TERANIA CREEK INQUIRY

M. MURPHY.
TNFAG.

23 March Address

TNFAG

NCC

NCNCC
And Diverse other Individuals and Groups.

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CHAPTER 1

POSITIONAL PERSPECTIVE

On 13th November, 1979 the Governor appointed the Commissioner, Simon Isaacs, Q.C. to inquire into the environmental factors associated with the proposed logging of Terania Creek and to recommend whether logging should or should not proceed. 1.

The Inquiry saw these terms as involving an inquiry into what the environmental factors are applicable in Terania Creek. These factors include physical factors, land use factors, biological factors and social factors. 2.

In addition the Inquiry determined to carefully consider the effect and impact of not proceeding with the logging, by examining the effect of not logging on the timber industry in that part of the State and particularly around the Terania Creek area and on all persons associated with or interested in directly or indirectly the timber industry in the Terania Creek area. 3.

From the outset this Inquiry has appreciated that different sections of the community would wish to participate in the inquiry but with different views,resources and ability to contribute. 4.

The major parties to the Inquiry have been the Forestry Commission, a statutory authority, the Sawmillers Association, a private commercial umbrella group created to foster and protect the commercial interests and reputations of sawmillers, the New South Wales Trades and Labour Council, a private union umbrella organisation designed to further and protect the interests of affiliated unions and those unions' members, the National Parks Association, a private non-profit organisation concerned with the management and use of national parks and reserves and a loose

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grouping of non-profit organisations groups and individuals who believe that logging of Terania Creek should not proceed.

From the outset the Forestry Commission has interpreted its role in the Inquiry as that of a defendant in a civil litigation suit concerned with management. This position has meant that the Forestry Commission's valuable resources have been used to justify its proposed logging plan or to obstificate the real issues.

The Sawmillers and the Trades & Labour Council have viewed this inquiry as the"thin edge of the wedge" into a cessation of all indigenous logging operations. This Inquiry has consistently ruled out this philosophy. Nevertheless, from this position these parties have sought to persuade the Commission that not logging Terania Creek will result in the extinction of the sawmilling industry on the north coast of New South Wales and thereby the profits and employment opportunities it creates. It is noted that these parties have not given any concrete figures to support this dramatic claim nor at any time have they placed the current industry position in its historical perspective. Indeed, the sawmillers have at all times, refused to reveal their inner-financial operations and despite their dramatic claims they have relied, without qualification, on the financial privacy afforded them by their proprietary limited status.

The conservationists were spread over a geographically wide area covering the State, with different views and different abilities and desires to be involved. Their involvement covers the field from the 8,000 people who responded to a commercial radio station's programme with the view the area should not be logged, 5. to the members of the Terania Native Forest Action Group. It must be appreciated that whilst forestry and the Sawmillers Association participated as part of their normal day to day work, without loss of salary or personal expense, the conservationists

participated at great cost of time, effort and money from all the people involved.

Most of our normal activities, including earning an income, have been severely affected and our lives have been completely disrupted. This fight has cost many thousands of dollars and although much of this has come from donations, a large proportion has come from group members putting all available personal funds into it. In contrast, most Forestry personnel can work normal hours, receive a salary and be assured of the backing of a well financed bureaucracy.6.

The common ground adopted by the Forestry Commission, the Sawmillers Association and the Trades and Labour Council was a perceived,vested,commercial interest in the logging proceeding. The conservationists were thrust into the role of plaintiffs. The de facto consequence of this has been that this Inquiry has been conducted on classic adversary lines. This, in turn, that the"defendant" parties (Forestry, Sawmillers and Trades & Labour Council) have not provided all evidence which may reasonably be proposed to be in their possession.7. On one view this has distilled the emphasis of this Inquiry into an inquiry into the proposed logging as a logging plan per se.

By way of contrast the original intention was to have informal round-table hearings.8. Had this method been adopted each party would have contributed all relevant information in their possession in a non-partisan fashion. This would have enabled the Commissioner to ascertain the best evidence available and base his findings and recommendations on that.

It is to be noted that the conservationists were not legally represented at the critical early interpretation and definitional stages of this Inquiry.

Nevertheless, a large body of evidence has been adduced during the course of this inquiry. This address analyses that "raw" evidence in light of the terms of reference as defined on the first day of the hearing.

CHAPTER 2

PREFACE

At the outset it is essential to define the area in which the proposed logging is to take place. That is, to determine what Terania Creek is.[1.] This encompasses the geographic boundaries, the soil composition, the indigenous flora, fauna and timber and their inter-relations as a dynamic eco system.

Terania Creek's environmental factors and their importance per se are then established from the evidence. That is, the unique qualities of flora, fauna and timber will be identified in their present state and their inter-relationships and their system of co-existence determined. From this study the potential environmental factors of the proposed logging can be determined.

The exact nature of the proposed logging must then be determined so that the Inquiry can evaluate the changes that would occur in the Terania Creek area should logging proceed.

The economics of the proposed logging are then analysed. This analysis is based on the generally accepted cost benefit analysis.[2,3.] Pursuant to the terms of reference these costs and benefits must be viewed from the community's viewpoint through the Forestry Commission, the Sawmillers, their employees and the population generally.

With regard to the unsubstantiated claims of the Sawmillers and the Trades & Labour Council it is necessary to analyse their assertions in a macro-economic historical perspective. This analysis based on continuing with the proposed logging must then be contrasted with a macro and micro economic analysis generated if the proposed logging does not proceed. The economics of not logging, that is, the economic consequences of leaving the area in its present state and the costs and benefits which flow from that situation must be evaluated so that the real economic choices

can be identified and assessed in terms of the local public benefit.

Furthermore, the social economics, costs and benefits to the public which results from not logging will be summarized in chapters dealing with the largely unchallenged evidence of the area's importance as a research basin, recreational facility and cultural refuge.

A critical practical consequence of a decision to log is the use of Terania Creek Road by logging trucks.

The analysis of the evidence on the use of the road raises fundamental public safety,social and environmental issues which can,and do,stand apart from the previous analysis.

CHAPTER 3

THE NATURE OF THE FOREST PROPOSED TO BE LOGGED.

The Forestry Commission typing of Terania Creek is based on the classification developed by Baur.[1.] This classification whilst initially based on previous ecological writings, was designed for use by forestries in the execution of its responsibilities as perceived by the Forestry Commission at the time of its production.[2.] The Forestry Act, in the opinion of Baur, emphasises the priority of timber production in its responsibilities.[3.]

There are different ways of classifying forests which take account of different aspects and factors. Baur has presented both an ecological classification[4.] and the forest management system of classification.[5.] The former is based on the dynamic forest situation, the latter freezes the dynamic situation and only looks at what is on a particular site at a particular time.[6.] Furthermore, the forest management system pays no regard to re-generation matters. For example, in the case of Terania Creek as to whether brushbox is growing under the rainforest understory.[7.] Baur acknowledges that in coastal forests in particular the situation is very dynamic and one could expect, over a period of 10 to 20 years, to get changes sufficiently significant appearing that require modification of type maps.[8.]

The Forestry Commission has argued that the areas to be logged are brushbox type, not rainforest. The data produced to support this claim assumes that brushbox will never be replaced by rainforest trees because of soil nutrient factors.[9.]

The data base for this claim includes: vegetation profiles[10.] forest sample plot statistics,[11.] soil chemical analysis,[12.] and radio carbon dating statistics,[13.]

This data was evaluated by both Forestry and independent witnesses.

The evidence reveals a dialectical philisophical approach to the problem of rainforest classification, viz, the pro logging parties adhere to the static classification which emphasises dominance of trees of economic value while independent expert witnesses consider the total dynamic eco system in the forests to be logged.

Research note 17 [14] outlines the criterion for the typing of a forest as inland brushbox, [15] that is, "contains over 50% of brushbox". It is explained in research note 17 that 50% relates to "stand basal area" and that "forest type" is defined as "any group of tree dominated stands". [16] Nowhere in research note 17 is "stand basal area" further qualified to mean "percentage basal area of upper canopy". [17]

It is a fair conclusion that this refined definition was produced in an attempt to salvage the Forestry Commission case when it was clearly demonstrated in examination of Mr. Horne [18] that only two of his plots, 3 and 5, [19] could be defined as "moist hardwood" using research note 17 typing.

From A190 (i) it is clear that Mr. Horne took the view that the basal area value for brushbox was applied as a percentage of the whole stand of tree above 10 cm Dbh. [20] He said [21] under the heading "The Forest Type" that "the basal area per hectare of the brushbox is about 40-60% of that of the total forest and that the canopy coverage by the brushbox trees crowns is about 60-90% of the total forest cover".

When it was established that Mr. Horne's plots 1, 2 and 4 failed to meet the 50% basal area requirement for brushbox type [22] he later tendered exhibit "A195" which expressed the basal area values as a percentage of upper canopy trees only and which thereby delivered the required high percentages

to produce a brushbox typing. This was no more than an act of expedience by the Forestry Commission.

In the case of Mr. Horne's plot 3 it was said 23. that "the overstorey coachwood has been removed, presumably by logging", thus distorting his results. On this plot there were far more coachwood, 266, than brushbox, 114, with abundant coachwood re-generation, 11,753, compared to brushbox, 127.

With regard to Mr. Horne's plot 5 there is 62% basal area of brushbox but there is no brushbox re-generation. Mr. Horne stated that a cataclysm, that is, fire, cyclone or logging would be required for re-generation of brushbox to occur. It was unlikely that brushbox would re-generate with the falling over of individual specimens. 24. This was substantiated by Mr. Baur. 25. "When the big old trees die if there hasn't been a further disturbance of the site in that interval of time, which may run for quite a few hundred years, then you are left with a fairly well-advanced rainforest which, once again, re-occupy the sight". Mr. Floyd 26. supports this view and explains its occurrence by reference to the seed characteristics of brushbox. 27.

Independent Systems of Forest Classification.

1. Specht's classification. 28. His system was referred to by Recher 29. and was used by Millege 30. who outlined its advantages and use to ecologists working in the field "one of the principal advantages is that the .... major types of specht can be measured in the field. They can be determined very quickly ... simply by measuring the protective canopy cover." Where the cover is 70-100% it is described as closed forest; where it is 30-70% eucalypt forest.

Millege criticised Baur's classification[31] stating that it was not very useful from a wildlife point of view as the species included in Baur's types "tend to be species of economical or non-economic importance and that means that the types are either too narrow or too broad to be of much use or to be of as much use as the Specht classification ...".

2. Webb classification.[32] This classification has developed a structural classification of Australian rainforest which is referred to in the National Conservation Council's submission. The Forestry Commission definition of rainforest[33] is basically structural and can be applied to the areas in Terania Creek[34] proposed to be logged.

3. Williams classification.[35] Mr. Williams outlined a system used by Mr. Baur in "Research Note 9".[36] "Silvicultural Problems in Rainforest In New South Wales" which utilised all stemps over 10 cm. in summarising plot data for rainforests. Mr. Williams pointed out that the number or density of trees, that is, mean number per hectare is equally as important as the bulk of particular tree species. A system known as the "Importance Value Index" has been devised to take account of both the above parameters and Mr. Williams produced I.Vs for stems over 10 cm Dbh using the data in A190 (ii)[37] In plot 1 the value for brushbox is 30.6 and for other rainforest species 53.3.[38]

These classification systems are regularly used by ecologists and indicate that the bulk of the areas in Terania Creek proposed to be logged are rainforest.

From the evidence of Mr. Squire it appears that the forest typing (relied on by Forestry Commission) was carried out largely from air photo interpretation (a highly specialised and rare skill 39. with some field checking of boundaries and typing where he was uncertain. He based the bulk of his typing and identification of emergent brushbox a correlation between basal area and canopy, 50% canopy = 50% basal area 40. This was said not to hold in Terania Creek by Mr. Horne, 41. when it was revealed that one could commonly have a situation where up to 70% canopy equalled 50% basal area. This leaves open the conclusion that areas which appeared to Mr. Squire to have 50% canopy brushbox may in fact have had only 30% basal area of brushbox.

Dr. Florence, 42. stated: "The boundary between the (sub-tropical) rainforest and sclerophyll forest (rainforest with brushbox overstorey) cannot be proscribed in precise terms and comments 43. that "there is a divergence of opinion about the exact location of type boundaries".

Mr. Squire did not check his typing quantitatively, but simply estimated various percentages using a circular reference area of 0.5 hectares. 44. Furthermore, he inspected only a small percentage of the Terania Creek Basin. Mr. Squire admitted that he could not be certain that there are no cases where dual typing could not be applied to one site 45. and that where intergradation of types occurred his decision as to where the boundary was placed was arbitrary.

We submit that this arbitrary element in the Forestry Commission's typing is evident in the dramatic reduction of palm and sub-tropical type rainforest in the Commission's field type map prepared in March, 1980, when compared with its earlier typing of the same forests. The contraction of rainforest types in favour of a 75% increase in the area of brushbox may simply have been expedient.

The Forestry Commission in A1 states that the "expansion and dominance of the rainforest understorey has been limited by rhyolitic soils of low fertility" and thus the hardwood stands have been able to maintain their ecological integrity.[46]. Exhibits A187, A188 contain statements to the effect that the soil nutrient status is the main factor delineating the forest vegetation in the basin, disturbance merely reinforcing the existing pattern. Dr. Turner concluded that "rainforests are not found on brushbox soils and conversely brushbox is not found on rainforest soil" [47]. and on 4.9.80, p. 25, stated: "while certain understorey species can be found (on brushbox soils) when they get to the stage of development where their nutrient requirements are at their peak ... they will ... fade out and you won't find a fully developed rainforest on those sites".

Dr. Turner's data, methodology and conclusions have been challenged by eminent rainforest ecologists and experts, including Dr. Webb [48]., Mr. Floyd, Mr. Williams and Dr. Hynes. Mr. Hitchcock has also commented on Dr. Turner's evidence.

Comments and rulings made during Dr. Webb's evidence indicated that the scope of the expertise developed by ecologists was not understood. Of necessity they must be able to evaluate data in many scientific fields in order to adopt a holistic approach to the study of ecosystems. Dr. Webb's evidence has been supported by later witnesses and it is submitted that the Commissioner should reverse his view regarding the little weight he would attach to Dr. Webb's comments on Dr. Turner's evidence [49]. in the light of the subsequent evidence of Mr. Floyd, Mr. Williams and others.

While Dr. Turner, a soil scientist, sought to be recognised as an expert on Australian rainforests, his qualifications and experience do not support such a claim. Dr. Turner's experience related to soil science and his publications are mainly concerned

with non-rainforest trees such as Douglas Fir. Only one of fifty papers listed in his curriculum vitae relates to rainforests. 50.

Discussion of the evidence relating to Dr. Turner's data and conclusions follows:

A) Sampling Methodology:

Dr. Turner indicated that the samples were taken from unambiguous areas and were confined within stands definitely of types in which the Forestry Commission were interested.51. No samples were taken from logging areas 3, 4 or 5. Floyd 52. pointed out that Dr. Barron's report (B17) indicated that the soils on the west side of the creek differed from those on the east, yet these were not tested by Dr. Turner. Indeed, Dr. Barron's report indicated that, contrary to Dr. Turner's conclusions, brushbox and flooded gum occurred over basalt while "Booyong type forest with no brushbox, flooded gum occurs over volcanic lithic conglomerate". The forest typing for this report was carried out by Forestry Commission officers, and even Dr. Turner stated that he had no basis for disagreeing with Dr. Barron's raw data 53. and, furthermore, selected Dr. Barron to do the work because of his expertise.

It is surely significant that the Forestry Commission did not produce Dr. Barron's report and objected to questioning on the report on 10th June, 1980, and on parts of the report being tendered on 20th June, 1980.

The least one could have expected from the Forestry Commission was further sampling of areas indicated by Dr. Barron as departing so clearly from the hypotheses developed by Dr. Turner.

The failure to produce Barron's report to the Inquiry may simply have been expedient for the Forestry Commission.

Only three sites typed as coachwood by Dr. Turner were sampled in Terania Creek. No comparative samples were taken in any nearby coachwood stands to test the validity of the coachwood results. In cross examination, Dr. Turner could not say whether the soil samples were unrepresentative of coachwood stands generally [54.] and admitted [55.] that it would have been useful to take samples in well developed crabapple stands (but didn't) which, according to Floyd are a pioneer species in the coachwood/crabapple succession. Baur [56.] states that "the coachwood/crabapple association in northern N.S.W. and the wet sclerophyll forests occur over the same range of values" [57.]

Dr. Hynes is particularly critical of Dr. Turner's sampling, stating that in such a complex situation as Terania Creek, sampling should have occurred along a continuum from one assocation to another to be statistically valid. His comments are in line with those of Dr. Webb who stated that in his experience it was rare if ever to find the rigid delineation stated,[58.] and that he wouldn't be satisfied unless he had done a whole series of soil analysis the samples for which were located either at random or systematically and then examine which tree species were found around the soil holes [59.]

B) Soil Fertility Index:

In evidence Dr. Turner stated that the soil fertility index was developed on soil in blackbutt stands and tested on at least 30 stands of trees for which the Forestry Commission had growth data. It has been tested

for other species, e.g. Eucalyptus, grandis, turpentine, brushbox, spotted gum and other eucalypt species 60. Mr. Williams 61. states that it is not justifiable to extrapolate from blackbutt stands to other communities in using the fertility index and certainly not valid to transfer the index to Terania Creek. Floyd also queried its applicability to other species.62. Dr. Hynes describes the fertility index as "simplistic" and "invalid" as it assumes that "a model derived from blackbutt can be transferred for use when interpreting soil fertility under brushbox dominated or booyong dominated forests. It is simplistic in that Dr. Turner could have just as easily used Mg or Potassium for Ca and could just as easily replaced Al with soil acidity". 63. Our submission is that the index was developed and tested on vegetation growing in a nutrient-limiting situation and it is not valid to apply it to more fertile soils in a rainforest situation where the growth rates of major species e.g. coachwood, palm, booyong, are unmeasured.

Both Floyd 64. and Williams 65. have particularly commented on the extreme range of values for the communities typed as coachwood which are derived from only 3 sites. Turner has explained 66. that he only found 3 sites where coachwood formed the upper storey and these occurred on paleosols of less fertility than basalt. There is no indication of which value is typical of coachwood - (0.2 or 3.8) or evidence to suggest that coachwood may not do even better on sites with less aluminium. The absence of coachwood on richer soils has been explained in Mr. Floyd's evidence on succession which will be discussed later. It is difficult to reconcile Dr. Turner's conclusion 67. with the data in Table 3., page 2 of A187, in which it is shown that "brushbox, palm and blackbutt are of

equal value statistically". This can only be interpreted to mean the palm type forests can grow on similar soils to brushbox types and brushbox types can grow where blackbutt types grow. The figures also show that blackbutt falls within the range for coachwood. Rather than soil types simplicita delineating these forest types, other factors play an equally important or over-riding role in the distribution of vegetation in the Terania Creek basin, e.g. drainage, (in the case of palm), fire or other disturbance (in the case of brushbox and blackbutt).68. Of course, we can accept that the sub-tropical Booyong type rainforest requires soils of considerably higher nutrient status than coachwood types. This has not been a disputed issue. However, brushbox has been demonstrated to be found over a whole range of soil fertility values both in Terania Creek and elsewhere. Mr. Williams found Booyong rainforest on soil with 638-928 ppm^P in New England National Park where the range for brushbox was 97-1082^P, far greater than the range found by Dr. Turner. Mr. Floyd's evidence 69. indicates that brushbox and palm occurred on the same site at the head of the valley, also Profile 4 (A38/5) depicts fully developed Booyong rainforest and fully developed palm rainforest, while Profile 2 (A38/3) depicts Booyong rainforest with brushbox. It is considered to be significant that no soil samples were taken at this type boundary.70.

C) Fire History:

From the radio carbon dating data (A189/1) Dr. Turner has reached conclusions about the historical fire patterns in Terania Creek basin. In the disclimax coachwood/crabapple rainforest with brushbox overstorey (typed brushbox by the Forestry Commission), the range is from 280-410 years which accords with the estimated

age of brushbox trees proposed for logging. This evidence supports the evidence given by the National Conservation Counsil et al, based on the expert advice of Dr. Webb and corroborated by the evidence of Mr. Floyd, Mrs Fox, Mr. Williams, Mr. Horne, Mr. Hitchcock and Mr. Baur, viz: most of the areas typed as brushbox will, in the absence of fire progress to pure coachwood/crabapple rainforest.

Mr. Baur 71. states he "would expect that when the old brushbox fall over in the absence of natural disasters, there would be no regeneration of brushbox. In those circumstances the classification would change from brushbox to rainforest".

Mr. Horne 72. stated that fire, cyclone or logging (i.e. a cataclysm) would be required for regeneration of brushbox to occur and that brushbox would not necessarily regenerate with the falling over of individual specimens.

Dr. Webb 73. states: "...to sum up the evidence quoted above, as well as some evidence which I probably did not recall when I scribbled these notes, has led me to consider brushbox as an integral part of the advanced succession of certain types of sub-tropical and warm temperate rainforest under certain ecological conditions, including fire frequency and soil nutrients. That is, if you like, a kind of disclimax rainforest".

Mrs Fox, in collaboration with Mr. Floyd, distinguished between two communities with brushbox overstorey. Type E which was classified as coachwood/crabapple with brushbox overstorey, and Type F, brushbox with low rainforest overstorey. The former is described as seral and Mrs Fox explained 74. " ... beyond ... approx. 300 years it's suggested here that those emergent (brushbox) trees will die and are not replaced, the rainforest then would remain" 75.

Mr. Floyd 76. in answer to a question from Mr. Officer, agreed that assuming there is no fire in the basin the brushbox stands proposed to be logged will be converted to coachwood and gave detailed evidence to support that statement 77.

Mr. Williams 78. indicated that he expects the rainforest understorey to take over the site as the brushbox trees died.

Mr. Hitchcock 79. stated: "Certainly fire is a factor which can retard or arrest ... succession. Fire can also invade a climax community and completely set the succession clock back to start. In the case of soil I have seen no evidence to suggest that soil fertility is going to inhibit the full process of succession succeeding on a significant part of the rhyolite soils of Terania Creek".

The Forestry Commission has argued that because a certain fire pattern existed in the past that that pattern would be maintained in the future. This hypothesis has been challenged by Mr. Floyd and Mr. Williams. Doubts about the continuation of past fire patterns were expressed by Dr. Webb 80. when he said: "... I'm a little worried as an ecologist that this is a static pattern that's being envisaged and my experience is that patterns are never static and I would wonder whether there won't be a change of some kind or another due to a whole series of factors, some of which may be predictable". Mr. Floyd 81. stated that he couldn't accept that what happened in the past will happen in the future as a man will try to prevent fires in the Basin and 82. when cross-examined, reiterated that he was optimistic that the fire history would not stay the same in the foreseeable future as land use in adjacent cleared areas changed, therefore eliminating one source of fire 83. and because of increased fire

fighting ability. This was corroborated by Mr. Williams[84.] who stated that "conditions have changed so much that I wouldn't expect the fire frequency to be the same now with European settlement and the extensive clearing as it has been in the past in Aboriginal times, pre-European settlement". He also referred to the mosaic of sclerophyll forest and rainforest which would lead to a much lower probability of the fire spreading extensively. It was revealed that even in the recent abnormally dry summer conditions in which several fires occurred in forests in the region, none were so severe as to penetrate into the rainforest.[85.] It is certainly not relevant to compare the fire pattern in north-eastern N.S.W. with fires in dry sclerophyll forest on Hawkesbury sandstone [86.]

Much doubt has been cast on the source of the charcoal found in Site 1 (A 189). Mr. Floyd [87.] indicated that there was no way of telling whether the charcoal sample was brushbox, a rainforest species or blackbutt, or whether it was deposited in situ or washed down from further upslope (the soils on which it was found being alluvial in origin). Mr. Floyd stated that he would expect to find the remains of an old burnt log or something like that buried in the ground ie. a definite accumulation of charcoal due to something being consumed, if it was an in situ situation. Dr. Turner's data and evidence indicate that he found 8 layers of charcoal in 30 cm. of soil with an absence of rhyolite glass which, according to Dr. Turner [88.] would be deposited with the charcoal if the latter was derived from upslope. It is also quite possible that whole sequences of deposition could have been washed away, i.e. there could be one or several discontinuities within the layers observed by Dr. Turner. The best one can say about the carbon dating material is that it is inconclusive, and the worst that it is pure supposition. Much more extensive and methodical sampling would need to be carried out before

the fire history of the Basin could be described with any certainty.

D) Succession:

Evidence was given by Dr. Webb regarding the process of succession which he stated was occurring in the areas to be logged and which he presented diagramatically in B73. This exhibit was produced in order to answer the statement made by Dr. Turner,[89.] that "the theory of succession is a theory, it's not a fact". When re-examined on this question,[90.] Dr. Turner stated that neither Dr. Webb, Mrs Fox nor Mr. Floyd had presented evidence that there is a process of seral succession proceeding.[91.] In fact, both the Forestry Commission and Mr. Floyd produced such evidence. In summary, this evidence is as follows:

- coachwood and crabapple genetically are never as tall as brushbox, regardless of soil fertility, so can never become "dominant" as defined by the Forestry Commission, i.e. the overstorey, while the brushbox are still standing [92.]

- Floyd identified two types of forest within the Forestry Commission's brushbox type: "E", coachwood/crabapple rainforest with brushbox overstorey (which comprises the majority) and "F", brushbox with low rainforest understorey. "E" comprises two forests one on top of the other [93.]

- Mr. Floyd produced samples of seeds and fruit and described the process whereby type "E" forest develops following severe disturbance such as fire or landslip:

1. The brushbox seed is very small and must get right in contact with the mineral soil. It has no dormancy. The brushbox trees produce seed nearly all year round. When the ground is disturbed the brushbox trees on the edge will drop the fine seed on to the ground where they germinate. Mr. Floyd gave evidence that this had occurred on a landslip in Perch Creek where there was a beautiful stand of brushbox trees about 15-20 cm diameter 94.

2. The crabapple is a pioneer species which moves in in advance of the coachwood. The crabapple fruit is juicy and eaten by birds which spread the seeds over many kilometres, whereas the coachwood seed is "a tiny little aeroplane propeller" object, spread by wind, about up to 30 m. from the source. "So crabapple is serial. It comes in first and then later on the coachwood eventually gets there" 95.

3. Crabapple is more resistant to wildfire as it has rough insulating bark, whereas coachwood has a smooth trunk with the living part of the tree on the outside so even a light fire will kill it 96., (confirmed by observations of Hitchcock 97.).

4. The crabapple seed can lie dormant for up to 12 months; if the hard coat is cracked by fire or similar they will germinate. Coachwood only drops seed for 2 months of the year and must grow immediately. Fire disturbance occurs in October-November, not in the period January-February, when seed is dropped, so there is no coachwood seed around at the time of most likely disturbance. 98.

5. The coachwood/crabapple association can be represented by different percentages of the two species.

6. Once the coachwood comes in the crabapple will eventually die out and does not regenerate underneath; however, coachwood will come up under the crabapple 99.

- This process was demonstrated by Mr. Floyd by reference to A38 (2):

Profile 1: burnt and logged - 6 brushbox, 2 crabapple, over 20 m; 6 crabapple, 10-20 m; many little crabapple under 10 m. No coachwood. Therefore crabapple at pioneer stage after severe disturbances 30 years ago 100.

Profile 6: partly burnt 1948, heavily logged. Where logging and fire, mainly crabapple coming up 5-10 m. Where logging without fire, coachwood occurs. 101.

Profile 3: Scattering of brushbox in overstorey. No crabapple under. Advanced stage of coachwood development over 20 m, 10-20m, and 5-10 m. Stump indicates former presence of crabapple. Close to climax coachwood. 102.

- A similar exercise was carried out on the transect presented by the National Herbarium (B105 (8) a). Mr. Floyd interpreted the western half with brushbox overstorey and considerable crabapple beneath (only 2 small coachwood) as a very advanced crabapple period in which crabapple has almost reached its maximum height with coachwood just starting to come in. The eastern half again has brushbox overstorey, with a number of substantial coachwood

and few crabapples, described as well advanced toward being a climax rainforest. "As soon as the brushbox go you have coachwood underneath" [103]. Both ends of the transect were described as part of the same succession of coachwood/crabapple rainforest but at different stages.

Again, using Forestry Commission data A190, the Corn Patch, Mr. Floyd described the succession from a cleared paddock to later stages of development of sub-tropical rainforest.[104]

Stage 1 - a crop of annual weeds may persist for 1 or 2 years.

Stage 2 - shrubs, including wild tobacco, lantana, raspberries, etc. which grow 2 to 3 m. high. Period approximately 10 years.

Stage 3 - Blackwood wattle, pioneer rainforest species, e.g. Red Ash, Kamala, Guioa, camphor laurel etc. Period approx. 100 years.

Stage 4 - Under the shelter of Stage 3 trees climax stage 4 trees develop e.g. booyong, yellow carrabeen, red carrabeen, etc.

The Corn Patch, according to Mr. Floyd, at present represents a well developed Stage 3 in which the blackwood wattles are dying out and Stage 4 species are coming in underneath, but the regeneration is patchy and at different stages of succession.

Despite the clear evidence presented by Mr. Floyd, which supported the statements made by Dr. Webb, Mr. Williams, Mrs Fox and Mr. Hitchcock [105]. Dr. Turner clung to his theory that succession is not happening, nor likely to happen, at Terania Creek [106]. His understanding of succession appears to be based on the out-dated work of Clements (1916) [107] and as pointed out by Dr. Hynes[108]. Clement's theory, where a community is born, grows, matures and

becomes senile and dies, is "illusory". Dr. Hynes states: "In the intervening period (between 1916 and 1935 when Clement's theory was first challenged), a large and significant literature on succession and successional processes has been produced from scientific research on this subject. This seems to have eluded Dr. Turner".

Dr. Turner' s lack of knowledge of rainforest ecology is obvious in his evidence [109] during which he suggested:

a) that palm might be more long-lived than brushbox [110]. (he has dated brushbox as up to 1,000 years old);
b) that coachwood seeds might just as easily be carried by birds as crabapple seeds [111] despite their unattractiveness to birds, and their shape which has evolved to take advantage of wind, and
c) he suggested [112] that "we could be getting a hundred species to start with at the point of disturbance and we come in 300 years later and see 50 species growing there" when, demonstrably, that is not happening.

As far as a) is concerned, Mr. Hitchcock [113] has observed that palm is a fairly short-lived species.

E) Botanical Status of Brushbox:

The Forestry Commission has alleged inconsistencies in the evidence of Dr. Webb. Whilst it is appreciated that many of the ecological concepts put forward by this witness might be difficult for non experts to grasp, we submit that his later evidence represents the latest accepted scientific thought on the definition of rainforest in Australia [114]. Below is a summary of the substance of Dr. Webb's evidence:

The orthodox view is that:

1) Brushbox is part of an advanced stage of rainforest succession, generally of the coachwood/crabapple type (Baur's warm temperate rainforest) under certain conditions of climate and soils, and initiated and intermittently regenerated by wildfires.

2. Brushbox is a member of the sclerophyll element of the Australian flora that is different from and unrelated to the rainforest element of the Australian flora.

3. Rainforest on basalt under relatively high rainfall in coastal areas is "true rainforest", whereas mixtures with sclerophylls (including "brush") are not.

However, the traditional view has also included:

1. Recognition of brushbox as an Australian rainforest tree by the botanical authority W. D. Francis in the first (and still the only) comprehensive book on Australian Rainforest Trees, which appeared in 1929. More recently, brushbox has been so recognised by the botanical authority A. G.Floyd in Forestry Commission published monographs on N.S.W. rainforest trees.

2. Recognition of the invariable association of so-called sclerophyll tree species such as Brushbox with rainforest successions following fire under certain ecological conditions (well summarised by K. W. Cremer in "Australian Forestry", 1960.

3. Recognition of rainforests of different complexity under different climatic and soil conditions, and under different soil conditions in the same climatic zone.

4. Recognition that brushbox has many of the attributes of a rainforest species such as shade tolerance, relatively slow growth, broad horizontally planed leaves.

A revised interpretation developed by Dr. Webb and some other ecologists and paleogeographers within the last ten years suggests that:

1. The sclerophyll and rainforest elements of the Australian flora have ancient common origins in what is now the Australian land mass and in other land masses, and many sclerophyll flora elements were derived from rainforest elements.

2. The segregation of sclerophyll and rainforest vegetation types in space and time has been exaggerated by earlier workers, i.e. the boundaries are generally not clear-cut and exhibit intergradations and transitions.

3. The definitions of Australian "rainforest" and "sclerophyll" vegetation that have been inherited from traditional sources of plant geography and botany outside Australia are no longer valid in the light of recent evidence from ecology, biogeography, paleobotany, taxonomy and cytogenetics.

4. Consequently, the genus Tristania (to which brushbox belongs) and many other genera provide significant evolutionary links between the closed forests and open woodlands, and it is scientifically

legitimate to regard biologically diverse mixtures of the two as a type of rainforest.

It should be noted that Baur himself classified Headland Brushbox, Type 25, as rainforest.[115.] This brushbox is Tristania conferta, a stunted form of the same species found in Terania Creek.

When all the evidence, exhibits and submissions produced by the Forestry Commission are examined it becomes obvious that it can produce only one "expert" with little experience in rainforest ecology to support its basic contention that the stands to be logged are not and never will be rainforest. We submit that Dr. Turner's conclusions have been shown to be based on inadequate and methodologically untenable data. We further maintain that expert evidence from the C.S.I.R.O., the National Herbarium, the University of New England and the National Parks & Wildlife Service, as well as some evidence from the Forestry Commission, demonstrates that the bulk of the proposed logging areas supports a disclimax warm temperate coachwood/crabapple rainforest, not a moist hardwood forest as claimed by the Forestry Commission.

CHAPTER 4

EFFECTS OF LOGGING ON FLORA.

Whilst forestry has made much of its alleged scientific directional felling and selectivity, the fact of the matter is you have to fall a tree the way it wants to go. 1. In fact, on an inspection, Forestry Commission conceded that, at best, the fall of the tree can be influenced to a maximum of 10°. In the 1979 logging, 44% of rainforest trees were killed or damaged. 2. Whilst Bruce in evidence alleged that snig tracs gouged only 6", on the inspection of Geebung Road, he had to concede that snig tracs gouged up to 1 metre. Under cross-examination Bruce admitted the proposed logging would involve"miles and miles of snig tracs". 3.

The evidence is that some 1280 trees are to be removed from 77 hectares 54% of the 77 hectares has never been logged. From that 54% will come 71% of the brushbox. The intensity of removal varies from logging area to logging area. In areas previously logged the rate is relatively low, as there are not many suitable trees left to take out. However, in the virgin stands up to 24 trees per hectare will be taken. This would cause substantial damage, but less in areas less intensively logged, according to Mr. Bruce 4.

Evidence has been given relating to snigging. On average each log would be snigged 150 m and that the snig track would be the width of a D8 tractor (3.7 m). It we multiply 150 m x 3.7 m x 1280 trees, then divide by 10,000 m, we get 57 hectares. Now we are not suggesting that each tree has its own individual track, but these calculations bear out Mr. Bruce's evidence 5. that a considerable area of the 77 hectares would be affected.

It is regrettable that Mr. Bruce's evidence is vague about the layout of snig tracks. He also seemed to be doubtful about

the number of log dumps needed in one logging area.

Both McIlroy and Florence have commented that in some instances gaps were unnecessarily large. Florence also stated that "some disturbance will occur where palm and rainforest species are well developed in favourable niches within the general area of wet sclerophyll forest" 6.

With regard to the enrichment planting with flooded gum in the gaps created (at the rate of 125 trees per hectare,7.) describes this as "of doubtful validity" if the objective is to maintain the forest's ecological integrity. The best he can suggest is 8. that "we can conserve the resource in a sort of quasi or semi-natural state".

Mr. Lemaire 9. said in evidence that logging tracks would be constructed in Terania Basin to a width of twelve feet and that a number of rainforest trees would consequently be removed. Later,10. he said the number of such trees "would take you years probably, to count" and "that it would be a big job to count them". Accordingly, although it is not proposed to log the Booyongtype rainforest on the floor of the basin, the impact of the construction of logging tracks through the Booyong rainforest will be great.

Mr. Floyd's evidence included his report "Rare and Endangered Plants, Whian Whian State Forest" 11. This establishes that the great majority of rare and endangered plants described by Floyd occur on the poorer rhyolite soils (where the brushbox logging is to take place) rather than on the rich basaltic red loam in the floor of the Basin. The failure of the Forestry Commission to introduce this document to the Inquiry (it was a report to the District Forester at Casino) can only be regarded as expedient.

Mrs Fox of the Herbarium12. considered that Whian Whian State Forest (in which Terania Basin is partly included) is of special

interest to the plant geography taxonomist and ecologist, and that its management should be planned so as to safeguard its special botanical features 13. She considered the area (Whian Whian) to be 14. outstanding for its occurrences of rare and endangered flora as described by Floyd. She described a complex mosaic of plant associations, rich in species (over 330 spp at a conservative estimate). Mrs Fox also gave evidence 15. that problems would be associated with logging, damage to canopy and understorey would occur, leading to possible introduction of weeds and long term changes if this happened. Reduction of canopy would have a desiccating effect on filmy ferns and other species which require moist conditions. The submission of the National Herbarium was that for these reasons and others, "logging should not proceed in the valley. Such logging would have severe adverse effects on the environment and vegetation there".

Dr. Webb's evidence pointed to the value of Terania Basin as, inter alia, a "scientific reference area" and as a "refugium" 16. for rainforest life.

CHAPTER 5.

EFFECTS OF LOGGING ON FAUNA

All parties concerned with local fauna agree that there would be substantial localised modification of the wildlife habitat. The only expert to carry out field studies concluded that this would be a significant disturbance, the Forestry Commission did not know.[1.]

Of the witnesses who gave evidence about the fauna, only Mr. David Milledge had actually carried out field studies. The Forestry Commission carried out no such studies and did not send its employed wildlife ecologist, Mr. W. G. Rohan-Jones, to Terania Creek [2.] according to the evidence of Dr. Gentle.

By the terms of its own policy on wildlife, the Commission is required [3.] to take "positive steps" to "facilitate the survival of any species designated rare or endangered under the National Parks and Wildlife Act". It was agreed by Miss Conway [4.] that species fitting this description occurred at Terania Basin (ten listed by David Milledge). Dr. Gentle admitted[5.] that the Forestry Commission did not know whether such "positive steps" as were claimed to have been taken, would satisfy the conservation of rare and endangered fauna in the Basin.

In A1[6.] the Forestry Commission claims that the proposed logging operation would have minimal impact on the mammals and no significant impact on the birds, reptiles and amphibians of Terania Basin. This assertion is not based on any specific fauna survey in the Basin.[7.] The submission of the National Parks and Wildlife Service [8.] criticises this assertion:

> "It is particularly difficult, if not impossible, to accurately assess the nature and magnitude of a recurrent logging operation such as is proposed at Terania Creek. Given such difficulty it is really

quite inappropriate to categorically conclude that the impact of such an operation is 'not significant'".

David Milledge [9.] also rejected the conclusion that logging would have no significant effect on fauna. So did Dr. Recher who [10.] predicted that the logging proposed at Terania Creek will result in the local extinctions of species.

Only Dr. McIlroy [11.] among the fauna experts agreed with the Forestry Commission view that the logging would not significantly affect fauna, but this was described by him as a "subjective opinion" and was limited to birds and mammals. Dr. McIllroy further stated that a "conservative professional answer" to the question of what effect the logging would have on fauna, was "I don't reliably know and I doubt if anyone else does either". The Inquiry must choose between Dr. McIllroy's two contradictory answers: we submit that the one to choose is his professional answer ("I don't reliably know") rather than his unprofessional, subjective opinion which is based on no specific scientific data, and twelve years' experience in sclerophyll forests, not rainforests.

Although Dr. McIllroy chose not to become involved in the debate about the type of forest to be logged [12.] he did agree that there were "rainforest elements" growing in the lower layer in the brushbox stands [13.] and that a "rainforest fauna" occurred in the basin.[14.] He agreed also that the rainforest fauna "quite possibly" would occur in the areas to be logged [15.]

Dr. Recher [16.] said that for the purposes of fauna the forest was a continuum from the pure rainforest through wet sclerophyll to dry sclerophyll - it is quite impossible to separate those into discrete units and say that one can

be disturbed without affecting the other. Dr. Recher said also 17. that for zoologists the brushbox is a rainforest formation and 18. that logging "can have a significant effect on smaller vertebrates and invertebrates". Dr. Recher further stated 19. that the logging must have a significant impact on fauna, and 20. that the Museum would like to see at least a moratorium on all rainforest logging pending a determination of the biotic resource of those areas - at least five years.

David Millege 21. found rainforest fauna species in sites that were brushbox according to the Forestry Commission's classification. Mr. Millege said 22. the vertebrate fauna in Terania Creek Basin are likely to occur throughout the whole area of this basin, and this was demonstrated by his fieldwork. He said 23. that the Albert Lyrebird, Marbled Frogmouth, Wampoo Fruit Dove, Sooty Owl and Crested Hawk all have requirements within the brushbox in Terania Basin - these are all endangered species under Schedule 12 of the National Parks and Wildlife Act. Because of the lack of study of their ecology 24. Mr. Millege was not able to predict the effect of logging of the basin on fauna. He stated 25. that the Forestry Commission could not claim that the logging would have "no significant effect" on vertebrate communities. He stated that the Forestry Commission had a special duty to ensure the conservation of the fauna of lowland tall closed and moist tall open forests in northern N.S.W., since such forests that remained were largely under the Commission's control.

Mr. Hitchcock stated 26. that there was ample evidence to indicate that from a fauna point of view much of the brushbox type as mapped by the Forestry Commission would be indistinguishable from the rainforest. He stated 27. that it was the responsibility of the management

authority (the Forestry Commission) to survey fauna prior to development and 28. that an initial survey would require 18 months.

CHAPTER 6

SOIL EROSION

No soil profile analysis or descriptions are in the evidence. We only have the Forestry Commission's (Dr. Cornish) opinion that they are of the average erosion class. Dr. Cornish did not look at virgin areas, nor look at the area referred to at stop 1. 1.

According to his studies in other areas, Dr. Cornish expects the effects of logging to last 4 - 5 years and whilst the regional impact is expected to be unnoticeable he expects a "somewhat significant" increase in runoff for a period 2. On P. 5 3. Dr. Cornish admits the Terania Creek would naturally have a fairly low turbidity and that landslips are fairly common in the basin particularly in areas that have already been cleared. It was pointed out to Dr. Cornish 4. that there will be a considerable amount of downhill snigging, some necessitating side cutting. Dr. Cornish was not aware that it is proposed that some logging tracks will cross running streams and he agreed that this was not desirable 5.

