
- * Areas of Specific User Interest - rock related adventure recreation:

Banyabba State Forest Cliff System, Richmond Range (Devils Pulpit, Tabbimoble Escarpment), Mt Marsh, Wyan Creek Cliffs, Mt Pikapene, Mt Pikabooba, Culmaran Creek Area (Richmond Range State Forest and Associated clifflines, Mt Belmore State Forest and Associated Sandstone Clifflines (High Potential).

4.0 Visual Resource Management

4.1 Introduction

Visual resources are an important resource of the State Forests of the Casino - Murwillumbah Districts. This section discusses the extent of the visual resources of the two forestry Districts, their classification, describes relevant issues and recommended strategies for the management of these resources.

4.1.1 Overview

The visual resources of State Forests often are associated with a recognised character of a District, particularly the scenic backdrops of the Tweed Valley which are comprised of several State Forest areas. Areas of visual sensitivity are well recognised for these values by the FC which aims to preserve the visual amenities of State Forests as a part of multiple use forestry. Visual resource areas often have recreational value and may encourage people to further explore forest areas.

4.1.2 Issues Raised in Submissions

A small number of issues relating to scenic or visual components of Casino - Murwillumbah Forestry Districts were discussed in submissions from members of the public. One of the issues raised was that of consideration for the visual impact of proposed activities, particularly from nearby National Parks, Wilderness Areas and Nature Reserves and the measures planned to protect visual/scenic/aesthetic values.

4.2 Classification and Extent of Visual Resources

Areas of State Forest containing resources of visual or scenic significance are classified under the Preferred Management Priority (PMP) system. This defines visual resources as: *"areas of visual sensitivity as in areas of vegetation along roads, escarpments, hillsides, which form noticeable landscape components and require special consideration to maintain visual quality"*. This broad definition is applicable to wide areas of State Forest that may have a significant visual resource value.

The extent of visual resources is quite extensive in both the Casino and Murwillumbah Districts, with 1,237 hectares of the Casino District presently under Visual Resource Protection Emphasis zoned under the PMP system (FCNSW, 1992).

4.3 Visual Resources

4.3.1 Definition and Classification

The visual resources in each district are assessed by the FC according to their sensitivity for visual preservation. Areas with significant visual values then are zoned in forests under the PMP system as Special Emphasis (Visual Resource Protection). This zoning of visual resources allows the visual amenity of forests to be retained by modifying or excluding forestry activities in areas zoned as visual resource protection.

Forestry land which falls under the Special Emphasis (Visual Resource Protection) category may consist of forest areas, thereby restricting forestry activities at these sites. Land areas that are excluded from activity frequently include cliffs, escarpments, prominent rocky areas, mountain tops or pinnacles, steep slopes, etc. These areas are often of the highest visual quality.

Areas of forest under visual resource protection located in less rugged terrain or, for example, only areas noticeable from longer distances, have modified logging prescriptions such as thinner selective logging, wider buffer areas, etc. Such forest areas include roadsides, ranges observable from long range distances and broader topographical, but prominent features or those with a certain degree of local significance.

Areas of Visual Resource Protection often overlap with other areas designated as special emphasis for other forest values such as catchment protection, recreation, flora/fauna protection and flora reserves. This overlap is particularly noticeable in areas such as forest drives, streams and lookouts where recreational, catchment protection emphasis, etc. overlaps. Due to recreation in State Forests being particularly visually orientated, the value of the visual resources is significantly higher in these areas and needs consideration under the PMP system.

Areas of streams and rainforest, associated or independent of each other, have their visual amenity preserved due to the general forestry policy of restricting forestry activities from areas of rainforest and streams. The forests of the three Management Areas often contain streams with rainforest associations along the banks which gives high value visual resource areas such as streams (especially larger ones) a greater degree of exclusion and/or buffering from forestry activities.

4.3.2 Inventory of Sites

Table 8 lists sites in the State Forests in the Casino - Murwillumbah Districts under Special Emphasis (Visual Resource Protection).

