

# Ecologically Sustainable Forest Management of Private Native Forest in the Wet Tropics

The project is funded by Natural Heritage Trust  
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QUEENSLAND FORESTRY RESEARCH INSTITUTE

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## **Ecologically Sustainable Forest Management of Private Native Forest in the wet tropics region**

### **Background**

This project aims to improve the management of private native forest (PNF) in the wet tropics region. The project is funded by Natural Heritage Trust (NHT) and is managed by the Queensland Forestry Research Institute (QFRI), which is an agency of the Department of Primary Industries Agency for Food and Fibre Science. The wet tropics region covers a band around 100 km wide along the north-east coast of Queensland. The area covered in this review comprises the wet tropics region, which, ranges from Ingham in the south to Cooktown in the north. The western limit of the region is defined by the westernmost extent of the majority of freehold leases in this part of Queensland. Most of the forest in this area is rainforest, though there are also areas of wet and dry sclerophyll; this project focuses on rainforest. The rainforest in the wet tropics region represents around 31% of the national rainforest area (National Forest Inventory, 1998).

The project's objectives are:

- to reduce the extent of clearing of forests in the wet tropics region;
- to improve the quality of native forest management on private lands in north Queensland;
- to demonstrate sustainable harvesting and management practices that reflect the multiple goals of private forest owners, such as timber production and nature conservation;
- to identify, map and estimate potential timber yields from the native forest resource available for timber production on private land in the wet tropics region;
- to educate landowners and harvesting contractors in sustainable management practices through development of silvicultural manuals, field days and training courses;
- to foster the development of a co-operative approach to native forest management and planning to meet regional conservation objectives and timber supply goals.

This project aims to reverse the trend of progressive erosion of the PNF resource base, through promoting the survival of an operational and sustainable forestry and timber milling industry based on PNF on freehold land, by:

- exploring the legal, policy and socio-economic framework in which such an industry need operate, as outlined in a literature review;
- using GIS data to establish where PNF exists on freehold land in the Region;
- surveying a sample of these PNF landowners to determine the history of the forest management and the landowners' forest management goals;
- assessing a sample of forest operations for damage to residual trees, levels of soil disturbance and impact on riparian zones;
- selecting PNF demonstration sites and developing management plans to demonstrate sustainable harvesting practices in representative forest types;
- developing silvicultural guidelines for landowners wishing to manage their PNF more sustainably.

### **Extent of PNF in the wet tropics region**

The 900 000 ha of the Wet Tropics of Queensland World Heritage Area (WHA) is in the wet tropics region. Only around 2% of the WHA is freehold, held in almost 200 separate blocks. No commercial forestry activities are permitted on this land and it is an offence to destroy the vegetation, unless it is deemed to be minor and inconsequential.. Consequently this report refers to PNF on freehold land outside the WHA.

The wet tropics region has been divided into nine bioregional provinces, based on climate, geology, landform and a series of biogeographic units (Nix and Switzer, 1991). These provinces are a useful way of examining the region as each has a characteristic pattern of geology, landform, associated soils and vegetation. Three of these provinces comprise the coastal lowlands; one comprises the high basalt plateau of the tablelands; and the rest comprise the extensive hills and ranges that dominate the region (Binning and Young, 1998). Around 700 000 ha of the region has rainforest on it, representing nearly 40% of Australia's total remaining rainforest (McDonald, 1985).

### Area of rainforest in the Wet Tropics

The Wet tropics area included in this Geographic Information Systems (GIS) study includes freehold land south of the Daintree River, north of Ingham and East of 1450 20' E. The total area contains approximately 567 000 hectares of freehold land. In 1995 approximately 17% (95 000ha) of this land was covered by rainforest vegetation, while a further 46% (264 000ha) has been cleared.

Nearly half of the total area of rainforest vegetation occurs in 2 lowland shires, with close to 23 500 hectares found in Cairns and 23 430ha in Johnstone shires. The 5 lowland shires (also including Cardwell, Douglas and Hinchinbrook) account for 71.3% of the total rainforest vegetation in the area. Of the remaining 28.7% almost half occurs in the upland shire of Eacham, with Mareeba shire accounting for 10%, and small percentages in Atherton and Herberton Shire, accounting for the rest of the 27 300 hectares of tropical rainforest in upland shires.

### Distribution of rainforest across shires and property size classes.

There are 19795 lots of freehold land greater than 1 hectare in the study area. Properties were sorted into size classes (1-20, 20-50, 50-100 and 100+ hectares).