It is also in evidence that the filter strips are not immune from logging; in fact, there is no limit to the number of trees which may be removed, although winching rather than snigging is used to remove the logs.

Dr. Cornish had no data on the intensity of logging per hectare proposed, nor the size of the tractors to be used. He spent little time in the basin, saw little of the areas proposed to be logged, produced no data on soil structure, nor stream or catchment conditions in the basin, knew little about the proposed operations yet made firm pronouncements about the anticipated effects of logging on stream turbidity and runoff and erosion prospects.

The photographs produced by the Nature Conservation Council revealed what Dr. Cornish described as "moderate" turbidity.

Whilst the degree of turbidity following rain prior to the logging was unknown (both to Mrs Elenius and the Forestry Commission), the Nature Conservation Council continues to maintain that the turbidity would have been exacerbated by the August, 1979 logging, as areas of recently exposed soil on roads and log dumps were observed and the soil particles would have been entrained by raindrop impact and some deposited in the creek during the 5 days preceding Mrs Elenius's visit during which 86 mm of rain fell.[6.] The soil in the catchment of Bishops Creek was virtually completely protected by a deep layer of litter as well as the almost 100% canopy cover. Furthermore, the 22 mm which fell on the day preceding Mrs Elenius's visit would represent a relatively heavy fall and no turbidity was evidence. If soil is not exposed to raindrop impact it remains in situ.

CHAPTER 7

EFFECTS OF LOGGING ON NATIONAL PARK VALUES

Whilst the Inquiry would not permit the National Parks Association to discuss the national park proposal for Terania Creek and adjacent forests, Dr. Florence was allowed to promulgate the recommendation [1.] "that the Terania Creek Basin be managed primarily as a nature and recreation reserve", and [2.] stated "there is no uncertainty about its role as a nature and recreation reserve".

The National Parks and Wildlife Service [3.] stated that Terania Creek basin appears to represent the largest remaining stand of predominantly rainforest vegetation (at least in a near natural condition) on Nimbin rhyolite and would be worthy of conservation on this basis", and pointed to the need to meet the demand for more public forested lands in the Richmond-Tweed to be permanently protected from the recurrent exploit of timber production [4.] if future conflicts are to be averted. It stated that Terania Creek fulfills the selection criteria normally applied to parks and reserves.

The concept of use of the area as a national park or nature reserve was discussed by Florence.[5.] Florence said conservative logging will not reduce its value in that respect. We submit that it will.

With regard to regeneration, Florence's evidence is inconsistent. At first he recommends against coming back in 25 years as there won't be enough brushbox, then suggests planting of flooded gum which could be taken out together with some mature and over-mature brushbox in 25 years. With regard to the impact on national park values he said it will be aesthetic only and last only 10 years, then suggested going back to log in 20 years. This would involve another 10 years disturbance.

Once the area is disturbed, that disturbance will be perpetuated. The opportunity to experience the unlogged forest will have been

lost. The Booyong type rainforest proposed not to be logged will nevertheless be penetrated by logging roads and accordingly diminished in value as a sample of undisturbed rainforest. The public access value of such roads is questionable when what is required are carefully sited and constructed foot tracks which do not impinge upon the natural aspect of the forest.

CHAPTER 8

THE ECONOMICS OF LOGGING

A) Public Economics - The Forestry Commission

The Forestry Commission has said [1.] that the net gain to the Crown of logging Terania Creek is $31,314.00. Cross-examination of Mr. Golding [2.] by Mr. Prineas showed that this net gain was arrived at by ignoring a number of costs including the costs of fire protection, enrichment planting and indirect overheads such as forest typing and mapping, field surveys and preparation of the management plan. The Forestry Commission's evidence [3.] is that "Indirect overheads such as administration costs, including group rates and debt charges are applicable to road construction in the commercial accounting context, but the Commission realises in practical terms the indirect costs are ongoing and would be incurred if a road were not built." Thus these indirect overheads were largely ignored in determining the profitability of the logging operation proposed for Terania Creek.

Evidence to the Senate Committee on Trade and Commerce by the Forestry Commission in 1979 [4.] was that, on a commercial accounting basis, the management of native forests in N.S.W. (other than in the Eden Woodchip concession) showed expenditure of $13.9 million with a revenue of $9.2 million, giving a loss of $4.7 million for the 1977/1978 year. In A1 p. 2 (2nd paragraph) the Terania Creek logging proposal is described as "similar in most characteristics" including "financial considerations" to the numerous logging operations that add up to the native timber supply of N.S.W., and it follows, to the $4.7 million loss for 1977/1978, incurred by the Commission in such operations. If commercial accounting principles were applied to the Terania Creek

logging proposal there would be shown without a doubt, a greatly reduced net gain to the Crown than that claimed by the Forestry Commission, if not a loss.

B) Private Economics - Profit, Income Creation, Employment and Capital.

The Sawmillers did not produce any financial records relating to their income producing activities. Therefore, the Inquiry must draw its conclusions from secondary assessments and economic analysis.

The Forestry Commission estimates, without divulging sources, the total wood value as $360,000.00.[5.] Forestry then says that extra value is added at each further stage of production. The Forestry Commission gives no estimate for the labour, material or fixed cost of this production process, nor are the economic variables of production and sale analysed. That is, there is no mention of gearing ratios, allowance or recognition of the cost of borrowed capital or market place fluctuation.[6.] Thus, this figure, $360,000.00, is of no assistance to this Inquiry.

The Forestry Commission, with the Sawmillers Association's consent, asserts that the proposed Terania Creek logging operation has a significant value to the local community because of the limited overall extent of accessible timber resources within the management area.[7.]

The evidence on this is,in fact, to the contrary,[8.] and in any event the Forestry Commission provides no evidence to support this. In fact, the economic indices and the oral testamony support the reverse. In monetary terms the community loses through the efforts of the Forestry Commission.

> In terms of volumes at best the mills are potentially only marginally inconvenient after the expiration of 20 years. 9.

Although 18 months have elapsed since the cessation of logging in Terania Basin, the two sawmilling companies involved - Standard Sawmilling Co. Pty. Ltd. and James Hurford & Co. Pty. Ltd. - have suffered no reduction in their supply of timber from the Forestry Commission. The sawmills are able to obtain supplies from other areas within the Commission's Mullumbimby and Murwillumbah Working Circles. Murwillumbah Sub-District Forester, Charles Le Maire's evidence 10. in response to a question from Mr. Somerville, was that in supplying timber to the two mills he would continue to move around the Working Circle. He said "the cut from Terania, although it is part of the Circle, doesn't mean the end of a cut by Standard Sawmilling Co. within the Mullumbimby Working Circle".

In the submission from the Nature Conservation Council 11. it is contended that the effect of not logging Terania Creek, in terms of timber supply, would be a completion of the cut of the (sustained yield) Mullumbimby Working Circle some 7 months earlier in the year 2000 than planned, and the cutting out of the (non-sustained yield) Murwillumbah Working Circle some 25 days earlier than planned in 1986. These calculations have not been challenged as to accuracy.

It is open to the Forestry Commission to impose an annual quota reduction on sawmills to take account of the loss of supply from Terania Creek. The submission of the Forestry Commission 12. states that the loss to the Mullumbimby Working Circle is equivalent to 150 cubic metres of timber per annum spread over three mills. The life of the Murwillumbah Working Circle would be reduced "marginally".

Mr. Lowery of the Forestry Commission 13. gave evidence that the

Terania Creek timber resource was "in terms of the 1979/1980 quota year ... quite a substantial loss" but agreed shortly after that if the loss was spread over 25 years it would be a "very diminutive result".

Expressed as a percentage, the loss of the Terania Creek (timber) volume to the Mullumbimby Working Circle is 2.1%. The Forestry Commission's evidence [14.] is that there has been an average net undercut for the five years 1975 to 1979, in respect of sawmills in the Murwillumbah Sub-District, of 4.8% per annum. Thus, a 2.1% loss represented by Terania Creek's timber resource could be readily absorbed if the same rate of undercutting of quotas is continued by the sawmills, or even if the rate of undercutting is reduced substantially.

It is suggested by the Forestry Commission [15.] that a decrease in quota to Standard Sawmilling Co. Pty. Ltd. will have significance in terms of decreasing economies of scale. There is no evidence to support such a contention. Nor is there evidence for the Commission's contention [16.] that James Hurford and Co. Pty. Ltd. might be influenced by a quota cut of the small size in question to refrain from rebuilding its mill and recommencing operations.

James Hurford & Co. Pty. Ltd. incurred a reduction in quote to 1430 M^3 p.a. in 1977, but continued operations and is rebuilding its sawmill after a fire in 1979. This strongly suggests that economies of scale are not critical in the operations of sawmills drawing upon the Mullumbimby and Murwillumbah Working Circles. In any event, advantages from increasing scale of production derive from substantial increases, not the negligible quantities of timber (150M^3, spread over 3 mills, p.a.) at issue here [17.]

Due to the small annual quantity of timber involved, the direct and indirect employment impact in the timber industry, of not logging Terania Creek, will be slight. The evidence of the

Nature Conservation Council [18.] was that the direct effect will be marginal (equivalent to one quarter to one third of a job in each of the three mills) and consequently the indirect employment effects will be negligible or nil as such effects are usually insensitive to such marginal direct reductions in employment.

Bearing in mind that no evidence was given to contradict this fundamental employment condition this Inquiry may not find on the value of the proposed logging to the community.

The historical picture established by the sworn testamony of long term intelligent local observers should convince the Inquiry that sawmilling as an industry in the immediate local area has not existed this Century. In the wider north-coast area sawmilling as an industry has declined since 1941.[19.] In essence the Forestry Commission's "management problem" is a trucking/transfer problem of logistics and public safety. Their economic argument [20.] distills to the question of how to maintain the rate of the decline of the industry now down to three mills when plantation supplies are the only avenue open to the industry to meet anticipated future market demands for sawn timber. [21.]

These plantations are so far to the south that to tranship from source to mill by logging trucks presents an unacceptable public menace. The second dilemma is that the local north-coast mills are unable or unwilling to re-tool. It is absurd to suggest that the proposed logging of Terania Creek provides any solution to this fundamental structural problem of the industry.

The hard fact for the sawmillers is that they must be prepared to rely on plantation timber and adjust accordingly. [22.]

CHAPTER 9

THE ECONOMICS OF NON-WOOD USES OF TERANIA CREEK

A) Tourism

Next to general maps the location of Terania Creek is the most sought advice at the Lismore Tourist Office. [1.] Tourism and tertiary industry employ the bulk of the local workforce.[2.] Tourism, since World War II has been both a fundamental and a growth industry on the north coast of New South Wales. However, the Forestry Commission spends its money in the area. This public money, including the losses, could be used in furthering the tourist value of Terania Creek. This sum could be used in employing the same number of people in the same or equally valuable public services.[3.] (National Parks, Reafforestation, Camp Sites etc.). The employment multiplyer of tourism is economically described as an "exploding cobweb". That is, each job created creates, in turn, more jobs again in geometric as opposed to arithmetic proportions.

After the local area became unsuitable for dairy farmers, the Terania Creek Valley slipped into disuse and most of the population left.[4.] The population return has been by people who have brought new skills and occupations to the area. [5.]

None of the locals' income is directly derived from sawmilling. The locals' income is, in the main, derived from the tourist trade or by the provision of services to the increasing population.[6.]

The clear felling policies employed by the Forestry Commission and the community [7.] coincided with a decline in employment opportunities in the area and population

movements out of the area. The reversal of this population move in the recent decade is motivated by the very existence in the area of Terania Creek.

It is a common economic fact that regional stability is best served by a stable or a growing population. The survival of Terania Creek in its present state causes this desired goal and creates employment. The proposed logging potentially has a negligible impact on employment opportunities and then, at the earliest, sometime after the Year 2000. 8. In any event, logging has historically been associated with declining employment opportunities and a continuous population shift from the area to the city. 9.

B) Educational, Scientific and Research Value

All the experts agreed that the Terania Creek Basin is valuable for ecological study. 10. It is a fertile research area for the pursuit of knowledge of biology, botany, the earth sciences and wildlife.

The Forestry Commission has not produced evidence to prove that Terania Creek is not the most valuable local area for scientific purposes.

From the evidence there is no other area approaching the significance of Terania Creek as a brushbox reserve. 11.

The Forestry Commission could not establish that the scientific value of the area will be preserved if logged.

There is a significant level of existence of endangered species in the area. There exists a unique and dynamic relationship between the soil, plants, trees and wildlife in the Basin.

The educational value of the area permeates education at all levels from pre-school to doctorial thesis. In the local area its value is increased by its proximity to schools and colleges over a wide area .

Its educational value is further heightened for the population at large in an era when people are increasingly attempting how to learn to live in harmony with nature.[12.]

The only counter-educational value proposed is the absurd one that seeing Terania Creek logged would be an educational experience.[13.]

C) Aesthetic Value

No party has suggested that the Basin has no great beauty. Floyd's comment "Terania Creek Basin is an attractive and compact area with much vegetational interest ... ",[14.] has not been contradicted.

There has been no dispute to the claim that "the un-logged brushbox stands to the east of us will be more severely affected by logging than any other stands in the Basin in spite of having the highest aesthetic, scientific, educational, recreational and landscape value in the whole Basin".

The proposed logging can only destroy these aesthetic values.

D) Recreational Value

The only sizeable forest reserve close to Lismore are much smaller than Terania Creek or have been heavily logged already.

For at least 50 years Terania Creek has been a popular recreational picnic area. The growing popularity of

camping has stretched the Rummery Park facility to the limit and people are using the Basin. [15.]

Interest in forests is generally increasing [16.] with more provision being needed for non-logged areas.

E) Spiritual Value

The significance of the area to the large number of local Aboriginal people and its importance as a learning and spiritual centre was not refuted,[17.] nor was the spiritual feeling of whites for the Basin. [18.] The Forestry Commission has shown no interest in Aboriginal value for Terania Creek and in assessing its importance did not even ask the local Aboriginals themselves.[19.]

The strong emotional ties which the Aboriginals have for the area of itself should be a strong factor for its preservation, particularly in view of the very limited options open to them for such sites.

CHAPTER 10

THE IMPACT OF LOG HAULAGE ALONG TERANIA CREEK ROAD

"To call it a road would be to glorify it". [1.] A comprehensive case against the use of Terania Creek Road by logging trucks is in evidence before the Inquiry.[2.] The Inquiry has had the benefit of testimony from people who live on the road but anyone who has travelled down the road would be horrified to think they ran the risk of being confronted by or driven off the road by a logging truck working on quota rates of income.

The local who live on the road presented a powerful case against such use on the grounds of public safety.[3.]

The population,[4.] the known record of accidents,[5.] the volume of traffic,[6.] taken in conjunction with the low grade nature and narrow width of the road combined with the existence of numerous blind corners,with sharp falls on one side and tall cliffs on the other, all add up to a situation in which the presence of logging trucks is totally unacceptable because of the high public risk involved.

It is submitted that this objection alone is sufficiently cogent to outweigh the slight economic advantages, if any, which may accrue to the local sawmillers from the proposed loggings. The irony of the proposed loggings stems from the fact that forestry feels it is too dangerous to tranship logs from Bathurst to north-coast mills on public highways but is willing to risk human life in pulling out an insignificant quantity of logs from Terania Creek.

CHAPTER 11

IN CONCLUSION

It is respectfully submitted that the foregoing comprehensive address has supported the argument against the proposed logging and has reputed the argument in favour of logging.- However Terania Creek is typed, typing being a matter of interpretation, it is a unique floral, fauna wilderness area in a relatively untouched state. The proposed logging would permanently disrupt this state thereby fundamentally altering the area's nature and usage.

A decision not to log will save the community considerable public moneys. In contrast, the private economic impact of not logging on the sawmillers' profits and local employment would not be experienced, if at all, for 20 to 25 years. Conversely, by not logging, the area would remain an integral part of the local economy and further, the growth of tourism, recreation, research and education. Thus promoting employment opportunities and income generation. This being the industries and future of the local area compared with sawmilling which has been declining since World War II if it was ever a major source of income and employment in the local area.

Coupled with the economic advantage flowing from not logging are the social advantages. The area clearly needs Terania Creek to be preserved as a much needed research basin, educational resource and recreational venue.

The use of the road by logging trucks,of itself, rules out any logging. The road's use by logging trucks produces an unacceptable level of public risk for little or no public benefit.

It is our submission that when the negligible inconvenience in the medium term to the sawmillers is weighed against the present and long-term damage the proposed logging would create,the inescapable conclusion is that the proposed logging should not proceed.

With the Compliments of

Mr. G. J. Graham

Dear Nan,

I've arranged for Manny Sicilia to send the rest of the transcript for the 22nd April '81 to you.

Enclosed are the Footnotes to our submission.

Best Wishes

FREDERICK JORDAN CHAMBERS
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Geoff Graham

3/6/1981

[illegible]
233 6055

FOOTNOTES

CHAPTER 1

1. terms of reference.
2. 21.12.79 - Tamberlin P.2.
3. 21.12.79 - Tamberlin P.1.
4. 21.12.79 - Tamberlin P.8.
5. Brian white submission.
6. T.N.F.A.G. preface.
7. Eg. financial records, labour figures, engineering statements etc.
8. 21.12.79 - Tamberlin P.5.

CHAPTER 2

1. Tamberlin 21.12.79 P.1.
2. Tamberlin 21.12.79 P.1.
3. Waugh C.S.I.R.O., 1980.

CHAPTER 3

1. A.O. Res. Note 17.
2. 2.9.80, P.9.
3. 2.9.80, P.18.
4. A44, Nature & Distribution of the Rainforest of N.S.W.
5. A10.
6. 19.9.80, Pp.25,26.
7. 19.9.80, P.28.
8. 19.9.80, P.26.
9. A188, P.1.
10. A188, P.1.
11. A190, (2), A190 (3).
12. A187, A188.
13. A189
14. A10

15. Type 53, P.44.

16. P.6.

17. A195.

18. 5.9.80

19. A190/2.

20. 5.9.80

21. A190.

22. A10.

23. A190C

24. 9.9.80, P.38, 5.9.80, P.14

25. 2.9.80, P.31.

26. 13.11.80, P.22.

27. A24 (1)

28. Supplement No. 7 of the Australian Journal of Botany.

29. 11.2.81

30. 5.11.80, P.4.

31. 5.11.80, P.4.

32. Australian Plants Vol. 9, No. 76, Pp 349-363

33. A (1).

34. Williams 1.12.80 P.6 and Floyd Appendix 5 of A (1).

35. 1.12.80, P.12.

36. B 111 (i).

37. B 111 (ii).

38. 1.12.80 P.14.

39. Constance Babington Smith - Excellence in Cameron Chatto & Windus.

40. Pp. 22,24 - 26.6.80.

41. P.17, P.21 - 5.9.80.

42. P.43 - 17.9.80.

43. P.57.

44. P.46.

45. P.56.

46. P.37.

47. P.3A 188.

48. P.22, 26.9.80, P.50, 24.9.80.

49. P.49, 24.9.80.

50. Cross examination by Prineas - 5.9.80.

51. P.9, 4.12.80.

52. P.48, 13.11.80.

53. P.40, 5.9.80.

54. P.52, 4.12.80

55. P.53, 4.12.80

56. A44.

57. P.25.

58. A187, P.3.

59. P.22, 26.9.80

60. Pp. 6,7, 4.12.80

61. Pp. 25-29

62. P.42, 13.11.80

63. P.2.

64. P.41, 13.11.80.

65. P.29, 1.12.80.

66. P.50, 4.12.80.

67. (1) on P.3.

68. Ref. Williams P.54, Webb, Floyd, Fox, Baur (A108, p.30, p.13).

69. P.55, 13.11.80.

70. P.45, 13.11.80.

71. P.29 - 19.9.80.

72. P.24 - 5.9.80/P.38 - 9.9.80.

73. P.4 - 26.9.80.

74. P.46 - 3.11.80.

75. P.83, 3.11.80, P.6, 7.11.80.

76. P.63, 14.11.80.

77. Pp. 63-65, P.54, 13.11.80.

78. P.60, 1.12.80.

79. P.11, 25.11.80.

80. P.19, 26.9.80.

81. P.50, 13.11.80.

82. P.61, 14.11.80.

83. P.60.

84. Pp. 33, 62 - 1.12.80.

85. P.41 - 4.12.80.

86. P.34, 4.12.80.

87. P.49 - 13.11.80.

88. P.31 - 4.12.80

89. P.17 - 3.9.80

90. 4.12.80

91. P.26.

92. P.26, 13.11.80.

93. Pp.27.28.

94. P.22, 13.11.80.

95. P.29.

96. P.30.

97. P.12, 25.11.80.

98. P.31.

99. P.32.

100. P.33.

101. P.35.

102. P.35.

103. P.59

104. Pp. 62-65.

105. P.7, 25.11.80.

106. P.30, 4.12.80.

107. P.17, 3.9.80

108. P.3.

109. 4.12.80

110. P.28.

111. P.29.

112. P.30.

113. P.57, 25.11.80

114. Ref. Bulletin of the Ecological Society of Australia Incorp. 10:3 Sept. 1980, P.6.

115. P. 35, A10

CHAPTER 4

1. Parn 15.5.80.
2. A32, P.3.
3. Bruce 13,14.6.80.
4. P.28 - 18.6.80.
5. P.26 - 18.6.80.
6. P.42 - 17.9.80.
7. Bruce P.29, 18.6.80, Florence P.37, 17.9.80.
8. P.34, 18.9.80.
9. 16.4.80.
10. P.36, 18.4.80.
11. Exhibit B106.
12. 3.11.80.
13. P.34.
14. P.33.
15. P.63,P.70.
16. 21-24.4.80.

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1. 25.3.80 P.94.
2. P.70, 9.4.80.
3. Clause 2 P.71. 9.4.80.
4. P.71, 9.4.80
5. P.82.
6. P.29.
7. P.28.
8. P.16.
9. P.61, 5.11.80
10. P.11, 11.2.81
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12. Appendix Q(1) of McIllroy's submission P.46 - 18.9.80.
13. P.51.

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17. P.7.

18. P.8.

19. P.7, 11.2.81

20. P.18.

21. P.19 - 5.11.80.

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24. P.28.

25. P.38.

26. P.28, 24.11.80.

27. P.29.

28. P.30.

CHAPTER 6

1. Pp. 25, 27, 25.6.80.

2. Pp. 33,35, P.26, 25.6.80.

3. 25.6.80

4. Pp. 7,8.

5. P.17.

6. P.68, 4.11.80.

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1. P.28, 17.9.80.

2. P.31.

3. P.12.

4. P.39.

5. Pp. 65,55, 17.9.80.

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1. A1, P.22.
2. 29.4.80, Pp. 51,52,53 (pp. 18,19 Somerville).
3. A75.
4. B15, p.23.
5. A1, p.22.
6. G.A.A.P. Measuring viability of sawmilling opo. C.S.I.R.O. 1980, Waugh pp. 3-6,15.
7. A1, P.22.
8. Ryan Lismore sittings 23.10.80.
9. P.76, 17.4.80.
10. P.74, 17.4.80.
11. B15, on P.30.
12. A1 on P.42.
13. P.16,27.3.80.
14. A90 (1).
15. A1, P.43.
16. A1. P.43.
17. N.C.C. Submission B15. P.32.
18. B15, p.31.
19. Maloney pres.
20. A1, P21.
21. Griffin '74.
22. A1, P.4. & Waugh.Pr.

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1. Ryan 23.10.80.
2. Maloney, Jones.
3. Korme & Brunt. The structure of the Australian Economy F.W. Cheshire Chapter.
4. Maloney.
5. October sittings.

7. A1, 3/4

8. 17.4.80, P. 76.

9. October (Maloney & Jones)

10. B70, P.41 etc.

11. A73, A62.

12. 20.10.80, P.73. 2SM.

13. 20.10.80, P.16.

14. P.20, 4.9.80.

15. A43 (2).

16. 2SM

17. Frank Roberts

18. P.102 of B70, Father Maloney 20.10.80.

19. A1, P.31.

CHAPTER 10

1. 19.3.80 P.48.

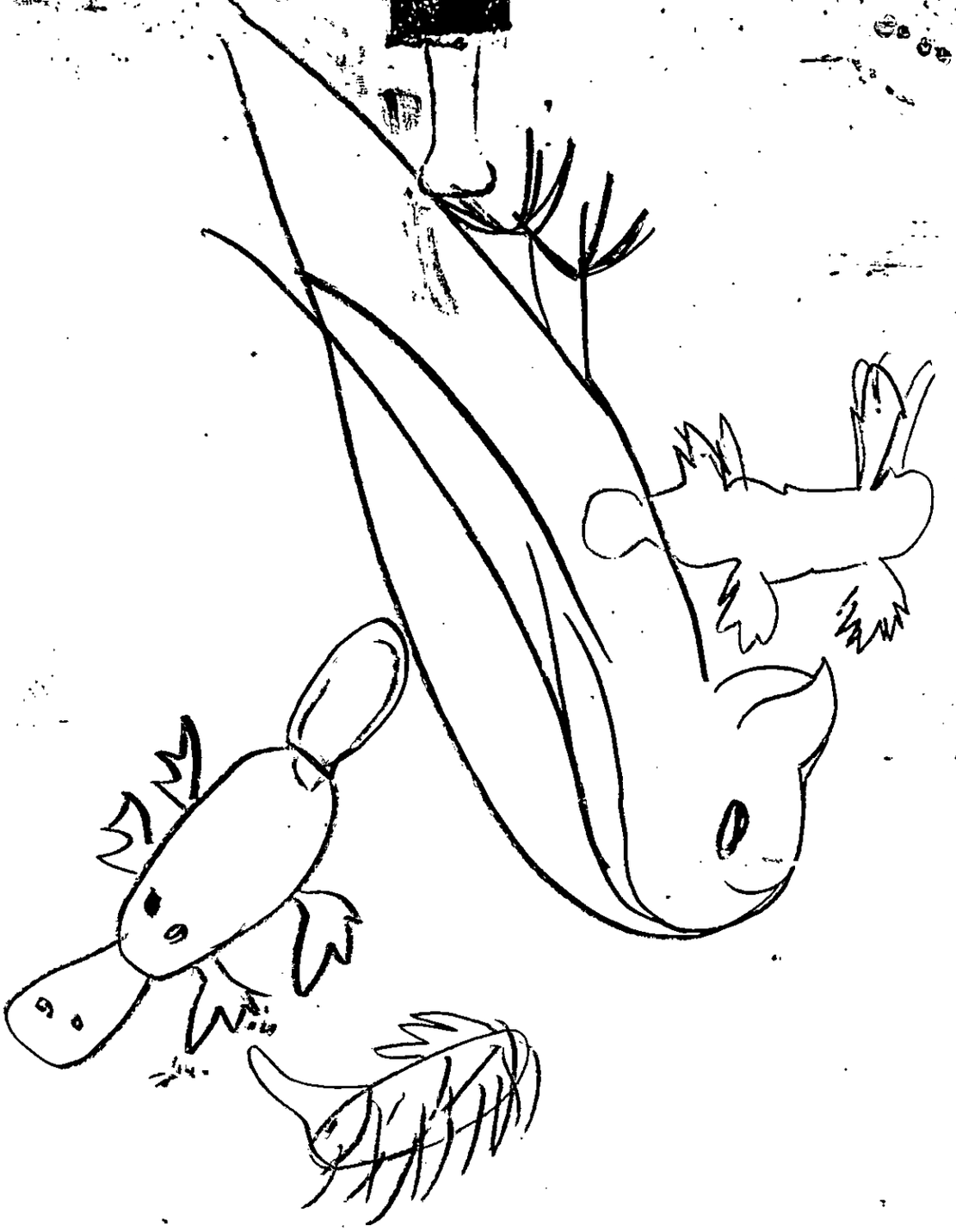
2. Ex. B70.

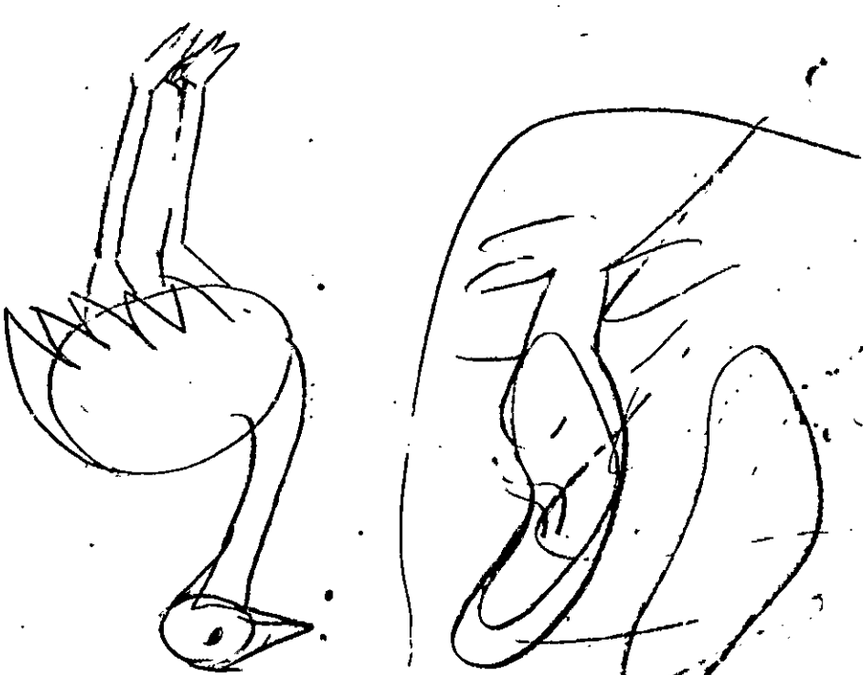
3. 20.10.80, Pp. 5360-5420.

4. Ex. B89.

5. Ex. B93 and 94.

6. Ex. B90, 91 and 92.





INQUIRY INTO THE PROPOSED LOGGING AT TERANIA CREEK

F I N A L A D D R E S S

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C O N T E N T S

PART ONE

1.0 GENERAL INTRODUCTION

1.1 The Commission is to inquire into two aspects of problems arising from the implementation of the Casino Forest District Management Plan and to recommence logging in State Forests adjacent to Terania Creek.

1.2 These aspects are firstly the impact upon the immediate environment if the proposed logging proceeds and secondly the impact upon the sawmilling and related industries if the proposed logging does not proceed.

1.3. It will be our submission that the proposed logging is so selective and such care is to be taken in its execution, that the effects upon the environment will be minimal and then only temporary.

1.4 We will further submit that the impact upon the sawmilling and related industries if the proposed logging does not proceed will be significant, particularly taking into account evidence to indicate that attempts to stop the logging are only 'the thin end of a wedge' of a much wider issue, in more than one way affecting the whole State of New South Wales and possibly beyond. — irrelevant to this Inquiry

1.5 We will contend that a great deal of evidence supporting these submissions has been presented to the Inquiry and that little or no supportable evidence to the contrary has been forthcoming.

1.6 It is therefore our belief that the Commission should recommend that, within the environmental constraints clearly stated in the Forestry Commission's submission to the Inquiry(1) the State Forests adjacent to Terania Creek should continue to be put to the purpose for which they were intended, in accordance with the Objects of the Forestry Commission in Section 8A of the N.S.W. Forestry Act 1916(2) for multiple use by and for the benefit of all of the people of the State.

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(1) Ex.A1
(2) Ex.A2

1.7 In making such a recommendation we believe that the Commission would be upholding and fostering the true concept of Conservation as expressed and practised by the world's leading authorities on the subject[3] and clearly iterated in Section 8A of the N.S.W. Forestry Act 1916 as amended and reprinted as late as 1st May, 1980.

1.8 At the same time the recommendation would show recognition of the importance of the sawmilling and allied industries in the district adjacent to Terania Creek where they are major employers in an otherwise somewhat depressed area[4] as well as recognising the value of these industries throughout the State, a value which is, of course, created and sustained by the demand, if not indeed the right, of the people of the State to be supplied with their timber requirements from the State's publicly-owned forests.

question this

(3) Ex.A193,p.2, Appendix B
(4) T.4118: Ex.A193, Appendix D

2.0 FOREST TYPING AND CLASSIFICATION

2.1 In relation to both major aspects of the Inquiry, much has been said on the subject of what is and is not rainforest and whether or not Brush Box is a rainforest species.

2.2 The Commissioner has repeatedly pointed out that the Terms of Reference of the Inquiry do not require him to investigate the rights and wrongs of rainforest logging.

2.3 It is therefore our contention that all such evidence only has relevance for the purpose of determining what flora and fauna may be present and what impact the proposed logging may have upon it.

2.4 However, bearing in mind evidence which we will quote later, which we believe reveals that the aims of the anti-logging group are extremely wide, we urge the Commission to make specific findings to the effect that:-

2.4.1. The classification procedure followed by the N.S.W. Forestry Commission and published in Research Note 17(5) is scientifically and silviculturally valid and should be adhered to and that

2.4.2. Brush Box is not a rainforest species.

2.5 In so urging the Commission we cite the great weight of scientifically and professionally based evidence presented by the N.S.W. Forestry Commission on the subjects of soil characteristics, fire and its consequences and the improbability of seral succession in places where rainforest species have invaded, to become understorey in forest stands dominated by Brush Box. We have no doubt that these matters will be dealt with fully in the N.S.W. Forestry Commission's final address and do not propose to take up the Commissioner's time on an exercise in repetition. However, we do point out

(5) Ex.A10

that this evidence was corroborated by our own expert witness, Dr. Ross Florence(6).

2.6 In addition we draw attention to descriptive literature on tree species presented in evidence, in which Brush Box is invariably described as being distributed on the borders or at the edges of rainforest and in adjacent tall open forest(7).

This evidence was confirmed by Mr. J.B. Williams when he appeared before the Inquiry(8) during which he agreed that he was the co-author of two publications so describing Brush Box and that in his submission to the Inquiry(9) he was describing Brush Box as a sclerophyll forest species "in the context of Terania Creek",(10).

2.7 We believe that this evidence, in part from the anti-logging group itself, is sufficient to justify the Commission agreeing with this request and stress our firm belief that any recognition, even tacit or suggested on the Commission's part, that areas other than those classified according to Research Note 17 are rainforest, in particular areas with Brush Box/rainforest species intermingling, could have repercussions involving the future supply of timber to the community from forests covering much of the Eastern forest belt of the State.

2.8 Many sawmilling and allied employers along with thousands of employees and in some places entire communities could be affected if the close relationship between certain forest types(11) were to be interpreted otherwise than in Research Note 17, as there is nothing unique about the forest adjoining Terania Creek and there are hundreds of similar locations in the State(12).

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(6) Ex.A193, Appendix E, p.p. 11,12,14,17&37: T.4179,4180 4181,4185,4198 & 4199.
(7) W.D. Francis, Ex.B71 (ii): J.B. Williams, Ex.B111.
(8) T.6475,6476,6478,6479 & 6480
(9) Ex.B111
(10) Ex.B111, p.1: T.6475 & 6476
(11) Ex.A193, Map 1 & Appendix E p.p. 9-17)
(12) Ex.A193, p.3: T.4166,4167,4189 & 4194: T.4239: T.6220: T.6255: Ex.B109 p.p. 22&23.
(12a) Ex.A225

PART TWO

3.0 IMPACT OF THE PROPOSED LOGGING ON FLORA AND FAUNA

3.1 In relation to the environmental impact of the proposed logging, evidence has been given by parties on both sides of the dispute to the effect that the forests adjacent to Terania Creek provide a habitat for a wide range of animal and plant life, some rare, or common only in narrowly defined areas.

3.2 Attempts have been made to press the existence of this habitat as a reason for not logging.

3.3 It is our contention that such an argument does not stand up to examination, but rather we will show that there is abundant evidence to support the proposition that the wildlife and plant communities are there in spite of and in some cases because of, human interference, possibly over thousands of years and right up to the present day.

3.4 This being the case, we believe that there is no reason to suppose that the species concerned will not continue to flourish if the proposed highly selective logging proceeds.

3.5 In support of this argument we draw attention to evidence from the National Parks and Wildlife Service and Mr. F. Roberts indicating that, prior to European colonisation, the area was extensively used by aborigines. Primitive artefacts have been found and other signs of occupation described(13).

3.6 This being the case, it is not unreasonable to assume that such occupation was over a very long period at pre-European - colonisation history.

3.7 The aboriginal people were in the habit of intensively husbanding the land by the use of "fire stick farming", in order to promote growth of young vegetation and to keep the landscape open for hunting purposes(14).

(13) Ex.A1, p.31: Ex.B70, Section 3.7; Ex.B109, Section 7; Ex.B109 (iii); Ex.B109 (v): T.5230 to 5252: T.6302 to 6319.

(14) Ex.B156 (i) p.p. 8to12: T.6227,6239 & 6240.

NB. Such fire making is not to be confused with the highly destructive "wildfires" dealt with at length in evidence by the N.S.W. Forestry Commission and elsewhere. (See T.4021 & 4022 for relationship small fires versus wildfires).

3.8 A possible reason given for the periodic intense wildfires which apparently swept the area, laying down heavy charcoal deposits, may have been aboriginal fires getting out of hand.(15)

3.9 Following European settlement, logging in varying intensities began, as well as clearing of forested land adjacent to Terania Creek for agricultural purposes.

3.10 Reference is made to cedar cutting 'at the head of Terania Creek" prior to 1879(16). The N.S.W. Forestry Commission also has recorded "Terania Creek Camp" as a cedar-cutters site, apparently around 1845.(17)

3.11 For a period probably as long as 135 years then, at least large parts, if not all of the forests adjoining Terania Creek have been logged in intensities varying from selective to clear falling.

3.12 The logging during World War II has been described as excessive, massive and very heavy.(18) The forests were continuously logged with some clear-falling between at least 1943 and the early 1970's.(19)

3.13 Over the years a number of farm properties have been carved out of the forest and limited land clearing is still proceeding.(20)

(15) T.4037: T.4241
(16) Poem attached to Ex.B105 (i) "An Old Ceadergetters Camp 40 Years Ago", written 1919.
(17) Ex.A1, p.5.
(18) Ex.A1, p.10: Ex.A132, p.2: Ex.A193, p.13: T.6217.
(19) Ex.A193, p.12: Ex.A193, Appendix J.&K.: T.3207
(20) T.5262

3.14 Visitors and campers in large numbers have in recent years descended upon the place, including a very large gathering in September 1979. Frequent visits by groups of primary, secondary and tertiary students have been made.(21) Organised tourist trips have intensified in recent times.

3.15 All this human interference is in addition to periodic wildfires and serious storm damage.(22)

3.16 Yet in spite of all this disturbance and activity, the wildlife and plant communities remain in numbers, form and quality considered to be so good as to produce the circumstances which instigated this Inquiry.

3.17 This, we contend, is in fact no more than is to be expected. It is nothing more than the general regime obtaining in hundreds of State Forest locations in New South Wales.

3.18 It is our view that it is completely illogical to suggest that this status will be altered by the proposed light, selective logging of five small locations involving only some thirty to forty per cent of the trees in ten per cent of the area, over a period of a few months, with the area then to be left unlogged for twenty to twenty-five years.

3.19 This view is, of course, supported by expert witnesses including Dr. John McIlroy and Mr. Alex Floyd who stated that whereas individual plants or animals may suffer during the proposed logging, species would not and that after completion of the proposed logging, the area would still rank very highly as a viable habitat for certain wildlife species.(23)

(21) T.5076 to 5081: T.5113 & 5114.
(22) T.85
(23) T.4300 to 4303: T.6253.

4.0 IMPACT OF PROPOSED LOGGING ON LOCAL RESIDENTS

4.1 As part of the environmental aspect, the impact of the proposed logging upon the people living along the approach road has been considered.

Evidence has been concentrated upon the alleged traffic hazard which would result from timber trucks using Terania Creek Road to haul away the logs.

4.2 There is no attempt here to deny that the road is narrow and in places winding, however, we do contend that it is no worse than and possibly not as bad as many country roads in remote areas of the State, particularly those adjacent to State Forests.

4.3 We contend that reasonable care and time - scheduling of the timber trucks, particularly away from school bus times, would minimise the problem.

4.4 Evidence has been given to the effect that under normal circumstances, Standard Sawmilling would only employ one logging crew.(25) It is reasonable to assume that, with their relatively small volume, Hurfords would also only use one crew and then not for the full period of logging.

4.5 With this in mind we believe that the number of timber trucks per day would in fact be quite small. There certainly will be no call for the nine trucks per day mentioned in evidence by the Forestry Commission.(26)

4.6 There is evidence to the effect that neither of the logging contractors, during many years experience, can recall any traffic accidents involving logging trucks, even at a time when there were numerous dairy farms along the road and a greater population than today existed.(27) The braking systems on modern log trucks are also very efficient, thus reducing the accident potential.(28)

(25) T.4108
(26) Ex.A1, p.21
(27) T.2130,2131 & 2132
(28) T.2152 & 2153

4.7 We submit that there is a strangely contradictory situation where the Terania Nature Forest Action Group are with one hand pleading that the Terania Creek road is unfit for all but the lightest of traffic at the same time as various of its members and some of their sympathisers, are and have been actively encouraging large numbers of tourists, students bodies and others to visit the place, involving tourist buses and many private cars.

4.8 We therefore contend that the attempt to establish a potential inordinate traffic hazard should logging proceed (29) is exaggerated, unsupportable and, in fact, contradicted by the actions of those making it.

(29) Ex.B70, Section 4

5.0 IMPACT OF PROPOSED LOGGING ON RECREATIONAL AND EDUCATION VALUES

5.1 In considering the impact of the proposed logging upon the immediate environment, the recreational and educational aspects must be given major consideration particularly taking into account the multiple use concept which this Association espouses.

5.2 True conservation, we believe, maximises the uses to which the environment is put and sets about extracting the essence from it in a manner designed to perpetuate the ability so to do.

5.3 This clearly means that no one activity can be allowed to disproportionately detract from any other and we have expressed this as our philosophy in evidence.(30)

5.4 It has been stated by many witnesses that the recreational and educational potentials of the forests adjacent to Terania Creek are particularly good(31) and we agree with this opinion.

5.5 In our view this does not detract from their importance as a source of valuable timber required, indeed demanded, by the community, nor, we contend, is there any reason why that timber should not be extracted in a manner designed to conform with sound conservation principles, which, of course, would be the case if the proposed logging were to go ahead.

5.6 Expert testimony has been given to the effect that the proposed logging would not reduce the area's value in its educational or recreational roles(32) and we argue further that to exclude the logging operation would in fact be losing an educational opportunity.