Table 8
Inventory of Sites under Special Emphasis (Visual Resource Protection)

Forest	Extent of Visual Zoning
Murwillumbah District	
Nullum	Steep Escarpment and slope areas of Mt Jerusalem, Koonyum Range, Wilsons Creek Valley, Coopers Creek Valley
Whian Whian	Surrounding Minyon Valley, Steep Escarpments above Coopers Creek Valley
Mebbin	Tweed Range Escarpment between Hanging Rock and Pinnacle Hill
Casino District	
Banyabba	Along Summerland Way adjacent to forest boundary
Billilimbra	Along Gibraltar Range, prominent ridges
Braemar	Along Summerland Way adjacent to forest boundary
Bungabee	On prominent escarpments
Ellangowan	Along Summerland Way adjacent to forest boundary
Ewingar	Escarpment from Bulldog Rock to Pig Creek
Mororo	Along boundary adjacent to the Pacific Highway
Mt Pikapene	Mt Pikapene
Mt Marsh	Mt Neville, prominent ridges, Mt Marsh
Myrtle	Along boundary adjacent to Summerland Way
Richmond Range	Along the Cambridge Plateau Forest Drive
Tabbimoble	Along boundary of Pacific Highway
Washpool	Along Washpool Road and Lionsville Spur Trail

Source: FC NSW

As presented in Table 8 the visual resources of the Casino - Murwillumbah District Forests are generally protected under the PMP system. As mentioned previously areas not included in the inventory in Table 8 may have their visual resources preserved by inaccessibility to forestry or by present coverage under other classifications of Special Emphasis.

4.4 Visual Resource Management Issues

Issues related to the management of visual resources include:

- * The site specific disturbance of logging operations.

The disturbances present at sites with active forestry are generally restricted to the immediate area in which the activity occurs. Sensitive visual areas observable from other areas beyond the immediate site maintain visual amenity by excluded or modified operations in such areas.

- * The visual disturbance of sites following forestry activities, with particular reference to weed infestation, soil erosion and waste material at the site.

This issue relates to the aesthetic appearance of forest areas following forestry operations with regard to weeds, waste material or subsequent erosion possibly resulting from these activities. These factors may compromise the visual integrity of sites where active forestry occurs.

The PMP system allows for the protection of visual resources in such areas where these factors may cause a significant visual disturbance through modification or exclusion of forestry activities in such places.

- * Visual Impact of activities, observable from adjacent areas of National Parks, Wilderness Areas and Nature Reserves.

This issue arises from concerns that areas of State Forest of visual sensitivity, that are adjacent to National Parks, may compromise the quality of recreational experiences if areas of visual disturbance can be observed in nearby forests.

- * Measures planned to protect visual/scenic/aesthetic values.

This issue addresses whether the present management of visual resources by the FC is adequate. The visual resources of the Casino - Murwillumbah District State Forests are protected and maintained under the present PMP system. State Forest areas of visual sensitivity which are not protected under the present PMP system are recommended for protection (zoning) under the PMP system in Section 4.4.

4.5 Recommended Management Strategies

4.5.1 General Recommendations

Generalised recommendations for the ongoing management of State Forest Visual Resources include the following:

- * Assessment of potential visual disturbances to individual sites and measures that may be implemented to lessen the visual disturbance to sites during and after forestry activities.
- * Implementation (i.e. zoning) of site specific recommendations for visual resource protection.
- * Ongoing monitoring of visual resources and adequacies of visual resource protection. A priority classification of visual resources should be made and preference for monitoring given to sites with a higher priority.
- * Clearing or 'cleaning- up' of waste materials from recently logged sites. This process could be incorporated into the overall process of log extraction at all sites.
- * Education of the community into the safeguards and management of visual resources in State Forests. This recommendation overlaps with recommendations for recreational management (Section 3.5 - Recommended Management Strategies) which may incorporate forest related education and interpretation.

4.5.2 Site Specific Recommendations

Recommendations for the protection of visual resources in State Forests include the extension of, or additional zoning of, areas recommended below in the potential areas for expanded visual resource protection.

Areas Recommended For Expanded Visual Resource Protection

Areas of visual resource sensitivity in State Forests are given special emphasis for protection under the PMP system. This classification is adequate to retain areas of visual significance in the landscape. Areas currently identified as having visual resource value under the present measures in the PMP system are considered as adequate. Areas where there is deficient protection of visual resources are described and include:

Murwillumbah District

- * Along the boundary of the Clarrie Hall Dam and Nullum State Forest
- * The North Chowan Road Lookout
- * Along the Steep Southern Facing Slopes near and including Burringbar Trig in the Mooball State Forest
- * Quandong Falls, escarpment and Valley