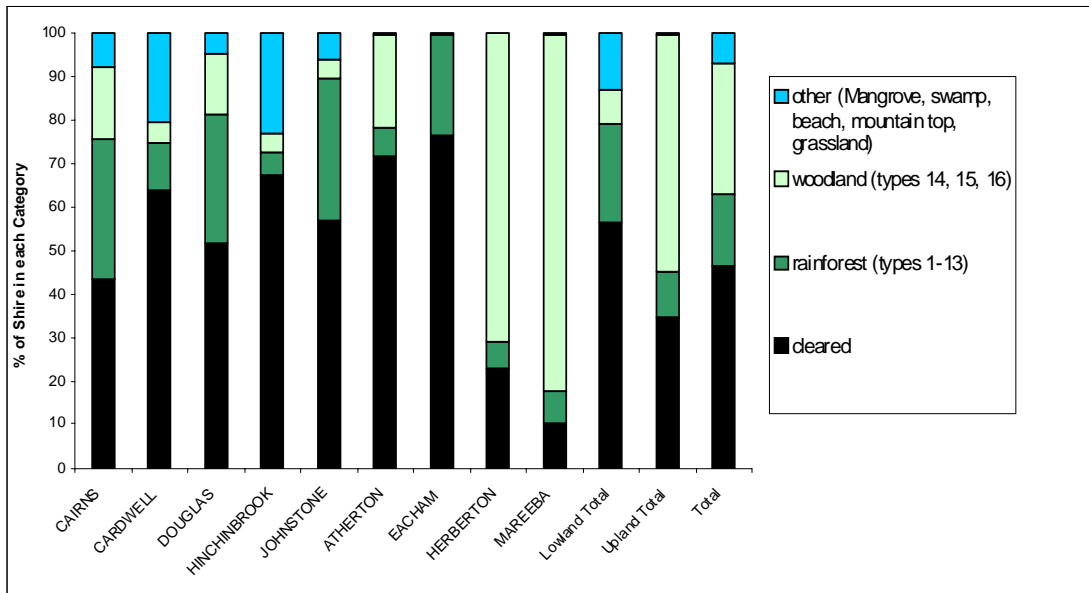
Although 67% of privately owned lots in the wet tropics are in the 1-20 hectare size class, these properties account for less than 10% of the total area of rainforest (both upland and lowland).

While only 2.6% (326) of lowland properties are greater than 100 hectares, such properties contain almost half (29 000 ha) of the 67 760 ha of lowland rainforest on freehold land. 100+ hectare properties cover 32% of the lowland land area and contain the highest areas of rainforest in Cairns and Cardwell shires.

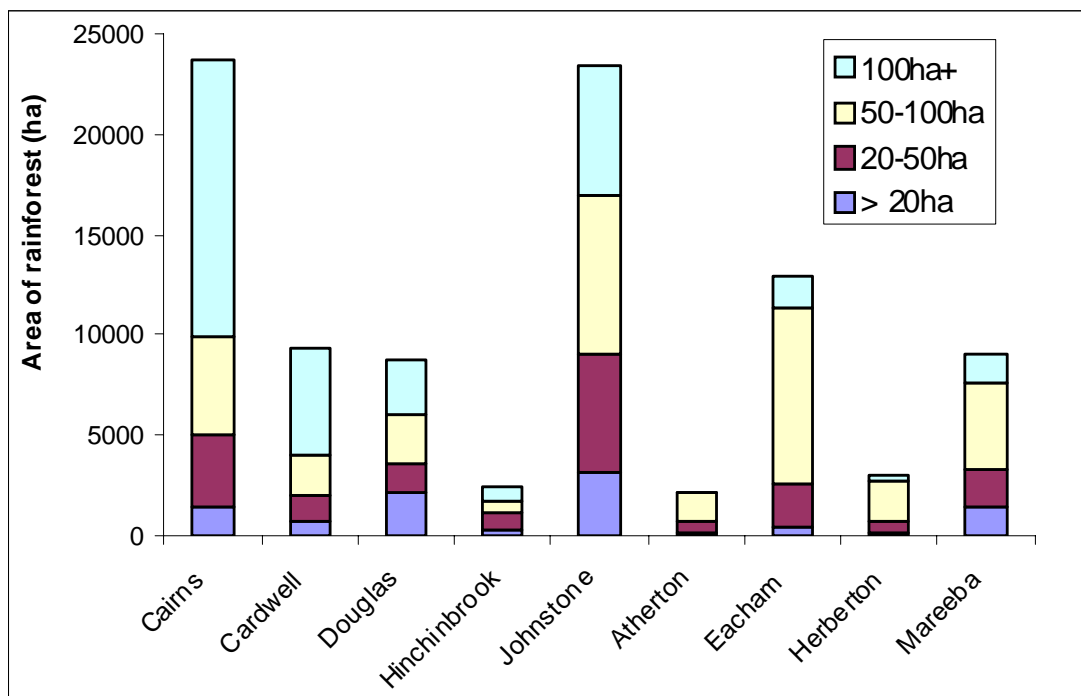
50-100 ha sized properties account for 31% of the total area in the upland shires but contain 60% of the rainforest. This pattern is consistent across all 4 upland shires.

Total area (hectares) of land cover on freehold land in Wet tropics shires in 1995. Cover types include rainforest (Webb and Tracey types 1-13), Woodland (Webb and Tracey 14-16) and other (commonly mangroves, beach, mountaintop types).