(30) T.4104
(31) Ex.A193, Appendix E, p.17 and elsewhere)
(32) Ex.A193, Appendix E, p.23

5.7 It seems to us that students of all ages need to be educated in the true principles of conservation and that the proposed logging operation would provide an excellent opportunity to see those principles in action.(33)

5.8 The very fact of watching nature in action in the regeneration process is surely in itself educational and to some even a spiritual experience.

5.9 We believe that even small children deserve better than to have the simple facts of man's proper and enlightened use of natural resources deliberately withheld from them, as was suggested by the Terania Native Forest Action Group.(34)

5.10 For the majority of people, both educational and recreational opportunities must, we believe, be enhanced by access which, in managed forests, is provided by way of logging roads and tracks. Expert testimony was given that this will be the case if the proposed logging proceeds.(35)

5.11 We submit therefore that there is ample evidence to support the contention that the proposed logging is consistent with true conservation principles.

5.12 It would not in a disproportionate way detract from other components of the multiple use of the forests and in fact may in some ways enhance it.

5.13 With regard to future use of the forests we uphold the principle that conservation of the environment may well demand some form of control over the behaviour of visitors.(36)

(33) Refer Ex.A193, p.2 and Appendix B
(34) T.5116
(35) Ex.A193, Appendix E, p.23
(36) T.4760 to 4764: T.84 & 85: Ex.B109, p.32: T.6316 & 6317

5.14 It is our belief that such control would be best achieved if the N.S.W. Forestry Commission were permitted to proceed without further harrassment, in their appointed task as Managers of the State Forests and in support of this statement we draw attention to Dr. Ross Florence's testimony on the subject of the Forestry Commission's general standard of forest management.(37)

(37) Ex.A193, Appendix D, p.25: T.4236 to 4238

6.0 IMPACT OF PROPOSED LOGGING ON ABORIGINAL RELIC SITES

6.1 Under the umbrella of the environmental impact of the proposed logging, we believe that careful consideration must be given to the sensitive subject of aboriginal sites and relics known to exist in the area.

6.2 This Association is demonstrably sympathetic towards the need for all Australians to preserve as much as is practical of the Aboriginal heritage.

6.3 However, we do not see this as a reason for not logging the five areas proposed to be logged.

6.4 Rather we see it as a reason for the right degree of care to be taken by all concerned in the logging operation and both the Forestry Commission and the sawmilling companies have indicated their willingness in this direction.(38)

6.5 At the same time we draw attention to the evidence of various parties and express our belief that some over emphasis has been placed on the importance of the place in relationship to this subject.

6.6 We consider it of some significance that the National Parks & Wildlife Service, up to the time of their representatives appearing before the Inquiry in late November, 1980, had not considered Terania Creek of sufficient importance for Miss Sullivan who is "in charge of the section within the Service which looks after aboriginal sites" to have visited the place.(39)

6.7 Considering that Miss Sullivan majored for her Honours Degree with a thesis on Aboriginals of the Richmond Tweed Valley and gave evidence of having carried out extensive field work in North East New South Wales with Dr. Isobel McBride,(40)

(38) Reference A1, p.31, 5.8
(39) T.6300 & 6301
(40) Ex.B109 (ii): T.6301

we contend that it can only be construed that the Service, Miss Sullivan and Dr. McBride place no extraordinary importance on Terania Creek in this context.

6.8 The Service was at pains to express the view that the known aboriginal sites were under no direct threat from the proposed logging[41] and stressed that the real danger to the sites was from uncontrolled visitation.[42]

6.9 Of his own volition, Mr. Hitchcock of the Service sought to have the word "sacred" substituted with the word "relic" in relation to the aboriginal sites and at the same time Miss Sullivan, the only truly qualified expert witness on the subject, supported Mr. Hitchcock in this action.[43]

6.10 Evidence from the National Parks & Wildlife Service laid stress on indications of aboriginal occupation.[44]

6.11 We accept this evidence but in so doing are bound to harbour serious doubts as to the degree of sacred significance of the area and we take special note of Mr. Hitchcock's word substitution mentioned earlier.

6.12 During cross examination[45] Mr. Hitchcock stated "we have not conducted any specific survey for aboriginal relic sites".

6.13 However, there is in evidence a document, on the Service's letterhead entitled "Aboriginal Sacred Sites Survey Team Terania Creek Basin" and dated 15/8/78.[46]

6.14 The Exhibit itself appears to have been written as a side issue by a member of a survey team and therefore makes no mention of the findings of the team in its prime purpose. Additionally there is evidence of another visit by a survey team from the Service in October 1978.[47]

(41) T.85:Ex.B109, p.31: T.6313
(42) T.84 & 85: Ex.B109 p.32: T.6316 & 6317
(43) T.6318
(44) Ex.B109, p.31: T.85: T.6302 to 6319
(45) T.6305
(46) Ex.A211
(47) Ex.A1 Section 5.8

6.15 However, it is significant that the findings of these survey teams have not been brought to the attention of the Inquiry by the Service and were apparently of such small or perhaps negative impact as to lead both Mr. Hitchcock and Miss Sullivan not to consider them worthy of mention, either in producing their submission to the Inquiry or in subsequent verbal evidence.

6.16 In its Submission to the Inquiry,(48) the Terania Native Forest Action Group quoted an exerpt from Exhibit A211 which was, we submit, completely out of context with the subject matter in hand and should therefore, in our view, be given no weight whatever by the Inquiry.

6.17 The only aboriginal witness to appear before the Inquiry, Mr. Frank Roberts, gave evidence indicating that the Forests adjacent to Terania Creek had religious significance to him and his people.

6.18 We do not wish to take issue with this witness's beliefs but there do appear to be certain weaknesses in the evidence.

6.19 Mr. Roberts is a member of the National Aboriginal Conference. His evidence as to what this entails(49) indicates that he occupies a position of influence considerably greater than the average man.

6.20 Yet he made no attempt to become actively or publicly involved in any matter concerning the forests adjacent to Terania Creek until August 1979.(50)

6.21 Furthermore, much of the evidence that he did give, related to events in which his deceased grandfather and father participated in their youth, long before Mr. Roberts' birth, and which supposedly involved the Terania Creek area.

(48) Ex.B70, p.66
(49) T.5236
(50) T.5238

6.22 At the same time Mr. Roberts stated that his own partial initiation did not involve the Terania Creek area and we are led to wonder why not, if the place is of such paramount importance.(51)

6.23 At the time of writing its Submission to the Inquiry, that is February or March 1980(52) the Terania Native Forest Action Group, which at the time had free access to Mr. Roberts in his official capacity, along with his relatives and others, stated, "we don't have the information to claim that the cave in Terania Creek has this very special (spiritual) significance but the local aboriginals don't discount the possibility".(53)

6.24 In the light of Mr. Roberts' evidence it seems that somehow between March and October 1980, the local aboriginals' memory crystalised.

6.25 We believe therefore that whereas there is conclusive evidence to the effect that there are relics of aboriginal occupation in the area, there is no such evidence of the sanctity of the place.

6.26 Be that as it may we hold to the view that, with proper care and co-operation between the parties, there is no reason why logging should not proceed at the same time as aboriginal relic sites, sacred or otherwise, are preserved.

6.27 We believe that matters concerning the future use of the area by aborigines may well be outside the scope of the Inquiry as indicated by the Commissioner.(54)

6.28 However, if the Commissioner does decide to comment on this matter, we respectfully suggest that, whether his recommendation is to proceed with the logging or not, he recommends to the local aboriginals that they co-operate closely with officers of the Forestry Commission who manage the forest, as the aborigines are much more likely to receive assistance in preservation of the sites from that body, than from people who have appeared to support them but who would have uncontrolled visitation by bus and car loads of tourists, students and others, thus seriously endangering the sites.(55)

(51) T.5248
(52) Ex.B70
(53) Ex.B70, p.65
(54) T.5235
(55) T.84 & 85: Ex.B109, p.32: T.6316 & 6317

7.0 GENERAL REMARKS ON ENVIRONMENTAL IMPACT OF PROPOSED LOGGING

7.1 In general on the subject of the impact upon the immediate environment we feel that we can not do better than to draw attention to expert witnesses, Drs. John McIlroy & Ross Florence who testified to the effect that:-

7.1.1. As a subjective opinion, (based on expertise and experience) the proposed logging would not significantly affect birds and mammals present, provided the high standard and special standards listed by the Forestry Commission of N.S.W. are maintained (Ex. A193, Appendix Q, p.12).

7.1.2. During the 1979 logging there were some good examples of the felling of Brush Box with very little damage to the understorey in the vicinity, this in spite of the logging having been carried out in unusual and adverse conditions. (Ex. A193, Appendix E, p.29).

7.1.3. There is no inherent danger to the Palm forest seen in logging the wet sclerophyll forest (Ex. A193, Appendix E, p.35)

7.1.4. There will be no case for suggesting any loss of vegetation component or disappearance of any type of animal habitat. (Ex. A193, Appendix E, p.38).

7.1.5. We can have our cake and eat it too. We can maintain the aesthetic attractiveness of these forests and we can utilise the resource. (T.4206).

PART THREE

8.0 INTRODUCTION TO IMPACT ON INDUSTRY IF PROPOSED LOGGING DOES NOT PROCEED

8.1 We believe that any consideration of the effects upon industry of not proceeding with the proposed logging, should follow two separate but related avenues, i.e., firstly the effect upon industry in the immediate vicinity of the proposed logging and secondly the possible flow-on effect in other areas of the State.

8.2 In pursuing this line of argument we define "industry" as any or all commercial activity which would be embraced by the multiplier effect attaching to the sawmilling industry.

8.3 However, we contend that the considerations should be taken further, in so far as the multiplier can only be measured against actual or contemplated measurable economic activity and does not take into account any unmeasurable, but nevertheless real effect, potentially produced by a lack of confidence restricting or curtailing economic activity.

8.4 In our view these matters are all so closely interelated that each must be considered in its relationship with the others and we ask the Inquiry so to do.

9.0 IMPACT ON THE IMMEDIATE VICINITY IF THE PROPOSED LOGGING DOES NOT PROCEED.

9.1 The sawmilling industry in the immediate vicinity of the proposed logging and particularly the two companies which were to have logged the area prior to suspension, have suffered severely in recent years from reductions in availability of raw materials, due in no small measure to the outcome of the Border Ranges Inquiry.

9.2 Details of these reductions are in evidence.(56)

9.3 The outcome of these reductions, in real, measurable terms, has been a serious reduction in employment and business activity with one company alone being forced to reduce its workforce by some 36% between 1976 and the present day and to withdraw completely from a marketing activity in Queensland.(57)

9.4 When the multiplier effect is taken into account (refer Appendix One), the district has suffered significantly resulting directly from these reductions of available raw material to the sawmilling industry; which is vital to the district's economic viability.

9.5 It has only been saved from being far worse by the innovative nature of the industry which has embarked upon further processing of sawn timber products, thus creating job opportunities. Details of some typical moves in this direction are in evidence(58) and the facts of resultant extra employment are also outlined.(59)

9.6 We believe that there is ample evidence to convince the Inquiry that the district could ill afford this decline in activity.

9.7 Various parties have testified to the disproportionate importance of the sawmilling industry in the district and to the fact that unemployment in the district is as high as three times the National average with the employment situation continuing to deteriorate.(60)

(56) Ex.A136, Sections 2.6 & 3.3: Ex.A7
(57) Ex.A136, p.16, T.3326 & 3334, T.3594,3595,3611,3612
(58) Ex.A136, Section 7
(59) T.3546: T.3594
(60) Ex.128: T.4122,4123,4124: T.4635,4636,4637: Ex.A203 (i): T.4964

9.8 This being the case, we contend that the Companies concerned, their employees and indeed all those in the community at large in the district who have any reliance whatever on the existence of the sawmilling industry, have suffered enough and any further reduction in available raw material to the sawmilling industry will be intolerable.

9.9 Specifically Standard Sawmilling Co. has stated that any reduction in raw material would place the company's business in jeopardy.(61)

9.10 The reasoning behind that statement can, we contend, be clearly seen by visiting the company's mill and was clearly stated in evidence.(62) We believe that in particular the evidence in relationship to valuation of the Company is of great significance and that the same remarks may well be extendable to other companies in the district whose activities revolve wholly or in part, directly or indirectly, around the availability of forest resources.

9.11 We also believe that evidence given on the subject of general business and personal confidence in the industry within the district, will lead the Inquiry to recognise that the enforced reductions in forest resources which have already taken place have undermined that confidence to a marked degree.(63)

9.12 Obviously the actual loss of business activity is measurable and the multiplier can be directly applied.

9.13 The results of the lack of confidence are less tangible, but are nonetheless recognisable.

9.14 One aspect was referred to by Standard Sawmilling Co. in relation to the valuation of the company. At the same time that company outlined plans and projects which it has under

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(61) Ex.A136, Section 2.14: T.3562 to 3567
(62) T.3326: Ex.A136, Section 3.13 to 3.18
(63) T.3330,3331,3332: T.3612 & 3613: T.4125,4126,4135,4136,4137: Ex.A203: T.4632,4633,4642,4643,4644,4649: Ex.A204: T.4661,4664,4665,4666

consideration[64] however, the company preambled that evidence by stating "It (the company) looks forward with justified confidence to many years of continued success provided of course, that future availability of local timber resource is not dimished from existing estimates for any reason".[65]

9.15 Again it does not seem unreasonable to assume that other companies in the district view the situation similarly and this is borne out by evidence from McKee Engineering Pty Ltd.,[66]

9.16 Personal confidence in the industry is being seriously undermined and evidence to this effect was heard.[67] We believe that decisions by the workforce involving spending from consumables through to major items such as homes and motor vehicles must be being affected, to the detriment of economic activity in the area.

9.17 In light of all the foregoing we believe that industry in the district has already been harshly dealt with and that it can not properly be asked to withstand more.

9.18 In our view nothing has been said in evidence to detract from statements made by Standard Sawmilling Co., and our own witnesses,

9.18.1. "We've reached the point that any further reductions (in timber resource), irrespective of how small, will become very significant in our future planning." (T.3520).

9.18.2. "We are saying we can go no further." (T.3574).

9.18.3."I think the industry has now reached a point where any further reduction in available timber will, regardless of their size, be of significance, any further reduction at all of any description." (T.4102)

(64) Ex.A136, Sections 3.8, 3.9, 4.1
(65) Ex. A136, Section 2.8
(66) Ex.A128, T.3110 & 3111
(67) T.4135

9.18.4. "There have been quite substantial reductions and any other reduction is, we believe, gone (going) beyond an acceptable line." (T.4103).

10.0 POINTS ON THE SAWMILLING INDUSTRY IN N.S.W.

10.1 Before passing on to the possible flow-on effect of not proceeding with the proposed logging, it may be pertinent to point out some facts as we see them, relative to the sawmilling industry in N.S.W.

10.2 Various attempts have been made by those opposing the logging, to portray the sawmilling industry as flagging, ailing, if not in fact doomed to ultimate failure.

10.3 This we emphatically refute and contend that there is sufficient evidence before the Inquiry for it to reject any such suggestion.

10.4 There is no denying that over a period of years, activity in the industry in some areas has declined. In other districts activity has increased, notably through further processing and on the N.S.W. North Coast as a whole, the local decline in the area adjacent to Terania Creek has been offset, resulting in an overall increase in employment in the last six years.(68)

10.5 It requires little effort to visualise the position the industry would be occupying on the North Coast were it not for the sustained decrease in activity in the Casino-Murwillumbah district.

10.6 Where sustained reductions have taken place they have been brought about by diminution or disappearance of the raw material source, in part from private property, further through Quota reductions with a view to achieving sustained yield, improved environmental safeguards and to a major extent through the conversion of forested land to National Parks and other reserves.

10.7 Between 1969 and 1979, 87,000 hectares of forest were transferred from the Forestry Commission to the National Parks and Wildlife Service.(69)

10.8 Resource and employment go hand in hand.(70)

(68) T.4118
(69) Ex.A193, p.7
(70) T.3594

10.8 It is true that due to the prolonged attack upon and erosion of forest resources there is a high degree of uncertainty within the sawmilling industry and that capital investment decisions are in many places being held in abeyance.

10.9 It only requires confidence in the raw material supply to be restored for the industry to revert to its true character. Progressive, innovative and enlightened.

10.10 Standard Sawmilling Co., has given evidence of its innovative nature(71) and that recent capital expenditure has tended to improve employment opportunities(72)

10.11 We submit that in these respects Standard Sawmilling Co., is typical of the sawmilling industry and may be used by the Inquiry as an example of the character of the industry as a whole.

10.12 The sawmilling industry is a major employer and is the largest decentralised industry in the State of N.S.W. directly employing some 7,500 people.(73)

10.13 Traditionally also, the industry provides vitally needed seasonal and part-time employment for small dairy farmers and beef cattle producers, thus playing an additional role in the maintenance of rural viability.(74)

10.14 More than half of the total demand for timber in N.S.W. is currently supplied by the local sawmilling industry predominately from indigenous species.(75)

10.15 Apart from a slight shift in species mix this situation is not expected to change greatly for the next five to ten years, at the end of which increasing volumes of plantation softwood will become available. However, by that time world supplies of timber may well be in a critical state with general short supplies both in Australia and abroad being experienced.

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(71) Ex.A136
(72) T.3594
(73) Ex.A193, p.4.
(74) Ex.A193, Section 3.13
(75) Ex.A193, Appendix F

10.16 With an eye to both the immediate and long term future, we contend that the sawmilling industry is of such importance to the State that any action on anyone's part which may undermine it, reduce its viability or detract from its ability to plan into the future, will be to the general disadvantage of all of the people of N.S.W.

11.0 THE THIN END OF THE WEDGE OR FLOW-ON EFFECT IF THE PROPOSED LOGGING DOES NOT PROCEED.

11.1 Having regard to all the foregoing we turn to evidence before the Inquiry to the effect that people on both sides of the controversy see the move to prevent the logging at Terania Creek as the thin end of the wedge of a much wider issue and that any recommendation not to continue with the proposed logging may well be used by the State Government in its future policy making in respect to the exploitation of the State's forests.

11.2 Reference to this concept was made on numerous occasions, some examples of which we will briefly quote:-

11.2.1 A letter dated 29th October, 1979 from Mr. Len Willan, Vice Chairman of the Nature Conservation Council, addressed to the Hon. D.P. Landa, clearly indicating the scope of that Council's campaign, including a reference to the native forests of N.S.W. in general.

Part Ex.B.102

11.2.2 A letter dated 11th February, 1980 from the same Mr. Willan, addressed to the Premier of N.S.W., again clearly refering to all the native forests of N.S.W. and to a broadly based campaign.

Part Ex.B.102

11.2.3 "The outcome of this Inquiry might not only determine the fate of Terania's Brush Box stands, it could flow on to affect Government and public attitudes to several more forestry 'dominoes' including the Black Scrub dispute in the Bellinger Valley and the Washpool Wilderness controversy in the Clarence Valley....."

National Parks Journal April 1980 p.15.
(Not in evidence but referred to by the Commissioner. T.4605 to 4607).

11.2.4 "..... this is the thin end of the wedge and if the environmentalists have a victory here they're going to close up a terrific amount of forest in this State and then where are we going to be for timber."

Mr. F. Mannewell T.3210

11.2.5 ".....that the original local nature of the issue has been extended to two ways to suit the interests of particular minority groups. Those two ways are (a) by the alternative society to test their capacity to influence society from without and (b) by various and sundry conservation groups looking for new techniques to preserve natural resources, irrespective of cost to the community."

Ex. A.136, Section 1.5

11.2.6 "In the course of that discussion, Mr. Leggett indicated clearly to us that he believed in the issues at stake, that is whether or not the forest should be logged but he had an overriding belief that this was a test of the small man and the small group of people to influence Government and to change society."

Mr. G.A. Adam T.3317

11.2.7 "It is the view of this Association that the Government's decision regarding the logging of Terania Creek could well be considered as the thin end of the wedge by parties to the Inquiry and the Government itself."

Associated Country Sawmillers of N.S.W. Ex.A193, p.8

11.2.8 Mr. G. Graham: "Isn't the real concern of your members the possible symbolic significance of the decision not to log the timber at Terania Creek?".

Commissioner: "By symbolic you mean the thin end of the wedge?".

Mr. Graham: "I suppose I do, yes."

T.4102

11.2.9 ".....Terania Creek is seen as the thin end of the wedge. We've said this in our submission and it's been repeated. And the danger as the industry sees it is that the gully down the road will be the next Terania Creek and the one after that and the one after that."

F.E. Allen T.4134

11.3 We contend that the foregoing is probably enough to convince the Inquiry that a recommendation not to proceed with the proposed logging would be seen and used as the thin end of the wedge in a wide campaign which we believe would, if successful, have a devasting effect upon the timber and allied industries in N.S.W. and through them, upon the whole community.

11.4 We further contend that evidence given by Mr. B.J. Unsworth was most telling, from an impeccable source which warrants very special recognition.(77)

11.5 Mr. Unsworth finally stated on this subject, "Well Your Honour, I am a member of the State Parliament and I'm not unaware of the way in which Inquiries of this nature are used by Government in respect to their future determinations. And I think that it's not possible to view the logging of the Terania Creek Basin in isolation in respect to determining the State's future policies in respect to the exploitation of the State's forests."(78)

(77) T.4644,4645 & 4646
(78) T.4650

12.0 PUBLIC OPINION

12.1 Various parties to the Inquiry have sought in different ways to impress upon the Inquiry the weight of public opinion supporting their own stance in the controversy.

12.2 It is our view that apart from two surveys carried out in the Lismore district itself, there is really insufficient evidence on this subject to justify serious consideration.

12.3 However, as the matter has been raised we feel obliged to comment on it and to point out what we perceive as weaknesses in the case presented by the anti-logging group as against our own.

12.4 A survey in the Lismore district was commissioned by the Terania Native Forest Action Group and carried out by the R.E.A.R.K. organisation.

12.5 This survey took the form of a telephone poll and it is our contention that the results must be open to question due to the phraseology of some of the questions and the small sampling.(79)

12.6 Subsequently, this Association commissioned a second survey which was carried out by Dr. Roger Munro.(79)

12.7 This survey covered a much larger sampling of residents, in fact over twice as large as the previous poll and in Dr. Munro's opinion accurately reflected the opinions of the majority of voters living in Lismore City L.G.A.(79)

12.8 We believe that it is most noteworthy that the questions posed in this second poll were agreed to by Mr. Bren Claridge and Dr. Peter den Exter, two prominent members of the anti-logging group.

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(79) Ex. A129 (i) and Ex.A193, Appendix O

12.9 The results of this second survey show a large majority of Lismore residents to be in favour of the proposed logging and we point out that even though a number of the questions and answers were ruled out by the Commissioner, Dr. Munro was still prepared, in writing, to state that he considered this outcome of the survey to be valid.(80)

12.10 We therefore argue that if these polls are to be given any recognition by the Inquiry, our own carries more weight.

12.11 We refute as unsupportable by evidence the statement made by the Terania Native Forest Action Group that the concern for protection of Terania Basin forest has found wide support throughout the Lismore Community as a whole, including a majority of longterm residents.(81)

12.12 An attempt to impress the weight of public opinion was also made by the Nature Conservation Council with a claim that they represented 100,000 members of various organisations in N.S.W.(82)

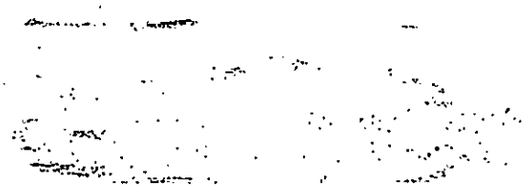
12.13 It is our contention however that, due to a high degree of multiple membership of the various organisations by individuals, this figure is overstated.(83)

12.14 Even given the benefit of the doubt however, we point out that the figure quoted is less than two per cent of the population of N.S.W. and can, in our view, hardly be considered as a great weight of public opinion.

12.15 Against this we have the statements in evidence that the Labour Council of N.S.W. represents eight hundred thousand members or almost sixteen per cent of the State's population, the overwhelming majority of whom are in favour of the proposed logging proceeding.(84)

(80) Ex.A129 (ii)
(81) Ex.B70, Section 5.8.7
(82) T.5562
(83) T.5860 to 5864
(84) T.99: Ex.A203: T.4649

12.16 We repeat that there is probably insufficient real evidence on this subject, but we do believe that there is enough to indicate in favour of the proposed logging proceedings.



13.0 THINNINGS, SMALL HARDWOOD REGROWTH, SOFTWOODS AND IMPORTS AS SUBSTITUTES FOR MATURE HARDWOODS.

13.1 Various attempts were made by the anti-logging group to demonstrate to the Inquiry that thinnings, small hardwood regrowth logs, plantation softwoods and imports could readily be used as substitutes for mature hardwood logs, thus obviating the need to harvest the mature trees.

13.2 In our opinion these views were expressed from a patent lack of knowledge of the sawmilling industry, the characteristics of various types of timber at the point of sawing, the problems of continuity of supply and costs relative to imported hardwoods, the differing strength and durability characteristics of softwoods and hardwoods, as well as ignoring completely, published data and previous evidence to this Inquiry as to the available volumes of plantation softwoods.

13.3 On the other hand, evidence from such experienced and qualified witnesses as Mr. P. McKelvie of McKee Engineering and Messrs. McGregor-Skinner and Adams of Standard Sawmilling Co., shows, we believe, that there can be no such substitution and that the suggestion is completely impractical for reasons of cost, availability and technical suitability.(85)

13.4 We are also bound to question the acceptability of an argument which implies that it is almost immoral to fell Australian trees but expresses an alternative that others fell theirs in order to supply our needs.

13.5 The evidence rejecting the concept of these substitutions is, we believe, overwhelming and we ask the Inquiry to give no credence to the concept which in our view renders itself irrelevant to the Inquiry through lack of credibility.

(85) Ex.A128: T.3119 to 3128: T.3439: Ex.A99 (i) & (ii): T.3449 to 3451
Ex.A136: T.3323 to 3325 —
T.3505 to 3513:
T.3569
T.3590
Ex.A193, Appendix F.

PART FIVE

14.0 CONCLUSION

14.1 In conclusion it is our contention that the evidence in support of the proposed logging has been presented from a base of acknowledged and recognisable expertise in both of the aspects of the Inquiry's Terms of Reference.

14.2 We believe that this evidence has been presented with pragmatism, has been consistent throughout and unshakeable under cross-examination.

14.3 On the other hand we see a matter which was openly admitted to have had its origins in the selfish motives of Mrs. N. Nicholson and her neighbours.(86) This lady sees no contradiction in herself running a business utilising land cleared from the very forest she now wishes to protect, land which she admits to keeping clear by slashing when the forest attempts to regenerate itself upon it.(87)

14.4 Subsequently others joined in, some by invitation from the original instigators,(88) others, we believe, because they saw a possible springboard for their wider ambitions in relation to forest preservation throughout the State.

14.5 Evidence from the parties opposed to the logging has, we submit, been notably lacking in expertise, particularly in relation to industry and economic matters.

14.6 Where expert or qualified witnesses have been called, the Inquiry has been faced with some of those witnesses completely contradicting their own earlier evidence,(89) disagreeing with their own published works of recent date,(90)

(86) Ex.A208
(87) T.5307-8
(88) Ex.A208
(89) T.4424 to 4465: T.4550 to 4621 with emphasis on 4603
(90) T.4554: T.4592 to 4594: T.6475 to 6480

submitting impressive looking technical data, only to subsequently withdraw it because simple laboratory procedures had not been followed[91] generally appearing in a way which, in our view, brought little credit to themselves.

14.7 Our perception is that the case of those opposed to the logging is, in large degree, based on emotion, in the hope of arousing sympathy and support for a cause which the majority of them are merely using as the thin end of a wedge in a much wider campaign.

14.8 We reiterate the statements made in our introductory remarks and believe that the Commission should recommend that the proposed logging proceeds.

(91) T.5421 to 5425

APPENDIX ONE

NOTES ON MULTIPLIER EFFECT

In the course of the Inquiry several witnesses have expressed views on the method of calculating the Multiplier Effect.

Some of these views differ and with this in mind we seek to clarify our own views on the Multiplier and the theory which we had in mind whenever we referred to the Multiplier in evidence.

We believe that the formula expressed in Chapter 2 of the Border Ranges National Park Proposed (Ex.B16) conforms with orthodox thinking on the subject and consequently we have adopted that formula as our own.

In brief this would mean that, where a multiplier of 2.2 is used, for every 100 jobs in the base industry, 220 jobs in total would exist between the base industry (in this case the sawmilling industry) and other industries servicing the base industry.

INQUIRY INTO THE PROPOSED LOGGING OF TERANIA CREEK

FINAL SUBMISSION

FORESTRY COMMISSION OF N.S.W.

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Final Submission by the Forestry Commission of N.S.W.

to the Inquiry into the Proposed Logging of Terania Creek

1. Scope of This Submission

In this submission the Forestry Commission of N.S.W. (here in after called the Commission) will deal with the issues as it sees them raised in the present inquiry. It is not possible to deal with all the evidence that has been given. The aim of this submission is to give a reasonable resume of the evidence, and in particular the expert evidence on the issues as the Commission sees them and to submit the conclusions which arise from that evidence.

2. Terania Creek - Locality and Topography (in brief)

Terania Creek Basin is formed by the head waters of a tributary of the northern arm of the Richmond River which flows through Lismore. Terania Creek itself is one of the creeks which rise in the State Forests which lie along the Nightcap Range about 25 km north of Lismore, those forests being Whian Whian State Forest on the eastern side of Terania Creek and Goonimbar State Forest on the west. These forests lie along the Nightcap Range which rises about 800 metres and forms part of the watershed between the Tweed and the Richmond Rivers in the far North Coast region of N.S.W. In the upper catchment of Terania Creek, within the State Forest, there is a distinct basin surrounded by steep slopes leading to a discontinuous line of cliffs.

The total area of the Terania Creek catchment in State Forests is about 1 890 hectares and of this about 740 hectares are in the basin. Of this area about 70 hectares are included in the 375 hectare Nightcap Track Flora Reserve and are thus excluded from logging. This leaves a balance of about 670 hectares accessible and available for logging within the basin.

On the western side of the basin there is a prominant rocky plug rising from the valley floor. This has been referred to in the evidence as

"the Crags" and was the subject of the second inspection in May 1980. Below the basin the creek flows between opposing spurs through a narrow cliff valley to the boundary of the State Forest and then the stream flows through the valley which widens out as it extends southwards towards The Channon (A1 P5 and 24).

3. The Concept of Forest Management

A. The Forestry Act 1916

NPWS has control of wildlife

The Forestry Commission of N.S.W. is constituted under the Forestry Act 1916 and by section 11 the Commission subject to the Act has the control and management of State Forests, Timber Reserves and Flora Reserves. The Commission thus has control subject to the Act of Whian Whian and Goonimbar State Forests and the Nightcap Track Flora Reserve which together make up the whole of Terania Creek Basin.

Section 8A of the Forestry Act 1916 sets out the objects of the Commission in the following terms:

- in the best advantage here

"(a) to conserve and utilise the timber on Crown-timber lands to the best advantage of the State;

(b) to provide adequate supplies of timber from Crown-timber lands for building, commercial, industrial, agricultural, mining and domestic purposes. TC won't effect that

(c) to preserve and improve, in accordance with good forestry practice, the soil resources and water catchment capabilities of Crown-timber lands; Marginal determ

(d) to encourage the use of timber derived from trees grown in the State; and (Really a P.R. aim)

(e) consistent with the use of State forests for the purposes of forestry and of flora reserves for the preservation of the native flora thereon -

Here they are inconsistent.

(i) to promote and encourage their use as a recreation; and

(ii) to conserve birds and animals thereon."

The Forestry Commission uses conservation as meaning the wise use of land (28/3 TP2) and sees its activities as operating through the whole range of activities from the complete reservation for scientific purposes of certain areas to the other end of the scale. In particular in relation to Terania Creek the Commission says it is both conserving and utilising the forests within the meaning of the object (a) referred to above in that it is proposing to selectively cut some of the brush box and blackbutt while preserving other areas within the basin including the Nightcap Track Flora Reserve (18/3 TP28).

There is always a conflict between conservation and utilisation but the Forestry Commission itself assigns no priority and doesn't have a bias in favour of either aspect of management (26/3 TP18 & 19) and it always has to resolve the conflict but it does so without starting out with a preassigned priority. The conflict involves considerations of multiple use of forests and the decision on Terania Creek was made without any particular feeling that it was a special case. It is just one of a great number of cases and again all factors were weighed by the Commission (26/3 TP18 & 19).

What about A10

Indeed Dr. Webb (B2) listed 6 options relating to land use ranging from a completely natural state to complete removal of vegetation and animal life and ulilisation for intensive urban purposes. Dr. Webb agreed that the proposed logging operation was a cautious decision and a conservative logging operation (24/4 TP22) and indeed agreed that what the Forestry Commission proposed was in the middle between complete conservation as opposed to complete utilisation (24/4 TP23).

It is submitted that on the whole of the evidence as later discussed the proposed logging operation meets the objectives of the

Commission as laid down in Section 8A and that the subjective and objective evidence establishes that the decision of the Commission was reached without any particular bias in favour of either utilisation or conservation.

Subsection 2 of Section 8A provides:

> "In the attainment of its objects and the exercise and the performance of its powers, authorities, duties and functions under this Act, the Commission shall take all practical steps that it considers necessary or desirable to ensure the preservation and enhancement of the quality of the environment."

but not wildlife

Terania Creek Basin and the proposed logging areas are by statute under the control of the Forestry Commission. It has proposed (in the details of the proposed logging operations to be dealt with below) all practicable steps that it considers necessary and desirable to ensure the preservation and enhancement of the quality of the environment. Although it will not be necessary in the Forestry Commission's submission for this Inquiry to decide any particular issue on this point it is the Commission's submission that if any person or body considers that the environment is not adequately protected by the proposed logging operation that party or body has the onus of proving that fact rather than there being any onus on the Forestry Commission to affirmitively establish that it has in fact (as opposed to as it considers necessary) taken all practicable steps. The Forestry Commission however submits that it has demonstrated by the evidence that it has in fact taken all practicable steps as envisaged by Subsection 2 of Section 8A.

The rel. between the Inquiry and the Act may not be established. The govt could amend the Act to exclude T.C. from its operation for example

B. Indigenous Forest Policy

This policy is set out in Exhibit A4. Its importance is that it is one example that indigenous forests are managed on the basis of a policy or guide over a long term (rather than on an ad hoc basis) and indeed the

guidelines are a prestatement of what will happen to a forest in the next 25-30 years time without much alteration (18/3 TP56). This policy represents the implementation of the Forestry Act in relation to indigenous forests and also serves as the policy guideline upon which Management Plans are based. At pages 7 and 8 of A4 the Commission's view of its objectives as stated in evidence is reiterated and in particular the competing needs of conservation and utilisation and that management policy must take account of both aspects. Does the Inquiry have to follow those policies, if, eg. they are wrong re classification?

In relation to rainforests (which word unless the context is to the contrary is hereafter used in the sense of rainforest according to Research Note 17 (A10)), it is the policy as set forth on page 12 of A4 "to limit the capacity of rainforests as long term major timber providers and to require that particular care be exercised in the logging of these stands. Special attention should be paid to their value in providing non material community benefits but at the same time the value and uses of many of their timbers indicates the desirability of periodic low intensity logging operations to maintain a supply of these timbers".

While no logging as such is proposed for the rainforest in Terania Creek there is a possibility of special purpose timber being harvested (A1 page 24) and to this extent A1 and the Indigenous Forest Policy are clearly compatible (see also 18/3 TP91). But what quantities? and when? and where?

Terania Creek and the Murwillumbah Management Area so far as they relate to hardwood management fall within the broad guidelines set down in the Indigenous Forest Policy page 13 as coastal hardwoods. : Must be subject to the evidence here.

The broad policies in respect of both rainforests and coastal hardwoods are summarised on pages 34 and 35 of A4. So far as rainforest policy is concerned the broad objective for all rainforest areas is to reduce harvesting to selective fellings for specialty logs at a level low enough to maintain canopy and rainforest structure. This would require the

phasing out of general purpose timber harvesting in most rainforest areas. So far as coastal hardwoods are concerned the basis of the policy is that the coastal forests should be managed to perpetuate the indigenous species that have occurred there. Coastal hardwoods policy also aims for the sustained yield concept as discussed below.

C. Management Plans

In 1968 Mullumbimby Sub-district was absorbed by Murwillumbah Sub-district, but implementation of the 1962 Mullumbimby Management Plan continued. The combined Sub-districts are known as the Murwillumbah Management Area and there has now been prepared and adopted by the Commission the Murwillumbah Management Plan which covers both Sub-districts as they existed prior to 1968 (A1 page 6 and 18/3 TP88). This Management Plan is based upon the principles set out in the Indigenous Forest Policy (18/3 TP88 and A1 page 6). The Murwillumbah Management Plan (A5) has retained the identity of the former Mullumbimby Management Area as the Mullumbimby Working Circle which comprises some 8 781 hectares of Whian Whian State Forest, Whian Whian East State Forest and part of Nullum State Forest. The other Working Circle within the Murwillumbah Management Area and covered by the Murwillumbah Management Plan is the Murwillumbah Working Circle which comprises some 12 467 hectares of Mebbin State Forest, Goonimbar State Forest, Mooball State Forest, Burringbah State Forest, Wollumbin State Forest and part of Nullum State Forest (A1 page 7). As mentioned earlier Terania Creek Basin lies within Whian Whian and Goonimbar State Forests both being part of the Murwillumbah Management Area and the creek also forms the boundary not only between those two State Forests but also between the Mullumbimby Working Circle to the east and the Murwillumbah Working Circle to the west. The logging operations proposed for Terania Creek Basin are therefore planned for both Working Circles (A1 page 11).

A Management Plan and in particular the Murwillumbah Management Plan can be described as a written document systematically outlining forest

management objectives and strategy and their factual basis and is aimed at achieving continuity of policy and action through prescriptions controlling activities on a management area over a period of years. In the case of the Murwillumbah Management Plan its period is 5 years from July, 77 to June, 82 (18/3 TP89) when it will be subject to review (18/3 TP89). Only short term.

Working Circles and in particular the Mullumbimby Working Circle and the Murwillumbah Working Circle, can be defined as a defined area comprising the whole or part of a Management Area for which specific and distinct prescriptions for yield regulation and silvicultural development are laid down in a Management Plan. The delineation of Working Circles may be based upon forest types, location, topography or access or a combination of some or all of these (A1 Glossary P3). In the case of the Mullumbimby Working Circle the prescribed yield is 7 000 m^3 net per annum and so far as is relevant Standard Sawmilling Co. Pty. Limited has a quota of 5 500 m^3 net per annum from this Working Circle and James Hurford and Co. Pty. Limited has a quota of 1 430 m^3 net per annum from this Mullumbimby Working Circle (A1 page 7). So far as the Murwillumbah Working Circle is concerned this has a prescribed yield of 9 970 m^3 net per annum and Standard Sawmilling Co. Pty. Limited from this Working Circle has a quota of 5 770 m^3 net per annum (A1 page 10). The quotas of these two companies and the concept of quotas in particular will be dealt with later in this submission.

If the proposed logging goes ahead it is estimated that the yield from Terania Creek would be 6 800 m^3 gross equivalent to 5 130 m^3 net of sawlogs (16/4 TP54, 55). It is also estimated that Standard Sawmilling Co. Pty. Limited would obtain 5 600 m^3 gross, being 1 100 m^3 gross (yielding 860 m^3 net) from the Murwillumbah Working Circle and 4 500 m^3 gross (yielding 3 390 m^3 net) from the Mullumbimby Working Circle, or overall 4 250 m^3 net. It is further estimated that James Hurford and Co. Pty. Limited would receive 1 200 m^3 gross yielding 880 m^3 net from the

Mullumbimby Working Circle. This would provide 38% of the quota of Standard Sawmilling Co. Pty. Limited and 62% of the quota of James Hurford and Co. Pty. Limited for one year. (A1 page 11 amended mathematically consequent on alteration to total estimated yield).

D. Harvesting Plans

A harvesting plan is a map drawn up before logging in a particular area goes ahead but after access has been gained to the area, by roading if necessary, to permit investigation of the area. The plan for Terania Creek (Ex. A68) was prepared by forester Harris and approved by J. Bruce. It shows the snigging pattern, the dump sites, the proposed roading, filter strips and logging areas (28/4 TP7-12). The economics of the proposed operation are set out separately.

The importance of the Indigenous Forest Policy, Management Plans and Harvesting Plans is partly in the fact that they reflect at different levels of forest management the Forestry Act and the objectives for which the Commission is established. Their importance is also that they show that State Forests are managed on a long term basis and not with ad hoc decisions. It is submitted that these long term management decisions should not be interfered with or altered on an ad hoc basis unless there can be demonstrated sound environmental or other grounds for doing so. It is submitted that on the whole of the evidence as discussed below no such ground has been demonstrated and indeed that on the contrary there are sound reasons why no such alteration or decision should be made.

E. The Sustained Yield Concept

Mullumbimby Working Circle has been described as being "on sustained yield". This phrase can be defined (A1 Glossary page 3) as the yield that a forest can produce continuously at a given intensity of management without depletion of its growing stock in the long term. It is important in the concept of sustained yield so far as it relates to the

Mullumbimby Working Circle that within the above definition the "forest" is made up of all the sections of the Working Circle. In other words it is not a question of the management of Terania Creek by itself having been so designed that it can give a particular yield in perpetuity, but more a question that all the forests which make up the Working Circle being so managed as to give the prescribed yield in perpetuity. The basic principle behind sustained yield is that between loggings in different parts of the Working Circle there is sufficient time for other parts of the forest to regenerate or mature to a stage where the other sections can be logged (18/3 TP84). A simple theoretical example is demonstrated by A9 where you have a theoretical forest of 10 hectares fenced off as it were into 1 hectare lots. At age 10 you log 1 of those hectares and you do not come back to that particular hectare for 10 years, by which time it will have regenerated (naturally or otherwise). In year 11 you log the second hectare and again do not come back to that hectare for another 10 years. In this way the timber available on any one particular hectare can be logged in perpetuity (see 19/3 TP20-27). In this illustration Terania Creek would be one of the hectares and the other forests which make up the Mullumbimby Working Circle would together make up the other hectares. See also 23/5 TP20 and following and in particular 12/6 TP28 and following where the distinction between Terania Creek itself being on sustained yield and Terania Creek forming part of a Working Circle on sustained yield was clarified. The real significance of the concept of sustained yield is the effect which it has on the management of the whole of the Working Circle, if one area or as it were 1 hectare in the A9 graph exhibit is "pulled out" or not logged. That effect will be discussed later, but the significance is in general terms that the Circle is concertinaed with the effect that logging takes place in areas before sufficient maturity in the trees is reached and depending on the size of the area withdrawn from logging the concept of sustained yield at the previously prescribed rate will break down.