Casino District

- * The escarpment along the Richmond Range in the Devils Pulpit State Forest/Tabbimoble State Forest
- * The major ridgelines in the Gibberagee State Forest
- * Banyabba State Forest along borders adjoining the Summerland Way
- * Mt Pikabooba and surrounding cliffs
- * Mucklewee Mountain and the nearby eastern scarp in the Bungabee State Forest
- * Bulldog Trig
- * Along the road and railway adjacent to Camira Creek State Forest near Camira Creek
- * Braemar Trig Station/Peak
- * Cambridge/ Richmond Range Escarpment in the Richmond Range State Forest
- * Mt Dyrabba
- * Western Side of the Gibraltar Range
- * Cherry Tree Road in the Cherry Tree State Forest
- * Along Main Road (Tabulam To Baryulgil) adjacent to the Sugarloaf State Forest
- * Dobie Mt and Bluff Mt in Mt Marsh Area
- * Washpool Road- Lionsville Spur Fire Trail, Washpool State Forest.

5.0 Wilderness

5.1 Introduction

The State Forests areas of the Casino - Murwillumbah Forestry Districts cover areas identified as having values as wilderness areas. These two areas are the Washpool Wilderness and Lost World Wilderness. This section of the report identifies the areas of concern to the wilderness proposals, the issues related to the management of such areas and the recommended management strategies for areas of Wilderness in State Forests.

The Washpool Wilderness as proposed by the North East Forest Alliance is presently being assessed by the National Parks and Wildlife Service for its wilderness values. Upon completion, a Wilderness Assessment Report will be displayed for public comment and submitted to the Minister for the Environment for consideration and possible declaration of the area as wilderness under the Wilderness Act 1987.

Presently the Lost World Wilderness (nominated by the Colong Foundation for Wilderness, 1989) is adjacent to areas of the Mebbin State Forest in the Murwillumbah Forestry District and has been assessed for its wilderness qualities. A Wilderness Assessment report recently has been displayed for public comment and to the Environment Minister for consideration for declaration. The present proposal for the Lost World Wilderness does not include areas under State Forest. Future wilderness proposals, however, may include areas (Tweed Range Escarpment in Mebbin State Forest) adjacent to the present Lost World Wilderness in the future as identified in the Lost World Wilderness Assessment report (NPWS, 1992).

5.1.1 Overview

Wilderness is an environmental resource defined in many ways and assessable by a diverse range of criteria. The relevant definitions and criteria for wilderness declaration in New South Wales though are those used in the Wilderness Act (1987) itself. Whilst other criteria may be used in the assessment of wilderness, in New South Wales, wilderness can be declared under the Wilderness Act only if it satisfies the following criteria:

- (a) *the area is, together with its plant and animal communities, in a state that has not been substantially modified by humans and their works or is capable of being restored to such a state;*
- (b) *the area is of sufficient size to make its maintenance in such a state feasible; and*
- (c) *the area is capable of providing opportunities for solitude and self-reliant recreation".*

Of particular relevance to the subsequent declaration of wilderness under the Wilderness Act is the present ownership of land affected. In this case a wilderness area cannot be declared in areas of land not in a National Park without the written permission of the landowner.

5.1.2 Issues Raised in Submissions

The following are the responses to the public EIS submissions relevant to wilderness areas in State Forests.

Area Description - Full description of the proposed wilderness area should be made.

Access Limitation - Wilderness declaration limits access to a small percentage of the population who have the fitness for lengthy walks.

Old Growth - Estimation of the decrease in wilderness value of the area following a logging programme. Disagree over the logging of forests with high conservation and wilderness values.

Natural Values - No operations should take place that compromise natural values of an area and suitable buffers should be observed along boundaries.

Existing Wilderness - Account should be made of the extensive areas of the Washpool, Gibraltar Range and Border Ranges National Parks in any consideration of Wilderness Potential of the Area. Future wilderness requirements are available already in huge areas set aside as National Parks.

The Washpool, Gibraltar Range and Nymboida National Parks should satisfy the public long term need for wilderness.

European Usage - The History of European Settlement also should be considered and lead to a rejection of protection under the Wilderness Act.

Monetary Value - Consideration should be given to the monetary framework for wilderness instead of the simple characteristics of the area.

Impact Assessment - Assessment should be made of the impacts of operations on proposed wilderness area.

