

RESOURCE USE, BIOLOGICAL AND ENVIRONMENTAL PLANNING FOR EUCALYPT FOREST MANAGEMENT*

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SYNOPSIS

If foresters are to retain the right to make and implement management decisions on public forest land, they must broaden the resource use and management planning base, and create or improve lines of communication with the public. The Forest Services and industries are urged to co-operate in drawing up minimum planning standards for all proposals involving major changes in existing forest use. A provisional set of standards is given, covering the justification for the proposed use of the resource, and the documentation of biological and environmental factors influencing management practices.

INTRODUCTION

Until the 1960s logging on eucalypt forests was almost invariably carried out under some form of selection cutting. Initially, only trees with high quality boles were logged. When the forests were brought under management, efforts were made to utilize trees with defective boles and to remove useless trees in improvement treatments. Despite this, many trees with poor quality boles or crowns have been retained, particularly in submerchantable and smaller sawlog sizes. Consequently, the improvement in bolewood production has been generally disappointing (Curtin, 1970).

During the 1960s the management trend has been to forest clearcutting with coupes varying from one or two acres to tracts hundreds of acres in extent. Initially these operations were largely confined to high quality, wet, sclerophyll forest sites where successful stand reproduction depends on severe site disturbance. These programmes were associated with supply of sawlog or pulpwood to industries based on the relatively small Australian markets. In more recent years, however, many factors have led to an acceleration of forest clear-cutting. For example, inventory and yield plot data have shown sawlog production from the typical irregular forest to be far below the site potential under intensive even-aged stand management. Some forests have a large component of species with the more durable, high density timbers, and these are no longer highly valued by the market; consequently there is

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pressure to replant such stands with species which can be oriented both to sawlog and pulpwood industries. Expansion of Australian pulp and paper industries and the development of export woodchip markets are leading to increased use of the eucalypt forests to grow short-rotation pulpwood crops. Finally, the recent acceleration of softwood plantings has been achieved, in part, by extending plantings on to better quality eucalypt forest sites previously selectively cutover for hardwood sawlogs.

This major reorientation in use of native forests has coincided with the world-wide development of interest in environmental quality and the conservation or planned use of the world's limited natural resources. The increasing rate of clearcutting within the eucalypt forests has been critically questioned, or opposed by conservation and related organizations. Representations have been made directly to governments and industry, management practices have been condemned in the press, legal action has been taken, and the issue has been debated in the Australian parliaments. There are several ways the profession might react to these expressions of concern. The issues can be ignored, or the urgency of expanding timber production can be stressed and the public assured that the profession has all necessary technical and management skills to carry out this work. Alternatively, the forester might be more sympathetic to these expressions of concern and seek ways of obtaining greater public acceptance of expanded timber management and essential management practices.

Within the forestry profession and forest industries there are probably few who would reject the latter, in principle at least, as the most appropriate of the three alternatives. Consequently, we might begin by asking whether the attitudes of those committed primarily to resource conservation and environmental quality, and those committed primarily to rapid resource development are totally irreconcilable, and if not, what initiatives might be taken to help close the widening gap between the forester and the conservationist. It is useful to begin the search for answers by examining the outcome of the conflict between the forestry profession and the public in the United States, where for many years opposition to clearcutting on national forests has been highly organized, strongly directed and politically oriented.

CONFLICT BETWEEN THE PUBLIC AND THE FORESTER IN THE U.S.

Forest management trends in Australia parallel those in the United States where clearcutting has largely replaced selection logging on nearly all national forests and forest types during the past decade. Public opposition to this reached a climax in two U.S. Senate Subcommittee hearings on the issue, and has contributed to the recent enactment of environmental legislation which is likely to have a very considerable effect on timber management on the national forests. The extent of the public opposition to clearcutting is indicated by the response of the *New York Times* (1971a) to the Senate hearings

—“despite the longtime opposition of conservation groups to this practice, there had been no prior indication of the widespread and intense emotion displayed over the issue”.