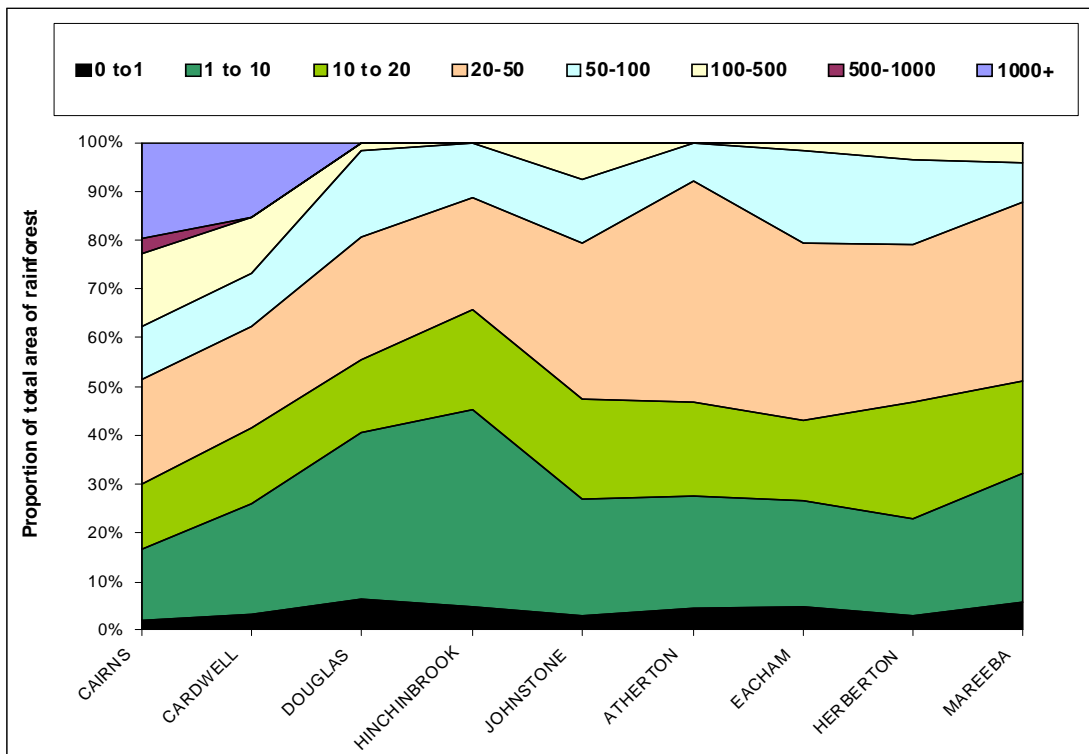
region	Shire	Rainforest	Other	Woodland	Cleared	Total
lowland	CAIRNS	23652.6	5633.0	12076.4	31695.7	73057.6
lowland	CARDWELL	9355.7	17050.2	3777.0	53227.4	83410.3
lowland	DOUGLAS	8798.6	1427.6	4052.7	15213.1	29492.1
lowland	HINCHINBROOK	2516.8	10864.8	1965.3	31585.4	46932.3
lowland	JOHNSTONE	23436.3	4315.7	3110.0	40786.6	71648.6
upland	ATHERTON	2205.5	183.7	7044.1	24165.8	33599.0
upland	EACHAM	12905.7	83.2	112.1	43053.6	56154.6
upland	HERBERTON	3047.2		35193.0	11329.4	49569.6
upland	MAREEBA	9139.0	365.9	101518.9	12786.4	123810.2
	Lowland Total	67760.0	39291.3	24981.4	172508.2	304540.9
	Upland Total	27297.4	632.7	143868.0	91335.3	263133.4
	<b>Total</b>	<b>95057.3</b>	<b>39924.0</b>	<b>168849.5</b>	<b>263843.5</b>	<b>567674.3</b>



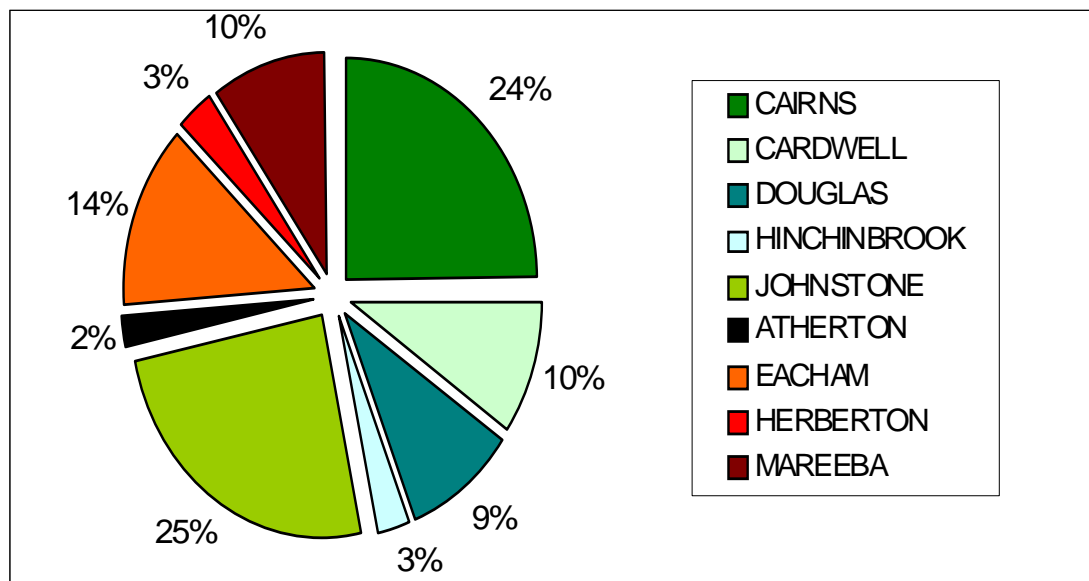
Shires with larger areas of woodland, poorer soil types and lower rainfall had lower proportions of cleared private land in 1995. Lowland shires of Cairns, Johnstone and Douglas and the upland shire of Eacham had the highest proportion of private land covered by rainforest.



The total area of privately owned rainforest in different property size classes and wet tropics shires. The total area of rainforest on the 1-20 ha properties is small. Medium sized properties (20-100ha) contain most of the rainforest in Upland shires. Large properties (100ha+) contain most of the lowland rainforest, particularly in Cairns and Cardwell shire.



Across all properties the size of individual patches of rainforest was collated. 70 - 80 % of privately owned rainforest is in patches less than 50ha and the highest proportion of rainforest in most shires occurs in either 1-10 or 20-50 hectare sized patches. Hinchinbrook and Douglas shires have a higher percentage of rainforest patches between 1 and 10 ha. It was not possible in collating this data to carry patches across property boundaries or, rainforest types on the same property.