May be theoretically correct but that will not be the practical effect if the impact is spread out.

Shows capacity to
accept major reduction
cf. minor reduction
of T.C. quota.

Ditto

Quotas are very much conditional and known to be. (cf. p. 11)

F. Quotas and Their History as Relevant to the Inquiry

A quota can be defined as an annual allocation of sawlog volume to a licensed sawmill on a continuing basis. Quotas are (1) subject to annual review and (2) may be varied by the Forestry Commission at its discretion (A1 Glossary page 2). Quotas can be reduced by the Commission if for example a licensee consistantly undercuts his quota commitment (11/4 TP5).

The form of a sawmill license is A41.

The quota history of Standard Sawmilling Co. Pty. Ltd. is set out in diagrammatic form in Exhibit A7. The substance of this exhibit and the evidence which appears primarily at 19/3 TP6-12 is that that company presently has a quota of 11 270 m^3. This quota was reached by various sawmill license aquisitions between 1962 and 1971 with the result that the quota rose from 4 200 m^3 to 25 340 m^3. In 1976/77 the quota was reduced from 25 340 m^3 to 23 460 m^3 as a result of the brushwood quota of 1 880 m^3 from the Mullumbimby Working Circle being withdrawn. In 1977/78 a 30% reduction of the quota commitment for Standards Sawmill in the Mullumbimby Working Circle namely 2 580 m^3 took place reducing their quota to 20 880 m^3 (19/3 TP11 and A1 P6). In 1979/80 there was a quota reduction of 9 610 m^3 as a result of the Border Ranges decision so reducing the quota level to the present figure 11 270 m^3. The significance of this history is that notwithstanding the company's enterprise in acquiring additional licenses its quota in 1980/81 is comparable to that in 1963/64.

So far as James Hurford and Co. Pty. Ltd. is concerned their quota history is diagrammatically represented on Exhibit A8 and again the history is primarily set out at 19/3 TP15 and following. The effect of that evidence is that that company presently has a quota of 2 150 m^3 the quota having been 2 890 m^3 up until 1975/76 when a sawmill license was acquired with the result that the quota went up to 3 610 m^3. As a result of the brushwood quota of 790 m^3 being withdrawn from the Mullumbimby Working

Circle in 1976/77 and a reduction of 670 m^3 in 1978/79 the quota is now at its present level of 2 150 m^3 or more significantly lower than it has been at any time since 1962/63.

It should be noted that while a quota is an annual allocation and can be reviewed annually both the Forestry Commission and the sawmillers view a quota as a firm commitment from the Forestry Commission to supply while the resource is available subject only to satisfactory performance on the part of the licensee. This is contrasted with a parcel which is a volume of timber that is made available to suit some particular requirement of management and is not necessarily an ongoing commitment and is certainly not viewed as such by the Commission or the sawmillers (19/3 TP17; A136 para. 3.4).

G. Private Property Timber

Various suggestions have been "floated" to the effect that private property timber would be an available resource to supplement any loss as the result of non logging at Terania Creek. While private property timber is not a resource in the control of the Forestry Commission the revised graph for the Murwillumbah Management Area (A42) shows that the private property input within the area is rapidly declining and is presently lower than it was in 1955/56. Reference should also be made to A90 (i) & (ii). Private property timber supplies in the area are fast dwindling (19/3 TP14/15). The graph A42 for the Murwillumbah area shows a dramatic decline and indeed that decline is continuing and is expected to continue still further (19/3 TP52). Private property timber is a deminishing resource (17/4 TP17) and the areas that are available are scattered throughout the whole of the sub-district and are not in themselves large areas (17/4 TP68). One of the reasons for the dwindling supply is partly no conscious effort by private property owners to regenerate the forests, no effort to control private property cuts and there is some evidence to suggest that the "new settlers" will not allow timber on their land to be cut (21/4

TP9). As a result of the declining private property timber this has brought forward an eventual reassessment of Hurfords mill in its present cutting capacity and they have gone as far as 120 miles afield although 60 miles is the practical limit economically and also bearing in mind that there is overlapping with other sawmilling interests. Hurfords know of no other private property resources that are available within the 60 mile radius (12/5 TP42 and following). Standard Sawmilling Co. Pty. Ltd. has experienced similar difficulties (see A136 2.5) and although they still have access to private property material it is becoming very very scarce and limited and indeed the "the new settlers" have different views as to logging private property timber than did their predecessors (17/7 TP36). Seeking private property timber is an ongoing need (17/7 TP37) and the radius for Standards sawmilling is 70 kms and there have been many "knock backs" (17/7 TP39). The overwhelming evidence of the dwindling and scarce private property timber is emphasised by A92 which indicates that James Hurford Co. Pty. Ltd. have three agreements for private property timber which expire respectively in August and October 1981 and May 1984.

It should be noted that no opponent of logging has even suggested let alone detailed where there are alternative sources of private property timber available to the mills.

It is submitted that in relation to private property timber the evidence is all one way and to the effect that it is a declining resource that is becoming increasingly difficult to secure. No one has suggested where this unspecified source of timber is located and it is submitted that suggestions that it could replace the timber lost if Terania Creek is not logged is on the evidence completely unfounded.

4. <u>The History of Logging in Terania Creek Basin</u>

Since the Cedar getting era parts of Terania Creek basin have been logged during three separate periods. From 1943 to about 1952 parts of the

area were logged very heavily and the timber taken down the Terania Creek Road to Lismore. Construction of the old logging road which exists in the rainforest stands of Terania Creek section of Whian Whian State Forest was commenced in 1943. This was at the height of the war when the demand for the war effort was intense. The timber at this period of time was requisitioned as the need demanded and the logging was without any control, environmental, or otherwise. Brushwood timbers were in particularly strong demand and were logged intensely during this operation. (A1 P10). Indeed the logging was ruthless (A1 P2). Exhibit A74 dated 4th July, 1950, indicates on page 2 that in the Terania Creek Area with the exception of three compartments the timber was cut out i.e. all the timber that could be got economically out of Terania Creek Road and timber situated between the cliffs and the creeks. In addition a lot of the timber had been cut from the creek area and in some places was almost devoid of any useful timber (see re this exhibit 29/4 TP6 and following).

In the 1950s logging continued spasmodically in Terania Creek being carried by West and Sharp Pty. Ltd. Both hardwoods and brushwoods were harvested (A1 page 10).

In the 1960s West and Sharp recommenced logging for brushwood, blackbutt, brush box and other hardwoods and this logging continued until 1968 to 1970. In total the basin has been previously logged to about 50% in area the yields being taken out betwen 1963 and 1970 being set out in A121 and the accompanying map A122 as to which see 20/6 TP11. 42% by area of the rainforest in the Basin has been logged before and approximately 60% of the blackbutt and 53% of the brush box (A123 and 24/6 TP1).

The effect of this past uncontrolled logging will be discussed in detail later. In summary however the evidence shows that there has been good regeneration, and that notwithstanding its uncontrolled nature the basin is still inter alia aesthetically attractive, of considerable scientific interest, very rich in fauna and flora, suitable for day walks, emi-

nently suitable for recreation, and of educational significance. The importance of the past logging history is to gauge its effect on the basin and to compare that effect with the likely effect of selectively logging the proposed areas. It's submitted that by comparison with the past logging the proposed operation is small in area, and in intensity and will be the subject of environmental controls and that in these circumstances the impact will be far less than in the past. The weight of the evidence both subjective and objective is to the effect that there will be good regeneration and it's submitted in all probability no significant adverse effect on the fauna, or flora of the basin nor on the recreational and other attributes which it has today notwithstanding the past extensive uncontrolled logging.

5. The Proposed Logging Operation

A. The Areas Involved

The total area of the Terania Creek catchment in State Forest is about 1 890 hectares and of this about 740 are in the basin. Of this area about 70 hectares are included in the 375 hectare Nightcap Track Flora Reserve and as such are excluded from logging. This leaves about 670 hectares accessible and available for logging in the basin and a rough dissection of the accessible vegetation types according to Research Note 17 are:

Rainforests - 190 hectares
Brushbox - 222 hectares
Blackbutt - 209 hectares
Rock - 41 hectares
Other - 17 hectares.

See Exhibit A6.

A dissection of the above vegetation appears in A11 with the percentages for the total basin area.

Under the proposed logging operations 77 hectares of Brushbox and Blackbutt are proposed to be selectively logged from five separate logging areas, three of which are on the eastern side of Terania Creek in Whian Whian State Forest and two of which are on the western side of Terania Creek in Goonimbar State Forest. The location of the logging areas is depicted inter alia in Exhibit A45, on the model A104 and on the maps comprising A16.

Accordingly, out of an accessible area of about 670 hectares available for logging only 77 hectares will be logged or 77 hectares out of an accessible Brushbox and Blackbutt area of 431 hectares. (See also 18/3 TP76, 19/3 TP1 as to revised logging areas.)

Of the area of about 670 hectares accessible and available for logging in the basin, 372 hectares are previously unlogged i.e. 54.8% of the basin is previously unlogged. Of the proposed 77 hectares for logging, 42.9 hectares are in unlogged areas or 6.3% of the total basin area proposed to be logged which has not been logged before. If the proposed logging went ahead there would be about 330 hectares in the basin available for logging but unlogged. (24/4 TP9 and 13/6 TP27).

B. Volume and Tree Numbers to be Removed

It is estimated that a maximum of 1,360 trees would be removed and this includes an allowance for the low probability of defective logs (13/6 TP20 and 21) and compare A32 page 2. In the Logging Area No. 1, which is unlogged, the area to be selectively logged is 19.4 hectares and the estimated volume is 90 m^3 per hectare or a total of 1 750 m^3. In Logging Area No. 2, which is partly logged and partly unlogged, a total of 26.5 hectares will be logged for an estimated volume of 120 m^3 per hectare or a total of 3 200 m^3. In Logging Area No. 3, 14.7 hectares will be logged for an estimated volume of 50 m^3 per hectare or a total of 750 m^3. In Logging Area No. 4, 5.3 hectares will be logged for an estimated volume of 90 m^3 per

hectare or a total of 450 m^3 and in Logging Area No. 5, 10.7 hectares will be logged for an estimated volume of 60 m^3 per hectare or a total of 650 m^3. The total estimated volume to be removed is 6 800 m^3. (A60). If there be any question as to the accuracy of these estimates and although they haven't been challenged in cross examination, a reference to A110 and the transcript at pages 1 and following of the 13th June, indicate a high degree of accuracy in comparing assessed volume with actual volumes logged.

In the proposed operation approximately 17 trees on average per hectare will be taken or 30 to 40% of the emergent trees. 60 to 70% of the emergent trees will remain (20/3 TP12).

The estimated 6 800 m^3 gross volume of timber to be obtained will yield approximately 5 130 m^3 net of sawlogs allowing for a defect in the timber of between 22 to 25% (16/4 TP55). Allowing for a 48% estimated recovery rate (17/4 TP1) 2 400 m^3 of sawn timber will be produced, which is sufficient timber for about 240 houses (A1 page 15).

C. Selective Logging

As indicated 30 to 40% of the emergent trees will be removed or 60 to 70% of the emergent trees left. This is a selective logging operation as opposed to that which was originally proposed for the Brushbox, namely a clear felling operation which can be defined as one where all commercial timber is removed, the non commercial timber is cleared and burnt and then the area replanted (18/3 TP44). If any support be needed for the self evident fact that selective logging is a more conservative management decision reference could be made to Dr. Webb 24/4 TP21 and following. Certainly in Dr. Florence's opinion it would be fair to describe the present logging proposal as a conservative logging operation 18/9 TP1, and Mr. Hitchcock agrees that in Terania Creek there has already been a compromise of interests between logging on the one hand and nature conservation on the other in that the Forestry Commission has modified its original proposal to

selectively log the rainforest and clearfell the brush box and blackbutt 24/11 TP53. Mr. Hitchcock is of the view that from a Forestry point of view selective logging is a responsible form of management of rainforests although he does not necessarily endorse selective logging from all aspects of nature conservation 25/11 TP42.

D. Tree Marking and Directional Felling

The supervising Forester or Forest Foreman will mark all the trees which are to be felled and these are the only trees which may be felled. They will be marked as to direction where they are to be felled to avoid, so far as is possible, damage to other vegetation (A1 page 18).

If the tree marking is not adhered to by the felling crew they are in grave dange of having their operator's licence cancelled or suspended at least. A check takes place after the tree is removed to ensure compliance with the tree marking (19/3 TP30). The Foreman who will be carrying out the tree marking is very experienced (16/4 TP72) and the area trial marked in 1979 marked 32% of the trees to be removed (16/4 TP73), i.e. well within the estimated 30 to 40% of trees to be removed. (16/4 TP72). The system used to check whether unmarked trees have been taken is that a nick is taken out of the base of the tree and that carries the brand of the Foreman so one can readily tell whether unmarked trees have been taken (17/4 TP38). The marking is done normally about a week before the felling. (28/4 TP51). The requirement not to take unmarked trees forms part of the standard conditions relating to all logging operations in the Casino Forestry District and is set out A1 page 19 and 28/4 TP51.

It is quite possible to swing a tree through an arc of 30° in a directional felling exercise unless the lean is excessive, say greater than 10° from the vertical, in which case it is a little more restricted, but if the tree is reasonably upright, even if it does have big branches on one side, there is probably a 30° arc as a minimum through which you can swing

it by use of cuts and wedges. On average it would be up to 45° (12/6 TP41), Standards practice directional falling and all logs taken in August, 1979, were extracted in this way. If the log has a 45° slope you can't make it fall against the way it wants to go, but generally speaking if the faller is prepared to work at it he can make a log fall where he would like it to go. It is the crown which really dictates the direction and the centre of gravity (14/7 TP33). If a tree has a very strong lean in one direction you can only fall it within a radius of say 30° on either side, but the majority of trees grow perpendicular and while directional felling is hard work it can be done and in 1979 in the aborted logging operation the trees did fall in the locations indicated by the Forestry Commission (21/7 TP49). See also 16/9 TP37, 12/5 TP60 and following and 13/5 TP9.

E. Duration of Logging and Hours Proposed

The proposed logging operation would take between 3 to 5 months depending on weather (compare A1 page 18). If the logging operation took place in the dry season it would be anticipated that it would be completed in 3 months, but the extension to 5 months allows for unseasonal wet weather and these estimates take into account stoppages because of safety conditions, school buses and the like (21/3 TP19 and 20). Standards think that with Hurfords they could get it done within 3 months of the dry season prior to the wet season commencing (21/7 TP48).

The hours of the proposed operation are partly governed by the school bus question which will be dealt with later. (See also A1 page 21). Hurfords contractor works very long hours, Standards not as long (17/4 TP30 to 32). James Hurford will operate one truck and estimate 3 trips a day, namely 3 in and 3 out (a total of 6 movements) and Standards would operate 3 trucks estimated 2 loads per day each, a total of 6 loaded and 6 unloaded. The combined total estimate is 18 truck movements per day, 9 loaded, 9 unloaded (28/4 TP63). Standards however if conditions are "normal" will use only one crew not three (16/9 TP12) and if this were done there would be a total of 10 movements per day 5 loaded, 5 unloaded.

F. Terania Creek Road and the Non Existence of Alternatives

There are only two roads out of Terania Creek Basin which are presently constructed, namely Terania Creek Road and McKays Road. It is not feasible in the circumstances for trucks to use Wallace Road because access to this road would have to be obtained through Mrs. Nicholson's property. However, McKays Road could be upgraded by the expenditure of a large amount of money, but this would not be warranted for the amount of timber now to be extracted nor justified by the short time for which the road would be used. The road construction which would be necessary could not be justified on environmental grounds (A1 page 42). Although there may in the very early stages of planning the proposed logging, have been some question about whether or not McKays Road was suitable the overwhelming evidence is that it is impracticable to use McKays Road in its present condition. Mr. Rann, in the late 50s or early 60s, drove down McKays Road in a logging operation and in his opinion it is impossible to go up that road because it is too steep, the traction would be virtually nil and you couldn't negotiate the hill without being pushed by a tractor, which would be very dangerous to the extent that you could end up over the bank. With all the improvements in the mechanisation of trucks and the like since the late 50s early 60s, it would still be impossible to use the road and indeed the very sharp corner at the bottom of McKays Road onto Terania Creek Road is another reason for not being able to take logs up there (12/5 TP50 and following).

Mr. Lemaire is of the opinion that it is quite impracticable to use McKays Road (17/4 TP35). Mr. Rann further expressed the opinion that if it was a condition of logging that McKays Road be used he would not be prepared to do the logging and he would not be prepared to let anyone else use his trucks and equipment to do the logging because of the unsafe nature of McKays Road (13/5 TP7).

Dr. Gentle agrees with the very acute angle at the bottom of McKays Road making it very difficult, if not impossible to get timber

jinkers around the bend (25/3 TP64).

A30 contains a detailed consideration of the design alterations which would need to be made to McKays Road to make it suitable and these include widening the road, blasting rock, puting a bitumen surface on the road and the like. See also 25/3 TP64 following. It was partly because of the unsuitability of McKays Road that the Council agreed in principle to the use of Terania Creek Road (8/7 TP37).

It's submitted that the only conclusion available on the evidence is that McKays Road can not from a practical point of view be used in the proposed logging operation. The only other road is Terania Creek Road. A detailed consideration of that road and its suitability is set out below.

G. The Harvesting Plan

(i) Snig Tracks and Snigging

The harvesting plan A45 shows the direction of snig. Snigging is the procedure of hauling the logs from their felled position (once the heads are removed) to the dump site for loading onto the timber jinkers. The snig pattern is generally uphill although because of the topography there is a considerable amount of downhill snigging 18/6 TP36 and 20/6 TP38. As far as practicable snigging should be uphill (28/4 TP44). Mr. Rann thinks downhill snigging is better 15/5 TP77. That view is against the weight of the evidence and in any event in Terania Creek snigging to a large degree will have to be uphill because of the position of the dump sites 12/6 TP43. One of the main reasons for uphill snigging is to prevent the uncontrolled movement of the end of the log and also to assist in erosion control. 12/6 TP44. If the log is difficult to get out or if the forest is going to be unnecessarily knocked about by tractors going in winching is used for the snigging 12/6 TP40. Standards propose to use a D7 tractor which has a tailor made winch which ensures that the butt end of the log is well off the ground in order to minimise any damage

during snigging 23/7 TP12. It is not possible to carry out a logging operation in Terania Creek without snigging nor is it possible to snig other than with tractors of the size proposed (20/6 TP37). The snig tracks will be the width of a tractor blade about 12 feet and their length will be considerable (18/6 TP26) and in parts there will be substantial damage to the understorey and there will be considerable soil surface baring upon some snig tracks. Sometimes there will be no gouging but in others there would about 6 inches deep 18/6 TP28 but certainly gouging would not be over the full width of the snig track though perhaps over the middle 6 feet of it (18/6 TP29).

The uphill logging extraction pattern is desirable because the logging machinery can be kept away from streams and there isn't the concentration of tracks leading to an increased amount of water on the dump site. There are less erosion possibilities (Dr. Cornish 29/5 TP13).

No alteration to the snigging pattern is allowed unless there has been a full investigation by the forester showing full cause A1 P19 and this is a special condition of the proposed operations. Special condition 4 (A1 P19) requires cross banks on all roads and snig tracks after logging has taken place. Cross banks are banks constructed a tractor across the road to catch water run-off that would otherwise run down the road and the bank diverts it into the surrounding vegetation and this prevents excess erosion on the track surface itself (29/5 TP13). Appendix 3 to A1 sets out the standard erosion mitigation conditions for logging in N.S.W. which were compiled in conjunction with the Soil Conservation Service of N.S.W. and Dr. Cornish was one of the people involved in its compilation 29/5 TP10. These conditions relating to uphill snigging have been complied with in the proposed operation so far as is practicable and it is proposed also in relation to snigging to comply with them so far as cross banks are concerned. The operation will be governed by those conditions (A1 P14). The snigging will also be governed by the standard logging conditions set

out on P19 and in particular condition 6 which requires care to be taken in snigging so that trees currently or potentially of commercial value are not damaged, condition 9 which precludes snigging along roads except with the express permission of the supervising forester or foreman and condition 12 which requires that where possible surface vegetation shall not be removed from snig tracks.

It is estimated (A63) that snig tracks will only go through the rainforest in two logging areas namely those served by logging tracks No. 1 and 7 and that the total area of rainforest effected will be .08 of a hectare.

It's submitted that the proposed logging so far as snigging is concerned has, so far as practicable, been designed to prevent unnecessary damage to the environment. No one in the Inquiry has suggested any practical alteration to the snigging pattern nor suggested that the snigging could be carried out in a more beneficial manner.

(ii) Dump Sites

The proposed dump site locations are shown on the Harvesting Plan A45 and have been designed in conjunction with the snigging pattern to ensure so far as it possible that there is an uphill snig pattern. It is not however unusual for the location of dump sites to be somewhat modified once an operation has been commenced 20/6 TP38 after the logging roads are constructed and people can get into the area and inspect it more thoroughly. Indeed in logging area No. 1 Mr. Bruce considers that it may be more environmentally desirable to establish another dump site south of the 2 indicated on the model 20/6 TP25.

The dump sites will be half a hectare at the outside in size and on average about 2 chains square or .016 of a hectare, something similar to the log dump which presently exists on logging road No. 4 near the 1979 logging (17/4 TP32). That log dump on the balance of the evidence would

appear to be a natural opening. Compare Mr. Bruce 12/3 TP88 Dr. Webb 12/3 TP88 (noting that the word "valid" was later changed "invalid") and Mr. Squire 26/6 TP50 and Exhibits A126 (ii) (iii).

If the proposed logging goes ahead on completion the dump sites will be demolished and planted with flooded gum to aid regeneration (A1 page 20).

(iii) Roading

Again A45 shows the location of the main road up Terania Creek Basin and the location of the roads which link that main artery to the log dump sites. It is proposed that these roads be used for haulage once the timber has been loaded onto the trucks at the dump sites. The main logging track will be some 1 570 metres long and the other tracks will vary in length from 902 metres for logging track No. 6 to 176 metres for logging track No. 3. Logging track No. 6 involves the reopening of an old logging track for its entire distance. The total length of the logging tracks in the rainforest is 1 858 metres and the Forestry Commission estimates that the area of rainforest affected would be .69 of a hectare. (A63 (1)). The Terania Native Forest Action Group in relation to logging track No. 1 carried out some measurements which are explained in the transcript at 20/10 TP62, 21/10 TP33 and 64. It is submitted that the system used for measurement is inaccurate but assuming its accuracy it shows that at worst 2.37 hectares of rainforest will be affected by the roading (A63 (2)) out of a total area of rainforest within the basin of 190 hectares (A6). On any view of it it is submitted that the disturbance to rainforest by the roading proposal is insignificant, especially bearing in mind the evidence discussed below on its ability to rapidly regenerate.

The roads have been designed to be of minimal width to avoid unnecessary clearing. The route has been located to avoid large or valuable trees and to minimise damage to standing vegetation (A1 P16). The roading

has also been put as far up the ridges as is reasonable to facilitate the uphill snig pattern 20/6 TP38. The roads and logging tracks have been designed to follow original tracks where they exist through the rainforest areas in Terania 21/3 TP30. In particular 3.2 kilometres of the old logging road up the middle of the basin has already been cleared and reopened A1 P16 and 28/4 TP13. It is said that in the construction of the main road little attempt was made to fell the trees parallel to the road (8/5 TP70) but it would be very difficult to fall the majority of trees along the roadline and in any event it would not help in the minimisation of long-term disturbance 12/5 TP60 and compare 13/5 TP9.

Eight creek crossings are planned for construction five on the old logging road and three on the road extensions. The design of these crossings varies with the site and it was proposed that at three sites pipe crossings or log bridges would be built. Splash crossings would be used at four sites utilising the natural stone in the bed of the stream and one temporary bridge would be constructed. Because of the difficult circumstances which took place when the operation commenced the crossings already constructed were not built to the usual standards the Forestry Commission uses. A1 P16. Some question has arisen as to the adequacy of the Cedar Creek bridge B86 and indeed Dr. Cornish was of the view that that bridge may be inadequate for the particular purpose 25/6 TP30. There was also the evidence of Mr. Murphy (20/10 TP51) dealing with this bridge and the fact that after a heavy downpour a lot of the filling had been removed. As indicated in A1 P16 and by Mr. Bruce (28/4 TP18) any inadequacy in the bridge arose out of the "difficult circumstances" in which the operation commenced.

The amount of side cutting necessary for the construction of roads and snig tracks will be fairly small in relation to the total area and will not lead to any significant increase in erosion 25/6 TP6 and 8.

The roads are likewise governed by the Standard Erosion Mitigation Conditions as referred to above in relation to snig tracks. All roads will

be temporary in the sense that they will be drained and blocked after logging is completed and it will be allowed to revegetate (A1 P16).

(iv) Filter Strips

In order to minimise the possibility of soil erosion affecting watercourses as a result of logging operations the Commission has developed a policy of minimising disturbance to vegetation along both sides of streams within a logging area. These areas of vegetation are called filter strips and extend for at least 20 metres on each side of the stream. They commence at the point on the stream where the catchment exceeds 100 hectares (or less at the foresters discretion) and extend down stream through the logging area. The filter strips to be retained in the current proposal are shown on map 4 of A45. (A1 P20). (See generally 19/3 TP39 and the reference to filter strips in the Management Plan A5 P6 and the abovementioned prescription which appears in the Standard Erosion Mitigation Conditions Appendix 3 to A1 on P2).

It is possible to log in filter strips in some cases but not where the stream is a prescribed stream under the Water Act. Terania Creek is so prescribed and accordingly no logging will take place within 20 metres of Terania Creek itself (28/4 TP56 & 57). There may or may not be logging in the tributaries which run into Terania Creek itself (28/4 TP59) but even if there is no tractors will be permitted to enter the filter strips and therefore there will be very little bared soil within the filter strips so as to affect their function (28/4 TP56). If trees are logged in a filter strip they are winched out and the filter strip so retains its dual function of preventing sediment entering the stream and also preventing equipment getting close to the stream damaging the banks and the bed of it 25/6 TP20 & 21.

(v) Flooded Gum

No flooded gum is proposed to be planted in rainforest areas affected by roading. In the brush box stands it is intended to plant

seedlings of flooded gum wherever necessary in the gaps created by logging and snigging and in the log dumps to assist in the regeneration of the area. There is no proposal to plant flooded gum in rainforest roads. The proposal to plant roads or tracks relates to the brush box type and possibly also the blackbutt but it does not relate to the rainforest 26/3 TP73. The roads and logging tracks in the rainforest will be left to regenerate naturally without any planting 26/3 TP74 and 16/4 TP76 and 77. Flooded gum is a native species in the basin Al page 20 there are quite a number of very large specimens there 11/6 TP52. The theory behind flooded gum is that wherever undue gaps occur flooded gum is planted to enrich areas where the expectation is that the opening has been so wide that there might not be adequate regeneration. The planting of flooded gum is to assist in the regeneration of the area 12/6 TP37 and flooded gum and brush box co-exist well 12/6 TP38. Flooded gum is also used to control weeds and is much more effective in this respect than brush box which is slower growing 19/3 TP35. Brush box will not be planted as it is believed that there will be adequate regeneration by natural means of brush box without the need for planting 28/4 TP61. The planting of flooded gum will not mean that the brush box areas become flooded gum areas. It is not the policy of the Commission to plant flooded gum and thereby introduce a commercial timber which will in effect dominate over the rainforest understorey. Whether or not it is planted in any particular place will depend on the prospects for regeneration of the brush box 19/3 TP35. The aim of planting flooded gum is to restore the natural forest cover to the area fairly rapidly to suppress weeds and to rehabilitate log dumps 19/3 TP36. The flooded gum will not eliminate the rainforest understorey 19/3 TP36. Further the planting of flooded gum will not increase the fire hazard at Terania Creek 17/4 TP69.

Dr. den Exter considers that flooded gum is not in sympathy with the rainforest types but that in some of the logging areas it does occur naturally as an emergent tree at the present time and has played an ecolo-

gical role in re-establishing forest cover in those areas. In his opinion it is in sympathy in the area marked 2 on A45 but out of sympathy in all other areas 6/5 TP22 to 24. It's submitted that the weight of the evidence discussed below is contrary to Dr. den Exter's view of flooded gum.

Dr. Webb was critical of the use of flooded gum for rainforest regeneration 21/4 TP87 but it will not be used in those areas (see above).

Dr. Florence accepts that the rapid growth of flooded gum could be important in restricting the rapid development of secondary species and that it could provide a degree of protection for the early development of the slower growing brush box. It could in his opinion be planted in the larger brush box gaps but it should be removed at a fairly early stage commercially if possible so that it doesn't form a large future component of the forest. He does not see any problem with some flooded gum component 17/9 TP38. Planting of flooded gum is not undesirable if it is regarded as a short-term cover crop to reduce the growth of undesirable secondary species and to help bring on brush box as a secondary storey species and if it was then removed in about 25 years time and you could certainly justify the logging of the flooded gum in 25 years time (17/9 TP64). In Dr. Florence's view you could relog the flooded gum in 20-25 years without prejudicing the ecological or environmental objectives of forest management within the basin 17/9 TP72.

The National Herbarium's submission (B105) suggests that flooded gum is undesirable on three grounds briefly summarised being that its introduction is unnatural, that the introduction of foreign seed could confuse the vegetation record and that it can lead to bad lantana infestation. Miss Fox agrees that it is a possible alternative to follow Dr. Florence's suggestion of planting it then logging in about 25 years time. (3/11 TP66 and 67). So far as her second concern about flooded gum there is no difficulty in accomodating the local seed source idea 3/11 TP67. The brush box and the flooded gum are associated and flooded gum is not exotic in

relation to a brush box forest in Terania Creek. (3/11 TP68). Miss Fox originally anticipated that flooded gum would be planted as a matter of course. She would certainly anticipate that brush box would regenerate normally in the smaller clearings 7/11 TP10. She agrees that it is a far superior proposition to the one envisaged in her submission if the flooded is used only where necessary in the larger openings where regeneration needed a hand and if seed is gathered from local sources 7/11 TP10.

Miss Fox also agrees that the third objection based on the photographs (B105 11) on the Gibragunya Range Road is not analogous to the situation one would get in Terania Creek 7/11 TP11.

Mr. Floyd is of the opinion that if flooded gum is planted in log dumps it would eventually have the effect of suppressing lantana because it would aid the regeneration of the rainforest species which would have a heavier canopy which would in turn suppress the lantana. In his opinion it's a purists' view to say flooded gum is exotic and floded gum probably would not be detrimental in the long term. From an ecological point of view Mr. Floyd doesn't see any real danger in planting the flooded gum 13/11 TP73 & 74 and although planting brush box would overcome the purist objection you would have to wait a lot longer before getting any sawlogs because the brush box is slower growing. From a general appearance point of view with regard to regeneration planting brush box would take much longer 13/11 TP74. Also TP82 & 3. In Mr. Floyd's view the planting of flooded gum will not have a great affect on the ecology of the rainforest beneath 14/11 TP31.

It is submitted that the overwhelming weight of the evidence is in favour of planting flooded gum where necessary in the brush box areas. It aids regeneration, helps suppress lantana and camphor laurel, is not exotic to the basin and in the long term will not be ecologically detrimental particularly if in 20 - 25 years they are removed. As no flooded gum will be planted where the road goes through rainforest areas it is submitted that

the initial concern in this regard may have been based upon a misapprehension of the proposal. It is submitted that there is no evidence that the proposed planting of flooded gum will have any detrimental effect and indeed the evidence established that its effect is beneficial.

(vi) Miscellaneous Aspects

So far as supervision of the operation is concerned the supervising forester in such an operation would normally visit an area about once a week the forest foreman visiting the area 2 - 3 times a week 26/3 TP69. This is in general terms the extent of supervision in an operation such as Terania Creek and all aspects of the operation are so supervised. It is Mr. Rann's experience that he usually has a foreman on site for a couple of hours nearly every day measuring logs, volume checking and checking for unmarked trees having been felled 13/5 TP8. Mr. Bruce was of the opinion that if the proposed logging went ahead it would be the most closely supervised logging operation in the history of the Forestry Commission and probably in the history of the world 13/6 TP33. While that might sound a bit exaggerated it is seriously submitted that in the light of the contraversy surrounding the proposed logging if the logging does go ahead it will be a very closely supervised operation. As Dr. Florence says 17/9 TP66 in a way the Commission is on trial and it has got to try and justify its logging in the area and its got to justify it on the basis that it has the expertise and the capacity to supervise the operations adequately and he certainly believes the Commission has that expertise and capacity and he felt that the Commission might have done a little bit more to positively demonstrate the capacity he believed it possessed to do a thoroughly good job.

As to the supervision of tree marking this has already been dealt with.

So far as the logging debris is concerned it will not be burnt but will be left to decompose. The debris will not be left on roads or fire

trails or in table drains, or mitre drains (standard logging condition No. 10 A1 P20). Terania Creek is not considered as a fire dangerous area from a debris point of view 28/4 TP54 and it is estimated that the leaves and smaller twigs would decompose within 12 months 18/6 TP32.

It is planned that the order of logging in Terania Creek will be to commence at the northern end of the basin and then proceed toward the south (A1 P18). As the operation moves south the road will be closed off and cross banked and erosion mitigation steps taken. The only reason these steps were not taken when the 1979 logging ceased was that all operations were halted, the tractor was moved out of the area and it wasn't permitted to return 28/4 TP55.

The standard condition of logging operations are set out in A1 P19 and it is submitted that they are designed to help ensure a careful controlled logging operation. Specific reference has been made to some of these conditions previously in relation to roading, snigging and the like.

(H) In Twenty Five Years Time

It is presently anticipated that after the proposed logging operation referred to above it will be 20 - 25 years before the harvesting cycle will return to the basin for the next economic harvest (A1 P23). This is illustrated on the Working Circle diagram for the Murwillumbah Management Area A1 P8. This proposal is in accordance with the Management Plan and is indicative that the basin is not immediately at risk of "dart in so to speak for another thousand brush box somewhere else 2 years after the immediately proposed logging procedures" 10/6 TP35. See also 20/3 TP25. In 20 - 25 years the operation may include areas the subject of the present proposal and areas logged prior to the present proposal. The Commission would not necessarily be coming back to the same stands although they could (20/3 TP58). It was emphasised by Mr. Bruce TP21-23 and 46 that whether or not the Commission came back to Terania Creek and if so to what areas would be reconsidered at a time closer to the proposed 20 - 25 years.

(I) Financial Aspects of the Proposal

In A1 pages 17 and 18 as amended by A70 it is estimated that there will be a gross gain from roading after deduction of marketing costs of some $45 793. The nett gain from logging and roading is estimated to be $31 314. See also A1 pages 21 and 22 where it is estimated that the timber will have a total value of some $360 000 and processing could increase the value of green rough sawn timber to approximately $568 000 wholesale.

The economics so far as they relate to roading and marketing were calculated in accordance with A71 and A75 and is an exercise carried out to compare the royalty the Commission would get if the Commission put a road in with the royalty the Commission would get if a road was not put in. (28/4 TP26). In the calculation there is utilised 25% for marketing costs. Of this amount 12.5% are direct marketing costs e.g. wages of marketing foreman and then 100% overheads are added i.e. another 12.5%. In addition 75% is utilised for roading cost overheads (28/4 TP29). The above evidence was challenged primarily in cross examination on 2 bases, firstly to show that inadequate overheads had been taken into account and secondly that the Commission as a whole was making a loss and in particular that this operation would result in a loss to the Commission (see Sommerville's cross examination of Golding and Bruce 29/4 TP13 and following, Sommerville cross examination of Beal 27/5 TP16 and following, B15, B4 and B5).

The evidence of Mr. Beal the Forestry Commission's Accountant was that you would not take into account a number of fixed costs which are expended regardless of what the Commission untakes as these would be incurred in any event and therefore they are not included in the calculation 27/5 TP4. As an accountant Mr. Beal thought that Mr. Sommerville's calculation on B4 was invalid because it assumed the whole of the expenditure in the Casino district was based on marketing timber which was not the case 27/5 TP8 & 9. Mr. Beal reaffirmed his view that 25% marketing costs were appropriate as were the 75% overheads 27/5 TP14 & 15 and that

fixed overheads had no bearing on the economics of the particular proposition or projects proposed to be undertaken 27/5 TP20. Mr. Beal was not aware of any criticism by the Auditor General of the Forestry Commission's accounts 27/5 TP37. Mr. Beal was cross examined by Mr. Sommerville at length about management accounting principles but Mr. Beal had not learn't anything during the course of development of the Forestry Commission's management account system which had caused him to consider the 75% or the 25% inappropriate 27/5 TP38 and 27/6 TP19. Contrary to N.C.C.'s submission B15 it is not unrealistic to present a case for logging of Terania Creek showing expenditure only half of expected royalties 27/5 TP11 and the Commission does not ignore Head Office administrative on-costs in relation to the logging proposals (27/5 TP11 and 12). The N.C.C.'s submission also alleges a subsidy is in effect being paid to the sawmills (B15 page 24) but in Mr. Beal's opinion if it be correct to say that a subsidy is being paid then it would be not to the sawmills but to the people that use the timber in the long run (27/5 TP12). On page 27 of the B15 it is suggested that the Commission needs a system of royalty charges under which consideration would be given to factors of location, species and distance from market. In fact these matters are taken into consideration in the Stumpage Appraisal System and are the whole basis of the system (27/5 TP12). The Stumpage Appraisal System is calculated on a value free in yard in Brisbane and contrary to the assertion of the N.C.C. in B15 P27 this does not mean that the Commission expects the bulk of the timber sawn to be sold on the Brisbane market (27/5 TP13). Basing the stumpage appraisal on Brisbane doesn't oblige the sawmiller to market in that particular place and indeed if the stumpage appraisal was based on a free in yard price in Sydney the royalty would be much less and there would be a greater incentive for the sawmiller to compete on the Brisbane market (27/5 TP13).

Mr. Sommerville in relation to B4 (commencing 4/11 TP19) agrees that for the Casino district he has taken the total expenditure including some capital expenditure and used that expenditure in relation to the

marketing of timber. (TP20). The administrative costs involved include those in relation to the establishment of plantations but he doesn't agree that it is an invalid exercise from an accounting point of view (TP21) however at P28 of B15 the N.C.C. criticises the Commission's estimate for Terania Creek and ascerts that there would need to be a substantial on-cost to cover non-revenue producing expenditure including that of salaried staff. This was the basis upon which Mr. Sommerville was criticising the Commission's figures and on that page of B15 there is then an exercise which asserts that there would then be a true loss of some $17 829. Mr. Sommerville however agrees that as an accountant he would not have used that method of calculation (4/11 TP23) because the 25% employed in that excerise was rather arbitrary and that method of calculation is one which Mr. Sommerville would not adopt.

The Forestry Commission is not enjoined to make a profit but rather to pay its money into consolidated revenue (A1 P1). See also 11/4 TP40 and general discussion 30/10 TP44 to 56.

It is submitted that any discussion of the Commission's past financial history and whether or not it has made a profit or a loss as a statutory corporation is wholly irrelevant to the present inquiry. The inquiry is only empowered to inquire into the environmental effects of the proposed logging and to determine whether or not that proposed logging should go ahead. It with respect cannot be part of that inquiry to look at the question of whether or not the Commission in the past has operated at a profit or a loss.

Indeed it is submitted that it is irrelevant whether or not the proposed operation will result in a nett gain or a nett loss to the Commission. It is submitted that this question is likewise outside the terms of reference and irrelevant notwithstanding the fact that reference was made to the matter by the Commission in exhibit A1. The Commission is not enjoined to make a profit and while no doubt it may endeavour to do so

it is common knowledge that various Government activities are either intentionally or otherwise not run at a profit as understood by the commercial world (see for example the discussion at 11/4 TP40).

If however the matter is relevant then it is submitted that the evidence clearly shows that the Commission's method of calculation is appropriate. With respect to Mr. Sommerville it is submitted that Mr. Beal's criticism of B4 is correct and that in working out whether a particular logging operation will be self funding or not it is from an accounting point of view completely inappropriate to assign to that logging operation proportions of costs which would be incurred by the Commission whether or not a particular logging operation went ahead. It is inappropriate to assign to the Terania Creek logging operation for example a proportion of the costs involved in the establishment of pine plantations, the erection of recreational facilities at e.g. Eden and similar costs. The only other suggested method of calculation if the B4 method is rejected (which in the Commission's submission it should be) is set out on P28 of B15 and no one has sought to support that method as being appropriate and Mr. Sommerville as accountant disclaims it.

6. Brush Box or Rainforest?

The Forestry Commission has consistently maintained that what is proposed to be logged should be regarded as brush box. The method of typing by the Forestry Commission and its suitability will be dealt with later in this submission. While broad generalisations are sometimes dangerous it is submitted that in the present case the opponents of logging have in general terms gone through 3 stages of development in their views as to the nature of brush box. Initially the opponents of logging either themselves drew the distinction or accepted the Forestry Commission's distinction between brush box and rainforest. This was particularly at a time when the Forestry Commission proposal was one to selectively log the

rainforest and to clearfell the brush box and blackbutt. Subsequently there emerged in relation to Terania Creek the theory that the brush box was one stage in the succession to rainforest and in effect that if they weren't logged the brush box stands would ultimately turn into rainforest stands. It is submitted that this theory so far as Terania Creek is concerned has been effectively disproven by the evidence in particular of Dr. Turner. There then emerged the theory that the brush box in Terania Creek should itself be considered as rainforest and impliedly therefore should not be logged. It is significant that the expression in this Inquiry of these changing views from acceptance of the distinction, to succession and to brush box being a rainforest species has a correlation in time with respectively the changed proposal so that no rainforest would be logged and the evidence of Dr. Turner on the possibility of succession. It's submitted that for reasons that have been unexpressed Dr. Webb and the persons who have utilized his views have changed their view of brush box for reasons of expediency in an attempt to keep Terania Creek a "rainforest issue" notwithstanding that "undoubted rainforest" will not be logged and notwithstanding Dr. Turner's evidence. On the question of expediency see 26/9 TP11.

It is proposed to deal with the above concepts in some detail and then to deal with the question of the suitability or otherwise of the Forestry Commission's method of typing the forest proposed to be logged.