5.2 Wilderness Areas

The only areas of presently defined wilderness in the Casino - Murwillumbah forestry districts is the Washpool Wilderness. The Lost World Wilderness under the present nomination does not include areas of State Forest but may be subject to further wilderness proposal in steeper western sections of the Mebbin State Forest in the Near future. Further discussion of the Lost World Wilderness is not relevant to the purposes of this report. Further information on the proposal can be gathered from the National Parks and Wildlife Service Lost World Wilderness Assessment Report, 1992.

The Washpool Wilderness is located in a large areas of State Forest and National Park, and relatively smaller areas of other land tenure to the far west of the Casino Forestry District. State Forests included under the Washpool Wilderness proposal are the Washpool and Billilimbra Forests.

The Washpool Wilderness is a large area of land covering a diverse range of forest types and other natural environments. The area presently is known to cater for various recreational activities with several recreational sites existing in State Forests of the proposed area.

5.3 Wilderness Management Issues

Issues related to the management of wilderness areas identified by Robertson *et al.* (1992) include the following:

- * access and transport
- * recreation
- * research
- * cultural heritage
- * nature conservation
- * introduced species
- * fire
- * external influences
- * restoration

This section briefly discusses these issues with respect to the proposed Washpool Wilderness Area.

Access and Transport

This is an important issue with respect for the access restrictions that may be incurred from an area being declared as wilderness. Access restrictions to such areas include motorised and animal (horse) transport by which people, particularly those of lesser physical fitness, otherwise may not be able to visit. Access provisions indicate the human modification of wilderness, however these works often can be restored to a natural state. The Washpool areas (eg Desert Spur Trail) is an important accessway for bushwalkers travelling through the proposed wilderness area.

Recreation

Wilderness provides a distinctive recreational resource in which people can experience environments free of human alteration and is an important criteria in declaration of wilderness areas. In contradiction of this statement, excess usage of wilderness for recreation may result in impacts on the vegetation, soil, wildlife and water (Cole, 1986) in such areas, lowering the recreational value of such areas.

Research

The lack of human alteration of wilderness areas allows wilderness areas to be used as reference areas for environmental research. This research is of value for studying the effects of modification of such environments. Research is vital in managing such areas, however, research may also have impacts on the wilderness values.

Cultural Heritage

Wilderness contains cultural values based on the environment and wilderness areas may be used presently or in the past for traditional activities such as hunter gathering. Again there is a potential for such activities and their associated activities to compromise other wilderness values such as remoteness (access for roading, eg.).

Nature Conservation

This a prime factor in the purpose of wilderness conservation as it allows for species and more fundamentally, ecosystem or habitat protection. The nature conservation values of wilderness still need active management because as Robertson *et al.* (1992) states, they are vulnerable to external influences, particularly fires, which may reduce their nature conservation values.

Introduced Species

The Bureau of Rural Resources (1991) states that introduced animals are found in most of Australia's natural areas. These species can severely affect native flora and fauna species. Wilderness areas often have a low incidence of introduced species. Areas of wilderness in the Washpool Wilderness are known to have introduced animals and plant species, potentially threatening the conservation and recreational values of the wilderness. Forestry activities may encourage the introduction of feral plant and animal species in the Wilderness Area. Active management is needed to prevent and maintain wilderness against introduced species.

Fire

This issue is relevant to many wilderness areas arising notably from burning of areas of wilderness (illegally) by adjacent landowners or from escaped fires, etc. Again there is a need for active fire management in Wilderness areas, based on research in an attempt to maintain the integrity and originality of natural systems in such areas. Hazard reduction and 'cool' firing of State Forests adjacent to wilderness (or other) areas is believed to be an important factor in reducing intense fire frequencies in adjacent areas.

External Influences

These are the impacts wilderness areas receive from surrounding areas which need to be taken into account in the overall management of wilderness. The external influences from any form of surrounding landuse potentially may threaten wilderness values.

5.4 Recommended Management Strategies

It is recommended the FC liaise with the National Parks and Wildlife Service in order to discuss areas of wilderness in State Forest pending the findings of the Washpool Wilderness Assessment Report. It is recommended that areas of State Forest that meet the criteria for wilderness and that are not feasible for forestry operations be included as part of the Washpool Wilderness under a Wilderness Protection Agreement or be relinquished and gazetted as National Park. This would include areas with significant rainforest stands, preferably adjacent to the boundaries of the Washpool National Park.