The percentage of privately owned rainforest in each shire. Almost half of the 95 000 hectares occurs in Cairns and Johnstone Shires. Upland shires contain 28.7% of the regions private native rainforest

### The current condition of PNF

Anecdotal evidence suggests that PNF is generally in poor silvicultural condition. It is likely that most blocks of PNF have been logged since European settlement, some more than once. No regulations have ever been enforced for selective logging in PNF and so the impact of logging will depend upon the care

taken by the contractor, the site conditions and the capacity of the forest to recover from disturbance. It is therefore likely that the condition of PNF blocks will therefore vary, some being highly impacted with virtually no economically viable trees surviving, through to stands with a relatively high commercial value.

Factors affecting the quality and extent of PNF are:

- history of poor management;
- introduction of alien organisms;
- unsympathetic management practices such as failure to control pollution, inappropriate use of pesticides, herbicides and fertilisers, changes to drainage patterns etc;
- altered fire regimes;
- climate change.

### **Current management of PNF**

The process for landowners wishing to market timber is *ad hoc*. Landowners typically contact a local sawmiller or logging contractor to request their services when they wish to log their forest. Sawmillers also will contact landowners they know to have forest suitable for selective logging to ensure a supply of timber. Increasing numbers of portable sawmillers are also offering logging services.

Evidence suggests that most logging of PNF is carried out prior to forest clearance, particularly when the land changes ownership. Thus, timber extraction is occurring not because the resource is considered valuable, but rather as an adjunct to the conversion of land to cropping, particularly for sugar cane. The presence of trees does not appear to be highly valued: cleared land is generally more valuable than timbered land of similar quality.

Landowners often have little or no experience in selective logging as it is generally only carried out once in a generation. The knowledge gained from the experience is often not passed on to others in a way that would enable them to deal with the situation better, and there are many stories of owners who are dissatisfied with the outcome. A logging contract is commonly drawn up in which it is agreed how much timber the contractor will extract and how much will be paid, but these often don't help the landowner if there is a dispute with the contractor. Common problems are that the contractor: will take out more than the agreed quantity of timber; will claim he took out less than he did; will claim the timber was of inferior quality and so is worth less than was agreed; or will damage the remaining forest extensively. These contracts act as surrogate management plans but fall far short of ecologically sustainable forest management standards.

Despite the problems associated with logging PNF, the practice continues. No figures are available for the area of forest logged or the amount of timber from PNF. Figures from the licensed sawmills are an underestimate, as they do not include the timber cut by portable sawmills. Figures are also not available for the area of PNF harvested by landowners that wish to retain the forest condition rather than carry out salvage logging before clearing. These landowners would presumably be the most receptive to the introduction of sustainable forest management.

### **Introduction to questionnaire survey**

Management of freehold land under native forest is a topical issue. With Queensland's rates of private native forest (PNF) clearance the highest in Australia, the State Governments introduction of vegetation clearance controls, prompted strong opposition from many landholders. Management of PNF (for a range of potential objectives) remains an option for landholders, but despite the political interest in PNF, little

has been known about the extent of this resource in the Wet Tropics Region, nor about landholders' attitudes, experience, intentions and capabilities with respect to PNF management.

A questionnaire survey of PNF landholders, was carried out as the first phase of the NHT-funded *Sustainable Private Native Forest Management in the Wet Tropics* project, managed by QFRI.

### Questionnaire Design

Using State Land Cover and Tree Survey (1995) information, 400 PNF landholders with a property of 20ha or more were mailed a questionnaire (see Appendix A) in September 1999. The survey was stratified according to the area of PNF in each Shire, and landholders were selected at random. The questionnaire covered past, current and future management of PNF, attitudes and perceptions towards sustainable forest management, and socio-economic background. The native forest referred to in the questionnaire was mature native forest naturally occurring on the land. The questionnaire did not refer to plantations or regrowth less than 15 years old.

Most survey questions asked respondents to give a rating of importance (1 the least important, 5 the most important) to a number of questions. For example, several possible reasons were given as to why the landholders had or would clear PNF, and the landholder was to rate each reason from 1 to 5. Other questions required a 'yes' or 'no' answer, or a short written response. The survey return-rate was about 25%.

### Questionnaire Results and Discussion

Respondents did not answer all questions on the survey. Significantly, only 19 of the 106 respondents answered 'Different reasons for land clearing'.

Reason for Clearing Land	Average Rating (1 to 5) of Importance to Landholder
1. Clear due to need for land	4.05
2. Clear because of mistrust of government	3.90
3. Clear because of suspicions about future regulations	3.67
4. Clear due to low timber prices	3.11
5. Clear due to lack of information about future financial returns	2.44
6. Clear due to long wait for returns	2.37
7. Clear due to lack of advice	2.00
8. Clear because of storm risk	1.84
9. Clear because of pest risk	1.72
10. Clear because of fire risk	1.42

n=19

The fact that only 19 of 106 respondents chose to answer this question seems to indicate that landholders are very reluctant to inform the government about clearing activities on their land. The ratings of importance given to the second and third reasons also indicate that many landholders in the Wet Tropics have cleared land in the past because they do not trust the government to protect their interests. The confusion in the lead up to the introduction of the *Vegetation Management Act 1999* most likely spurred many landholders in the region to clear land or consider clearing land.

This result is reinforced by the contact with landholders during Stage 3, when landholders with rainforest on their land were asked to give permission for QFRI field staff to access the site. Almost 41% of property owners refused to allow QFRI access, mostly due to a mistrust of the government, and the belief that the government would use of the information gathered against them.