(i) Brush Box and Rainforest Distinguished

In the letter of the 27th February 1975 (Exhibit A124 P3 - 4) the authors including Mr. Michael Murphy were putting forward 3 conditions in relation to the then proposal to clearfell the brush box and blackbutt and selectively log the rainforest namely no planting of flooded gum, no use of Terania Creek Road and no logging of undoubted rainforest. If these conditions were satisfied then as of February 1975 it was acceptable to clearfell the brush box and the blackbutt (20/10 TP85 & 6). In the letter of

25th April 1975 (A124 P23 - 24) Mr. Murphy in the third paragraph refers to "pure rainforest" as opposed to "brush box forest with rainforest understoreys". Similar distinction is drawn on P2 of that letter. That system of classification was then being used by Mr. Murphy without dissent and it was probably his view in 1975 that a system of selective logging would have satisfied the Commission's responsibility of (a) preserving the habitat, the native flora and fauna, (b) provision of forest areas for public recreation, and (c) protection of water catchment (20/10 TP89).

In the letter of 28th April 1975 (A124 P35) Mrs. Nicholson says that Terania Creek had been selectively logged for many years and "this policy seems to fulfil very adequately the Forestry Department's stated objectives of (a) timber production, (b) wildlife protection, (c) public recreation and (d) catchment protection. She was not objecting to logging in general but merely to the "insane policy of clearfelling". What she was saying in substance was don't clearfell the brush box but selectively log it (20/10 TP94).

The distinction between brush box with rainforest understorey and "pure rainforest" is repeated in the letter from Mr. & Mrs. Nankervis of the 20th April 1975 (A124 P37 - 38) and 6th May 1975 from Mrs. Nankervis to Mr. Duncan A124 P41 - 42. Again the distinction is set in the letter of the 2nd May 1975 from Mrs. Murphy to the Forestry Commission (A124 P45). Again without dissent the distinction is accepted (20/10 TP96).

On the 14th May 1975 in a letter to the Northern Star Mr. & Mrs. Nicholson again were saying in substance that selective logging as opposed to clearfelling would in their view fulfil the Commission's objectives of wildlife preservation, public recreation and water catchment protection (A124 P57-58).

In June 1975 The Channon Residents Group (the previous name of the now Terania Native Forest Action Group) made a submission to the Minister

for Lands and Forests in relation to the logging at Terania Creek. The submission is variously A53 and A56 (2). In that submission there again is the distinction between brush box and rainforest (see generally the submission and 20/10 TP101 and following. There is no suggestion in that submission of the question of succession (20/10 TP102).

In the letter of the 28th October 1975 (A124 P73 - 76) the distinction between brush box with rainforest understorey and rainforest is again referred to without dissent (20/10 TP103).

In the letter of the 22nd January 1976 (A124 P81 - 83) Mrs. Nicholson makes reference to the "three forest types" namely rainforest, brush box and blackbutt without dissent 20/10 TP103.

In the "Earth Garden" article in February 1976 (A207) it was her view that it was not apparent from walking through the basin that it had been logged in the past (20/10 TP103/4) and again there is the distinction between pure rainforest and brush box rainforest understorey (20/10 TP104). When that article was written Mrs. Nicholson was aware that a considerable part of the basin had been logged before and she could tell where some of the logging had taken place because of the stumps yet in some parts it was difficult to tell that logging had taken place notwithstanding the stumps because it had regenerated so well (20/10 TP105/6).

Again the letter of the 6th February 1976 from Mrs. Nicholson to the Commissioner of Forests (A124 P91) adopts the distinction between rainforest and brush box with rainforest understorey without dissent. The letter of the 10th February 1976 from Macquarie University to the Commissioner of Forests (A124 P92) refers to the need for protection of "true rainforest".

By letter of the 10th January 1976 Mrs. Nicholson wrote to Dr. Webb (A208). As she there says on behalf of The Channon Residents Group they were originally concerned at the proposed logging on a purely

selfish level (20/10 TP113). She there expressed the view that where logging had taken place it had regenerated very well and when she wrote that letter she was visiting the forest on average once a week. She sought Dr. Webb's assistance in clarifying the status of brush box and was again drawing the distinction between that and pure rainforest (20/10 TP114). Dr. Webb replied by his letter of the 9th March 1976 (A124 P96 - 7) in which he classified the brush box forest with rainforest understorey at Whian Whian as interalia "a type of wet sclerophyll forest maintained by repeated wildfires under a particular climatic regime and soil fertility status. That classification according to Dr. Webb was one of the acceptable classifications of the forest (25/9 TP58).

In the letter of the 13th March 1976 from Mr. Virgona to the District Forester (A124 P98) a compromise is offered involving amongst other things the non logging of rainforest. It is submitted that this is to be construed as a compromise of the non logging of rainforest proper but that the logging of brush box would be acceptable notwithstanding Mrs. Nicholson's attempt to seek the inquiry to come to a different conclusion based on an earlier letter to Mr. Morris. (20/10 TP108 and following).

Probably in October 1976 a pamphlet was produced by the Action Group (A209) which again drew the distinction between rainforest and brush box forest (20/10 TP115).

On the 15th June 1976 Ms. Selwood wrote to the Lismore Council and again there is the distinction between rainforest and brush box and the emphasis in the letter is on catchment effects not on logging in itself. In September 1977 the Terania Native Forest Action Group made a submission to the Government in relation to Terania Creek (A26). In that submission on page 1 a distinction is drawn between rainforest and brush box with rainforest understorey and indeed the map which appears on page 2 draws a distinction between the three forest types namely rainforest proper, brush box and the wet sclerophyll forest, which is the same distinction referred

to on page 4 2.2. Again the distinction between brush box and rainforest is referred to on page 6 without dissent and the distinction appears throughout the whole of the submission (20/10 TP116 & 117).

There was no mention in that submission of Aboriginal significance and the educational significance of the basin was not mentioned Mrs. Nicholson not thinking it a very significant point anyway (20/10 TP117).

The letter of the 24th January 1978 from Mr. Murphy again refers to brush box and blackbutt stands without dissent (A124 P131).

In December 1977 it was decided not to log rainforest in Terania Creek (A3).

On the 15th February 1978 Mr. Murphy on behalf of the Terania Native Forest Group wrote to the Minister for Conservation and Water Resources congratulating him on the decision not to log the rainforest proper A28(1). The letter goes on to express concern about the brush box stands and there is no dissent from the Forestry Commission's view of brush box as opposed to rainforest. In this letter there is a reference to the buffer zone protecting the rainforest although this point does not seem to have been seriously advanced in this inquiry.

On the 9th June 1978 Dr. Webb wrote to the Minister for Conservation and Water Resources (A124 P143) and in that letter he congratulated the Minister on his decision to forego further logging "of the rainforest stand" in the Terania Creek basin. At the time he wrote that letter he was aware that the Forestry Commission still proposed to log the brush box stands and no where in the letter did he object to that proposed logging. Nor in that letter did Dr. Webb claim that the brush box was rainforest. It is a fair implication from his letter that the brush box which was to be logged was not part of the rainforest (25/9 TP56).

In the letter of the 12th March 1979 (A124 P169) the Terania Native Forest Action Group was again repeating the distinction between

rainforest and brush box without dissent (20/10 TP120).

On TP65 of 10/3 Dr. Webb expressed the view that the site there involved (within logging area No. 1) didn't deserve the term a young rainforest. On the 23rd April 1980 P41 Dr. Webb agreed that there were other areas in Terania Creek classified as brush box by the Forestry Commission which in his view didn't deserve the term a young rainforest. Dr. Webb agrees that that view was inconsistant with the view put forward on the 24th and 25th September that regardless of soil fertility and fires brush box in Terania Creek should be classified as rainforest (25/9 TP70). He now considers that that was an off-the-cuff statement which should be withdrawn (25/9 TP60-61).

On the 22nd April 1980 at P35 Dr. Webb expressed the opinion that sclerophylls such as brush box are the hard-leaved species which do not belong to the rainforest. It it is submitted that this view is likewise inconsistent with the view express on the 24th and 25th September that brush box should be regarded as rainforest (see 25/9 TP62).

Dr. Webb in his submission B2 advances the theory of succession. He gave evidence firstly in April 1980. Dr. Turner gave evidence on 2nd September 1980 and it's submitted effectively showed that succession was not a fact in Terania Creek. It was only after this and for the first time on 24th September that Dr. Webb expressed the view, inconsistant with his earlier evidence that brush box was a rainforest species.

Dr. Webb agrees that the views put forward by him in his submission in February 1980 to the Commission as to the nature of brush box is inconsistent with the evidence he gave on the 24th and 25th September (26/9 TP11) and indeed he agrees that the views put forward on the 25th and 26th September are equally inconsistent with views expressed by him in B71 which views were put forward to the inquiry by Dr. Webb on the 24th September 1980 (26/9 TP8).

Dr. Webb agrees that the most recent view of brush box put forward by him is a departure from the traditional view of brush box which he was putting forward in the submission B2 in February 1980 (25/9 TP74). Mr. Williams agrees that the traditional or orthodox view of brush box trees with rainforest understorey is to regard them as something different from rainforest 1/12 TP69-70. Mr. Hitchcock agrees that the normal or orthodox view or traditional view certainly in the Forestry sense is that brush box is different from rainforest 25/11 TP38-39. To the extent that Dr. Webb relies on Francis and to the extent that Mr. Floyd relies on Francis and to the extent that Mr. Floyd has written an article on the nature of brush box it should be observed that both authors refer to brush box as being "on the margin" of rainforest and it is submitted that there is a distinction between that and being part of the rainforest itself (see B71 (2), A214 14/11 TP27.

(ii) Succession

The Forestry Commission in A1 P36 & 37 espouses the view that the vegetation in Terania Creek is in a dynamic state of equilibrium (compare Mr. Bruce 18/6 TP55 and Dr. Gentle 12/6 TP32). The opposing view is that the brush box with the rainforest understorey is a disclimax rainforest or to put it another way is one step in a seral succession and could eventually turn into rainforest. As Dr. Turner said (3/9 TP17/18 and 4/12 TP10 and 24-30) this succession theory was only a theory and was not supported by any scientific data. Indeed Dr. Webb in B2 agreed that a fire once every 300 - 400 years was enough to regenerate schlerophylls and destroy the rainforest in such places as were burnt. Dr. Webb also in B2 makes reference to "the forest pattern in Terania Creek Basin is therefore determined by several historical processes on different time scales that are in turn controlled by topography and soils". No evidence other than the "theory" is put forward to substantiate the possibility of succession in Terania Creek.

Dr. Webb's reference to both soils and fire frequency, perhaps unwittingly, it is submitted was accurate and the theory of succession in relation to Terania Creek was certainly put forward before the opponents of logging were aware of Dr. Turner's evidence in particular relating to soil fertility and fire frequency. It is proposed to deal with each of these matters separately.

(iii) Soil Fertility

As noted above in A1 the Forestry Commission maintained that soil nutrition was a factor in the nature and distribution of vegetation in Terania Creek Basin. As also noted above so did Dr. Webb. Such a view was also put forward by Dr. Gentle 18/3 TP63 Mr. Lowery 19/3 TP29, A35 26/3 TP29 although Dr. Webb at 22/4 TP83 and in exhibit B3 sought to say that the predictive values were accurate at the extremes but not in the middle. Dr. Webb however agrees that he can express opinions in relation to soil factors and their predictive value in general terms only and speaking broadly and the only anywhere near relevant soil analysis which he had done was in Whian Whian State Forest. He also agrees that unless he had done a detailed analysis in Terania Creek there would real dangers in applying his Whian Whian and Eastern Australia results to Terania Creek (26/9 TP13 & 14). To the extent that Dr. Webb uses results from Fraser Island he agrees that there are enormous dangers in extrapolating results from Fraser Island to Terania Creek if it is claimed that this can be done with precision. He was only adopting a broad brush understanding (26/9 TP15). Dr. den Exter 8/5 TP15 agrees that in Terania Creek soil is a significant factor in the question of succession.

It is submitted that on the evidence Dr. Turner is undoubtedly a soil chemistry expert and that no other witness has anything like such expertise notwithstanding the fact that they sought to comment on and in the main did comment on Dr. Turner's results without objection. Dr. Turner carried out what is submitted was a detailed soil analysis for Terania

No

Creek and the results of that analysis appear in A187 and A188. Dr. Turner is of the view that there is no evidence that rainforest species are succeeding on brush box sites from a soil chemistry point of view 3/9 TP15 and he concludes that the soil types as typified by their nutritional status delineate the forest vegetation of the Terania Creek Basin. This conclusion means that from a soil analysis point of view there are distinctive soil types in Terania Creek which support distinctive forest types in the sense of rainforest, brush box and coachwood and that you do not find brush box on sites of rainforest nutritional value and likewise you don't find rainforest on sites of a lower nutritional value at present occupied by brush box. This does not mean that you do not have an understorey of rainforest but that the understorey is severely limited in its development because of the absence of the nutrients. Dr. Turner was of the point of view that on the brush box sites you would never get a fully fledged rainforest (3/9 TP15 & 16). Dr. Turner also concludes that it is very highly probable that the existing configuration of forest types is restricted by soil chemistry and will continue in its present state and that soil drainage and disturbance, e.g. fire, would reinforce this pattern. Dr. Turner's evidence indicates that succession is not happening at Terania Creek and that the species that are on one site will stay there unless there is some dramatic change in climate or some other factor and these opinions are based solely on soil chemical analysis (3/9 TP17).

It is submitted that Dr. Turner's evidence on soil chemistry and his conclusions were not challenged in any material sense by any witness.

Dr. den Exter and Mr. Coates had carried out certain soil analysis in Terania Creek and on the 21st October 1980 took the stand and were no doubt prepared to give evidence in relation to that analysis and no doubt draw conclusions which one can confidently predict would not have been in accord with the evidence from Dr. Turner. Leaving aside the question of those witnesses' lack of expertise in soil chemistry matters, the transcript

for that day revealed what could only be described as an extraordinary circumstance where the witnesses were aware that different extractive procedures led to different analysis figures and in turn different interpretations, yet they did not know what extractive procedure had been used in relation to the soil analysis certificate about which they were to give evidence. Suddenly these witnesses were not being recalled and were not recalled notwithstanding that they were invited to be recalled for the purposes of answering 4 allegations, namely: (a) knowing that different methods of analysis produced different figures yet not knowing which method of analysis was used how was it nevertheless that those witnesses were prepared on oath to state the conclusions that they drew from those figures; (b) how did they reconcile their evidence that the samples were sent on the 2nd June with the laboratory records which showed that they had not been received until the end of August; (c) how did they explain their evidence and Mr. Graham's allegations about cost involved with the laboratory records which showed no cost at all; (d) knowing that plastic bags "cooked" soil samples and vastly distorted the figures how was it that they were prepared to put forward to the inquiry the results as a fair and reasonable analysis of the soil they took from the ground when the clearer implication was that the soil samples had been "cooking" for six weeks.

As it turned out the proposed evidence from these witnesses was not given and it is submitted that the clear implication was that they were not expert, the allegations could not be answered and the analysis about which they were proposing to speak was highly inaccurate.

No other expert evidence was called to challenge Dr. Turner's evidence though Miss Fox, Mr. Floyd and Mr. Williams did make some comment on Dr. Turner's soil chemistry report. The substance of Miss Fox's comments were that Type E namely rainforest with brush box emergents may be the subject of succession although she agrees that at the time that evidence was given the only evidence she had before her was Dr. Turner's which indicates

that from a soil nutrition point of view the probability of succession in Type E was very slight and she also agrees that when she prepared her submission she had an opinion as to soil nutrition which was unsubstantiated or unfounded (7/11 TP6 & 7).

Mr. Floyd has no experience in soil chemical analysis (14/11 TP44). Notwithstanding this he commented upon Dr. Turners's results as set out in A187 and although he had not studied the range of fertility in coachwood stands before he thought the coachwood fertility range was fantastic. This comment has been answered by Dr. Turner 4/12 TP1 the substance of his evidence being that the range is not fantastic nor anything out of the ordinary.

Mr. Floyd also suggested that plot 2 in Mr. Horne's exhibit A190(2) seemed to be inconsistent with conclusion No. 2 in A187 namely that rainforests are not found on brush box soils and conversely that brush box is not found on rainforest soils. Mr. Floyd suggested that it would have been useful to have analysis at the boundary between brush box and booyong. In fact Dr. Turner's evidence establishes that site No. 2 in A187 (Terania Native Forest Action Group Profile) is on such a type boundary 4/12 TP3 (see also 14/11 TP47 and following). As Dr. Turner says in A187 (and reaffirmed in evidence at 4/12 TP3) the data from this transect including the boundary site is not at variance with expectations derived from assessing the whole basin of Terania Creek from a soil nutritional view point.

The third comment made by Mr. Floyd related to the possibility that sample 1 could have been contaminated in effect by a wash down of ryolite from the upper slopes. (See 14/11 TP56). Dr. Turner answers this comment at 4/12 TP4 where in effect tests were carried out and precautions taken to ensure that samples were taken at an area which was not subject to such contamination.

John Williams also make 3 comments in relation to Dr. Turner's work. Mr. Williams declined to claim expertise in the area of soil analysis though he said that he was competent to comment on Dr. Turner's work based on a reasonable working knowledge of the subject matter (1/12 TP25). Mr. Williams' first comment was that the soil fertility index formula had been worked out in experiments on the growth of blackbutt not in Terania Creek and he doubted whether it was justifiable to extend that formula for blackbutt to the Terania Creek forest communities (1/12 TP25). Mr. Williams had not done any work on constructing a soil fertility index (1/12 TP53) and in making the criticism he had assumed that the index had been constructed from work in other areas on the growth of blackbutt only (1/12 TP53). He agreed that if the index had been tested against a range of vegetation types on a range of sites up and down the coast and found to be accurate that would overcome his first criticism (1/12 TP55). In fact Dr. Turner's evidence (4/12 TP6 and following) was to the effect that the formula had been tested over a 10 year period against a number of stands of varying types of trees, some 30 stands in all and was found to be accurate. It was tested against brush box and Dr. Turner as a soil chemist knows of no reason why that fertility index could not have been applied to Terania Creek as he applied it (4/12 TP8).

Mr. Williams' second criticism had to do with the calcium multiplier in the index to the effect that with such a low multiplier calcium would have no significance in Terania Creek (1/12 TP26 & 27). Dr. Turner's evidence (4/12 TP9) was that although there was adequate calcium in Terania Creek to maintain tree growth there was not an excess of it and therefore it was not playing a critical role within the equation.

The third comment by Mr. Williams was to the effect that so far as the coachwood stands were concerned there were only 3 samples. (1/12 TP29). Mr. Williams agrees that in Terania Creek there are limited areas where coachwood dominates. He was not aware that in the sample areas subsamples

were taken (1/12 TP56). He wasn't aware that in the 3 sites there were 15 subsamples (1/12 TP57) but he indicated that if were doing the sampling he would take 10 - 20 subsamples spread over an area of a few square metres (1/12 TP57). Dr. Turner's evidence was to the effect that the coachwood stands were limited and that with 3 sites and with 15 samples in each these were sufficient to give a meaningful result (4/12 TP9). Details of the sampling methods are contained in Dr. Turner's evidence 4/12 TP1 and following. It was his opinion (contra Mr. Williams) that taking a few square metres say 5 - 10 square metres would be risky because of the problem of contamination. It was his opinion that you needed an area of at least .1 of a hectare (i.e. 1 000 sq.m.) 4/12 TP23.

It is submitted that Dr. Turner is clearly an expert in his field and that there is no evidence from any other expert in the field let alone any other evidence which casts any doubt on his conclusions. To the extent that various people have commented on aspects of his conclusions these comments are (a) inexpert and (b) have been shown by Dr. Turner to be without foundation. It is submitted that Dr. Turner's conclusions should be accepted by the inquiry, the result (on a soil chemical analysis basis alone) being that succession is just not working in Terania Creek. As Dr. Turner pointed out (4/12 TP10 and 24 and following) succession as far as Terania Creek is concerned is a theory, there is no evidence of a scientific sense to support it and his evidence, on a scientific basis, is to the contrary.

(iv) Fire

It was common ground amongst the experts that succession if it were to take place would require in excess of 400 years and perhaps up to 1 000 years and that if there were severe fires prior to succession being completed the effect would be to destroy the rainforest understorey and to assist the regeneration of the brush box such that the process of succession would as it were go back to zero. See Mr. Lowery 19/3 TP40 and

following, Miss Fox 7/11 TP7 & 8, Mr. Baur 2/9 TP31, Dr. Gentle 26/3 TP78 and 12/6 TP32, Dr. Webb 26/9 TP37 and B2, Mr. Horne 3/9 TP20. See also the evidence of Mr. Floyd 14/11 TP54-55, Dr. Florence 18/9 TP6,, , Mr. Williams 1/12 TP61-62.

Dr. Turner carried out radio-carbon dating work in Terania Creek to establish the fire frequency and his report is contained in exhibit A189. Its effect (see generally 3/9 TP33) is that the fire frequency within the brush box in Terania Creek ranges from 280 to 400 years and on average a severe fire will occur once every 360 years and that in the blackbutt stands the severe fire frequency is about once every 250 years. Dr. Turner's conclusions are that the soil properties delineate the species and the extent of their development in the basin and that the fire frequencies reinforce this pattern. On boundary areas of rainforest fire could allow sclerophyll species to temporarily invade razed rainforest sites but the rainforest very rapidly regenerates and the different forest types are re-established on their original sites. Dr. Turner's evidence in this regard was unchallenged apart from the possibility of a wash down on the No. 1 sample site which has been dealt with above.

It is Mr. Baur's view that if in Terania Creek there were severe fires every 360 years for the past 3,000 years then the effect would be in the brush box stands but it would ensure that the brush box remained there that it never got to the stage where the oldest trees died out without being able to regenerate and were replaced by rainforest. The same would apply in respect of the blackbutt. As far as the future is concerned all other things being equal in the absence of a major climatic upset the probabilities are that the fire pattern in the future would be repeated 2/9 TP50-51.

Faced with this fire frequency and their previously expressed views as to the effect of fire 2 witnesses sought to overcome the logical conclusion by suggesting that although the fires may occur as frequently as

they have in the past fire fighting techniques have been so developed that the fires would be put out sooner in effect before damage to succession could take place. See Mr. Floyd 13/11 TP51 and 14/11 TP60 and Mr. Williams 1/12 TP62. Mr. Williams agrees that if the past few thousand years are repeated over the next 1,200 years then you would never reach the stage of complete seral succession assuming that all things around were the same (1/12 TP70), although he has some difficulty in projecting past fire frequency rate into the future, primarily it appears because of extensive European settlement and extensive clearing as well as changes in fire fighting techniques and hazard reduction programmes by the Forestry Commission 1/12 TP62. Both witnesses agree that Terania Creek is relatively well protected from a fire point of view and it is submitted that on the probabilities if there is a severe fire in Terania Creek then there will be major fires on Whian Whian and Goonimbar State Forests and the fire fighting capacity of the district would still be stretched. Mr. Williams agrees that if a fire got into a very limited small area such as Terania Creek it could go through the area before any fire fighter got time to get near the place 1/12 TP63. The fire fighting strength is set out by Mr. Bruce 4/12 TP20 and even in 1980 when it was a potentially very bad year for fires but was not quite as bad as it could have been and where every effort within the district means was used to put the fires out 1 800 hectares of Ewingar State Forest, 300 hectares of Wiangaree State Forest at Razor Back, 600 hectares at Paddys Mountain, 500 hectares at Mt. Lindsay State Forest and 400 hectares in Kurilla State Forest were burnt. These fires were rated as causing moderate to heavy damage which meant that most of the damaged crowns were either scorched or actually burnt off and the understorey was gone 4/12 TP21.

In the circumstances it is submitted that the possibility of the fire frequency pattern in the past being significantly interfered with as a result of fire fighting techniques is nothing more than wishful thinking. The probabilities are that the past fire history in Terania Creek will be repeated in the future.

Faced with the previously expressed views as to succession, soil properties, fire frequency, and the evidence of Dr. Turner and Mr. Horne the overwhelming weight of the evidence was that the probabilities of succession taking place in the brush box stands at Terania Creek was slight or to put it affirmatively the probabilities are that the stands will stay substantially the same at least for the next 1 000 years (see Dr. Turner's evidence referred to above, Dr. Webb 26/9 TP20, Miss Fox 7/11 TP9, Mr. Floyd 14/11 TP64, Mr. Williams 1/12 TP61 & 62 and Dr. Florence 18/9 TP6).

In the circumstances and in light of all the evidence it is submitted that the overwhelming weight of that evidence is to the effect that succession is not and will not in future take place in the brush box stands at Terania Creek.

(v) The Classification of the Brush Box Stands in Terania Creek

In light of the fact that in all probability there is not and will not be any succession in the brush box stands in Terania Creek, the concept of succession it is submitted can be disregarded for the purposes of classifying or typing those stands. It appears that there are only 4 possibilities, namely Dr. Webb's structural and/or floristic classification, Mr. Floyd's E and/or F classification, Dr. Webb's view propounded in the witness box for the first time on the 24th and 25th September 1980, or Research Note 17 (Baur's classification) exhibit A10. There is also Mr. Williams classification system.

In giving his evidence to the inquiry Dr. Webb sometimes used his floristic classification, sometimes used his structural classification and sometimes combined the 2 (25/9 TP38 and following). The floristic classification system is unpublished 25/9 TP40. Dr. Webb agrees that in those circumstances the details of the floristic classification can't be tested 25/9 TP41. In those circumstances Dr. Webb agrees that it would be unfair

or unrealistic to expect the Forestry Commission to have used Dr. Webb's floristic classification. See also 23/4 TP20. In Dr. Webb's structural classification there is no necessary relationship to species type and if that classification were used one would not know with any precision what species were in a particular area nor what timber volumes were there and Dr. Webb agrees that it would be unrealistic for the Forestry Commission to type a forest according to his structural classification 23/4 TP22. There is no document which sets out the combined floristic and structural classification 25/9 TP46. Dr. Webb agrees that if one of the purposes for classifying Terania Creek was timber production it would be unrealistic to use his floristic classification and unrealistic in those circumstances to use his structural classification although he is unable to agree that by combining the 2 it would be equally unrealistic 25/9 TP47. He does agree that using the mixed floristic and structural classification it doesn't enable one to know with any degree with precision what timber volume is there nor the species present 25/9 TP47 & 48. He ultimately agrees that if one is going to consider logging an area the use of the floristic and structural classification would be unrealistic, would only be helpful as a rough guide and nothing near as helpful as a classification according to Baur's Research Note 17 25/9 TP48.

Dr. Webb's classification of Terania Creek as expressed on the 24th and 25th September is something that only became his view from about June 1980 onwards prior to which he adhered to the orthodox view of brush box (26/9 TP8). In those circumstances, it is submitted that it is totally unrealistic to expect the Forestry Commission to have used a system of typing the brush box in Terania Creek such as expressed by Dr. Webb on 24th and 25th September when (a) that system was not even in existence when the typing was done or Al written, (b) that system is unpublished and untested, (c) on the evidence for reasons already expressed it is very doubtful whether that system is validly held or believed in by Dr. Webb or whether it was a matter which came about for reasons of expediency only.

Mr. Floyd's E and F classification likewise is not published (14/11 TP65-66) and he cannot recall any report prior to his report of 12th March 1980 which sets out that system. There is no publication which sets out the scientific criteria for distinguishing between types E and F. In the circumstances again it is submitted it is unrealistic to have expected the Forestry Commission to have utilised such a system of classification.

Mr. Williams in his submission B111 suggests that in classifying a forest while it may be suitable for forest management purposes to take into account trees of 50 cm or more in diameter, ecologically he would regard it as necessary to take into account trees down to 10 cm in diameter (1/12 TP9) and it is also necessary to take into account the number of trees of the particular species or group of species per hectare you then utilise what is called an Importance Value Index 1/12 TP12 and following. Mr. Williams agrees that according to his classification of overall dominance of numbers and basal area in relation to Mr. Horne's plots contained in A190 (and see B11(ii)), plot number 1 qualifies as having overall brush box dominance in terms of numbers and basal area, in plot number 2 brush box is the second top species, in plot number 3 it is the top, (plot number 4 is pure rainforest) in plot number 5 brush box is just behind bangalow palm and in plot number 6 brush box is in Mr. Williams classification the dominant species 1/12 TP47 and 48. Mr. Williams agrees that in order to use his system in Terania Creek for classifying the vegetation it would take an enormous amount of work at least 100 plots of 1 hectare or 50 or more for certain and it then would involve counting within those plots every type of vegetation from 10 cm in diameter up. Mr. Williams appears to agree that his system would be completely impracticable for the purpose of typing State Forests and he agrees that Research Note 17 is very suitable for forest management. Mr. Williams system of classification has not been used for forest management purposes but only for ecological scientific study 1/12 TP49.

Terania Creek Basin is made up of 2 State Forests. One of the purposes of State Forests is timber production and it is therefore submitted that the only appropriate system of classification of Terania Creek is a system which takes into account the possibility of utilising an area for timber production. This does not mean that ecological considerations are to be ignored but it does mean that systems, leaving aside the question of them being unpublished, which are solely ecologically based and which don't give any indication of timber species or volume (see the references supra and 26/9 TP42) are inappropriate. It is submitted that in these circumstances State Forests should be typed according to a system which does not ignore the possibility of logging and likewise does not ignore the ecological approach. The only such system published or unpublished is Mr. Baur's system of classification as set out in Research Note 17 exhibit A10. Dr. den Exter does not know of any other published system of classification of forests which enables a forest manager to know with some precision the different types of timber that are within a forest nor which facilitates or aids in the knowledge of volume of timber within a forest (8/5 TP38). Dr. Webb agrees that Mr. Baur's system works for the system of identifying different timber species and enables one to know with some precision timber volumes in an area and that where different timbers have different uses it is necessary to know with some precision what species you have and with some precision what volumes are there 23/4 TP21. Mr. Floyd agrees that Mr. Baur's system of forest classification is an excellent system from a forest management point of view 14/11 TP65. Despite various opinions expressed to the contrary, the author of that system Mr. Baur describes the system as neither purely ecological nor purely commercial but is an attempt to marry the two interests. Mr. Baur is not aware of any other publication which attempts to marry the ecological with the needs of the Forestry Commission from a forest management point of view 2/9 TP11. See also 2/9 TP9. Similar views were expressed by Dr. Gentle 18/3 TP54 and 20/3 TP13 and 14. Dr. den Exter agrees with the statements in A10 to the

effect that the forest types are based primarily on ecological principles, that many of the types described in A10 are in fact based on several associations recognised by ecologists, that the classification resembles and owes much to ecological classifications and that it is intended as an aid to forest management in the broadest sense 8/5 TP36. Dr. Webb also thinks that Mr. Baur's typology for the purposes of logging and the things he specifies is admirable (i.e. forest management in the broadest sense).

It is submitted that in the circumstances of lands being controlled for management purposes in the broadest sense, forests should be classified according to a system which attempts to marry both the ecological and the commercial purposes. Forest management in the broadest sense can not and should not ignore either. Mr. Baur's system is the only system which attempts to marry the two purposes. Indeed in the case of Terania Creek Mr. Baur does not think there has been a substantial departure as between Forestry Commission typing and what he would expect ecological typing to be 19/9 TP18. In the circumstances it is submitted that that system of forest classification is the only system which could have or should have been used by a management authority attempting to classify a forest taking into account both commercial and ecological factors. It is unrealistic to expect the Forestry Commission to have utilised systems which were either unpublished or systems which were only ecological and which ignored or did not aid in the commercial side of forest management. Mr. Baur's system is the only balanced system available for typing forests.

(vi) Is Terania Creek Correctly Typed According to Baur's System?

The first question which was "floated" on this question by the anti-logging group is whether or not the 50% referred in type 53 refers to 50% by basal area or canopy cover of the upper canopy trees or whether it includes the understorey. This suggestion was first raised by Mr. Prineas in cross examination.

As a matter of construction of Research Note 17 type 53 (A10 p.44), it is submitted that it is abundantly clear that the 50% does not include the understorey. This is also made clear on P10 of exhibit A10 where it refers to wet sclerophyll forests as being trees in excess of 100 feet in height. Clearly it is submitted that in type 53 what is to be typed and what is to satisfy the 50% is the upper canopy and one does not take into account the understorey. It is submitted that that is clear as a matter of construction of A10 and indeed that was the understanding of that document by its author Mr. Baur 19/9 TP1 and TP22, Mr. Horne 5/9 TP 5 and following, 10/9 TP16 and following. See also the evidence to the effect that Baur's system has been in use since 1963 and it has never been suggested that there is any ambiguity in the meaning of type 53 or that it referred to anything other than the upper canopy. The fact that it did refer to the upper canopy was also the understanding of Dr. Webb.

It is submitted that on the evidence there can be no doubt but that according to Baur's system of classification Terania Creek has been correctly typed.

The areas of various types of forest were originally set out on P5 of A1 but were subsequently revised as indicated in A6. This retyping arose because originally typing had been done in 1972 from aerial photography without an extensive amount of field work and the revision arose out of revised work and field inspection done by Mr. Squire in late 1979 early 1980 (19/3 TP3, 27/3 TP57 & 8, 18/4 TP3 and 21/4 TP20). Mr. Squire did the retyping and his system of doing it appears at 26/6 TP11 and involved two full days in the field. The maps contained in A45 were produced from the retyping as was map A16 and the model (26/6 TP13 & 14). In Mr. Squire's opinion (and he is undoubtedly an expert) there is no other practical way in which the forests of Terania Creek could have been more accurately typed (26/6 TP14). So far as he is aware there is no area in Terania Creek which could have been typed yellow carabean but which hasn't

or any area which should have been typed coachwood crabapple but hasn't (26/6 TP15). As a result of a possible dispute as to the area G6 Mr. Squire went back into Terania Creek and he was satisfied with the accuracy of the typing of that area as it appears on the model (26/6 TP14). The accuracy of Mr. Squire's typing and his evidence was not materially altered in any way in cross examination.

The accuracy of the typing was reinforced by Mr. Horne's evidence and in particular in relation to the basal area and canopy cover of his plots which appear in exhibit A190 with particular reference to A195. During cross examination of Mr. Horne particularly by Mr. Prineas it was suggested that the plots in A190 so far as they relate to brush box did not satisfy type 53. Mr. Horne's evidence in reexamination 10/9 TP10 and following was to the contrary namely that in respect to all five logging areas the basal area of the upper canopy brush box in each case exceeds 50% (the range being 53% - 82%) and the canopy cover of the upper canopy brush box in each case exceeds 60% (the range being 60% - 90%) 10/9 TP11. This evidence was reinforced by Mr. Baur 19/9 TP1 - 3.

Notwithstanding what is submitted to be the undoubted accuracy of the typing some areas of dispute have arisen in relation to type boundaries and certain undertakings in relation to type boundaries have been given by Mr. Bruce. One such area is indicated at 2/5 TP35 and as Mr. Bruce indicated 2/5 TP36 the logging areas are designated with a fairly broad brush which is considered quite adequate for forestry purposes and it doesn't mean that every hectare of the country shown in the logging area will in fact be logged. See also 18/6 TP4. As Mr. Bruce explained on 13/6 TP32 the logging areas have been mapped as realistically as they can be without a vast amount of field work and the only alternative which would certainly not be practicable would be a vast amount of field work locating the trees on the ground from the aerial photography or alternatively getting a licensed surveyor. This difficulty is compounded by the map scale and it

is just totally impracticable for the Commission to delineate on the ground the exact boundaries of the areas intended to be logged (13/6 TP33) and if Mr. Bruce has given an undertaking in respect of any particular area that undertaking would be adhered to in the logging plan, unless directed by the Commission or the Minister to the contrary, and no such contrary direction has been given in respect of the undertaking given by Mr. Bruce and referred to 1/5 TP18 (see 13/6 TP32 & 33).

It is submitted that in fact Research Note 17 and the typing system set out therein has been applied to Terania Creek as accurately as is practicable and should be accepted by the inquiry as accurately reflecting the forest types at Terania Creek and in particular that the areas typed brush box in the proposed logging areas should be accepted as in fact being accurately typed as brush box according to type 53 in Research Note 17 exhibit A10.

7. Terms of Reference and Their Construction

The substantive terms of the Inquiry are that the Commissioner is to enquire into the environmental factors associated with the proposed logging of Terania Creek and to recommend whether logging should or should not proceed. Forestry Commission accepts the interpretation of the terms of reference made by Mr. Tamberlin on 21/12 TP1 and following. The Forestry Commission maintains the submission made and ruled in its favour on 6/8 TP5 that the question for the Inquiry is in substance should logging go ahead or not but the inquiry is not, with respect, empowered to entertain the further question namely if logging is not to proceed should Terania Creek become a National Park.

The Forestry Commission also maintains the submission made on various occasions and ruled in its favour that the terms of reference do not empower the Commissioner to enquire into questions of reafforestation, questions of ammendment of the Forestry Act, questions of the overall

financial viability of the Forestry Commission nor matters arising out of and associated with the August 1979 "incidents".

8. The Form of Inquiry

During the course of the inquiry certain groups and individuals have made comment and criticism as to the form of the inquiry and the conduct of it. The Commission does not propose in this submission to deal with those matters but seeks to reserve a right of reply if they are again raised by other parties to the inquiry.

9. The Likely Effects of Logging as Proposed or not Logging (in no particular order)

(i) Erosion and Turbidity

In part the question of erosion has already been dealt with in this submission in relation to the snig tracks, the snig pattern, the dump sites and the roading and the filter strips all of which have been designed to minimise the possibility of soil erosion and the possible effects on water courses.

The only expert hydrologist who gave evidence was Dr. Cornish from the Forestry Commission. His view was that the proposed logging operation in Terania Creek would not cause any significant erosion or pollution problems 29/5 TP11. It is recognised that natural land slips have taken place in the Terania Creek forest before but in Dr. Cornish's opinion he does not anticipate that the proposed logging operation would contribute to any significant increase in natural land slips 29/5 TP12. Indeed exhibit A116 indicates where natural land slips have occurred in unlogged areas of Terania Creek Basin 13/6 TP11. All parts of the harvesting operation have been designed so that the erosion impact will be minimised A1 P33 and this has particular reference to the snigging pattern and the other matters referred to above. Dr. Cornish spoke about the importance of the special

conditions imposed on this operation at 29/5 TP12 and following. Notwithstanding very heavy logging which has taken place in Terania Creek in the past prior to the imposition of any conditions to minimise the erosion impact of such operations there is now no visible evidence which Dr. Cornish has seen in the Basin of serious erosion resulting from these former operations although short term effects were doubtless evident at the time 29/5 TP25 and 26. 'While it is likely that there will be an increased run-off from the logged area immediately after logging it will reduce with time to something like the original run-off within three years. Dr. Cornish is of the view that it is almost certain that in such a small disturbed area such as is proposed in Terania Creek that no noticeable increase in storm flow peaks in Terania Creek would occur 29/5 TP33. Indeed if the proposed logging operation in Terania Creek goes ahead at peak flows he did not consider that there would be any noticeable change in turbidity for people along Terania Creek Road who may use the water for domestic purposes 29/5 TP35 although perhaps in a scientific sense it could be measurable. At peak flows any increase would not so far as Dr. Cornish is aware have any health overtones 29/5 TP35. At low flows Dr. Cornish is of the view that there would be no noticeable effects at all for possible users of the water and he would think that it may even be difficult to measure any changes at low flows 29/5 TP35. Immediately after the proposed logging takes place Dr. Cornish would not anticipate that there would be any noticeable increase in the water flows in Terania Creek 25/6 TP43 and even on the assumption that there may be miles and miles of snig tracks at peak flows Dr. Cornish does not anticipate that there would any noticeable change in the turbidity of Terania Creek 25/6 TP45 and 46.

Although there appears to be no dispute that the turbidity is caused by run-off of water into streams which in turn is caused by rain, only two pieces of evidence were sought to be adduced in an attempt to indicate that Dr. Cornish's views may be inaccurate. The first was contained in B15 to the effect at P.19 that photographs taken on the 14th

November, 1979, and 16th November, 1979, respectively at Bishops Creek and Terania Creek indicated turbidity in the latter but not the former. This suggestion ignored the fact that at Bishops Creek there had been some 22 millimetres of rain where as at Terania Creek there had been some 86 millimetres 4/12 TP24. In Mr. Bruce's opinion the differences in rainfall at the different sites could certainly account for the differences in visual turbidity and so could such matters as the type of terrain and soil that the stream flows through. Mrs. Elenius 30/10 TP85, not a hydrologist, would not accept that if there had been four times the quantity of rain at Terania Creek the comparison of the two creeks would be completely invalid.

The second piece of evidence which sought to indicate that Dr. Cornish's evidence was erroneous was referred to in the Terania Native Forest Action Group submission B70 para. 5.4 at P.89 of that exhibit which was also stop 1 day 1 of the second inspection of 1st May, 1980. Although there is no doubt that there is erosion at that spot there is no definite evidence that this slip had not occurred before logging and there is certainly no evidence that it was caused by logging (1/5 TP1 and following).

In any event it will be recalled that logging at that spot took place in 1968/69 prior to the introduction of the erosion control mitigation measures referred to above.

It is submitted that the overwhelming evidence is to the effect that there will be no significant erosion problems caused by the proposed logging and there will be no signficant turbidity problems caused by the proposed logging.

(ii) Confidence or the Thin End of the Wedge

This question of confidence has been referred to in three general contexts, namely confidence in the area and industry generally within the area, confidence within the individual companies involved and confidence insofar as it relates to the employees of Standards Sawmilling Co.

Mr. Boyd, the Officer-in-Charge of the N.S.W. Department of Tourism Information Centre at Tweed Heads and also the President of the Tweed Shire Council, on behalf of the Council expressed the views that the encouragment of industry and indeed the non loss of industrial enterprise in the Tweed Shire was vital to its future (15/7 TP6). The very fact that this Inquiry has been set up by the Government has of itself engendered some uneasiness in the business community as to the future of the timber industry. The industry is nervous and it is submitted that if this Inquiry recommends to the Government that Terania Creek not be logged then that uneasiness or lack of confidence in the future of the industry would be exacerbated 15/7 TP26. Of course if Standards Sawmill, which is a major component of the Shire's total economy, had to close its doors it would have a major detrimental effect on the Shire 15/7 TP9 and the concern of the Council is that the Terania Creek issue is the trendsetter for what is going to happen in the future 15/7 TP21.

Mr. Graham's clients were not prepared to undertake that the results of the Inquiry would not be used in relation to other areas (15/7 TP21) so showing it is submitted that they believe that Terania Creek is the thin end of the wedge.

Mr. Manewell was concerned that Terania Creek may be a thin end of the wedge and if the environmentalists have a victory in Terania Creek they are going to close up a terrific amount of forest in the State and then where will the timber come from (8/7 TP79).