6.0 Conclusion

This study has reaffirmed the diverse recreational scenic and wilderness qualities of State Forests of the Casino - Murwillumbah Districts. Whilst recreational, scenic and, to a lesser extent, wilderness values are provided for within existing forest management regimes, the study has shown that there is considerable potential to improve current management practices. This observation also is reinforced in a parallel study (CCM, 1992a) of public attitudes towards forest management.

The current EIS process is an important component of long term planning for multiple use of NSW State Forests. The information developed during this study, together with the recommendations made, should enable the FC to more fully evaluate options for the protection and enhancement of the many values which State Forests provide. The information provided also represents a formative input to our understanding of the social significance of forests, and should be upgraded as resources permit to meet emerging management needs.

7.0 References

ANUTECH 1991, *Review of cultural perceptions of Australia's forests, past and present*, Resource Assessment Commission Forest and Timber Inquiry consultancy series, AGPS, Canberra.

Aukerman, R. 1987, *User Pays for Recreation Resources*. Colorado State University Research Services, Fort Collins, Colorado.

Australian Bureau of Statistics 1986, *Local Government Area Residential Population Data analysis from the 1986 Census*, ABS, Canberra.

Brown, I. 1984, *Plan of Management Project; Abseiling, Rockclimbing and Canyoning Activities in the Blue Mountains, Kanangra and Wollemi National Parks*, Technical Report for the Blue Mountains District of the New South Wales National Parks and Wildlife Service, NPWS, Sydney.

Bureau of Rural Resources 1991, *Wild Animal Resources and their potential use by Aboriginals*, Newsheet, Department of Primary Industries and Energy, Canberra.

Centre for Coastal Management 1992a, *Casino - Murwillumbah - Grafton Forests EIS Community Consultation Report Part 1: Attitudinal Survey*, Report to Margules Groome Poyry for NSW Forestry Commission, Sydney.

Centre for Coastal Management 1992b, *Casino - Murwillumbah - Grafton Forests EIS Community Consultation Report Part 2: Direct Consultation*, Report to Margules Groome Poyry for NSW Forestry Commission, Sydney.

Clark, R. and Stankey, G. 1979, *The Recreation Opportunity Spectrum: A Framework for Planning, Management and Research*, U.S. Department of Agriculture Forest Service, General Technical Report, Seattle.

Cole, D.N. 1986, *Resource Impacts caused by recreation, The Literature Review: The President's Commission on Americans Outdoors*, US Government Printing Office.

Forestry Commission of NSW 1979, *Casino West Forestry District Plan of Management*.

Forestry Commission of NSW 1979, *Recreationalist Survey Conducted in the Whian Whian State Forest*, FC NSW, Murwillumbah Forestry District.

Forestry Commission of NSW 1980, *Murwillumbah District Recreation Files*. FC NSW, Murwillumbah, unpublished.

Forestry Commission of NSW 1980, *Forestry Commission Policy Statement on Recreation in State Forests*, FCNSW, Sydney.

Forestry Commission of NSW 1983, *Casino Forestry District Plan of Management*. FC NSW, Casino.

Forestry Commission of NSW 1984, *Murwillumbah Forestry District Plan of Management*, FC NSW, Murwillumbah.

Forestry Commission of NSW 1987, *Grafton Forestry District Plan of Management*. FCNSW, Grafton.

Forestry Commission of NSW 1992, *District Recreational Expenditure 1989/90-1990/91*, Coffs Harbour Regional Forestry Office.

Forestry Commission of NSW 1992, *Casino Forestry District Public EIS Submissions*, FC NSW, unpublished.

Forestry Commission of NSW 1992, *Murwillumbah Forestry District Public EIS Submissions*, FC NSW, unpublished.

Forestry Commission of NSW, *Casino Forestry District Recreation Files*, FC NSW Casino, unpublished.

Forestry Commission of NSW, *Casino Forestry District Recreation Returns 1981-1990*, FC NSW, Casino.

Forestry Commission of NSW, *Murwillumbah Forestry District Recreational Files*, FC NSW, Murwillumbah.

Forestry Commission of NSW, *Murwillumbah Forestry District Recreational Returns 1979-1992*, FC NSW, Murwillumbah.

Forestry Commission of NSW, *Forestry Operations Manual: Recreation Planning Guide, Furniture and Signage*. FC NSW, Sydney.