The four most common responses to the section: ‘Different Reasons for Keeping PNF’ rated almost equally. These reasons were:

- Protect Soil
- Attract Wildlife
- Protect Catchment
- Personal Reasons

<b>Reason for Keeping Private Native Forest</b>	<b>Average Rating (1 to 5) of Importance to Landholder</b>
1. Keep to protect soil	4.26
2. Keep to attract wildlife	4.20
3. Keep to protect catchment	4.19
4. Keep for personal reasons	4.14
5. Keep to improve look of property	3.54
6. Keep as a legacy for children	3.52
7. Keep to recreation	2.71
8. Keep as shelter	2.51
9. Keep for future income	2.43
10. Keep to diversify income	2.43
11. Keep as superannuation/retirement fund	2.08
12. Keep to provide fenceposts	1.34

n=97

From the above responses, it seems that when landholders chose to keep native forest on their land, they do so for mainly ‘environmental’ reasons, followed closely by ‘personal reasons’.

Economic reasons (i.e. for future income) do not rate highly as a motivation for landholders to keep native forest. This suggests that private landholders are unaware of sustainable selective logging practices, which may provide an opportunity to supplement property incomes. This also suggests that landholders are ill informed about the potential for natural areas to provide good quality timber, and the potential to do so while maintaining biodiversity values and forest structure.

<b>Future Incentives for Keeping Private Native Forest</b>	<b>Average Rating (1 to 5) of Importance to Landholder</b>
1. Tax incentives	3.95
2. Rate rebates	3.89
3. Security to harvest	3.79
4. Grants to assist management of PNF	3.43
5. Information on management of PNF	3.34
6. Information on native silviculture	3.05
7. Separation of harvest rights from property	2.91
8. Demonstration sites	2.84
9. Existence of groups like AFG	2.70
10. Existence of timber co-operatives	2.64
11. By laws	2.59
12. State Legislation	2.55

n=85

Economic incentives rate highly as motivation for landholders to keep the native forest on their land. This indicates that where economic incentives do not currently exist, government authorities in the Wet Tropics may have to consider their introduction in order to maintain natural areas on private land. Information about management and native silviculture also rates relatively highly as possible incentives, suggesting that PNF conservation and management would benefit from landholders simply being better informed about the value and potential of PNF in the area.

## Preliminary Rainforest Plot Assessment

Stage Three of the PNF project involved quantifying the physical condition of rainforest on private lands within the Wet Tropics. The main objectives of the assessment were:

- To determine the status of PNF (ie. Its vegetation structure, the slope of the land, its condition, ground truthing GIS etc)
- To apply timber yield forecasts to assess possible future supplies to the local timber industry.

Due to limited funding and time restrictions, a low number of rainforest plots were assessed. This report is therefore a preliminary assessment only. See appendix C for summary of results.

### Property sampling procedure

Data for this assessment was obtained from the earlier studies conducted during Stage Two. That is, the Department of Natural Resources 1995 SLATS data – a study of the vegetation coverage of Queensland. The database contains data on the type and area of vegetation on 19795 freehold lots greater than 1ha, south of the Daintree River and north of Ingham.

The following characteristics were removed from the dataset in order to gather a representative sample of properties and vegetation types for on ground survey.

- All non rainforest vegetation types were removed, including woodland, 'other' and cleared areas.
- All non freehold tenure types were removed, including tramways, beach access and roads on private land.
- All properties less than 20 hectares were removed.

The relative proportions of each property size class (20-50ha, 50-100ha and 100+ha) for each shire were determined. The total areas of each rainforest vegetation type (as described by Webb & Tracey 1975) for each shire were also determined, and the rainforest types within each shire were selected.

## Methodology

### Property Selection

The procedure identified properties with prominent rainforest types in each shire and size class. Preference was given to properties with;

- a large proportion of property area with rainforest vegetation,
- a large area of the target vegetation type
- significant areas (20ha +) of 2 or more target vegetation groups,
- lots that gave repeated and significant representation of target vegetation types across size classes.

The number of properties selected is shown in the table below, with region and property size class.

Select actual	20-50ha	50-100ha	100+ha	<i>Total</i>
Upland	13	11	3	27
Lowland	19	10	4	33

This process produced a *Selected Plot List* of 60 parcels of land. Information regarding owner contact details was sought from relevant Shire and City councils. However, one local shire council required payment from the QFRI for providing the information. This payment took some to process, and therefore, information regarding landholders in this shire was acquired much later than other shires. As a result, all but one of the parcels of land within this shire were removed from the *Selected Plot List*. The *Selected Plot List* therefore consisted of 50 freehold lots and their 47 corresponding landowners.

### **Contacting Landholders to Obtain Approval**

A letter outlining the project (See Appendix B) was sent to the 47 landholders over a period of three months (May to July 2001). In total, two written replies were received. In late June, QFRI staff began to contact landholders by phone to follow up on the letters.

It was decided that for practicality, plot assessments should commence at properties closest to the Atherton base, then the assessment should radiate out to more distant locations. However, as the project progressed, it became evident that the time and effort required to establish assessment plots was greater than anticipated. Therefore, several *Selected Plot List* property owners in the Hinchinbrook, Douglas and Cardwell shires were never contacted by phone. These landholders represented 5 of the 47 *Selected Plot List* owners.

Contacting landholders by phone proved to be a time consuming and often unproductive process, as many owner contact details were incorrect, or the owner/s failed to answer the telephone after successive attempts to contact them. A further 5 of the 47 landholders were never successfully contacted.