Despite the bitter opposition to this single issue, there is some doubt that clearcutting *per se* is the really basic issue in the controversy. Rather it may be the tip of the iceberg, the visible expression of the fear that forestry is still essentially exploitive, and that an insensitive bureaucracy committed to “furnishing timber to commercial loggers at attractive prices” (*New York Times*, 1971b) is incapable of making balanced resource-use decisions and implementing ecologically sound and environmentally acceptable management practices. Unfortunately, a few highly publicized instances of clear-cutting, examples of bad management in anyone's terms, have sharply focused this fear of Forest Service motives. Conservationists demand that management decisions flow from a careful evaluation of all possible factors bearing on the use and management of each segment of the forest resource, and charge that—“too frequently the decisions that ultimately affect the land and environment are being made unthinkingly on the basis of rote procedures and dogmatic directives” (Wilderness Society, 1971).

The recent enactment of the National Environmental Policy Act of 1969 (Public Law 90-190 Jan. 1, 1970) could have a major impact on forest management. Under this Act, all Federal agencies responsible for public land management are required to:

- (1) Ensure the integrated use of natural and social sciences and environmental design arts in planning.
- (2) Ensure that previously unquantified environmental amenities and values be given appropriate consideration in decision-making.
- (3) Study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative use of available resources.
- (4) Utilize ecological information in the planning and development of resource-oriented projects.

Perhaps the most important requirement of this Act makes it obligatory for Federal agencies to prepare environmental statements for “all major Federal actions significantly affecting the quality of the human environment”. They are required to examine the environmental impact of each proposal, alternatives to the proposed action, the relationship between local short term uses of man's environment and the maintenance and enhancement of long term productivity, and any “irreversible and irretrievable” commitments of resources involved in the proposed action.

The U.S. Forest Service sees legislation to improve the environment and bring about the multiple use of forest lands as imposing important constraints on timber production on national forests. But they go further: “In the years immediately

ahead the impacts are likely to be largely confined to the national forests and other public land. Over a longer period however, the forest management practices of forest industries and many other private forest owners will probably be significantly affected" (Josephson and Hair, 1970).

The enthusiasm of conservation organizations for the legislation is reflected in the reaction of the Environmental Defense Fund to the Forest Service's statement on a proposed co-operative programme of aerial spraying against gypsy moth. The Environmental Defense Fund (1971) presented a technically detailed criticism of this statement and concluded: "We also feel it incumbent upon us to point out that unless and until an adequate final environmental impact statement is filed for each of these programmes, federal participation remains potentially vulnerable to legal restraint".

RESOURCE USE AND MANAGEMENT PLANNING IN THE EUCALYPT FORESTS

Australian foresters have much to learn from United States experience. If the worst features of this experience are to be avoided here, the lines of communication between foresters and the public must be improved, and a better image of professional competence projected. This may be achieved, in part, by broadening the resource use and management planning base, and the publication of statements based on this planning. Initially this should apply to all new proposals involving major changes in native forest use, or likely to have a marked environmental impact. Ultimately, it should apply to all forestry programmes.

The Forest Services, forest industries and forestry profession are urged to co-operate in drawing up resource use and management planning standards which can be applied to all relevant forestry proposals. These standards should define all the resource, social, economic and environmental factors which should be considered before a forest use decision is made and appropriate management practices are determined. In this paper, a tentative set of planning standards is proposed. These relate to the analysis of the resource and resource use, the ecological and economic basis of forest management, and the environmental impact of the proposed programme.

The Resource Analysis

Any timber management proposal must be justified as the most reasonable use of the forest, both in the short and the long term. This requires an examination of the nature of the forest resource, the current use of the resource, and likely future demands on the resource. The resource itself should include all forested land in public and private ownership within the supply zone of proposed industries, and any alienated lands which might conceivably be oriented to the project. The resource analysis should include the appropriate estimations of forest area and wood volume, and the definition

of the resource in terms of land systems or other soil, vegetation and topographic units. For each land system a statement should be made of the land potential for all possible uses, including timber production, agriculture, water supply, recreation, and maintenance of wildlife and environmental quality.