Mr. Hauville who is President of the Lismore and District Chamber of Commerce and Industry also referred to the question of confidence and the uncertainty as to whether or not people in finance would be prepared to lend money for ventures involved in the timber industry e.g. machinery 9/7 TP12. It is his opinion that industry would not succeed without confidence and that what was needed was positive findings (from the Inquiry) and positive statements to return confidence to the industry 9/7 TP32.

Standard Sawmilling Co. recognises that the resolution of this particular issue is a critical factor in the determination of its future, the particular issue being the logging of Terania Creek, because the Company has to make investment decisions and at the same time it is facing an uncertainty and in fact a credibility gap with its major supplier of resource namely the Forestry Commission 14/7 TP6. The Company's creditors and bankers also require confidence to work with the Company in a normal business relationship, particularly where the Company has reached as it has a stage where it must seriously consider substantial additional capital expenditure. The submission of Standards A136 and the evidence referred to above in the Forestry Commission's submission make it clear that in that Company's view it has lost confidence in the ability of its major supplier the Forestry Commission to deliver the supplies of raw material which it has available.

Mr. Barnett from Munro and Lever expressed the opinion that the setting up of the Inquiry had caused his company a great deal of apprehension because it felt that it couldn't make very definite plans for the future until there is some surety that undertakings and the past record of the Commission will continue into the future. His company has delayed quite a number of investment plans that they had and believes that if the Inquiry is against the logging of Terania Creek there will be a nexus or attemped to be a nexus formed that is used as a precedent for other areas. As such his company would be very loathe to invest further in the timber industry in N.S.W. He doesn't believe that the Inquiry is really only talking about Terania Creek. It is really talking about the future of the indigenous timber industry in N.S.W. 15/7 TP45 and TP61.

Mr. McKelvie from McKee Engineering Pty. Ltd. 16/7 TP11 expressed the view that investors in the sawmilling industry are lacking the confidence to go ahead with their updating or modernisation programmes. And see also re Standard Sawmilling Co. Pty. Ltd. 21/7 TP30.

Standard Sawmilling Co. has experienced a drop in employee morale or lack of confidence by employees in their future and this is based upon discussions with employees as to their future. A good many of these employees perhaps the greater bulk would be married (75%) with families, the greater bulk of them would be involved in commitments relating to the purchase of their homes (50%) and some of the concern expressed by employees was related to what might happen to them in the future 21/7 TP57. See also A223.

The Associated Country Sawmillers believe that any decision not to log Terania Creek would be the thin end of the wedge 16/9 TP7 and 16/9 TP39.

The Manager of Speer and Jackson Pty. Ltd. Mr. Middleton 23/9 TP5 was of the opinion that if logging was stopped at Terania Creek it was a precedent and "they" would go from strength to strength. The matters which cause the loss of business confidence are ad hoc reductions in quotas 23/9 TP23.

Mr. Unsworth on behalf of the Labor Council also viewed the decision in Terania Creek as a pacesetter for what might happen in the future in other areas 30/9 TP27. Mr. Weir on behalf on the Australian Timber Workers Union expressed a similar view 30/9 TP39.

It is submitted that in light of this overwhelming evidence there is already a lack of confidence in the area generally, in Standard Sawmilling Co. and in the employees of that company about the future of the timber industry. This lack of confidence is, it is submitted, detrimental to the well being of the area, of the company and of the employees and any decision by this Inquiry to recommend against the proposed logging operation will exacerbate the already present lack of confidence. That in itself it is submitted is one reason why the proposed logging should go ahead or to put it negatively it is a very sound reason why the opponents of the proposed logging operation should be required to establish affir-

matively and on sound scientific grounds why the proposed logging should not go ahead. It is submitted that the opponents of the proposed logging operation certainly have not so demonstrated. A recommendation in favour of the proposed logging operation will, it is submitted, have the effect of restoring business and community confidence in the area.

(iii) Regeneration

Notwithstanding the history of logging in Terania Creek Basin and its uncontrolled nature, it is submitted that the evidence clearly establishes that the areas previously logged have regenerated well. Certainly in February 1976 A207 it was Mrs. Nicholson's view that it was not apparent from walking through the basin that it had been logged in the past. When that article was written Mrs. Nicholson was aware that a considerable part of the basin had been logged before and she could tell where some of the logging had taken place because of the stumps yet in some parts it was difficult to tell that logging had taken place notwithstanding the stumps because it had regenerated so well.

Road 6 is a fine example of regeneration notwithstanding no prior controls (11/3 TP74). In areas heavily logged, (Stop 1 day 2 of the first inspection) was regenerating (11/3 TP60). In some places there is ample regeneration and after 30 years it is very hard to see any detriment to the logged areas and the recovery is very good (23/7 TP22). Indeed the degree of regrowth is "probably fine for what it is" (Mr. Murphy 23/7 TP24). Further, there was no directional felling and the logging was heavier and more severe than is proposed (23/7 TP25). Plot 3 as indicated in Exhibit A38 is regenerating satisfactorily to brush box after logging 20 years ago (20/3 TP4). Road No. 6 referred to above was a road through rainforest. It is fairly pessimistic to say that it is difficult to ensure that you're going to get natural regeneration from selective logging (21/4 TP31 and 18/6 TP56). Indeed you could nearly guarantee sufficient natural regeneration following logging (20/6 TP40). Stop 4 of the inspection on the 12th

March had been logged 30 years ago and the restoration of the canopy is looking good (12/3 TP82).

Detailed evidence as to the past regeneration was given by Mr. Horne in particular in relation to Exhibit A190. Plot 1 which was just west of logging area No. 3 was logged in 1949 and regeneration of brush box was satisfactory (3/9 TP55 and following). The assertion made by Mrs. Nicholson 23/7 TP23 that this plot was not typical is incorrect in that it is very typical of logged and burnt brush box and even more typical of the proposed logging area No. 3 (3/9 TP59). Plot No. 3 in A190 was logged in 1959 and it is inside the southwestern end of the proposed logging area No. 2. The regeneration here is such that it is not an area of any worry as far as perpetuation of the brush box type is concerned (3/9 TP63-65). Plot 6 in A190 was logged in 1959 and is contained in logging area No. 5 and again this area is out of contention as a worry as far as perpetuating the brush box is concerned (3/9 TP70-71). The availability of ample seed trees makes it certain that brush box would regenerate in plot No. 2 if the stand were to sustain some change which would allow light onto the forest floor with some baring of the soil e.g. logging (A190 (1) P2).

With the exception of road No. 6 the above evidence relates to areas which would be typed by the Forestry Commission as brush box. The most outstanding example of rainforest regeneration is the Cornpatch located south of Terania Creek Basin but within the valley. The Cornpatch was cleared in 1942 and has subsequently regenerated. The photographs of the Cornpatch show the progression from 1942 to 1972 (A34 1). Indeed the evidence is that not only was the Cornpatch as it were clear fallen but it was also sowed with crops at one stage and at another used for pasture. The nature of the rainforest regeneration is that not only early succession species have regenerated but also many of what might be considered final succession species are part of the regenerating stand (A190 (1) P5 and 4/9 TP5 and following). Mr. Floyd says that the Cornpatch is an example of

rainforest growing without a buffer zone to protect it over the last 40 years 13/11 TP66. He also says that you would be likely to get better regeneration of rainforest understorey under the brush box trees in the five stands proposed to be logged in that it has up to a two stage or 30 year advantage over the Cornpatch. Mr. Floyd said that he noticed stage three species coming in straight away among the regrowth coming into the 1979 logging area 13/11 TP66. In relation to the quality of the regeneration on the Cornpatch, Mr. Floyd says that there is a very good diversity of species 13/11 TP62.

The overwhelming evidence is that the basin which was subjected to heavy and in parts ruthless logging in the past and without the environmental controls and constraints proposed in the current operation has regenerated well both as to brush box stands and areas that would be typed as rainforest.

Indeed the regeneration has been such that the previous logging has made no substantial impact on the view from the overview on the cliffs above the basin (12/3 TP95). Mr. Hitchcock from National Parks and Wildlife Service agrees that from such a point you may not see much difference between logged and unlogged areas (12/3 TP97). Mr. Murphy agrees that from such a vantage point the basin is undoubtedly one of the most spectacularly beautiful examples of various forest systems in one area in the vicinity of Lismore (12/3 TP102).

Notwithstanding the extensive logging that has taken place in the past in Terania Creek the 372 unlogged hectares is still a scientificly significant bench mark preserve (24/4 TP9). Indeed the logging episodes dating back to World War II have superimposed very short-term changes over the past 40 years (B2 P13) although Dr. Webb seeks to qualify that statement at 24/4 TP12.

Dr. Florence envisages that any impact would be short term and certainly within 10 years or so he could imagine the basin being an

excellent recreation and nature and education area. There would in his opinion be rapid regrowth, the actual impact of disturbance would be removed in something like 3 years and in 10 years the gaps would be beginning to be less evident because of the regrowth in them. After 3 years the gaps would be evident but it would be covered well 17/9 TP65. Given the sort of soil disturbance which Dr. Florence observed in the area logged in 1979 and given the large number of seed trees he would be confident of brush box regeneration 17/9 TP70.

Notwithstanding the previous logging, the basin is suitable for day walking and if the proposed logging went ahead involving a reduction in unlogged area in Terania Creek by 42 hectares this would not make it unsuitable for day walking (7/5 TP60-61) and, notwithstanding the past logging, Terania Creek does have considerable scientific interest and if the proposed logging went ahead it would still have considerable scientific interest (7/5 TP61 Dr. den Exter). The suitability of the basin now and in the future for recreation is dealt with below.

Given that the environmental safegards in A1 are complied with and given that the Forestry Commission exercises the expertise which in Dr. Florence's opinion it has demonstrated, it is his opinion that the proposed logging in Terania Creek would not unduly effect the ecological integrity of the ecosystems and the forest in his opinion would retain a capacity for rapid aesthetic recovery 18/9 TP9.

Logging which involves removal of between 30 and 40% of the overstorey of brush box would leave ample seed source for regeneration in Dr. Florence's opinion 18/9 TP6-7.

Notwithstanding the extent of the past logging and the severity of it in the basin, it is Dr. Florence's opinion that the basin as a whole is aesthetically attractive and that to the casual observer he would be unaware possibly that there had been heavy and environmentally disturbing logging 18/9 TP9.

It is Mr. Hitchcock's view that standing on the floor of the basin and looking around one sees for all practical purposes a very attractive type of wilderness rainforest from a recreational aesthetic point of view 25/11 TP47.

As a result of the previous logging in Terania Creek it is Mr. Hitchcock's view that the subtropical rainforest has recovered well and in general terms is a resilient form of vegetation 25/11 TP44.

In Mr. Hitchcock's view where logging has taken place in the past in Terania Creek one sees stumps and some cases sawn heads but the good regrowth conceals most of the signs of the logging impact and from a visual impact point of view there has been good regrowth of the rainforest understorey which is associated with the brush box 25/11 TP53.

Mr. Lemaire 16/4 TP76-77 was of the view that where roads go through the rainforest areas there would be regeneration in only a matter of a few months and in the hardwood areas at the end of the year there would be regeneration there. The selective logging will provide sufficient soil exposure to enable regeneration 11/6 TP10. It is Mr. Bruce's view that you could nearly guarantee sufficient natural regeneration following logging in the proposed areas and that the planting on the log dumps and in the larger openings would be more in the nature of insurance than a necessity 20/6 TP40. Mr. Horne, in addition to his earlier evidence, was of the opinion that brush box in plot 3 was regenerating even in the absence of fire 3/9 TP65 and indeed it is his opinion that if the logging were to go ahead it satisfies the two needy conditions of opening the forest floor by taking out some of the canopy. Once this happens the seed falls and the very act of getting the logs out makes an ideal bed so that logging will perpetuate brush box (3/9 TP69, see also 9/9 TP38). Dr. Florence is confident, given the sort of soil disturbance that was observed in the area logged in 1979 and given the large number of seed trees remaining, that there will be regrowth 17/9 TP70. Mr. Floyd is of the opi-

nion that snig tracks are beneficial to the regeneration of both brush box and flooded gum and indeed are essential, either that or a wildfire 13/11 TP75. Mr. Floyd says that brush box trees produce seed all the year round 13/11 TP22. Miss Fox, from the National Herbarium, was of the opinion that certainly in the smaller clearings she could anticipate brush box would regenerate normally and she acknowledges the role of flooded gum in assisting regeneration in larger openings 7/11 TP10.

It is submitted that the evidence clearly establishes adequate regeneration from past uncontrolled heavy logging operations unaided by the use of flooded gum and that flooded gum indeed assists in regeneration in the hardwood stands where necessary. The evidence also clearly establishes that if the proposed logging goes ahead, it can be anticipated that the regeneration will be as good if not better than the regeneration that has taken place in the past, bearing in mind the selective nature of the logging operation, the planting of flooded gum to assist regeneration and the environmental controls on the operation which were not in force in previous logging operations. It should be noted that no one, let alone an expert, has said that the regeneration will not take place as referred to above or that it will be unsatisfactory.

(iv) Recreation

It should be noted that many opponents of the proposed logging have stressed the recreational potential of Terania Creek notwithstanding that about 50% of the Basin has been logged before and notwithstanding that some parts have been very heavily logged. It is implicit in the submission by these persons that that extent of logging has nevertheless left Terania Creek Basin suitable for recreational purposes.

The Lismore Council deals amongst other things with tourism 23/10 TP16. In Mrs. Ryan's opinion the influx of tourists into the area is important for the area's economy 23/10 TP18. In relation to the value of

Terania Creek for tourist purposes in terms of the whole area it is her view that the majority of family people will tend to go to the beach particularly if they're from the city. Terania Creek would be in the top five attractions but so far as Lismore is concerned it is basicly the only tourist attraction the city has. She would expect the majority of tourists that come into the Lismore area to go there so long as they are not elderly because it is pretty difficult to wonder around the forest 23/10 TP20.

In relation to the tourist attractions in the Lismore city area Mrs. Ryan agreed that Rocky Creek Dam is a good tourist attraction as is The Channon Market, Mount Nardi, Minyon Falls and Whian Whian State Forest generally 23/10 TP24-25.

Also linked with the question of recreation is the question of regeneration which will take place which has already been dealt with. Also linked with the question of the impact of the recreational aspect of the Basin is the fact that the unlogged area in Terania Creek if the proposed logging goes ahead will only be reduced by 42 hectares to some 330 hectares.

Mr. Hitchcock from the National Parks and Wildlife Service views at least certain areas of the unlogged forest as very attractive from a recreational point of view 11/3 TP65. Indeed from a recreational point of view from vantage points above the Basin you cannot see much difference between the logged and unlogged areas. The open area where lunch was had (the Police Camp) is an attractive area for recreational purposes. Hitchcock (12/3 TP97) is of the view that roads should terminate at such a point and thereafter access to the forest should be on foot 12/3 TP98. Mr. Prineas who agrees that to some extent the educational value would be less if there were no means of access to the various features of the Basin 12/3 TP99.

People wishing to see rainforest for recreational or other purposes have other areas close to Terania Creek and for the quarter ended

30th November, 1979, only 400 visited Terania Creek out of a total of 9 000 which visited Rummery Park, Minyon Falls, Peats Mountain, Terania Creek, and Mebbin State Forest (A43 (ii)) 27/3 TP10 & 11. It is the Forestry Commission's experience that easier access immediately encourages visitation A1 page 32 and 21/3 TP15 and indeed the Forestry Commission's activities in the Basin have made it a much more attractive area because it has been more accessible 14/4 TP4.

North Coast Conservation Council in their submission gave evidence as to increased numbers visiting Terania Creek 5/5 TP65. The indications are that now that the glare of publicity in relation to Terania Creek has declined the visitation statistics are tapering off 11/6 TP38.

Mr. Bruce does not agree that Terania Creek Basin compares favourably with all the other reserves and proposed reserves in the Byron Bay - Evans Head area in terms of road access 18/6 TP38 and there is nothing unusual about Terania Creek's lack of undergrowth which does not impede walkers. Terania Creek certainly stands up favourably in terms of the variety of walks of different standards of difficulty available within an hour and half of Lismore or Ballina, likewise in terms of scenic quality 18/6 TP39-40. Mr. Bruce does not agree that Terania Creek by reason of its size and topography offers a degree of isolation from users of it for walking experience which is at least comparable to any other reserve or proposed reserves. In his opinion Limpinwood would certainly be better. Terania Creek from a camp site availability point of view and access to water is in his opinion at least comparable to other reserves and taking into account all these criteria Terania Creek compares not more than favourably but favourably with the other reserves or proposed reserves as a tourist attraction 18/6 TP40-41. There is not a lack of high quality forest areas within a comparable distance from Lismore and Ballina and indeed such areas as Mount Warning, Limpinwood, Minyon Falls Flora Reserve, Big Scrub Flora Reserve, Nightcap Track Flora Reserve, Wiangaree State

Forest and parts of the proposed Border Ranges National Park and Numinbah Nature Reserve fall under this category. In the area demand for forest recreation is not increasing faster than the making available of the reserves 18/6 TP42-43.

Mr. Boyd is of the view that in the small radius of Murwillumbah they are very well endowed with areas for one day walk or wilderness experiences and it has been his experience that most people want to gain access via the roads to get into these areas and then possibly do an amount but not a great amount of walking from that point and it is of his opinion that good access roads and good signpointing is an indispensable aid to assisting people in their appreciation of these areas (15/7 TP11-13).

Dr. Florence is of the view that if the proposed logging went ahead it would not reduce the forest in its value from a recreational reserve point of view 18/9 TP10 and he does not think that management of the basin primarily as a nature and recreation reserve is incompatible with wood production remaining a significant part of the management of the basin 17/9 TP62.

The walks relied upon by the North Coast Conservation Council were advertised both directly and indirectly as a result of the "incidents" (see 7/5 TP77 and 8/5 TP1). The walks were directly advertised in February or March 1979 and onwards 14/10 TP38.

Dr. den Exter is of the view that the timber in Terania Creek should be left untouched and that in Terania Creek he is opposed to the use of the timber resource for any commercial purpose 15/10 TP37. Notwithstanding that it has been logged previously and notwithstanding that the proposed logging would be a very short term high intensity usage and that tourism could be described as a continuous long term low intensity use 15/10 TP32, it is submitted such tourist use would undoubtedly cause damage e.g. increased use of Terania Creek Road, parking control, camping controls and the like 15/10 TP29 and following.

Mr. Andrews who was called on behalf of the Terania Native Forest Action Group was of the view that bush walking in logged areas was affected by roads, snig tracks and associated disturbance and also that regrowth impeded access 20/10 TP45. He has not been back to Terania Creek since the August '79 "incidents" and he doesn't know whether he will go back again or not as it has been utterly spoilt in his opinion (20/10 TP46).

Mrs. Elenius agrees that where the Forestry Commission has in various rainforest areas established roads, parking areas, lookouts and picnic facilities, whilst they may lack appeal to those seeking wilderness experience, they do satisfy an obvious demand for this type of rainforest recreation 31/10 TP32.

Mr. Hitchcock from the National Parks & Wildlife Service agrees that the existing roads in Terania Creek provide ease of access for the visitor to some of the prime observation areas 24/11 TP43. Mr. Hitchcock further agrees that after the proposed logging operation, most but not all of the recreational attributes of Terania Creek will still be present 25/11 TP30. The one in particular which would not be present would be some detraction from the large brush box trees in logging stand 46 north, although there will still be some undisturbed stands of brush box remaining after logging 25/11 TP30. Mr. Hitchcock agrees that hardwood or red cedar stumps do have some recreational and educational value, although there is a need for some form of interpretative sign. The substantial logging activities in the past can undoubtedly be used for recreational and educational purposes 25/11 TP50 and he agrees that it is certainly open to argument as to whether past human disturbance has detracted from the recreational potential of Terania Creek 25/11 TP51. To his eye where there has been logging in the past there has been good regrowth of the rainforest understorey, which conceals most signs of the logging impact TP53. It is submitted that the National Parks & Wildlife Service submission B109 on Page 29 should be construed to the effect that there is in Terania Creek no

immediate or obvious evidence of past human disturbance 25/11 TP50 and following. On the question of detraction from recreational resource by visual splendour of some of the brush box trees, see also 3/12 TP16.

Linked with the question of recreation is the suitability or otherwise of Terania Creek for day walking and the availability of alternative areas nearby. It is submitted that the evidence establishes (a) that Terania Creek will not be unsuitable for day walking even if the proposed logging takes effect and (b) that even if this conclusion could not be drawn there are adequate alternative areas available for that recreational pursuit.

Dr. den Exter is of the view that there are adequate areas of developed recreational facilities within State Forests, both local to Terania Creek and within the Casino Forestry District, but that the more specific requirements of bush walkers, particularly for full day walks, are not so well catered for and that Terania Creek Basin was more suited to this type of recreational activity 6/5 TP75. The day walk to Dr. den Exter is a walk which normally involves a pack for one days duration and generally in undisturbed forest although formed tracks for the purpose of walking do come within his concept of day walks 7/5 TP47. Dr. den Exter agrees that the Nightcap Track Flora Reserve contains an area that could be used for limited day walks 7/5 TP48. Minyon Falls Flora Reserve is suited for day walks for the more elderly and less agile 7/5 TP50. Mt. Warning National Park is eminently suitable for day walks TP49. Limpinwood Nature Reserve is suitable for inter alia day walks for the fairly energetic TP51. The Mt. Nardi Preserved Area would be suitable for some types of one day walks TP55 and the Lost Valley Preserved Area is suitable for day walks for the more energetic TP56 & 57. Dr. den Exter was organising a day walk in the Sphinx Rock - Blue Knob Area, just west of Terania Creek. Dr. den Exter was of the view that Terania Creek is suitable for day walks TP59, notwithstanding its prior logging, and if the proposed logging went ahead

it would not make Terania Creek unsuitable for day walks and indeed if the proposed logging goes ahead it would not prevent Dr. den Exter from walking in Terania Creek Basin, though to some extent it may discourage him from doing so 8/5 TP68.

There are various proposals to create new or extend Reserves in the vicinity of Terania Creek. There is a proposal to create a Forest Preserve No. 67755 in the area of Point Lookout, there is a proposal to create the Numinbah Nature Reserve of some 900 ha and Nightcap Nature Reserve of some 550 ha (4/12 TP17-18).

In Mr. Bruce's opinion combining the Boomerang Falls Flora Reserve and the adjoining areas of State Forest, it is suitable for day walking 13/6 TP24. The Sheep Station Creek Flora Reserve for half a day is quite pleasant for walking. The Nightcap Track Flora Reserve, in Mr. Bruce's opinion, is eminently suitable for day walking 13/6 TP24. The Minyon Falls Flora Reserve has a walking track of some 7 km and, in Mr. Bruce's opinion, is very suitable for day walks TP25. Mr. Bruce, in relation to the Black Scrub Reserve, considers it suitable for day walking TP26. The Big Scrub Preserved Area, in Mr. Bruce's opinion, is at least as suitable for walking as the previously logged area in Terania Creek and the Mt. Nardi Preserved Area is, in his opinion, most certainly suitable for day walking TP27. Mr. Bruce is of the opinion that Terania Creek is undoubtedly suitable for day walking and if the logging proceeds, in his opinion, would most certainly still be suitable for day walking TP28.

The Byron Flora and Fauna Conservation Society, in relation to Lost Valley, wrote to the Shire Clerk, Exhibit A118, seeking its preservation on the basis that it represented a good outlet for bush walking activity 18/6 TP4-5.

Dr. den Exter agrees that in respect to the proposed logging areas there will be a number of effects on their attractiveness or otherwise in

respect of day walking 15/10 TP40, such as roads, regrowth and the like, although he does not seek to further qualify his evidence that the proposed logging would not make Terania Creek unsuitable for day walking.

It is submitted that the evidence clearly establishes

(a) that Terania Creek is presently suitable for recreational activities, including day walking, notwithstanding its prior logging history,

(b) that there are other areas within the near vicinity of Terania Creek for recreational activities, including areas suitable for day walking,

(c) that if the proposed logging operation goes ahead, this will not, make Terania Creek unsuitable for day walking or other recreational activities or to put it positively it will still be suitable for such activities.

(v) Employment and the Effects of Logging or Not Logging

There can be little doubt but that the existing rate of unemployment in the Lismore District is exceedingly high. Mr. Hauville who is the President of the Lismore and District Chamber of Commerce and Industry gave evidence that the unemployment rate was in the vicinity of 16% which he believed to be one of the highest in the Commonwealth 9/7 TP6. Indeed this rate of unemployment has created a great social problem in the city where there are not only people who have come to Lismore by desire who are unemployed but also local people TP7. Indeed there has been an increase of about 140% in the total number of registered unemployed in the Byron and Tweed Shires 1976-1980 there now being at the end of May 1980 2 080 males and 800 females (total 2 880) unemployed as opposed to a population growth of about 9% per annum 15/7 TP6-8. Perhaps it should be noted that there is no real dispute but that the unemployment rate in the area is of the above order.

The Associated Country Sawmillers A193 page 4 indicate that in the Richmond-Tweed-Clarence Area the sawmilling industry directly employees (as at June 1979) 1 250 people who earn approximately $11 million per annum.

Dr. den Exter produced figures for the Casino Forestry District relating to employment in sawmills and contract logging related to Crown sawlog sales which purported to show that employment declined as Crown sawlog sales increased and vice versa (B12(2)). However, when the table was corrected for the conversion from super feet to cubic metres, (15/10 TP2) he agreed that the figures showed that the opposite was the case (see also 14/10 TP52 and following). The significance of these figures is that, contrary to other suggestions, employment is closely related to timber volume.

The multiplier can best be described as an economic concept which expresses the relation between a change in the level of expenditure and the consequent change in total income produced by it. The multiplier however is more commonly but less accurately considered to express the relation between the level of expenditure and the level of income to which it is linked. By analogy the concept is extended to employment where the phrase is related to the indirect effect of one person becoming unemployed (see for example A203 page 9, 12/3 TP100, 14/4 TP63, 28/4 TP74, 6/5 TP65 particularly 8/5 TP47).

Opinions vary as to what is the particular value of the multiplier in the Lismore region. The Border Ranges Inquiry thought that the multiplier factor for the entire Tweed Shire was 2.1 (see for example 6/5 TP65, A193 page 4). The Forestry Commission gave evidence that the value of the multiplier might be more than 3, A1 TP23, 14/4 TP63 and following, 12/6 TP4-5 and 12/3 TP100. There is disagreement as to what is the value for the Lismore District but it suffices to say that it is a range of 2-3. This means that if it is 2 then for every person employed by either Hurfords or Standards who becomes unemployed 1 other person elsewhere will

become unemployed. If the value of the multiplier is 3 then for every 1 person who becomes so unemployed 2 other persons become unemployed as a indirect result of the first person from Hurfords or Standards becoming unemployed. Perhaps one of the most obvious examples of related unemployment would be the prospects for McKee Engineering who manufacture and repair sawmilling equipment (see for example the evidence of Mr. McKelvie 7/7 TP12 and 29).

Hurfords is in the local context of Lismore a major industry employer 12/5 TP19. On average they employee a staff of 50 the break up of which appears on A85(1). Standard Sawmilling sees itself as and, it is submitted, is a significant employer in the region and has been for many years. See A136 page 16 and 14/7 TP25. The Company currently employs 89 persons though on average for year 1979/80 the figure is 88 21/7 TP26.

In the above circumstances it is necessary to consider the possible effects on employment in the event that the logging at Terania Creek does not go ahead as proposed. Standard Sawmilling Co. says that the resolution of the Terania Creek issue is a critical factor in the determination of that company's future A136 1.1, 14/7 TP6 and critical in the sense that the company shortly has to decide whether or not to invest substantial sums of money in replacing existing plant or indeed in new technology and processers while at the same time it is facing an uncertainty and in fact a credibility gap with its main supplier the Forestry Commission 14/7 TP6. Between 1970 and 1975 the Company spent a total of 1.5 million dollars in expanding the company's complex at Murwillumbah 14/7 TP11. The history of the Company's quota as referred to above in these submissions indicates that there has been a very substantial cut in quota. The Company has searched for alternative economic supply within Australia with very limited success and in New Guinea, Canada, Fiji, Malaysia, Solomon Islands, New Zealand and Western Samoa A136 2.5. Between 1973 and 1975 when the abovementioned sum of money was spent in expanding the

complex the Company had no indication that their quotas were going to be reduced in respect of Border Ranges 14/7 TP14. The Company so far as alternative supplies are concerned state that the physical and financial considerations positively exclude their ability to substitute expensive imported timbers for any further short fall in local quota A136 2.8. Indeed the cost of obtaining the timber from Samoa is more than twice and approaching three times that of local resource 14/7 TP15. In the Company's opinion it could process significantly more timber than presently available without a substantial increase in its existing facilities but less timber availability would obviously place its entire operation in jeopardy A136 2.14.

The evidence clearly shows that much of the plant and equipment at Standards is lying idle for significant periods of time. Pre Border Ranges all the plant and equipment at Standards was fully occupied, the drying complex and boiler house working 7 days a week 3 shifts or in other words they were going continuously except for Christmas and the odd shut down for maintenance. The ripping and planing shed was fully manned and producing for a full 8 hours every day of the week 5 days a week and the primary mill was fully manned cutting eucalypt hardwood during daylight hours 8 hours a day and at night time it would start cutting flitch, Brush Box and Brushwoods. It was virtually working 2 shifts 14/7 TP17. Now the boiler house and drying complex work on a 4-5 week cycle on drying and a 4-5 week close down. The ripping and planing section works basically 2 days at close to full production and the other 3 days doing dressing. The night shift in the primary mill is now non existent. It cuts eucalypt, hardwood and brushwoods to a schedule as the market demands generally on a weekly basis, 2 days of one, 3 days of the other, and the same crew or some members of the crew are moved from area to area to work these various plants at these times to produce market requirements 14/7 TP17 and see the note of the inspection 10/7 TP10, 11, 12.

The volume of timber proposed to be extracted by Standards from Terania Creek is approximately 5 300 m^3 gross which represents approximately 40% of the Company's existing annual quota. Standard Sawmilling views this as 5 300 m^3 of log resource which will be lost to the Company forever if logging does not proceed and bearing in mind the reduction in the Company's quota of 55.5% since May 1976 in terms of employment levels and viability it is that company's opinion that any further reduction in quota however small in quantum assumes truly significant proportions A136 3.1 - 3.3 and 14/7 TP18. Indeed the fact that the Forestry Commission's decision to log a small part of Terania Creek Basin has been challenged and has resulted in this detailed public Inquiry leads Standards directly to the conclusion that the Forestry Commission's forward projections of resource availability are susceptible to significant variation A136 3.6, 14/7 TP19. The Company says that it is imperative for the future development and growth of the Company that it is able to rely with confidence on the ability of the Forestry Commission to both control and supply a resource it has projected is available and that otherwise the most appropriate action by the company shareholders may well be to sell the company's assets piece meal and close its doors A136 3.10 & 11.

Standard Sawmilling points to the fact that the sawmilling industry is generally facing a supply situation of natural species which are not expected to increase at least over the next 2 decades. It therefore follows that irrespective of which individual sawmiller is to consume the available resource any reduction in the volume of that resource must lead to a reduction in productivity and loss of employment opportunities 14/7 TP33.

Standard Sawmilling says that in the event of timber not being made available to it from Terania Creek one of the alternatives open to it is to consider its continuation of its present operations 17/7 TP19.

It is submitted that the evidence in relation to the availability of more Samoan flitch should be accepted, that evidence being to the effect

that the further supplies of flitch over and above those that are ordered would engender an unacceptable cost component for the company and that if the loss from Terania Creek were replaced by imported Samoan flitch and assuming it could be imported there would be a very significant effect on product mix 17/7 TP32 and following. The scarcity of private property timber has already been dealt with.

Bearing in mind all these matters the company says that they've reached a point where any further reductions irrespective of how small will become very significant in their future planning a) because it is a quantity of timber that has gone forever and b) it is a question of confidence 17/7 TP41 and although calculations can be made of its effective split over 20-25 years to the company it is a quantity of timber gone forever in one lump sum 17/7 TP41.

Within Australia some predominantly brushwood flitch and sawn timber has been available in the past but the company has received only small supplies - nothing that continued for any length of time 17/7 TP45. Although they have sought alternative sources of brush box there has been limited success with small supplies on ad hoc basis ranging from an odd truck load to a supply over a period of 4-6 weeks 17/7 TP47.

In reference to the option of the shareholders selling the company's assets piece meal and the company closing its doors, while this is not the only alternative it is indeed a serious possibility and was not submitted to the inquiry with the intention of scaring the public 21/7 TP23. It is the company's view that if Terania Creek timber was available then a reasonable level of confidence would be established. The timber itself is important being a one time loss forever and access to timber is just another positive way of stating the company's confidence in the Forestry Commission 21/7 TP29.

It is the company's opinion that the reduction in the company's number of employees since about 1976 has been caused by a reduction in the

amount of resource available rather than the increased mechanisation.

Many of the anti-logging submissions, and indeed the cross examination on behalf of those bodies, have sought to show that there will be no unemployment consequences in the event that logging of Terania Creek does not go ahead as proposed. It is submitted that this stance is a) not in accord with the evidence and b) certainly is not in accord with the view taken by the Terania Basin Committee of which Dr. den Exter was a member prior to this Inquiry being set up. Those views are set forth in Appendix 4 to the North Coast Conservation Council's submission being exhibit B12(1). On page 2 of that appendix it is stated "it can be argued that withdrawal of the Terania Basin allocation need not involve a scaling down of operations by Standards in the immediate future provided that no more than 1 000 m^3 are removed from the total supply in any one year.

It is therefore suggested in that appendix that the quota allocation from the Mullumbimby Working Circle be reduced by 1 000 m^3 to 4 500 m^3 for a period of 6 years, this volume of timber representing the total volume intended to be removed from the Terania Basin at this time. At the end of a 6 year period the quota allocation from the Mullumbimby Working Circle can be increased again to its current level although at this time it would seem that there will need to be a review of the industry as the Murwillumbah Working Circle ends its current economic life span.

From the above analysis it can be seen that removal of the Terania Basin allocation spread over a time period of 6 years need not result in undue hardship to Standards or lead to the standing down of employees .....

However it is also clear that in the longer term (beyond 7-8 years) the company will face severe difficulties as its supply from the Murwillumbah Working Circle runs out".

It is submitted, despite Dr. den Exter's denials (8/5 TP20 and following), that it is clearly implicit in this proposed solution that

unless some remedial action is taken in the event of Terania Creek not being logged there would be undue hardship to Standards and it would lead to the standing down of employees of Standards. The appendix also emphasises supply difficulties which will shortly face the company.

This proposed solution it is submitted is in accord with the general tenor of the Standards evidence to the effect that the non logging of Terania Creek will cause the company hardship and is completely not in accord with the "revised thinking" of the anti-logging parties to this Inquiry.

So far as James Hurford and Co. Pty. Ltd. is concerned the effect of not logging on that company is more difficult to ascertain bearing in mind that Standards are receiving approximately 5 300 m^3 gross where as James Hurford and Co. Pty. Ltd. is receiving 1 100 m^3 gross and bearing in mind the fact that James Hurford and Co. Pty. Ltd. is a more diversified company dealing also in finished products, hardward and the like. Mr. Hurford is of the opinion that the loss to his company of 150 m^3 a year for the next 5 years would result in 1 weeks cutting being lost per year. He said "now the 150 m^3 on a very rude bit of work with a pencil appears to be a weeks cutting. What do we do? Do we all go for a holiday or what?". Of course if that loss of timber is to be regarded as being lost but not spread over 5 years presumably the result would be that 5 weeks cutting would be lost in one year with resultant effects.

In an area which has a very high unemployment rate already it is submitted that the possibility of unemployment is more serious than it might otherwise be. It must follow it is submitted that in the event that people do lose their jobs, their prospects of finding alternative employment are remote.

Both Dr. den Exter's table B12 and the evidence from Standards referred to above indicate a correlation between available resource and

employment levels, both moving in the same direction. In other words as timber available to the mills is reduced employment likewise reduces.

Although it cannot be said with certainty that any particular number of people will lose their jobs, the above evidence indicates that there will be at Hurfords a not insignificant loss of resource and at Standards it is indeed a serious possibility that the company will close its doors. That possibility would of course have very serious consequences not only for the employees involved and their families but also for the economy of the area. The effect of such action would not be confined to the direct employees but through the multiplier concept would have further adverse effects on the region's economy.

Such consequences should it is submitted be avoided at all reasonable cost particularly where the overwhelming weight of the evidence is to the effect that there will be no significant detrimental environmental effect if the proposed logging goes ahead. In those circumstances it is submitted even the possibility of such employment consequences should be strenuously avoided.

Even if for example Standards were not to close their doors in the event of a recommendation being made that the logging not proceed, it is submitted that the evidence undoubtedly establishes that the business confidence in the area will seriously deminish. Such lack of business confidence must it is submitted result in unwillingness of business to expand and develop with resultant detrimental effects on the employment levels in the region. On the other hand the evidence establishes that a decision to permit the proposed logging to go ahead will have the effect not only of avoiding the possibility of unemployment as referred to above, but also of restoring some of the business confidence in the area with no doubt beneficial effects for the unemployment in the region and business investment, and on the evidence particularly the investment which Standards say they need to make in the foreseeable future if their sawmilling business is going to be continued in its present form.

Flora and the Effect of Logging

Earlier in this submission the significance of flora has already been dealt with in relation to flooded gum, the ability of the forest to regenerate and various aspects of roading and the like being designed to minimise the effect on inter alia flora.

(i) Weeds including Camphor Laurel and Lantana

As far as Terania Creek is concerned Mr. Lemaire does not consider the problems of weeds to be a serious one 11/3 TP75 and he cannot recall an instance of camphor laurel developing where there was a canopy over it TP76 and 28/3 TP25. At the Police Camp there is a great deal of lantana and there is also some crofton weed present and at the completion of logging the Commission plans to clear this weed growth by tractor and plant flooded gum seedlings to encourage regeneration of forest under their shelter Al page 21, 28/4 TP63. Flooded gum has the effect of controlling weed growth after it develops and the crowns start to meet and cut down on the light reaching the forest floor 28/4 TP63, 12/6 TP46. The effect of flooded gum suppressing weeds has already been dealt with.

Dr. den Exter in his submission (B12) and at 6/5 TP69 criticises the Forestry Commission for its lack of reference to potentially serious weeds particularly camphor laurel and he refers to the work of Mr. Firth. He expresses the view that the bulk of Terania Creek that has camphor laurel in it is down stream from the State Forest so that camphor laurel is present in his opinion and posing quite a problem in the area down stream from the forested area of Terania Creek and it is his opinion that these trees would provide a seed source from which seeds could enter the forest by way of birds 6/5 TP70.

In Dr. den Exter's opinion Mr. Firth's article in the Agricultural Gazette sufficiently sets out the material on camphor laurel for his purposes 14/10 TP34. The Agricultural Gazette is exhibit B80. Dr. den Exter

admits that he was seeking to imply that there was a possibility of camphor laurel growing in Terania Creek if the logging goes ahead (14/10 TP61). It should be noted that, in addition to Mr. Horne's evidence that he found no camphor laurel in the basin in logged and unlogged plots (A190(1) page 3 and 3/9 TP73), Mr. Williams in his species list makes no reference to camphor laurel and Mr. Floyd's species list likewise makes no reference to camphor laurel as being present in the basin.

Dr. den Exter referred to the camphor laurel 2 metres high near the 1979 logging site and in addition he has seen several trees several metres in height on the western side of Terania Creek on an old logging track 14/10 TP61 and in recently disturbed areas he has seen quite a number of camphor seedlings about 4 inches high 14/10 TP62. The areas F6, G5, G6 and G8 on A16 are the areas where he has noticed camphor laurel 14/10 TP62. On the western side as referred to above there were 2 trees and that was all he saw on the western side of Terania Creek. On the eastern side there were the seedlings referred to above and the tree near the 1979 logging 14/10 TP62. He agrees that the amount of camphor laurel that he has seen in the basin is minute in comparison with the extent of the logging that has taken place in the past in the basin 14/10 TP63.

Notwithstanding that Dr. den Exter is prepared to rely on Mr. Firth and refer to him as a source material, he rejects Mr. Firth's statement that camphor laurel cannot establish itself in areas predominanted by wet sclerophyll forest because of the competition 14/10 TP63 and exhibit B80. Dr. den Exter is not prepared to concede that Mr. Firth's statement that camphor laurel cannot establish itself in areas predominated by wet sclerophyll forest is consistent with his observations of the amount of camphor laurel in the basin 14/10 TP64.

Dr. den Exter states that the long term effects of camphor laurel are unknown and he doesn't think that there is enough information as to the possible long term effects 14/10 TP65. He does not agree that if camphor

laurel was going to be a threat in Terania Creek basin it would have made itself more evident in the past TP65 although he would have expected it to have done so had there been locally available mature source trees. Although Dr. den Exter seeks to explain the absence of camphor laurel in Terania Creek on increasing numbers of source trees since the last logging TP65 and although he is aware that camphor laurel grows to something in the order of 90 feet in height over a long period of time, leaving aside the seedlings the sum total of his observations in the basin were 3 trees, all relatively young TP66. He denies the possibility of camphor laurel is another bogey that he has introduced into the Inquiry TP67. He agrees that the Wompoo Pigeon uses camphor laurel as a food source TP68. As to the gradual spread of camphor laurel and the possibility of Wompoo Pigeons speading the seed see also 15/10 TP57.

Mr. Nicholson has seen a number of camphor laurel seedlings along the main road into the Terania Creek basin. In his opinion the fact that fruit eating pigeons and other open country birds eat the camphor laurel seeds means that the dispersal of camphor laurel is more rapid because most of the camphor laurels in the Lismore area occur in open country situtations but they are presently invading closed forest situations more and more. In this regard the Currawongs have the effect of bringing the camphor laurel seeds from outside into the forest areas 20/10 TP67. It is Mr. Murphy's view that camphor laurel has been a serious threat in the last 20 years 21/10 TP54-55. It is Mrs. Nicholson's view on behalf of the Action Group that while weeds will not take over and destroy the forest weeds will alter the ecology of the rainforest. She is not sure whether it would be to a minor degree or to a significant degree 21/10 TP67. Mrs. Nicholson was actually very surprised to see the camphor laurel tree near the 1979 logging TP68. As to the location and size of this tree see also 21/10 TP73.