Many of the landholders who *were* successfully contacted were sceptical about the project and its aims and outcomes. 15 out of the 37 owners successfully contacted (approximately 41%) refused to allow the QFRI access to their properties. The three main responses from owners not wanting to be involved in the project are as follows:

1. “No thanks - don’t want to be involved”
2. “Would rather not have (government) staff on my land”.
3. “No thankyou - not interested”

Apparently there is still some mistrust of the government since World Heritage Listing within the communities of the Wet Tropics. Property owners seem very concerned about the *Vegetation Management Act 1999*, and evidently find the thought of the government having information on their native forest a very threatening concept.

As a result of these refusals, other known properties to which the QFRI might easily be allowed access were sought after. These properties were selected to match forest type where possible with other selection criteria including shire, size class and accessibility to property.

In total, 21 of the 37 successfully contacted *Selected Plot List* landowners allowed QFRI access to their land. Another 4 additional properties (i.e. not from the *Selected Plot List*) were also accessed.

## Property access

The owners usually provided directions for vehicle access to the properties over the phone, and an appointment time was made. Several owners instructed field staff to visit their residence before entering the rainforest on their property. Owners would then give instructions regarding access to on their property.

On three occasions, property location or access was unsuccessful. The reasons for this are listed below:

- Directions to property unclear and difficult to follow.
- Confusion over Lot and Plan numbers. Property identification unclear and did not belong to the owners contacted.

In all 36 plots were established in all on 23 separate properties (see Appendix C). These plots were established within the following shires:

<u>Upland shires:</u>	<u>Lowland shires:</u>
<i>Atherton</i> x 9	<i>Cairns</i> x 7
<i>Eacham</i> x 2	<i>Douglas</i> x 2
<i>Herberton</i> x 8	<i>Johnstone</i> x 3
<i>Mareeba</i> x 5	

## Field Assessment

### Field Sampling Method

Plot sites were selected according to accessibility and on the basis that they were representative of the rainforest type on that property. If the land parcel was over 40ha, 2 plots were established if possible, at least 100 metres apart in order to assess variation in rainforest types, logging history, forest regeneration etc. on that parcel of land.

At each plot on the access road/track into the rainforest, a galvanised steel peg was hammered into the ground to identify the plot, spray painted (orange or yellow) and a red cattle tag attached to it identifying the plot number. This peg was placed at a location visible from a road, track or clearing to gain a Global Positioning System reading. The peg might also be used as a marker for future relocation. A 'mud map' of the area and the position of the plot were also drawn at this point, to assist field staff in future relocation.

Field staff then identified a suitable location for a 90 metre line transect. This point was at least 50m inwards from the edge of the rainforest or property boundary. Here a transect was established consisting of 3 spots, each 30 metres apart. The distance and bearing from the steel peg at the rainforest entry-point to Spot 1 was then measured.

### *Plot measurements*

The following measurements, recorded on the *Private Rainforest Plot Establishment Form* (see Appendix B), were taken at each of the three spots on the transects:

- Slope (%) - Slope reading taken with a *Sunto* clinometer.

- Aspect (N, S, E, W) - While facing down the slope, the aspect was recorded with a compass.
- Densiometer readings - Using a densiometer, an approximate reading of canopy cover was taken.
- Soil type - A rudimentary estimation was made of the soil type by field staff
- Basal area count of trees of less than 40cm DBH – the standard method was used to estimate basal area using a size10 basal area prism.
- Basal area count of trees of more than 40cm DBH – the standard method was used to estimate basal area using a size10 basal area prism.

Each tree of greater than (>)40cm Diameter at Breast Height (DBH) was measured, and an estimation of its bole length (the potential length of the log) and its centre diameter was made. These estimations were carried out to enable QFRI to later apply yield-forecasting models to those trees. Trees >40cm DBH were also classified according to their forestry application, ie. As useful, useless, dead etc. Field staff estimated tree species, however, due to a limited staffing and resources, species identification can only be taken as rudimentary.

At the completion of Spot 1, a transect bearing (degrees) was chosen according to the lay of the land, property boundaries etc. Field staff then placed Spot 2 at 30 metres in a straight line from Spot 1. The plot measurement process (above) was then repeated for at Spot 2, and again at Spot 3.

## **Results and Discussion**

Appendix C summarises the data collected at each plot site. The following questions were posed during the examination of the plot data:

- Of the total number of trees in a plot (= 3 spots), what percentage were over 40cm DBH?
- What was the average log volume (m<sup>3</sup>) of commercial trees over 40cm DBH per plot?
- What was the average overstory density (%) (canopy cover) per plot?

All plots displayed relatively high average overstory densities. The lowest was recorded in Cairns shire at 90.56%.

As this assessment is only a preliminary evaluation, it is difficult make conclusions from this data about the current condition of rainforest on private lands. However, this assessment identifies the need for a comprehensive inventory program and data collection if a sustainable timber industry is going to continue in the region based on private native forest.

## **Appendix A**

### **Private Native Forest Landholder Survey: Wet Tropics Region**

What is the survey for?

This survey is to find out how you, as the landholder, manage the native forest on your land and how you feel about the future of your native forest. It is being organised by the Queensland Forestry Research Institute in the Department of Primary Industries (Forestry) and is part of a statewide survey.

What will the information be used for?

We are interested to find out about your native forest because we are planning a project to help you maximise the long-term economic returns and other values of your private native forest. The project will provide advice for native forest landholders by developing forest management demonstration sites on private land, and by publishing and distributing forest management manuals and model management plans. We would like to learn from your experiences in managing your native forest to make sure that the advice we provide will be tailor-made to meet your information needs. For us to do this we really need you to spend some time filling in this questionnaire.