Hall, C.M. 1989, *Special Interest Travel: A Prime Force in the Expansion of Tourism?* in *Geography in Action*, ed R. Welch, pp 81-89, University of Otago, Dunedin.

Hall, C.M. 1991, *Tourism in Australia: From Susceptible to Sustainable Development*, Longman Cheshire, Melbourne.

Kates, Peat, Marwick and Co. 1970, *Tourism and Recreation in Ontario*, Ministry of Tourism and Information, Ontario.

Lismore City Council 1990, *Lismore Community Directory*. Lismore City Council, Lismore.

Northern Rivers Bushwalking Club 1977-1992, Club Newsletters, Lismore.

NSW Department of Planning 1991, *North Coast Population Monitor*, DOP, Grafton.

NSW Government 1987, *The Wilderness Act*, Government Printer, Sydney.

NSW National Parks & Wildlife Service 1988, *Field Management Policies*, NPWS, Hurstville, Sydney.

NSW National Parks & Wildlife Service Lismore District Recreational Files: District Recreation Visitation Statistics, NPWS, Alstonville.

NSW National Parks & Wildlife Service 1992, *Lost World Wilderness, Wilderness Assessment Report*. NPWS, Sydney.

NSW Tourism Commission 1989, *Tourism Trends in NSW*, Prepared by the the Bureau of Tourism Research, Canberra for the Policy and Research Branch of the NSW Tourism Commission, Sydney.

Pigram, J. 1983, *Outdoor Recreation and Resource Management*, Croom Helm, London.

Queensland Forest Service 1992, 'Bushnotes' in *Bush Telegraph*, newsletter of the Brisbane Forest Park, Autumn 1992, Brisbane.

Resource Assessment Commission 1991, *Inquiry into Forestry in Australia*, Volumes 1 & 2, AGPS, Canberra.

Robertson, M., Vang, K., Brown, A.J. 1992, *Wilderness in Australia, Issues and Options - A Discussion Paper*, Written for the Minister for Arts, Sport, the Environment and Territories, Australian Heritage Commission, Canberra.

Tweed Shire Council 1990, *Murwillumbah Community Directory*, Tweed Shire Council, Murwillumbah.

Tweed Shire Council 1991, *Tweed Tourism Strategy: Proposed Local Tourism Plan*. Prepared by the Hunter Valley Research Foundation, Maryville, NSW.

Appendix A: Study Team and Acknowledgements

This report was compiled by the following team:

Project Officer	Duncan Sanders (CCM)
Project Supervision	Ian Dutton (CCM)
Specialist Advisor - Recreation:	Stephanie Knox (CCM)
Specialist Advisor - Visual:	Ray Margules (MGP)

The Study Team gratefully acknowledges the information provided by organisations and individuals listed in Appendix B.

Appendix B: List of People/Organisations Contacted During Study

Byron Bus and Coach (Byron Bay)

Craig Bellamy, Asst Walks Convenor (Northern Rivers Bushwalking Club - Clarence Valley Branch)

Damien Wilkinson - Big Scrub Tours (proprietor)

David Balloch - Sub-Consultant Hydrologist, North Coast Forestry EIS.

Gary Hewson - Public Relations Officer; Gold Coast Tweed Motorsporting Club

Glenn Meade - Forester - Casino District

Greg Watts - Regional Planning Forester-Forestry Commission, Coffs Harbour Region

Ian Roberts - Murwillumbah District Forester

John Murray - Dorrigo District Forester

Kathy Lyons - Forester-Wyong Forestry District

Lismore Pony Club

Michael Crummy - Lismore District Leader of the Scout Association of New South Wales

Michael Digby (UNE, NR)

Mick Hoskins - Micks Bay to Bush Tours (Proprietor)

Northern Rivers Bushwalking Club Committee

Peter Heiliger (NRBC)

Pinnacle Tours (Murwillumbah)

Ray Margules - Margules Groome Poyry-Environmental Consultants

Richard Adams - Business Manager - Tweed Shire Council

Richard Riley - Surveying Assistant, NSW Forestry Commission

Robert Williams - Grafton District Forester

Ron Fussel - Casino District Forester

Ross Laker - Community Consultation, Direct Consultation Project Officer

Steve Phillips, NSW NPWS, Lismore District

Steve Stevens

Tourism Information Office - Lismore

Tourism Information Office - Murwillumbah

Whitewater Adventures - Coffs Harbour

ISBN 0 7310 6708 8