Ms. Fox from the National Herbarium in her submission B105(1) says that damage to the overstorey, understorey, roads and snigging tracks etc.

may allow the introduction of weeds in the short term. In the northern rivers area lantana is a problem on forest edges or where forest treatment increases the amount of light reaching the forest floor and this can be seen in the lower reaches of the Terania Creek basin. The weed list for Terania Creek is B105(10). See also as to the exotic nature of some of the weeds 3/11 TP65-66. Again in the submission (B105(1)) it is stated that camphor laurel is a severe weed of much of the cleared area around Lismore and up the creek valleys such as Terania. It is spread by birds and its rapid growth rate means that it can out compete the native species. Camphor laurel in Ms. Fox's opinion is a particularly bad tree weed species in that it is long lived and a continuous source of seed and fruit to birds 3/11 TP70. She certainly did not observe any camphor laurel trees in the areas she inspected in the basin but there are sources of seed in the valley very close by and there is a potential for birds from the basin to feed on these trees 3/11 TP71. The camphor laurel trees are a very obvious feature of the landscape around Lismore and are sufficiently large that Ms. Fox presumes they have been there for some time. Certainly neither she nor Mr. Floyd found any camphor laurel in the Terania Creek basin 7/11 TP11.

In relation to lantana the submission by the National Herbarium B105 refers to certain photographs of an area on Gibbergunyah Range Road. Ms. Fox accepts that those photographs are not an analogous situation to the one that one would envisage in Terania Creek in the event of logging going a head 7/11 TP11.

Mr. Floyd in relation to the Cornpatch which was totally cleared states there was almost an impenetrable mass of lantana for a number of years perhaps 20 - 30 which is now starting to be killed off or suffocated as the other trees regenerate 13/11 TP65.

In relation to camphor laurel Mr. Floyd attributed the spread of camphor laurel to the decline in the up-keep of dairying properties and stated that the camphor laurel took about 15 years to produce seed i.e.

about 1955 - 1970 13/11 TP67. If they commence to grow in the rainforest area itself their growth will be restricted if they are shaded but where there is a large opening they grow rapidly and they can take over in the middle of the opening 13/11 TP69. He agrees however that camphor laurel in the rainforest where there is a canopy over it will not in his expectation produce a camphor laurel tree of any substantial height 13/11 TP70.

Indeed where there is a canopy over the camphor laurel seed in Mr. Floyd's opinion he doesn't think they are a worry, the only problem would be where there were large openings created for log dumps and the like. But if on these sites flooded gum were planted, for 10 years the flooded gum would effectively suppress the camphor laurel 13/11 TP70. Where flooded gum grows tall and has open crowns you normally get a rainforest understorey developing and he hasn't seen in this situation camphor laurel because the flooded gum and the rainforest is an inhibiting factor 13/11 TP71.

In relation to lantana Mr. Floyd 13/11 TP72 refers to the Gibbergunyah Range Road site but expresses the view that if flooded gum in suppressing the lantana at the same time encourages the rainforest species to form an understorey then there is no worry of lantana getting in because the rainforest continues to do the job which the flooded gum started to do 13/11 TP72. The planting of flooded gum in the log dump would eventually have the effect of suppressing lantana because it aids the regeneration of the rainforest species which have a heavier canopy which would in turn suppress the lantana 13/11 TP73. In small openings Mr. Floyd would anticipate that there would not be weeds such as lantana and the like. Mr. Floyd refers to the camphor laurel near the 1979 logging log dump 14/11 TP38 and apart from that has not made any mental note of any other camphor laurel within the basin. Notwithstanding Mr. Firth's conclusion as to camphor laurel in B80 in relation to the competition and wet sclerophyll forest, notwithstanding his findings that it hadn't invaded Whian Whian, Goonimbar

and "Tom Rummery" (sic) State Forests (14/11 TP39 and 41), notwithstanding the relative absence of camphor laurel and notwithstanding the past logging in Terania Creek basin, Mr. Floyd would expect that if the proposed logging went ahead that there would be camphor laurel in the large openings such as log dumps and major access roads but would not expect to see camphour laurel along individual snig tracks 14/11 TP41.

Mr. Bruce (A215 and 4/12 TP10 and following) expresses the opinion that camphor laurel problems seem to be mainly confined to areas previously cleared for dairying or banana plantations and that it does not appear to be invading forested areas even though they have been subjected to past logging including clear felling and planting. He further expresses the opinion based on his own observations, Mr. Firth's article and the other material referred to in A215 that if camphor laurel was capable of successful establishment in situations such as Terania Creek it could have been expected that there would be some 37 year old camphor laurel in the basin. Mr. Bruce knows of no such occurrence of camphor laurel 37 years old either in the basin or elsewhere on Goonimbar or Whian Whian State Forests. Further, Mr. Bruce expresses the view that birds have been carrying camphor laurel seeds into Terania Creek basin and other parts of Goonimbar and Whian Whian State Forests for the last 40 years at least and there is evidence to show that at least some of the seed germinates to plants at least 2 metres in height and that they are then suppressed by competition from native species and/or severely damaged by native animals. To Mr. Bruce's knowledge there is no evidence to suggest that any such trees have developed or will develop to the stage that they will have any significant effect on the forest environment and Terania Creek in particular 4/12 TP12.

In relation to lantana Mr.Bruce refers to the Gibbergunyah Range Road site referred to by the National Herbarium and says that the history of the site was no where near comparable with what could be expected in Terania Creek. In relation to the Cornpatch the photographs A216 indicate

that there is a considerable area within the Cornpatch in which lantana has been suppressed by rainforest trees and secondly photographs show that where there is still dense lantana there is quite a satisfactory stock of rainforest trees underneath 4/12 TP13.

It is submitted that the evidence establishes that there will be no significant problems so far as lantana is concerned. It will not appear in the smaller openings and in the larger openings where flooded gum is planted it will be suppressed and will die out. So far as camphor laurel is concerned it is submitted that this remote possibility is no more than an attempt to raise a false issue. There is no evidence of any significant camphor laurel in the basin notwithstanding the extensive logging in the past and Mr. Firth's conclusions following his study on the subject indicate that in a situation such as Terania Creek camphor laurel will be no problem. To the extent that Mr. Floyd considers that there may be some problem from camphor laurel in larger openings, it is submitted that this view is nothing more than speculation and is contrary to observations as to Terania Creek and past logging, observations in Whian Whian and Goonimbar State Forests by Mr. Bruce, and contrary to the findings of Mr. Firth.

(ii) Rare and Endangered Flora Species

The National Herbarium Bl05(1) lists various species under the headings either restricted distributions or at/or close to the southern limit of distribution or special examples of flora. Without being specific the submission on page 10 says that many of the species are ones with restricted distributions and are associated with the brush box stands and are therefore in peril should the logging proceed. It is also stated that the filmy ferns are also threatened with any opening of the canopy.

Ms. Fox agrees that because of the attention that has been paid to Terania Creek it is the one small area of N.S.W. that's received the most botanical investigation of just about any that she can think of and it is

quite possible that if the same intensity of work went into Lamington, Minyon Falls or other areas around Terania Creek it may well be that a lot of the restricted distribution species would be found there as well 7/11 TP13.

Mr. Hitchcock agrees that Terania Creek has been more comprehensively surveyed from a plant species point of view than any other area in the Casino District although he considers that it would be speculating to say that if other areas were similarly surveyed the probabilities are that more or the rare species in Terania Creek would be found elsewhere 24/11 TP62.

In relation to the plants with restricted distributions these are not peculiar or singular to Terania Creek but in the State generally they may be rare or endangered 3/11 TP31. There is a distinction between the plants being e.g. locally abundant and rare and endangered on a State-wide basis or perhaps even a nation-wide or continent-wide basis 3/11 TP35 and when Ms. Fox talks of endangered she is talking about liable to extinction in the course of nature and when she talks of extinction she means plants dying out as a result of nature and not regrowing 3/11 TP79. In some cases the species because of the intervention of man have reached a stage where their survival is at risk in the sense that they may be unable, whether or not there is further intervention of man, to maintain their survival 3/11 TP81.

The large fruited white lilly pilly is growing in areas where there are brush box in the vicinity of the large cave and also to the north in the vicinity of the transect although the larger part of the population would be in the area immediately in front of the caves and there are some individuals that would probably fall within the area that is proposed to be logged 3/11 TP80. It is locally abundant near the cave in the area reserved from logging 7/11 TP15. It appears also in Minyon Falls and Goonimbar TP16.

The shrubby hazelwood was not found in types E and F which are the types proposed to be logged 7/11 TP14 and see B105(4) and it is conserved

in the Nightcap Flora Reserve, the Mt. Nardi Preserved area and the Boomerang Falls Flora Reserve 7/11 TP14. The agrophyllum nullumense (no common name) is in the Mt. Warning National Park and the Nightcap Flora Reserve and according to Mr. Floyd (B106) it also appears in Limpinwood Nature Reserve, Lamington National Park and Nullum State Forest 7/11 TP14.

The pink cherry is in the Nightcap Flora Reserve and has also been found in the Boomerang Falls Flora Reserve and the Big Scrub Flora Reserve 7/11 TP16 and B106.

Corakia appears in Terania Creek both in the area proposed to be logged and there are some individuals nearer the caves in the area proposed to be reserved 7/11 TP16.

Mangobark is common in Queensland and is within the Minyon Falls Reserve, Lost Valley, Rocky Creek and Nullum State Forests 7/11 TP16. Ms. Fox wouldn't be sure it was in a logging area 3/11 TP81.

The pink ash is common in Queensland and it prefers the coachwood-brush box association TP17.

The smooth leaved quondong is common in Queensland and is scattered throughout the coachwood-brush box association at Terania Creek TP17. There are several regrowth trees in Rocky Creek and there is one tree in the Big Scrub Flora Reserve B105(1).

The velvet myrtle does not appear in the types of forest proposed to be logged and it also occurs in Boomerang Falls, Wiangaree, Gradys Creek and Lamington TP17.

The filmy ferns, although stated in the body of B105(1) to have been found in the 1979 logging, are not listed in B105(4) as appearing in the brush box type and are listed only as occurring in association A namely the booyong-yellow carabeen subtropical rainforest 7/11 TP18. The filmy ferns are a very specialised group of ferns and although a taxonomic bota-

nist would no doubt recognise them many other people doing survey work would probably ignore them because they grow on the buttresses of other trees. The ferns found near the 1979 logging had survived that logging 7/11 TP18. The selenodesbium filmy fern does not occur in the type of forest proposed to be logged 7/11 TP19.

The white beech which is listed as a special example in B105 is well away from the proposed logging area 7/11 TP20.

The hairy treefern doesn't occur in Terania Creek in the types of forest proposed to be logged 7/11 TP20.

The rifle grass is a common understorey in the blackbutt and it is submitted has adequately survived fire and logging in the past (compare 7/11 TP20).

Mr. Floyd agrees that the large white lilly pilly is just in front of the overhang and there is quite a bit of it and it is also near the Crags (away from the proposed logging) 13/11 TP38. Mr. Floyd would expect to find more instances of rare and endangered species in the brush box stands rather than on the rich or basaltic soils supporting other vegetation associations 13/11 TP86. The large flowered white lilly pilly is more commonly found in Terania Creek in relation to association F rather than association E and it is Mr. Floyd's opinion that it will suffer from damage although he has found it growing in previously logged brush box areas on Mt. Nardi this indicates that it has sprouted up again following logging. If logging went ahead it could reduce the number of individuals of that species present to some extent 14/11 TP24-30.

Mr. Floyd is of the opinion that the same order of diversity of species that applies to Terania Creek also applies to many other valleys 14/11 TP32. In his opinion, expressed both in 1977 (A24(1)) and in evidence (14/11 TP32), there do not appear to be any unusual or rare species not already preserved elsewhere on the Whian Whian and Goonimbar State

Forests. Indeed, all the rare and unusual species which have been mentioned in Bl05(1) are found in other reserves 14/11 TP33. Mr. Williams agrees with Mr. Floyd that although there are some fine individual specimens of trees in Terania Creek there do not appear to be any unusual or rare species not already preserved elsewhere on the forests and although he cannot say that they are adequately preserved elsewhere he does not have before him any that are not already preserved elsewhere on the forests as Mr. Floyd says 1/12 TP52.

Mr. Hitchcock on behalf of the National Parks and Wildlife Service accept the advice and expertise of Mr. Floyd and the National Herbarium in relation to rare and endangered species 24/11 TP25.

The extent of the reservation of the rare and endangered species can further be gauged by comparing the above mentioned evidence Bl05(1), and Mr. Floyd's report on rare and endangered plants in Whian Whian State Forest Bl06.

See also the evidence of Mr. Williams 1/12 TP18 and following including his evidence as to the reclassification of mangobark and occurrence in areas proposed for logging. In addition Mr. Williams has seen the Comboyne bottlebrush Bl06 species number 1, the thick leaved laurel species 2, the mangobark species 5, and species 6 the hairy treefern, and species 10 the mountain wattle, also corokia, the rusty rose walnut species 15, 1/12 TP20.- See Bl06 for the extent of the reservation of these species. The mountain wattle is the only species that Mr. Williams can recall having seen in a logging area 1/12 TP20. Mr. Williams accepts Mr. Floyd if the latter says that a particular species is common or appears in some location 1/12 TP50 and in particular accepts his evidence that mangobark is in Terania, Rocky Creek and in Lost Valley and also on the slopes at Minyon Falls, Nullum State Forest and also certain non-viable remnants at Crabs Creek and Palm Vale. Mr. Williams accepts that what Mr. Floyd is saying is that mangobark is common in parts of Whian Whian par-

ticularly Terania, Rocky Creeks and Lost Valley but not common elsewhere at all in N.S.W. 1/12 TP50. In relation to the filmy ferns Mr. Williams accepts that as they have been found near the 1979 logging indicates that they have at least survived from August 1979 to March 1980 although he does think that this is a relatively short period of time. In his opinion any disturbance of the canopy must be a serious threat to their survival 1/12 TP51.

The evidence establishes that there are certain plant species considered as rare or endangered that occur in Terania Creek. It is submitted that the evidence establishes that there are no such species in Terania Creek which are not already preserved elsewhere on Goonimbar and Whian Whian State Forests. No witness has asserted that the proposed logging will lead to the extinction or severely jeopardise the existence of any particular species. Many of the species occur in areas other than the brush box and blackbutt type. Many of the species occur in areas of Terania Creek either away from the logging areas e.g. the white beech, the red cedar. Some of these species occur in areas reserved from logging e.g. the reserve area in front of the cave. One species of fern appears to have survived the 1979 logging.

It is submitted that the evidence does not establish any particular danger to any particular species considered to be rare particularly bearing in mind that in relation to such of the species as do appear in logging areas it is only proposed to log 77 hectares out of a total in the basin of about 740 hectares. It is also submitted that while some of these plants are presently considered rare and endangered, bearing in mind the amount of work that has been done in Terania Creek, Ms. Fox's opinion should be accepted, namely that if similar work were done elsewhere it is quite possible that the restricted distribution species would be found elsewhere.

(iii) Palm

According to the Forestry Commission's typing of the basin there are very substantial areas typed as palm forest. Palms occur frequently on the whole North Coast and are so abundant in the Terania Creek Basin that only a small proportion will be damaged during logging. The prolific regeneration of palms following disturbance will probably mean that they will be more abundant following logging than before 17/4 TP35 and see 26/3 TP11. Palms will not be deliberately felled but some damage occurs 17/4 TP36. Where the palms occur as a part of the understorey in brush box they are never capable of becoming a dominant species in relation to that brush box because they don't grow high enough and also because of their basal area, although from a nutritional point of view palm and brush box are capable of developing fully on the same type of soil and brush box does occur in good to impeded drainage where you get optimum conditions for palm 9/9 TP13 & 14 (Horne). Dr. Florence considers that there is no reason why damage should occur to the unlogged palm rainforest although some disturbance will occur to palm where it and rainforest species have developed in nitches within the general areas of the wet sclerophyll forest. In his opinion this can be minimised by due regard to selection of trees for felling, felling direction, tractor paths and the working of tractors 17/9 TP42 and Appendix E to A193.

In Mr. Milleges opinion the palm stand in Terania Creek has been recognised as the largest palm stand in N.S.W. and this has particular implications for birds and in particular the top knot pigeon which depends heavily on the palm fruit at certain times of the year. He agrees that there is a large amount of palm outside and some distance from the logging stands which wouldn't be harmed by logging 6/11 TP9. In his opinion such palm species as may be damaged during logging would certainly come back 6/11 TP10.

Mr. Floyd A24 refers to the extensive apparently natural palm forest at the head of the creek and says that in his opinion they could be

of ecological interest as they must surely be the greatest area of this type in N.S.W. He also refers to the fact that any disturbance up-slope may be risky and it may perhaps jeopardise the palm forest future. Mr. Floyd agrees there are substantial areas of palm away from the proposed logging areas at 5E and 4E, 5G and 2F and he wouldn't envisage any danger to those areas as a result of the proposed logging in the hardwoods 14/11 TP37.

Mr. Hitchcock agrees that in general terms it is fair to say that sub-tropical rainforest is a resilient form of vegetation and where it appears to have been the subject of logging before in his judgement it has recovered well 25/11 TP44. In addition as to the resilience of rainforest species the cornpatch referred to above is it is submitted an outstanding example. There is further the evidence referred to above relating to regeneration generally in relation to Terania Creek. It is submitted that the evidence establishes that palm and rainforest species generally in the Terania Creek area are very resilient and that after the short term effects of disturbance regenerate well.

It is submitted that much emphasis has been layed on possible damage to the understorey by the anti-logging parties as part of a case (which it is submitted is now disproven) that logging will cause damage to the understorey which in turn will interfere with succession of the brush box to a rainforest. In other words while on the orthodox and accepted view of it rainforest trees were not being logged, they sought to establish nevertheless that rainforest would be adversely effected in the long term by damage to the understorey so impeding succession. It is submitted that the evidence (referred to above) disproves in relation to Terania Creek the successional theory and also establishes that while there will undoubtedly be some damage to the understorey as a result of logging the brush box trees the understorey both in palm and coachwood is resilient and that regeneration of these types and other rainforest understorey will take place after the initial short term disturbance.

(vii) Aboriginal Sites

The Forestry Commission because of the possible Aboriginal significance of the large cave decided to restrict logging operations in its vicinity A1 page 31. This reserve is shown on maps detailing the proposed logging areas.

The archeologist from the National Parks and Wildlife Service submitted a report on the cave at Terania Creek (exhibit A19) and, notwithstanding that very little cultural material was recovered during auger sampling, it was recommended that Mr. Warne be permitted to continue guiding small parties of visitors to the cave, subject to the restrictions mentioned in the report. It was also recommended that the National Parks and Wildlife Service staff visit the site every six months to monitor the effects of visitation.

On the first inspection 12/3 TP79 Mr. Hitchcock dealt with certain possible Aboriginal sites and on page 84 referred to the cave and occupation deposit material in relation to the cave. On page 85 he referred to a stone axe having been recovered and also to three other sites in the basin and noted that none of the sites was in direct threat from logging although three of them were in close proximity. He stated that the main threat to the sites would probably come from people. In his evidence on 24/11 TP5-6 Mr. Hitchcock records that during the course of the inspection he encountered a number of Aboriginal relics and that the number of sites should now be increased to four. Reference should be made to the transcript 24/11 TP6 and following and to exhibits B109(3) and 109(4) and 109(5). Mr. Hitchcock is not aware of the existence of, nor has he any knowledge of the location of, a "bora ring" said by Mr. Roberts to be of significance to the Aborigines 24/11 TP22 (see 21/10 TP14). The map (B109(4) and (5)) in fact reveals five sites although it is Mr. Hitchcock's opinion that none of the five sites is under direct threat of the current proposed logging 24/11 TP16. It is his opinion that the reserved area should prove adequate pro-

tection for inadvertent gross destruction by logging and associated activities 24/11 TP17. The Commission has also undertaken with the cooperation of the National Parks and Wildlife Service to take all necessary steps to ensure that no damage will occur to known Aboriginal sites 25/11 TP55-56.

Mr. Frank Roberts (21/10 TP1 and following) is a member of the Bundjalung Tribe. He learnt the traditions of that tribe from his father, his grandfather and his uncle. His grandfather, Mr. Lyle Roberts senior was the last Aborigine to undergo full initiation rights and the Terania Creek site was part of his educational experience, this having taken place about ninety years ago. More recently, occasionally Mr. Frank Roberts and others go to Terania Creek and he has been out there about four times this year (1980). He is involved in moves to restore the Aboriginal culture to the area 21/10 TP4 and he envisages that Terania Creek might be used for these purposes 21/10 TP6. Terania Creek was not used in respect of marriage ceremonies nor was it used for burials 21/10 TP7. The Aboriginal people first became actively concerned with the Terania dispute in August 1979 and this was the first time that they expressed opposition to the proposed logging. Mr. Roberts explained that prior to August 1979 they did not have any apparatus (presumably for expressing their opposition) 21/10 TP9. Mr. Roberts says that Terania Creek is sacred and has spiritual significance because it has a site such as the cave and it might have a tree which is sacred. It also has other sites such as Durangar Rocks in the Nightcap Track Flora Reserve TP9. It should be noted that neither Mr. Roberts nor the Terania Native Forest Action Group (in their submission B70 paragraph 3.7) nor the National Parks and Wildlife Service has suggested that this wider significance to the Aboriginal people is such that the proposed logging should not go ahead.

In the absence of such an assertion and in light of the fact that the evidence establishes that the Aboriginal sites within Terania Creek such as are known will be protected from the effects of logging, it is sub-

mitted that the proposed logging in this regard, so far as the evidence establishes, will have no adverse impact.

(viii) Fauna

The Forestry Commission in A1 page 28 and following on the information then available to it concluded, in relation to mammals, that it was not expected that the impact on the mammal populations would be significant. In relation to birds, again on the information then available to it the Commission concluded that there should be no significant effect on the bird population of the whole area as a result of logging. In relation to reptiles and amphibians, it was concluded that it can be anticipated that the proposed logging operation would have no significant impact on the reptiles and amphibians in this section of Whian Whian and Goonimbar State Forests. It should be noted in particular that contrary to various assertions the Forestry Commission did not conclude that there would be no impact.

Miss Conway on behalf of the Forestry Commission gave evidence to support the above conclusions 20/3 TP62 and following. The Forestry Commission Wildlife Ecologist Mr. Rowen-Jones did not work at Terania Creek because his priorities lay elsewhere, namely in an area of about half a million acres of woodchip country at Eden 9/4 TP70.

Miss Conway considers the statements made in A1 and set out above to be "fair enough". She does not agree that a great deal more research needs to be carried out in Terania Creek in relation to the impact of the logging on the fauna, given the limited nature of the proposed operation and given the experience of other areas 2/6 TP22-23. It is her view that to prepare complete listings of fauna would require intensive scientific research that could take many years to complete 20/3 TP63.

Miss Conway's opinions are based on reading the literature, in particular the paper by Dr. Calaby in relation t mammals and in relation to

bird life Mr. Trudgeon's report, A15 (28/3 TP44 and following). She also relies upon the fact that, so far as molluscs are concerned, the Museum has not notified the Forestry Commission since they did their original survey in 1974/75 that molluscs are of major significance and nor has the Museum notified the Commission that logging would have any significant effect on them 26/3 TP75 and 76. Further, in relation to the rare and endangered fauna, it is the Forestry Commission's opinion that the National Parks and Wildlife Service which has the statutory responsibility for the protection of such fauna certainly has not advised the Forestry Commission in any way that any practices of the Commission are not appropriate in relation to any of those species that are at present in Terania Creek 9/4 TP83.

Miss Conway also relies on the fact that the removal of 1 280 stems from a wildlife point of view over the whole area that is involved in Terania Creek is very little 28/3 TP49-50. Miss Conway also takes into account, in assessing the significance or otherwise of the proposed logging on the fauna, the fact that the proposed logging will only take between 3-5 months, will only cover an area of 77 hectares out of a total in the basin of about 740 hectares and that it will be selective logging 2/6 TP15. She also relies upon Kikkawa and others in relation to birds 2/6 TP15-16 and their conclusion that the bird population of the lower strata of the forest generally increase in response to the growth of dense understorey following selective logging 2/6 TP16.

Also relied upon is the fact that trees which have hollows and are therefore not merchantable will not be logged. Such trees provide habitat facilities for possums and bats 20/3 TP70. In Miss Conway's opinion there is no inconsistency between page 29 of A1 and A32 question 18 because the overmature and dead trees are the ones which have the most abundant hollows for possums and bats and if they are therefore not merchantable they will not be logged 2/6 TP13-14.

Miss Conway's conclusions would not be different if what the Forestry Commission called moist hardwood stands over rainforest were

regarded as rainforest stands. Her opinions are based on the type of forest call it what you like 26/3 TP78.

It should also be noted that in Dr. Gentle's opinion steps will be taken to facilitate the survival of any species designated as rare and endangered under the National Parks and Wildlife Act (see Commission's Wildlife Policy A49 clause 2C). In relation to Terania Creek these include the non logging of rainforest, leaving the old veteran trees particularly the ones with holes in them, filter strips along the waterways, the flora reserve at the head of the basin which won't be logged, the disturbing of only a very small area in the whole basin and the fact that the area will only be selectively logged 9/4 TP82.

It is Miss Conway's opinion that the rare and endangered species of birds are rainforest dependent in the sense while certainly they do move outside the rainforest as classified by the Forestry Commission the rainforest is the area where these particular sorts of species spend most of their time 9/4 TP75. A similar view is expressed by Dr. Gentle 28/3 TP42-43.

Notwithstanding past logging in Goonimbar State Forest, there has not to Miss Conway's knowledge been any suggestion of any injurious impact on reptiles or amphibians nor on bird life or mammals 20/3 TP78. It would be Miss Conway's view that any birds that are disturbed in Terania Creek would stay within the same general vicinity and after regeneration she would expect them to come back again 20/3 TP78. It should be noted that Mr. Trudgeon's bird list A15 expresses the view that it reflects creditably upon forest management especially in rainforest and sclerophyll areas that have been logged heavily during several eras 26/3 TP77. It is Mr. Trudgeon's opinion that as it is not intended to log rainforest it will help the conservation of many species of native laurels upon which pigeons rely for a year round food supply. It should be note that Mr. Trudgeon does not express any concern as to any adverse effect as a result of the proposed logging operation.

Miss Conway was cross examined upon the submission subsequently made by Mr. Milledge.

Miss Conway regards herself as a conpetent zoologist 2/6 TP1. In her opinion as a broad guideline it is desirable to maintain the maximum diversity in the age of trees and the species of trees and in the condition of the trees from a fauna point of view 2/6 TP2. The proposed logging would assist in spreading the diversity of tree age 2/6 TP2 and see Indigenous Forest Policy A4 page 33. In Miss Conway's opinion although she can't be more specific most of the larger mammals in the area of Terania Creek are fairly well preserved and certainly some of the birds are well preserved 2/6 TP2-3. She agrees that the vertebrate communities of the Terania Creek basin are representative of the distinctive vertebrate fauna of low and tall, closed, and moist tall open forests of far north-eastern N.S.W. Although this fauna has had its habitat reduced to a few scattered remnants, she does not agree that these are mainly insufficient to guarantee the preservation of the remaining fauna of that kind in terms of size, protection from weeds, other animals and man 2/6 TP2-3. In Miss Conway's opinion there are other reserved and preserved areas other than Mt. Warning that also are suitable areas for fauna protection as well as Terania Creek, though she cannot make a value judgement in relation to their respective importance because she doesn't think a sufficient study has been made of the entire area 2/6 TP4. The number of rare and endangered fauna in Miss Conway's opinion really reflect the Richmond and Clarence River areas of N.S.W. 2/6 TP6. Miss Conway agrees that you cannot predict with certainty what the ultimate result from the proposed logging would be and she is aware that professional estimates as to the effect of the proposed logging differ. In her opinion Terania Creek would probably be an excellent area for research into problems such as the varying degrees of dependence that tall closed forest associated vertebrates have on adjacent moist tall open forest and she agrees it would be an excellent area for research into the effects of logging on the communities of such vertebrates. In her opinion

one of the reasons is that there is a range of regeneration stages from relatively recently logged areas to undisturbed mature forest and she does not think that any further logging would limit those research possibilities. On the contrary, she thinks that they would possibly add "controls" 2/6 TP7. All the information that has been gathered for the Inquiry this would be extremely valuable in undertaking detailed scientific study of the effect that the proposed logging would have on the area. In her opinion there is a lot of data and the Forestry Commission knows precisely what form the logging would take and in that way it would be possible to control the experiment much better than basing a lot of conclusions on things which are at best estimates of a previous activity from an earlier historic period 2/6 TP26.

Dr. McIllroy in Appendix Q to A193 as amended concludes that because of the lack of information on the animals at Terania Creek, particularly their habitat requirements and response to environmental alterations, it is impossible to provide an objective evaluation of the effects of the proposed logging on the native fauna. His subjective opinion however, based largely on the small scale of the operation and the size and distribution of the areas to be felled, is that the logging will not significantly effect the birds and mammals present, provided the high standard and special conditions listed by the Forestry Commission are maintained. In his opinion this view is supported to a certain degree by Pattemore and Kikkawa, Hopkins Kikkawa Graham Tracy and Webb.

Dr. McIllroy would not expect the bird population to migrate out of the Basin as a result of the proposed logging operation unless it was part of the normal seasonal migration. He would imagine that any change in the distribution patterns of birds would be internal to the Basin and that for most birds the internal change distribution pattern would be short term 18/9 TP50. In his opinion the likely effect on fauna is a slight internal shuffle rather than any significant loss of species or distribution 18/9 TP65. Notwithstanding that some noise will be involved in the logging operation, in Dr. McIllroy's opinion some species of birds will come back to the disturbed area notwithstanding that the felling is taking place 18/9 TP72. It is his opinion that the vast majority of bird species will stay in the area 18/9 TP72 and indeed it is his experience working in areas with far more extensive bulldozing and carting of timber that animals that he has experienced there are not seriously disturbed by the noise 18/9 TP73. Although the internal shuffle that he has referred to could lead to competition between mammals and some competition between birds as to territory they move into, it is really just adding in his opinion another factor to the mixing pot of what is happening naturally in the forest area in any event 18/9 TP74.

Dr. McIllroy agrees that there is no "hard data" and it is his opinion that a close study of the effects of any logging would take 5 years or more and a considerable sum of money and indeed there would need to be in his opinion a range of studies 18/9 TP54. It would depend on the manpower available for each species. If there were one person working on each of the rare and endangered species it could take 3 to 5 years and someone would then have to weigh whether it was worthwhile waiting that period of time before the proposed logging went ahead. Although Dr. McIllroy would personally like to see such species conserved he is also a pragmatist and realises that in some instances it is not practicable to spend a lot of time and effort on such animals 18/9 TP58-59.

Dr. McIllroy comes down on the side of proceeding with the proposed logging primarily for two reasons, firstly that in his opinion the

logging will not significantly effect the fauna in the Basin and secondly the rare and endangered species that do occur in Terania Creek also occur in other areas 18/9 TP59.

Dr. McIllroy was likewise cross examined in relation to Mr. Milledge's submission. Dr. McIllroy does not agree with Mr. Milledge's conclusion that the fauna at Terania Creek has had its habitat reduced to a few scattered mainly untiable remnants and is very poorly conserved. In his opinion the phrase "mainly unviable remnants" is a subjective judgement and there is not enough known of what constitutes a viable area for wildlife 18/9 TP55.

As with Miss Conway, Dr. McIllroy's view as to the likely effect takes account of the fact that only 77 hectares are proposed to be logged in an area of about 740 hectares 18/9 TP56 and following. Also involved in his assessment is the fact that in the 77 hectares there will only be removed 30 to 40% of the emergent brush box trees and also that the logging areas are scattered throughout the Basin as opposed to being in one concentrated area 18/9 TP60. Further, in his opinion the retention of over mature and dead trees with the most abundant hollows is an important aspect of the operation 18/9 TP61.

As with Miss Conway, Dr. McIllroy's opinion is that the four endangered bird species listed by Mr. Milledge, namely the Crested Hawk, Wompoo Fruit Dove, the Marbled Plumed Frog Mouth and the Albert Lyrebird are all closed forest associated and he would not anticipate that there would be any particular danger to those species bearing in mind the fact that the rainforest is not to be felled and that some of these species occur in disturbed and undisturbed rainforest and have been recorded throughout the Basin 18/9 TP65 and following.

If the proposed logging went ahead it is Dr. McIllroy's opinion that Terania Creek would still rank as a viable habitat suitable for reser-

vation 18/9 TP67-68. It is his opinion that the construction of the road on the floor of the Basin facilitates research in the Basin and that if the proposed logging went ahead there is a strong possibility that it would increase the diversity of research sites within the Basin. Further, the actual road could be used for transit counts and other forms of research including spot lighting 18/9 TP64.

In Dr. McIllroy's opinion the planting of Flooded Gum will not have any significant adverse effect on the number or distribution of fauna within the Basin 18/9 TP69. The proposed clearing of lantana from road verges and the like will overall benefit the fauna of Terania Creek and to the extent that lantana may come in as a result of the proposed logging it will in his opinion be for a limited period of time and will benefit some of the mammals and disadvantage others 18/9 TP69. Taking into account all relevant matters, it is Dr. McIllroy's opinion that Flooded Gum and lantana would not have any significant adverse effect on the distribution and species number of fauna in the Basin as a whole 18/9 TP70-71.

Mr. Hugh Nicholson gave certain evidence in relation to fauna in particular in relation to the Terania Native Forest Action Group's submission B70, his evidence commencing on 16th October, 1980. The Rufous Scrub Bird apparently was sighted in Terania Creek in 1860. It hasn't been seen in Terania Creek recently, which just means that people haven't looked for it 16/10 TP8. It is uncertain from the evidence whether in fact it was sighted at Terania Creek or at Federal, which is a considerable distance to the east of Terania Creek 16/10 TP7. In Mr. Nicholson's opinion Terania Creek still has significant importance from a fauna point of view, notwithstanding that about 50% of the Basin has been logged, some of it ruthlessly, for over at least 40 years 16/10 TP27. It is Mr. Nicholson's opinion that if the proposed logging goes ahead, the basin's faunal significance would still be considerable though diminished, but he cannot put the diminution in terms of percentages 16/10 TP29. The Action Group did

not express any view as to the probable effects of logging because there has been no detailed studies 16/10 TP31. The Action Group in its submission, page 93, expresses the view that brush box forest cannot be considered as quite distinct from the rainforest and no more can its fauna. Reference is then made to an article by Dr. Frith (A206), who does when talking about the effects of various forms of logging of wildlife habitation deal firstly on the one hand with rainforest and then on the other hand with the associated wet sclerophyll. Mr. Nicholson does not see any inconsistency between Dr. Frith's treatment of the varying forest types and the approach taken by the Action Group 16/10 TP36. The view taken by the Action Group is based on the theory that some species require the whole of the Basin, perhaps half a dozen to a dozen species out of about 100 16/10 TP37-38.

Notwithstanding the logging and its intensity in the past, it is Mr. Nicholson's view that Terania Creek is still suitable for fauna research 16/10 TP44. He certainly has not suggested that the logging should not go ahead because of the existence of the rare or endangered species and indeed he agrees with Dr. McIllroy's view that it could indeed increase the research opportunities in Terania Creek in that you will have yet another logged area to study at a different age 16/10 TP45.

In relation to the rufous scrub bird, Mr. Nicholson acknowledges that its siting at Federal was not in the Terania Creek Basin. He seeks to explain this on the basis that it was near a lower part of Terania Creek some ten miles from the basin and to his knowledge it has never been discovered in Terania Creek itself 16/10 TP50-51. Notwithstanding that several months ago he realised this error to page 25 of B70, he did not seek to make any ammendment to it 16/10 TP50. Federal is not even near a lower part of Terania Creek. In relation generally to the impact on mammals, Mr. Nicholson was not aware of the article of Dr. Calaby 16/10 TP51. Mr. Nicholson has read the evidence of Dr. McIllroy and he has no reason to

doubt but that he is an independent expert witness 16/10 TP53. Mr. Nicholson does not specifically disagree with anything in Dr. McIllroy conclusions 16/10 TP56.

Mr. Milledge describes himself as a "wildlife biologist" (23/7 TP27). He does not however have any formal qualifications in biology or associated subjects. His curriculum vitae speaks for itself B108(2), although it is submitted that he does not have the expertise of Miss Conway and he certainly does not approach the expertise of Dr. McIllroy.

Mr. Milledge's submission is B108(1). Mr. Milledge in his submission follows the Specht system of classification. In his opinion the Baur system of classification is not terribly useful from a wildlife point of view and the Specht system is used by a number of wildlife ecologists 5/11 TP4.

It is Mr. Milledge's opinion that the vertebrates in Terania Creek Basin are likely to occur throughout the whole area of the basin and this has been demonstrated in his opinion by recent field work. In his opinion the vertebrates cannot be expected to follow the boundaries of forest types or alliances mapped for the basin and hence any habitat disturbance in the area will have an effect on the communities of the whole basin 5/11 TP25. It is his opinion that the sort of effect is a little more difficult to assess because there is no research to show how important or how drastic that effect will be 5/11 TP26. While the effects on vertebrates cannot be predicted in any detail, it can be expected that many species will be disadvantaged and others advantaged. The species likely to be advantaged are those known as edge species or species that are probably not mature closed forest associated species. They will be advantaged by the proliferation of their food 5/11 TP27-28. Mr. Milledge cannot indicate one way or the other whether the logging would have a serious effect on any of the rare and endangered species because their detailed ecological requirements are not known, although he could postulate that logging would disadvantage

a bird like the Marbled Frog Mouth 5/11 TP28-29. He does not know any species that have been lost as a result of logging in Terania Creek 5/11 TP29. Only two birds could possibly have been lost as a result of logging in the past. The Double Eyed Fig Parrot could have quite easily have been last seen in the basin in the middle of last century 5/11 TP31. The Rufous Scrub Bird was last recorded at Eltham near the lower reaches of Terania Creek in the late 1800s 5/11 TP32. Eltham, like Federal, is no where near Terania Creek.

Mr. Milledge considers that the field investigations of the basin have only been superficial and that the total vertebrates recorded are likely to be increased considerably with more intensive work, namely a study of between 5 to 10 years carried out by a team of specialists in various fields. In this sort of work you never get a completely exhaustive list, although after such a study of 5 to 10 years it would be a very small increase in species listed compared with the increase that you would expect in the first couple of years of an intensive study (5/11 TP33).

Mr. Milledge agrees with the concept expressed by Miss Conway (9/4 TP75) as to the rare and endangered fauna in Terania Creek being dependent upon the rainforest but not necessarily found exclusively in it 5/11 TP42. It is Mr. Milledge's opinion that taken as a whole Miss Conway's evidence is to the effect that some of the fruit eating birds are dependent on rainforest trees, that they are uncommon in sclerophyll but that they are not totally restricted to rainforest 5/11 TP44. It is submitted that Miss Conway's evidence (2/6 TP9) at the bottom of the page is, notwithstanding Mr. Milledge's view to the contrary, confined to reptiles which in her opinion to a greater extent follow boundaries of forest types or alliances 5/11 TP46. After a further analysis of the evidence Mr. Milledge agrees that Miss Conway does not say that the rare and endangered species follow the closed forest boundaries 5/11 TP48 and 49.

Mr. Milledge was not when giving evidence at first aware that if the proposed logging goes ahead then approximately 43% of the basin will

still be unlogged 5/11 TP50.

Mr. Milledge ultimately agrees that over mature and dead trees which have the most abundant hollows for possums and bats are not merchantable and he accepts that such trees will be left but he does not accept that they are the most suitable trees for wildlife 5/11 TP51. He agrees that if the proposed logging goes ahead and thereafter 42% of the basin remains unlogged, there will be in the immediate future a considerable amount of undisturbed mature forest in the basin 5/11 TP51. He accepts however that if the proposed logging goes ahead there will be over 300 hectares of undisturbed mature forest in Terania Creek and that there will be areas in Terania Creek part of which have been logged and parts unlogged. It is his view that the vertebrate communities in Terania Creek do not distinguish between moist open and a closed forest and he would expect the same species throughout the ranges of forest in Terania Creek although their abundance may change from place to place. Part of the importance of Terania Creek in his opinion is that it acts as a reservoir for recolonisation of the whole area so far as vertebrates are concerned, the whole area being the Goonimbar and Whian Whian State Forests area 5/11 TP52. He agrees that there are substantial areas of palm which are not proposed to be logged and notwithstanding its past logging history in his opinion it is certainly important from a wildlife point of view 5/11 TP53. It is his opinion that if the proposed logging goes ahead it will still act as a reservoir for recolonisation of vertebrates although he qualifies that by saying to a lesser extent than at present 5/11 TP54.

In Mr. Milledge's opinion Terania Creek at present has a high bird species diversity and at present has a high bird species richness (those phrases as used on 5/11 TP54), species richness meaning the number of species and the species diversity referring to the number of individuals of the particular species. Mr. Milledge agrees that logging can increase species diversity and richness, although he does not view bird species diversity and richness as a gauge of the health of a ecosystem 5/11 TP55.

If the proposed logging goes ahead there will a considerable amount of closed forest and the endangered species are all in Mr. Milledge's opinion closed forest associated 5/11 TP58-59. All the vertebrates in the basin in Mr. Milledge's opinion at present are in both logged and unlogged areas 5/11 TP59. When Mr. Milledge talks about Terania Creek vertebrates colonising Whian Whian and Goonimbar State Forests he is talking about them physically moving out of Terania Creek into other areas. Notwithstanding this evidence, Mr. Milledge disagrees that the most likely effect of carrying out the proposed logging will be a slight internal shuffle so far as the vertebrates are concerned although he agrees that that postulate is the same sort of postulation which Mr. Milledge has referred to TP60. Notwithstanding that only 77 hectares are involved in the proposed logging operation and that there are 222 hectares of brush box in the basin Mr. Milledge does not agree that the probabilities are that there will be no significant effect on the fauna which is partially dependent on brush box 5/11 TP61. However, he is unable to say where the effect would be between no effect, a minimal effect or no significant effect 5/11 TP62.

In relation to the Double Eyed Fig Parrot the only possible unsubstantiated record of it having occurred in Terania Creek is the record of the Australian Museum 5/11 TP63-64.

Mr. Milledge disagrees with the National Parks and Wildlife Service's publication that since 1788 no bird species is thought to have become extinct 5/11 TP65. Mr. Milledge agrees that it is a subjective judgement as to whether or not Terania Creek is a viable habitat suitable for reservation because there is no hard data as to the conservation requirements of the species 5/11 TP67.