Is the survey confidential?

The information you give will be anonymous because at no time will it be linked to your name. We will treat the information as strictly confidential. It will only be used to enable us to provide advice for you on forest management and to improve understanding of private native forest in the Wet Tropics Region. If you are interested in finding out the results of the survey, please feel free to contact us.

To fill in the survey

The survey should take you around 30 minutes. Each question comes with instructions: some questions just need a tick in the right box and some need a brief written answer. Please try to answer all the questions.

The native forest we are interested in is mature native forest naturally occurring on your land: we are not asking about plantations or regrowth less than 15 years old.

Prize!

We need this information as soon as possible so that we can use it in the rest of the project. The first completed questionnaire returned will receive a copy of *Fruits of the Rainforest*, beautifully illustrated by local artist William T. Cooper. All completed questionnaires received by Friday 8<sup>th</sup> October will be entered into a draw to win one of five copies of a photographic guide to Australian rainforest plants. Don't delay – fill it in today!

Freecall number

If you have any questions or comments about this survey please contact Christine Herd on freecall number 1800 500 420.

## Questionnaire

### 1. The Role of your private native forest

The first thing we are interested in is how important a role your native forest plays in your property.

1.1 What is the total size of your property?

\_\_\_\_\_ Hectares/acres (delete as appropriate)

1.2 Please list in order of priority the different land uses on your property, giving the one that generates the most income the number one, the one that generates the second most income the number two etc.

Land use category	Priority number
Dairy	
Beef / wool / lamb	
Sugar	
Annual crops (eg maize, peanuts, cotton etc)	
Tree crops (eg mangoes, avocados, olives etc)	
Other crops	
Native rainforest	
Native wet eucalypt forest	
Native dry eucalypt forest	
Native swamp forest	
Native cypress	
Native forest regrowth	
Plantation timber	
Other activities on property (eg ecotourism) Please list	
Off property income	

1.3 What do you think is the quality of your native forest for both timber and wildlife?  
Please circle one choice on each row.

Timber	Very poor	Poor	Satisfactory	Good	Very good
--------	-----------	------	--------------	------	-----------

Wildlife	Very poor	Poor	Satisfactory	Good	Very good
----------	-----------	------	--------------	------	-----------

1.4 What shape is your native forest block? Please indicate one choice.

Blocks	Strips	Scattered
--------	--------	-----------

1.5 Does your native forest adjoin another block of similar native forest? Please circle one choice.

Yes	No
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1.6 Is all or part of your native forest on land unsuitable for agriculture?

Yes	No
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If yes, please circle any number of choices. If no, please go to the next question.

Rocky ground	Steep slopes
Swampy ground	Flood plain
Riparian zone	Officially protected
Other (please list)	

## 2. Past management of your private native forest (clearing and logging)

We are interested in how you have managed your native forest **in your time** of ownership/occupancy. Here **clearing** means totally removing the native forest purely to clear the land for other purposes and **logging** means felling some trees for commercial gain. If management has occurred previous to your owner/occupancy go to section 3.

2.1 What proportion of your native forest have you **cleared**?

All	Some	None
-----	------	------

If none, please go to question 2.8

2.2 How much of your native forest did you clear and when?

Decade	Pre 1980	1980's	1990's
Area cleared (hectares/acres – delete as appropriate)			

2.3 Did you use any of the forest products from the cleared native forest?

Yes	No
-----	----

2.4 Did you sell any of the forest products from the cleared native forest?

Yes	No
-----	----

2.5 If you sold the forest products, how do you rate the financial returns?

Very poor	Poor	Satisfactory	Good	Excellent
-----------	------	--------------	------	-----------

2.6 Did the costs of clearing exceed the returns from the forest products?

Yes	No
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If yes, then go to question 2.7, if not then go to question 2.8.

2.7 How long do you think it will be before you recover the costs of clearing by using the profits from the current land use of the cleared land?

Number of years	
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2.8 What proportion of your native forest have you **logged**?

All	Some	None
-----	------	------

If none, please go to Section 3.

2.9 How much of your native forest did you log and when?

Decade	Pre 1980	1980's	1990's
Area logged (hectares/acres – delete as appropriate)			

2.10 For the most recent logging operation, please fill in this table:

Year of logging	
What area of the forest was logged?	
How many cubic metres were removed?	
What species were removed?	
How was logging carried out	yourself / portable sawmill contractor / contractor takes logs away for off-site milling – delete as appropriate
Were you happy with the standard of	Yes / No

logging?	
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2.11 What problems did you have with the logging operation?

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2.12 Did you sell the logged timber?

Yes	No
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If you answered no, please go to Section 3.

2.13 What price did you get for the logs in \$ per cubic metre?

\$	cubic metre
----	-------------

2.14 How do you rate the financial return from selling the logged timber?

Very poor	Poor	Satisfactory	Good	Excellent
-----------	------	--------------	------	-----------

3. Ongoing management of your private native forest

3.1 Do you currently carry out any native forest management on your native forest?

Yes	No
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If yes, then please go to question 3.2. If no, then please go to question 3.3.