Notwithstanding Mr. Milledge's statement in his submission B108 page 1-2 that "the only adequately sized and buffered reserve occurs in Mt. Warning National Park and because Terania Creek basin is well buffered by

surrounding tall open forest with approximately half its area undisturbed it must rank very highly among the few remaining areas of viable habitats suitable for reservation", it is submitted that his credit on this point was significantly challenged when confronted with a letter written to the Forestry Commission on this respect seeking funding for research 5/11 TP69. Ultimately (5/11 TP73), the above sentence was changed by deleting "adequately" and substituting "large" and ultimately the whole sentence was changed by reference to Limpinwood Nature Reserve although that statement does not take account of Lammington National Park nor the Border Ranges 5/11 TP74. Mr. Milledge agrees that his statement on page 7 of his submission B108 to the effect that any habitat disturbance in the area will have an effect on the communities of the whole basin is an emphatic statement. He also agrees that on page 12 of his submission he makes a mistake in quoting the Forestry Commission's conclusion as to the effect on fauna 5/11 TP76.

Notwithstanding Mr. Milledge's emphatic statements as to what the effect will be in Terania Creek, he agrees that after two years of study in Camden Haven what he put forward was suggestions as to what might happen what the effects of logging might be 5/11 TP76. Mr. Milledge disagrees with the word "will" have an effect is too strong and what he is saying is that there will be undoubtedly an effect although it may not be highly detrimental 5/11 TP78. Mr. Milledge further ammended his submission 5/11 TP80 by deleting the word "exceptionally" in respect of the high totals of vertebrates recorded in the basin.

Mr. Milledge agrees that research in the sense of getting equipment into research sites in Terania Creek is facilitated by roading. He further agrees that from a spot lighting point of view roads are the only feasible way of conducting that type of research in dense forest 5/11 TP81. He agrees that the construction of the road up the middle of Terania Creek in fact facilitates research. 5/11 TP81. Notwithstanding the past logging

in Terania Creek he agrees that it is an excellent area for research because it has a range of regeneration stages 5/11 TP81. He further agrees that if the proposed logging went ahead it would provide yet one more regeneration stage which would facilitate research particularly in about 30 years time TP82. Mr. Milledge states that the short term effects of logging are not terribly important TP83.

Mr. Milledge agrees that no species of bird has been proved to have become extinct since 1788 6/11 TP1. In Mr. Milledge's opinion most Australian birds including the ones that are tendeded to be found in Terania Creek are fairly resilient. It is as high as Mr. Milledge can put it that he could see some species with mature forest requirements becoming extinct in N.S.W. within the next one hundred to two hundred years if disturbance proceeds at its present rate 6/11 TP2.

A very intensive study of the basin area would be "the ideal" but the problem is the time factor 6/11 TP3. Such a study would take between 5 - 10 years 6/11 TP4 and would require an expert ecologist, experts in different vertebrate fields and also invertebrate fields, plant ecologists, bird ecologists, mammal ecologists, mollusc experts, and reptile and amphibian experts. The ideal situation would be 6 - 8 high powered experts to move into Terania Creek and examine it over a period of 10 years before going ahead with any logging operation TP4.

Notwithstanding the agreed low intensity of the logging operation, its wide spread nature, the number of trees to be taken and the like, Mr. Milledge disagrees that the basin as a whole after the proposed logging would be left in a nearly natural state taking into account its state at the momment 6/11 TP15. Notwithstanding the evidence of Miss Conway, Dr. McIllroy and Dr. Recher to the contrary, it is Mr. Milledge's opinion that it is a disadvantage to have wide spread rather than conjoined logging areas 6/11 TP15.

Mr. Milledge agrees that the effect of the Kikkawa and Pattemore survey was that selective logging doesn't have a significant effect on bird life in rainforest stands 6/11 TP24 in subtropical rainforest in northern N.S.W. at Wiangaree State Forest about 30 - 40 miles from Terania Creek. The only distinction Mr. Milledge draws is that it is highland rainforest at Wiangaree as opposed to lowland rainforest at Terania Creek 6/11 TP25.

It is Mr. Milledge's "professional" opinion that where logging in one particular area takes a few weeks and possibly a month he would not necessarily expect birds to fly to adjoining areas outside the area of disturbance 6/11 TP26, although he would expect that a bird would want to go to an area that is as close as possible to the area to which it was living before the disturbance occurred and the logical place if there was room for it would be a short distance away 6/11 TP26. Without having had any research, it is Mr. Milledge's opinion that all the areas immediately adjacent to the proposed logging operation are completely saturated and are incapable of holding any more bird life 6/11 TP27. It is from his point of view a guess as to how many birds would stay in the area and how many would come back 6/11 TP27. He does not agree with the National Parks and Wildlife Service's submission (B109) that it may have been reasonable under the circumstances for the Forestry Commission to have concluded that no significant detrimental impact could be foreseen 6/11 TP28-29.

The National Park and Wildlife Service in their submission B109 state (page 13) that from a faunal habitat view point much of the vegetation mapped by the Forestry Commission as brush box is indistingu shable from that mapped as rainforest and therefore rainforest fauna will tend to be encounterd throughout the basin floor and much of the lower slopes. After reviewing various of the rare and endangered species, the Service concludes that it may have been reasonable under the circumstances for the Commission to have concluded that no significant detrimental impact could be foreseen B109 page 16. Such an opinion is expressed after misquoting or

misinterpreting the Forestry Commission's statement A1 as to what conclusions the Forestry Commission drew. See 25/11 TP22. And indeed Mr. Hitchcock agrees that there is virtually no difference between the expectations as expressed by the Forestry Commission and the expectations as expressed by the National Parks and Wildlife Service 25/11 TP22.

Mr. Hitchcock agrees that roads make it easier to carry out spot lighting research 24/11 TP50.

Mr. Hitchcock is of the opinion that it would take a period of 18 months for an inventory study of the fauna of Terania Creek to be prepared but that to carry the studies further to a point where you actually attempted to assess the impact of any proposed disturbance this would probably take at least 4 - 5 years before you started to get any particularly significant results 25/11 TP59. In his opinion if the results at 5 years were totally inconclusive then you may have to consider a much longer period of study and he certainly could not say whether 5 years would be conclusive or not 25/11 TP59. In Mr. Hitchcock's opinion it would be unrealistic to expect the Forestry Commission when it comes to a particular logging area to spend 4 or 5 years or even 18 months investigating the area before it made a decision whether to proceed 25/11 TP59. What he did suggest was that perhaps a 6 months survey to investigate more about the fauna species that were present could have been carried out. Such a study would only give a list of the fauna and would in no way satisfy Mr. Hitchcock as to the impact which would be likely to occur as to the result of logging, although the presence of any known rare or endangered species would be useful information upon which further consideration of the development could be guided 25/11 TP59-60.

The National Trust in B76 on pages 24 - 28 deals with the Forestry Commission's submission in relation to fauna on Terania Creek in fairly critical terms. The Trust is not saying that the impact on fauna will be significant nor are they saying it is insignificant; they do not know one

way or the other 5/12 TP18. At B76 paragraph 7.52 the Trust misinterprets or misquotes the Forestry Commission's conclusion and Mr. Guilfoyle agrees that the Commission has in effect said that in so far as it can anticipate there should be no significant impact 5/12 TP19. The statement from Calaby which appears on page 25 of the said submission is admittedly wrong 5/12 TP21. Mr. Guilfoyle also admits that the Trust has no particular expertise in relation to the bird life such as exists at Terania Creek and that the Trust is prepared to stand by the views in relation to bird life in Terania Creek expressed by those people in the Inquiry who have exhibited expertise in the subject 5/12 TP23.

Dr. Recher appeared on behalf of the Australian Museum. It is a little difficult to tell from the evidence what views he was expressing as those of the Museum and what views he was expressing in his personal capacity. It appears certainly that on the Science Show he drew such a distinction 11/2/1981 TP1.

Be that as it may, Dr. Recher has done work on birds and mammals predominantly in eastern N.S.W. Although he has not done any work in sub tropical rainforests in Australia, he has in Puerto Rico, but that work was related to the effects of radiation on fauna, not the effect of logging 2/10 TP2 and 4. Dr. Recher has been to Terania Creek once, when the 1979 logging was taking place 2/10 TP3.

The Museum's submissions B77 (i) and (ii) do not say that the proposed logging will adversely affect the fauna in Terania Creek, although they do say that logging of the brush box will adversely affect the rainforest avifauna. As Dr. Recher says 2/10 TP15, it is an educated guess as to whether logging will lead to extinction of species. The thrust of the Museum's submission is that it would like to see research done so that it could be convinced that the effects of logging will not lead to irrevocable losses of species 2/10 TP16. What the Museum wishes to have is a moratorium on logging in rainforest areas, all rainforest areas in N.S.W., so

that the information could be obtained 2/10 TP17 and 11/2/81 TP18. Such a moratorium would be of a 5 year duration although excellent information would be had in 10 to 15 years 2/10 TP17. If it were to take at least 5 years it would assume proper funding and personnel 11/2/81 TP18.

Notwithstanding such a call for a moratorium, the Museum has been aware for at least 10 years that rainforest logging has been going ahead, the Museum has not carried out any such study as is now being advocated 11/2/81 TP19-20 and indeed has not previously called for the moratorium which it is now seeking 11/2/81 TP20. The Museum has not sought any funding from the Forestry Commission for research such as is now suggested 11/2/81 TP20.

Dr. Recher agrees that because of the amount of interest shown in Terania Creek it is not impossible that Terania Creek would be better known than many comparable areas from a fauna point of view 11/2/81 TP21. He agrees that one way of carrying out research as to the effect of logging on fauna is to do a pre study and then log and then see what the effect of logging is. Another way of carrying out research is to compare a logged area with a comparable unlogged area 11/2/81 TP22. Bearing in mind these matters Dr. Recher however does not accept that it would be meaningful to go ahead and log Terania Creek and to measure the effects 11/2/81 TP25. However, when first asked the question at 11/2/81 TP24, he did not expressly disagree with the suggestion of using Terania Creek as an ideal site to test the effect of logging, but rather said "let me answer the question this way that if the Government gives approval for logging to proceed at Terania Creek I hope that simultaneously it provides the funds to do the research that was outlined".

One of the alternative uses for the Basin being advocated by the anti-logging groups is tourism. It is Dr. Recher's view that he would be reluctant to allow swarms of tourists to range freely through Terania Creek Basin 2/10 TP19 and it is his view that tourism in the Basin would have to

be carefully controlled. Effectively this would mean keeping people to a single pathway or a single set of pathways 2/10 TP20 and indeed, if the research which Dr. Recher has spoken about is to take place, it might be desirable for a period of time to exclude all human usage other than that of the people conducting the research 2/10 TP23.

Dr. Recher in the Science Show attributed to the Forestry Commission (erroneously) that it had stated that there would be no effect on fauna from the proposed logging. Dr. Recher agreed that the Forestry Commission has not so stated the effect on fauna 11/2 TP10. On the same show he categorically stated that the logging will lead to the extinction of species, although he cannot name those species 11/2 TP11. It is submitted that this categorical statement as to the extinction of species is inconsistent with his evidence in October, 1980, notwithstanding his denial of the inconsistency 11/2 TP11 and 12. When questioned as to the extinction of birds in the past in relation to Terania Creek, Dr. Recher first stated that they could not have been affected by fire because there were no fires in that area 100 years ago. When Dr. Turner's evidence was put to Dr. Recher, he nevertheless adhered to his view, notwithstanding that the basis for it had, it is submitted, disappeared 11/2 TP32 and 33. Likewise, it is submitted that his evidence, that the logging of 1 hectare in Terania Creek would have a significant adverse effect 2/10 TP11, should not be accepted, particularly in light of the fact that he concedes that the fauna within that hectare would move to escape the disturbance 11/2 TP34.

Dr. Recher, it is submitted, has in the past consistently supported the Forestry Commission's competence as forest managers and its competence and concern for wildlife conservation, notwithstanding the fact that he refused to comment on those matters when put to him (11/2 TP34 and A218). Indeed, it's Dr. Recher's view that it is desirable to have the logging operations spread over 5 areas rather than concentrated in one,

desirable to have buffer zones along creeks and desirable to avoid clear-felling which is more deleterious than selective logging 11/2 TP37-38. He however does not concede that it would be reasonable to conclude that no significant adverse effect on fauna is anticipated 11/2 TP39.

It is submitted the weight of the evidence, mainly that of Miss Conway, Dr. McIllroy and the National Parks and Wildlife Service, is to the effect that although there has been no detailed study in Terania Creek it is anticipated that there will be no significant adverse effect on the fauna. It is submitted that such a finding is supported by Caliby, Kikkawa and Pattamore and indeed, although he was reluctant to admit it, Milledge's work at Camden Haven. It is further submitted that such a finding is supported by the following facts:-

(a) it will be selective logging as opposed to clear felling,

(b) there is a total of only 77 hectares proposed to be logged out of a basin of 740 hectares,

(c) filter strips will be retained which are of assistance to wildlife conservation,

(d) the fauna in the basin is such that it at present appears in both brush box and rainforest and in both in logged and unlogged forest and the consensus of the evidence is that it moves without differentiation between the forest types,

(e) the over mature trees with hollows in them will be retained,

(f) the logging areas are spread and a consensus of the evidence is that this is beneficial for wildlife conservation,

(g) after the proposed logging goes ahead some 47% or over 300 hectares in the basin will be undisturbed forest including a large or substantial area of palm which is of importance for its food supply,

(h) the basin is considered by all to be of significance from a fauna point of view notwithstanding that it has been heavily logged in the past and over 50% of it has been logged at times when there were no effective enviornmental controls on the logging,

(i) the most probable effect of the logging it is submitted will be that there will be a slight internal shuffle.

It should also be noted that no one has indicated that any particular species is likely to become extinct if the proposed logging goes ahead and it should also be noted that the National Parks and Wildlife Service which is responsible for the rare and endangered species in this State agrees with the Forestry Commission's conclusion as to the likely effect of the proposed logging.

It is generally agreed by all parties that there is no "hard data" in relation to selective logging of brush box as is proposed for Terania Creek. It is acknowledged that this hard data could only be obtained after at a minimum five years and even this may not be conclusive. It is submitted that it is just impracticable for areas such as Terania Creek to be subjected to such a survey before logging operations go ahead and the evidence is there is probably more knowledge about the fauna of Terania Creek than about any other comparable area. Dr. Recher agreed that one method of research is to log an area and then to compare the fauna in that area to an unlogged area. A second method is to carry out pre studies and then to log the area and then to gauge the effect of the logging by comparing the same area in its pre logged and post logged condition. It is submitted that in the above circumstances and in light of the balance of the evidence as to the likely effect of logging that Terania Creek should be logged as proposed and then research can be carried out. This, it is submitted, is a balanced approach between not logging Terania Creek and other comparable areas at all for at a minimum 5 to 6 years and logging Terania Creek without any pre study work having been carried out.

To the extent that Mr. Milledge and Dr. Recher disagree with the abovementioned submissions, it is submitted that their evidence should not be accepted. It is submitted, with respect, that in significant areas the credibility of both these witnesses was severely damaged and that as witnesses they should not be preferred.

(ix) Terania Creek Road

The use of Terania Creek Road and the non existence of alternatives has already been dealt with.

The Forestry Commission acknowledges, and has never implied to the contrary, that the residents' concern in relation to the Terania Creek Road is a genuinely held concern. The Commission submits however that the evidence clearly demonstrates that that concern is not well founded, providing of course that adequate safeguards as discussed in the evidence, for example as to clearing edges, speeds, school buses and the like, are complied with.

Mr. Manewell gave evidence as to the use and condition of Terania Creek Road in the late 40s and early 50s when it was very heavily used for logging extraction. In those days it was in a deplorable condition in comparison with now, it was narrower, overgrown with lantana and very poorly gravelled. In Mr. Manewell's opinion some of the bends were sharper and there was traffic from cream trucks and the like. He is not aware of any collision on the road involving a logging truck from 1947 to 1975 (8/7 TP83).

Mr. Rann was driving on Terania Creek Road about 18 years ago for about 2 years 12/5 TP54. He has 27 years log truck driving experience without any accidents 12/5 TP53. It is his opinion that in those days the road was very windy and had lots of corners that were mostly washed out and that it was in a very bad condition 13/5 TP4. He received no complaints and so far as he is aware no one else received any complaints as to his use

of the road 13/5 TP5. He experienced no difficulties in negotiating Terania Creek Road, loaded or unloaded, and trucks had no difficulty in passing each other 13/5 TP10.

Mr. Spencer also used Terania Creek Road between about 8 and 11 years ago 12/5 TP56 and he had no difficulty with the traffic or school buses. He is not aware of any complaints in respect of his trucks during the period in which he used the road nor was he aware of any complaints in respect of other trucks using that road 12/5 TP58.

Mr. Spencer agrees that the first 3 miles from the Channon has been straightened out and it has been bitumened. When he was driving on the road it was a lot narrower and there were a lot more bends. The corners are clear of lantana now and the surface has improved 13/5 TP2-3.

The Minister in charge of Police advised Dr. Gentle that there were no records of accidents on Terania Creek Road on the police files in the last 5 years. Neither Mr. Bruce nor Mr. Lemair are aware of any accidents on the Terania Creek Road or in the Terania Creek area with logging timber jinkers 17/4 TP32.

When Mr. Spencer was driving he was using a Leyland Hippo and AEC single drive. In the proposed logging operation Mr. Rann would be using a 1969 Kenworth truck. The Leyland Hippo was equivalent in length to the 1969 Kenworth and the width was the same (13/5 TP1 & 2). The AEC single drive was about 6 feet shorter than the 1969 Kenworth and the width was about the same. Mr. Rann was when previously using Terania Creek Road using a single axle AEC which was about 6 feet shorter than his present truck a 1969 Kenworth and the width was about the same. The Albian Reba truck which he was also using would be about the same length and width as the Kenworth (13/5 TP4). In Mr. Rann's opinion the braking system on the Kenworth is a lot better than the Albian or the AEC (13/5 TP5). The vision from the Kenworth is very much better than the AEC and a little better than the Albian (13/5 TP6).

It is estimated that Standard Sawmilling Co. Pty. Ltd. generally would operate 3 trucks, each operated by one driver and it is estimated that each would transport 2 loads per day, i.e. a total of 6 loads full and 6 loads empty. It is estimated that James Hurford and Co. would operate one truck and make 3 trips per day, 3 loaded and 3 unloaded, for a total for both companies of 18 trips per day, 9 loaded 9 unloaded (A1 page 21). The evidence is however that under normal circumstances Standards would use 1 logging crew, the trips would then be 10, 5 loaded and 5 unloaded (16/9 TP12).

In March, 1979, the Deputy Shire Engineer of the Lismore City Council wrote a report (A23) setting 5 areas of concern about possible hazards on the road and methods to alleviate those hazards. Prior to the logging proceeding in August all those conditions were carried out with the exception of the safety fencing which was to be erected by the Council. It was the Deputy City Engineer's opinion that the implementation of the safeguards should maintain the status quo in respect of safety standard. As to compliance with the Council conditions see 8/7 TP30. Speed restrictions as mentioned in A23 would "be no problem" and 25 miles/hour is suggested by Mr. Rann (12/5 TP66).

By reference to A23, the inspection which is referred to therein took place on the 22nd March, 1979, for the express purpose of identifying the main hazards of Terania Creek Road. That inspection was with the Deputy City Engineer. The report was adopted subject to the proviso that logging should not be restricted to weekdays 8/7 TP22 and certainly the City Engineer has not suggested to the Council that there are any other hazards which would warrant Council's attention. It was the Council's view that by adopting the report it would be satisifed that such hazards as there may be would be minimised by following the action recommended 8/7 TP23 and if that hadn't been Council's view then the use of Terania Creek Road subject only to the conditions set out in A23 would not have been approved.

So far as the conditions in A23 are concerned, the Council has carried out some removal of roadside growth and the Forestry Commission has agreed to carry out clearing of roadside growth over a whole length of the gravelled section and the Council has no doubt that it will be done 8/7 TP24. Indeed again in March, 1980, some grading, clearing and gravelling took place (8/7 TP21). So far as the second condition is concerned, prior to the 1979 logging signs were prepared advising motorists to proceed with caution and as well restrict speed to 30 km an hour and these were handed to the Forestry Commission for action 8/7 TP24. The safety fence referred to in A23 has not been erected although if the proposed logging is to proceed the Council will erect the safety fencing in conjunction with the Forestry Commission 8/7 TP24. There would be no objection from the Council to a speed restriction being applied to the whole of the gravelled section of the road, although there would need to be some discussion with the Police Traffic Department 8/7 TP24. Further if any damage is caused to the road by heavy vehicles then arrangements have been made between the City Council and the Forestry Commission for its reinstatement 8/6 TP26. See page 18 of A1 for the $1,000 estimate for accelerated wear and tear on the Terania Creek Road.

So far as the number of families living in Terania Creek is concerned, Mr. Blair's opinion was that originally there were quite a number of families that lived in Terania Creek, but that as the dairy industry became "as" (sic."less") attractive, families left and the number of children declined and that was the reason for the second school closing. He knows that there is now a new type of people living there and he does know that the population of children has increased since then 8/7 TP27.

Mr. Rann was driving about 18 years ago and in his opinion there were more people up in Terania Creek than there are now (12/5 TP55) although he cannot estimate the number of people that were there. His opinion is based upon observaitions when he was there more or less daily over

2½ years (13/5 TP15). He lives in Nimbin which is about 15 miles from The Channon and he travels past The Channon in wet weather possibly every day other than weekends and while he is working at Whian Whian every day. He has taken notice of the population as he has been commuting to and from Nimbin (15/5 TP87).

The Lismore City Council's submission A129 annexes to it the results of a survey and that survey, in Question 5d, reveals that 61.94% of people consider that the Lismore City Council should not intervene to stop timber trucks using Terania Creek Road. 14.27% of persons considered the Council should intervene and 23.79% of persons had no opinion.

The Terania Native Forest Action Group which perhaps is understandably more concerned about the road than other anti-logging bodies, deals with the matter in its submission B70 pages 68-76. The Action Group feels that the road is constructed for light traffic only and makes reference at page 68 of the submission to a report of K. Hudson in respect of rural road standards in Tasmania. See Exhibit B88. The object of referring to Hudson was to use that work to support their contention that the road was of inadequate engineering standard for the log trucks 22/10 TP48. An extract from the report is set out on page 72 of the submission. The Hudson report dealt with the Tamar Valley in Tasmania which is used for two main industrial purposes, namely wood chipping and iron ore works 22/10 TP49. The authors in that report after dealing with bulk milk trucks deal with gravel and mineral ore trucks that have a frequency of 40 to 50 loaded trucks per day 22/10 TP50. On page 4 of the report the authors deal with log trucks carrying approximately 1.5 million tonnes of timber a year and Mr. Nankervis on behalf of the Action Group agrees that where the author is dealing with heavy trucks he is talking about ore trucks with trip frequencies of 40 to 50 per day and carrying in the order of 1.5 million tonnes per annum 22/10 TP50. It is however fair to say that, so far as truck loads and frequency are concerned, some aspects of the Hudson report and

the proposed logging operations correlate 22/10 TP71. It is submitted that what may be appropriate for a heavy industrial area in Tasmania has little or no relevance to Terania Creek, where certainly the City Engineer is satisfied as to the road maintenance standards, the Council is satisfied as to the proposed safety measures. Further the evidence indicates that log truck drivers are used to driving on such roads and indeed roads which they consider to be of similar if not in worse condition than Terania Creek Road and which carry a greater amount of tourist traffic.

Notwithstanding the evidence referred to above as to populations when prior logging took place and its effect on the use of Terania Creek Road, Mrs. Nankervis compiled a statement as to the present population compared with that in 1973 (B89). This evidence indicates that in 1973 there was a total population of 76 approximately, made up of 40 adults and 36 children and that in 1980 there was a total population of 195, comprising 129 adults and 66 children. The total number of vehicles is 84 and 16 pre-school children are attending the Channon Hall, see 22/10 TP16. Neither Mr. and Mrs. Nankervis, Mr. Saulwick nor Mr. Nicholson lived in the area in 1968 - 70 (when the latest logging bar 1979 took place) and they certainly did not live in the area back in the late 40s or early 50s. The said witnesses were not aware of the evidence that had been given by people who were around in the late 40s and early 50s using Terania Creek Road for comparability of traffic conditions. That evidence is referred to above.

Certain surveys were done as to road usage, the first being B90 which was done by Mrs. Nankervis. That survey of road usage recorded at a central point along the road showed that 76 vehicles used the road on a normal week day between the hours of 8 a.m. and 5 p.m. This survey was done on the 6th February, 1980. The tally indicated 38 car resident trips, 8 trucks and 30 tourists. A second road tally was conducted on the 20th October, 1980, by Mr. Nankervis and is B91. This survey indicated that there were 48 resident cars, 17 tourists and 2 trucks. A third survey was

done by Mr, Nicholson and is B92 and was conducted between Christmas Day 1979 and the 29th January, 1980. In that period Mr. Nicholson observed 495 cars, but it is conceded that it was a holiday period and that at that time the area had received a considerable degree of publicity in the weeks before.

Notwithstanding the above evidence as to no reported accidents on Terania Creek Road and the above evidence from log truck drivers as to no knowledge of accidents involving log trucks in prior logging use of Terania Creek Road, including the period 1968-1970 and the period in the 1940s and 50s, evidence was adduced on behalf of the Action Group (B93 and B94) as to the number of collisions and near misses involving Terania Creek Road. The accuracy or otherwise of these exhibits could not really be tested (as to which see 22/10 TP24 following). Mrs. Nankervis describes the near missed as situations when a car would have to brake really quickly and change direction to avoid a head on collision but she and the other members of the panel agree that they have had near misses on other narrow roads around the area.

The Action Group also gave evidence as to determining distance of drivers when they first see each other, this evidence was contained in B95 and is referred to in chief at 22/10 TP29-37, the results being set out in B70 page 74. On each corner mentioned on page 74 the width of the road in metres was measured and the calculation in B95 done. B96, the document in relation to braking distances, was dealt with at 22/10 pages 37-43. It was conceded that these braking distances did not distinguish between cars which are automatically driven and cars which are manually driven, nor does the chart allow for reaction time, nor whether the vehicles are going uphill or downhill, nor the type of surface, nor the type of tyres or the type of braking systems 22/10 TP38-40. It was conceded that reaction time varies between experienced and inexperienced drivers 22/10 TP41 and the different weight of vehicles has not been taken into account 22/10 TP41.

Mr. Saulwick, who did the calculations, did not know in what gear the log trucks would be travelling at his assumed speed of 15 km per hour. On the above basis he calculates that at 15 km an hour the average stopping distance would be 20 ft. and that takes into account a reaction time of 1 second. He then has doubled that figure because of the loose surface and estimates that of the 26 approaches to 13 corners only 6 are safe 22/10 TP43.

In addition to the inponderables conceded by Mr. Saulwick, he agreed that his system of measuring the corners did not in any way take into account the added height that a log truck driver has by reason of his cabin being higher than most other vehicles 22/10 TP52. He also did not taken into account the possibility of drivers seeing each other across the corner 22/10 TP52, because he thinks that there is only one instance where that occurs 22/10 TP53. It is submitted that the inspection of Terania Creek Road indicates to the contrary. Mr. Saulwick agrees that you can see clouds of dust ahead of you when its very very dry but he states that that is unusual. Bearing in mind that the proposed logging will take place in the dry season it is submitted that dirt clouds could very well be seen. The work that the Council did in clearing back the lantana was done after Mr. Saulwick took his measurements 22/10 TP54. He agrees that the grader work at the side of the road made it more trafficable although he would not describe it from a visibility point of view as being "far better". In carrying out his calculations Mr. Saulwick was also not aware of the type of truck that was going to be used, nor the type of braking system, nor what gear the trucks would be in going around the corners, although he agrees that all these matters would have a material bearing on his calculations 22/10 TP55. Mr. Saulwick agrees that all these matters, including the coefficient of friction, have not being taken into account by him and are inponderables 22/10 TP59.

Notwithstanding that the logging would take place over a relatively short period of time of some 3 months and notwithstanding the views of

the Council Engineer, it is Mr. Saulwick's view that if the proposed logging goes ahead he cannot see the avoidance of somebody's life being taken 22/10 TP62. It is also his view that the only way in which Terania Creek Road could be made safe would be to straighten out some of the bends and to improve the width of the road considerably, which would mean blasting or bulldozing or major earth works 22/10 TP62. In expressing such opinions Mr. Saulwick is not ualified as a traffic engineer, but he is applying his experience over the years as a driver. If the weeds were cut right back, then in Mr. Saulwick's view roughly half the corners might be considered safe.

In relation to water crossings, the effect of the point being made by the Action Group at page 69 of the submission is that tourists wouldn't be aware of the effect of water on their brakes. It is a pure guess as to how many of the tourists would have drum brakes, how many would have disc brakes 22/10 TP64 and Mr. Saulwick doesn't know what type of brakes the logging trucks will have. Mr. Saulwick agrees that tourists' cars are not going to be nearly as familiar with the problems of the road as will logging truck drivers and that increased tourist use would be continuously and on an escalating basis over a period rather than for a short period of time as in the case of the proposed logging. Mr. Saulwick also agrees that a logging truck approaching a the corner would make a fair bit of noise and that the situation would be improved if drivers used their horns and that certainly the situation would improve if notices were put up to the effect "blow horn at corners" (22/10 TP65 and see 22/10 TP53). It will be submitted in due course that one of the proposed conditions, in the event of logging being permitted to proceed, should be that such notices be put up on Terania Creek Road. It is Mr. Saulwick's view that if logging trucks blew their horns on every approach and every vehicle that used the valley blew its horn on every approach and everyone travelled very slowly and kept their eyes and ears pealed then there may not be a serious accident. 22/10 TP68. One question raised by Mr. Nankervis is the narrowness of the road

and the inability to pass, although he is unable to answer the question of why reversing couldn't take place. Neither Mr. nor Mrs. Nankervis have encountered a logging truck on Terania Creek Road when driving and nor has Mr. Nicholson.

In relation to photographs numbered 1 to 3 and 4 on pages 75 and 76 of the Terania Native Forest Action Group submission B70, Mr. Bruce 4/12 TP15, produced certain recent photographs A217. He also gave evidence that if logging were to proceed, before the trucks used the road the edges would be slashed again. The photographs in his opinion showed that the road had improved since the Terania Native Forest Action Group photographs were taken, but that they did show that there was some vegetation on the sides of the road that could be cut back by slashing and that the road could be considerably improved before logging trucks were to use it again. Certainly the road would be slashed again, together with any other work necessary to fulfil the requirements of the Lismore Council.

It is submitted that while it is conceded that the residents concern for the road is a genuinely held concern, the objective facts indicate that that concern is not well founded. In this regard attention is particularly drawn to the fact that the road was in worse condition when prior logging took place and there were no accidents involving logging trucks. Further, the trucks which will be used if the proposed operation goes ahead are from a braking and visibility point of view more advanced than the trucks used in prior logging operations. Further, bearing in mind the controversy which has surrounded the proposed logging operation, it is submitted that one could expect the drivers to be perhaps more cautious than usual. Certainly it is submitted that the Lismore City Council is hardly likely, particularly in the circumstances, to have overlooked or ignored any matter which in its opinion required attention so far as road safety is concerned. Its requirements are set out in A23. It should also be borne in mind that the evidence of those who were around at the time, indicates

that at worst the population in Terania Creek on previous logging occasions was comparable to that at present.

It is submitted that if the proposed logging goes ahead then the conditions contained in A23 should be imposed, including the condition that no log trucks are to use the road while the school bus is using it. It is submitted that a further condition should be imposed for a maximum speed limit of 30 km an hour and that advisory signs should be put up warning that log trucks are using the road and advising motorists, including truck drivers, to sound their horns on each corner.

The Effect of Not Logging Terania Creek on the Sustained Yield Concept

Reference should be made to pages 8 and 9 above where the concept of sustained yield is dealt with.

Mr. Lowery was of the opinion that if Terania Creek was not logged there would be an immediate loss of sawlog volume of the amount proposed to be taken from Terania Creek because the resource is fully committed under the Management Plan and fully committed on a sustained yield basis so that in effect there is no alternative resource available under the Management Plan. 27/3 TP15. In relation to Hurfords, it was Mr. Lowery's view that it was not possible for Hurfords to have any chance of getting allocations from the other areas in the circle increased because the resource was fully committed (27/3 TP16). Indeed it had been the Commission's policy to reduce commitment to a level that could be maintained by the Commission for that Working Circle on a sustained basis (". In terms of the particular quota year, it was Mr. Lowery's view that it would be quite a substantial immediate loss, although if spread over 25 years you would get a very diminutive result. It was his opinion that the deprivation of the resource would have its repercussions on other facets of the timber industry and also would have an impact on the overall management situation 27/3 TP16.

If Terania Creek is not logged there are only two alternatives. The first is to reduce the cycling time of the sustained yield operation

This is not feasible because the concept of sustained yield is based on there being sufficient time elapsing between logging operations to allow timber to regrow and if this scale is reduced the overall amount of timber to be cut from the management area in the second logging operation would be reduced so that it would not be functioning on sustained yield. It would be a regression to the old cut out and get out philosophy which the Forestry Commission has spent some sixty years eradicating A1 page 42 and 25/3 TP76.

The second option is to reduce quotas (A1 p42, 25/3 TP77). The significance is that if quotas are reduced the existing commitment level is no longer a sustained yield and the real sting of the exclusion of Terania Creek would be that it would be lost in perpetuity although the amount of timber per se is not a great volume 25/3 TP80. In relation to Murwillumbah Working Circle, in the event that Terania Creek is not logged it would mean deprivation of 702 m^3 nett which would only very marginally reduce the 7 year period of that Working Circle.

See 26/3 TP2 and following on the discussion between the Commissioner and Mr. Lowery as to whether it is relevant to average the loss over 25 years or whether it should be considered as an immediate loss. On this point, it is submitted that it is relevant to note that, if this Government does not permit the proposed logging, then it's highly unlikely any other will. The result would be that the <u>whole</u> resource in Terania Creek will be lost forever and not just the timber the subject of the current proposal.

It's Mr. Golding's view that in relation to the Murwillumbah Working Circle there would be a major effect in the event of Terania Creek not being logged, considering the reduction in Crown resources that Standard Sawmilling Co. has already suffered. The effect in his opinion would be significant. It is Mr. Bruce's opinion that the resource is already limited and any further reduction would be significant although perhaps it is going a little far to say that it is major 29/4 TP32.

In Mr. Lowery's opinion the impact of not logging Terania Creek can be considered over 25 years or it can be considered in terms of its impact in 1 year. If it is considered over 25 years it is very diminutive although the immediate loss would be quite substantial 11/4 TP16. Notwithstanding undercuts which have taken place in the past, it is Mr. Lowery's opinion that any loss of resource is significant 11/4 TP20. In assessing the impact of not logging Terania Creek, it is submitted that the evidence establishes that the Forestry Commission's past record in respect of volume estimates as opposed to actual yield volumes is exceedingly accurate A97 and 21/5 TP55, A110, 13/6 TP1, A117, 13/6 TP18.

It is also Mr. Bruce's opinion that f Terania Creek were taken out then that lack of resource would mean that the Commission would be (in the absence reduction of quotas) going back into areas that hadn't had the extra growth on them and therefore the volume would be less. This would have a cumulative effect and you would get a continual shortening of the life of the Working Circle.

It is submitted that the management of forests is a long term process and the Commission has since 1962, 11/6 TP7, been working towards getting Mullumbimby Working Circle on a sustained yield basis. In light of the accuracy of the volume estimates as opposed to volume yields, it is submitted that if Terania Creek (taken alone) is not logged then the evidence clearly establishes that there will be a cumulative effect on the Working Circle because there will be an immediate loss of the Terania Creek resource and, at the present prescribed yield, areas will be cut before trees have reached appropriat maturity. The result is that the other areas in the Working Circle will yield less volume and more areas will have to be cut sooner in order to maintain the prescribed yield of the Working Circle. This result from a management point of view is unacceptable.

The only other alternative if Terania Creek (by itself) is not logged is for there to be a reduction in quotas. This option assumes that

the correct view of the effect of removing Terania Creek is not an immediate loss but a loss which is spread over 25 years. If this is done then from a timber volume point of view the evidence indicates that the results would be diminutive. It is submitted however, that where the quotas have already been significantly reduced in the past, any further reductions in quota will have a significant effect on the industry as a whole, on the confidence of the area and in particular on the confidence of the sawmilling companies in the Forestry Commission to produce the resource which is available.

It is submitted that either of the above effects of not logging Terania Creek are detrimental to the industry as a whole and to the management practices in the area, particularly where it is submitted it has been demonstrated that there is no valid environmental reason for not logging Terania Creek.

Miscellaneous

During the course of the enquiry various "issues" have been raised and it is not proposed to deal with those matters because it is submitted that there is no evidence to support them. To mention but a few, there is no evidence to suggest that "crown dieback" will be of any significant problem in Terania Creek (compare Baur 2/9 TP12 and Floyd 13/11 TP84 and Florence 18/9 TP33).

Another "issue" has been the question of "historical sites" within the basin e.g. Gracy's Track, the white beech, red cedar, cathedral rocks (the Crags), waterfalls, cliffs and the pinnicles in Doon Doon Saddle see B109. There is no dispute that all these sites are well away from the logging areas and will not be disturbed by the proposed logging.

Another "issue" is the question of the brush box acting as a "buffer zone" for the rainforest which is referred to sometimes in the correspondence A124. No one at the Inquiry has seriously put forward a

case to the effect that logging in the brush box will interfere or destroy a buffer protecting the rainforest vegetation.

Some of the anti logging parties suggested in their submissions that the sawmillers could use "thinnings" as a substitute for the loss of sawlogs if Terania Creek were not logged. It's implicit in such submissions that there will be a loss of timber to the mills if logging does not go ahead, but save for this point there is no evidence at all to support the suggestion. Indeed the whole of the evidence is to the contrary. The evidence without exception establishes that the required technology has not been developed and won't be in the forseeable future to enable thinnings to be utilised as a substitute for sawlogs.

10. Conclusions

It is submitted that the Forestry Commission's decision to log Terania Creek as proposed in A1 has been fully justified in this Inquiry. Indeed it is perhaps worth noting that in no material respect has the Forestry Commission's view on the effect of the proposed logging been successfully challenged. Indeed, on the contrary, views, particularly for example on wildlife, as to the anticipated effect have in substance been supported by Dr. McIllroy, an independent expert, and by the National Parks and Wildlife Service.

In contra distinction to the Forestry Commission, many of the other parties to this Inquiry have clearly altered or have ultimately modified the views set forth by them in their submissions. The Forestry Commission, in relation to these parties, views it as unfortunate that they could not have been more accurate in the first instance. If they had have been more accurate, a considerable amount of time in this Inquiry would have been saved. It is not considered appropriate to go through these matters in detail, but some examples will suffice. Dr. den Exter's cross examination in Lismore on the first occasion was one example where he

substantially modified or varied the submission made by him. Dr. Webb was another witness who it is submitted was highly inaccurate in the expression of his views to this Inquiry leaving aside for present purposes the changed view which has already been dealt with. Again Mr. Sommerville on behalf of the Nature Conservation Council spent a large amount of time in this Inquiry cross examining Forestry Commission witnesses to the effect that there would ultimately be a loss on this operation of approximately $17,000. When he himself was asked questions about this figure he agreed that as an accountant he did not think that method of calculation appropriate. Likewise Mr. Milledge in significant areas varied his submission. They are but some of the examples.

The Forestry Commission also views it as somewhat unfortunate that in this Inquiry some of the anti-logging parties have unnecessarily in its submission wasted time. Milo Dunphy on behalf of the Total Environment Centre made an outburst 18/3 TP23 to the effect that the model had been deliberately exaggerated by the Forestry Commission and that it was not a faithful reproduction. It was therefore considered necessary to call Mr. Max Maddock, the model maker, to testify as to its accuracy. His evidence wasn't challenged in any material respect. Another example of what the Forestry Commission views as time wasting by certain of the conservation groups is the cross examination by Mr. Prineas of various of its witnesses (Mr. Horne and Mr. Baur in particular) in an attempt to establish that Research Note 17, where it refers to inland brush box and 50%, refers to 50% of the basal area including the understorey. Perhaps it should be noted that, not only did all the witnesses that he cross examined disagree with him and continually do so, but also he did not call any person nor did any of the anti-logging groups call any person to establish that that was their understanding of Research Note 17 or that there had been some confusion in Forestry circles as to what it did mean. On the face of the document the suggestion by Mr. Prineas was, it is submitted, without foundation.

Mention has already been made of Dr. den Exter and Mr. Coates and the extraordinary circumstances surrounding their proposed evidence in relation to soil and nutrition.

Again these are but some examples coupled with what has already been referred to as some false issues raised in the case, namely thinnings, buffer zones, Crown dieback and the like.

As indicated above, the Forestry Commission will at this point of time refrain from commenting upon the "extra Inquiry" activities of various of the anti logging groups and the time that has been taken up by the Inquiry and parties to it including the Forestry Commission in relation to those matters.

As has been said, the Forestry Commission's stance in Al has, it is submitted, been completely justified by the evidence. While the Forestry Commission welcomes informed criticism and comment on its Forestry practices, the evidence in this Inquiry, it is submitted, has demonstrated that the opposition to the proposed logging of Terania Creek was not well informed in the sense that it has, it is submitted, been demonstrated that that opposition has no substantial basis. It can but be hoped that in future the Forestry Commission and the people of N.S.W. will be spared the cost and the necessity for Environmental Inquiries in relation to the Forestry Commision's practices unless opponents of those practices can on a a sound scientific basis demonstrate some prima facie case for their opposition.

11. The Decision

It is submitted that the logging as proposed in Al should be permitted on the following terms:

a) The conditions of logging, including the special conditions, the standard conditions and the erosion mitigation conditions, as set out in Al be complied with.

b) Terania Creek Road be used for log haulage subject to:

(i) the Council's conditions in A23 being complied with;

(ii) the lantana and other roadside growth being cleared prior to logging;

(iii) there being a speed limit imposed on the road of 30 km an hour;

(iv) that signs be placed on the road advising of the logging operations and advising motorists to sound horns when approaching corners; and

(v) that log trucks be prohibited from using the road when the school bus is using it.

c) That the undertakings given by Mr. Bruce in relation to the logging or not logging in certain areas in the evidence be complied with.

d) That the undertaking in relation to co-operating with the National Parks and Wildlife Service in relation to Aboriginal Sites be complied with.

e) That following the logging, the Forestry Commission continue to co-operate with the Australian Museum, the National Herbarium and the National Parks and Wildlife Service, in carrying out research and monitoring impacts in Terania Creek as to the effects of the logging as proposed on the flora and fauna of the Basin.

f) That only local seed be used in the planting of flooded gum, where such planting is considered necessary following logging.