3.2 Please tick or list the kind of native forest management in the table below, and then proceed to Section 4.

Pruning	
Thinning	
Fertilising	
Fencing	
Grazing/shelter	
Burning	
Other	

3.3 Please write down any reasons you have for not carrying out any native forest management.

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4 Future management of your private native forest

4.1 Please indicate what you are planning to do with your native forest by ticking the appropriate boxes.

Actively conserve (feral weed and animal control etc)	
Leave alone	
Use for ecotourism	
Log once only	
Log carefully so can log repeatedly at set intervals in the future	
Clear completely	
Not sure	
Other	

4.2 Please write down you reasons for planning this kind of management.

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## 5 Your attitudes to your private native forest

5.1 Are you planning to **keep** at least some of your native forest?

Yes	No
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If no, please go to Question 5.4.

5.2 How important do you consider the following reasons for **keeping** your native forest? Please indicate one choice in each row.

No.	Possible reason for keeping native forest	Not important	Slightly important	Moderately important	Quite important	Very important
1	Personal interest in trees					
2	To make money in the future					
3	To diversify farm business					
4	To protect soil					
5	To protect the water catchment					
6	To attract local wildlife					
7	To improve the look of the property					
8	Legacy for children					
9	Superannuation or retirement fund					
10	To create shelter (windbreak/livestock etc)					
11	To provide fenceposts					
12	To increase the value of the farm					
13	To use for recreation					
14	Other (please specify)					

5.3 Which of the possible reasons above do you consider to be **the most important** reason for you to keep your native forest?

Please write the relevant number in the box.

5.4 Are you planning to **clear** at least some of your native forest?

Yes	No
-----	----

If no, please go to Section 6.

5.5 How important do you consider the following reasons for **clearing** your native forest? Please indicate one choice in each row.

No .	Possible reason for clearing native forest	Not important	Slightly important	Moderately important	Quite important	Very important
1	Low profitability if retained					
2	Long wait for returns if retained					
3	Need land for other activities					
4	Lack of advice on how to manage native forest					
5	Risk of fire damage					
6	Risk of pest damage					
7	Risk of storm or cyclone damage					
8	Suspicion that regulations may be introduced which will prevent future logging					
9	Mistrust of government especially after World Heritage Listing					
10	Lack of information about likely future financial returns					
11	Low prices for timber					
12	Other (please specify)					

5.6 Which of the possible reasons above do you consider to be **the most important** reason for clearing your native forest?

Please write the relevant number in the box.

## 6 Attitude to Sustainable Forest Management

Sustainable forest management is forestry that is economically viable and environmentally and socially aware.

6.1 How would you rate your understanding of sustainable forest management? Please circle one choice.

Very poor	Poor	Satisfactory	Good	Excellent
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6.2 How interested are you in receiving advice on sustainable forest management on your land? Please circle one choice.

Not at all	Slightly	Moderately	Quite	Very
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6.3 How important do you consider the following as potential incentives for encouraging sustainable forest management in your native forest? Please circle one choice in each row.

No .	Possible incentive for encouraging sustainable forest management in your native forest	Not important	Slightly important	Moderately important	Quite important	Very important
1	State legislation					
2	Local government by laws					
3	Security of right to harvest					
4	Separation of rights to harvest trees from rights to land					
5	Local Council rate rebates for forested land					
6	Tax incentives					
7	Grants for practical measures such as fencing					
8	Information on management planning					
9	Demonstration sites in native forest showing good and bad management					
10	Information on native forest silviculture					

No .	Possible incentive for encouraging sustainable forest management in your native forest	Not important	Slightly important	Moderately important	Quite important	Very important
11	Local timber growers co-operative					
12	Groups such as Australian Forest Growers					
13	Other (please specify)					

6.4 Which of the possible reasons above do you consider to be **the most important** potential incentive for encouraging sustainable forest management in your native forest?

Please write the relevant number in the box.

## 7 Socio-economic information

We would now like to ask you a few broader questions so that we can relate these with the information you have given us regarding private native forest management on your land. As with the other questions, these will be strictly confidential and will not be linked to you as an individual.

7.1 How do you operate this property? Please tick the appropriate box.

Family property	
Partnership	
Company	
Other (please specify)	

7.2 How long have you or your family owned or managed the property?

 years

7.3 Do you live on the property? Please tick the appropriate box.

Full time	
Part time	
Never	

7.4 What age bracket do you fall into? Please tick the appropriate box.

Less than 25	
25-35	
36-50	
51-65	
over 65	

7.5 Who is the main person or people who makes decisions about the native forest on this property? Please tick the appropriate box.

Family: adult male	
Family: adult female	
Family: group	
Resident manager	
External decision maker	
Other	

7.6 What type of education have you received? Please tick the appropriate boxes.

Primary	
Secondary school	
Diploma	
Degree	

7.7 What gross income band do you fall into? Please tick the appropriate box.

Less than \$20,000	
\$20,000 to \$40,000	
\$40,000 to \$60,000	
\$60,000 and over	

7.8 Are you a member, or interested in becoming a member, of any of the following organisations that work with the environment? Please tick the appropriate boxes.

Organisation	Currently a member	Interested in becoming a member
Landcare		
Conservation group		
Australian Forest Growers		

FNQ Timber Growers Co-operative		
Other (please specify)		

Information on the FNQ Timber Growers Co-operative is available from Graham Cossins, PO Box 524 H, Edgehill. CAIRNS 4870. Tel: (07) 40533443.

Information on the Australian Forest Growers is available from Errol Wiles, PO Box 375, BABINDA 4861. Tel: (07) 40671877 after 6.30 pm.

**Thank you** very much for taking the time to fill in this questionnaire. Your answers will help to make sure that the project on private native forest management will address your needs.

Please post the questionnaire in the envelope provided.

If you have any questions about this survey, please contact Christine Herd on Freecall number 1800 500 420.