The outline of present resource use should relate both to its timber and non-timber values. For timber production, this should include the yields of all forest products, the location of dependent industries and their contributions to employment and the wellbeing of local communities generally. For non-timber uses, it would be necessary to evaluate the present role of the forests in water supply catchments, in wildlife maintenance, particularly uncommon or unique wildlife, and in making provision for recreational pursuits such as fishing, bushwalking, or enjoyment of scenic quality. The analyses should also attempt to project all long-term demands on the resource, and likely developments if the new timber management proposal were not implemented at this time.

The new timber management proposal must be shown to be justified in terms of the demand for forest products at the local and national levels, and in terms of its contribution to local and national economies. The economic consequences of failing to implement this and similar projects should be considered. The anticipated use of the resource should be presented in a series of statements showing the volume and range of products to be harvested, the area which must be cutover annually, the land systems from which wood supplies will be drawn, the economic zone of supply for proposed industries, and the silvicultural methods which will be used. The statements should show the location of proposed industries and their probable effects on the environment (water and air pollution, noise levels, use of public roads for log transport, etc.) and the effect the programme will have on population growth.

Timber can be produced in stands managed in very different ways. Therefore, alternative silvicultural methods must be evaluated and reasons for recommending a particular method given. Normally this would be based on the requirements of industry, the condition of the existing growing stock, the ecological requirements for the establishment and continuing growth of regeneration, and comparative studies of wood production and money yield where different silvicultural methods have been used. More specifically, where management of a forest for multiple purposes is important and a clearcutting programme is proposed, the planning statement should show clearly that the timber management decision has been made within the context of multiple use objectives, and why alternative silvicultural procedures are inappropriate.

The Biological Basis of Management

All forest management plans should be evaluated in terms of ecological criteria, and should demonstrate that the forester has sufficient expertise to achieve stated objectives, to obtain

satisfactory forest regrowth, to ensure continuing stand health and productivity, and to prevent soil erosion and maintain water quality.

Changes in the scale and technology of timber management highlight the need for a greater understanding of ecological relationships within the eucalypt forests. Under selection logging regimes, species patterns and species-environment relationships were largely of academic interest, but under extensive clearcutting regimes this is no longer so. For example, in eastern Australia, there is a trend to replace natural species and type mosaics with one or two preferred species, and the ecological consequences of this are uncertain. Therefore, resource use and management planning standards should call for an interpretation of ecological pattern within the forest in terms of all environmental factors likely to influence that pattern. This is one area where basic knowledge of the eucalypt forests is clearly deficient. Greater research emphasis on forest ecology is needed, including the elucidation of relationships between species distribution and soil and microclimatic factors, controlled studies of the way species react to different environmental factors, and examination of differences in species susceptibility to pathogens. Management proposals must be examined against such ecological background, and where any doubts arise, reasonable constraints to development of extensive even-aged monocultures should be prescribed.

All relevant expertise in silvicultural management of the forest should be documented. This can be done through summaries of research work or experience relating to the regeneration of the forest and the management of the growing stock. This could include a summary of seed production and seed fall patterns, seed tree requirements, the influence of environmental factors on seedling establishment, site preparation, direct seeding, the raising and planting of nursery stock, weed control, thinning of regrowth, and so on. Based on this, the specific proposals to be used for regenerating the forest should be given, including the provision made for regeneration surveys, and contingency plans should reproduction fail, wholly or in part in any one year.

Environmental Impact

If foresters are to retain the freedom to make and implement timber management decisions on native forests, they must be balanced decisions in terms of resource use, and all forestry operations must be made as environmentally acceptable as possible.

The resource use and management planning standards should require an evaluation of environmental impact, and an outline of steps to be taken to minimize any unduly adverse impact. For example, where clearcutting of forest is proposed, the size of coupes, the roading network and the planned harvest pattern should be given, with evidence that these have been designed to complement the landscape as far as possible. Actions which will be taken to minimize soil erosion and any

other adverse impact of the logging operation should be explained. For example, these could include constraints on the type of harvesting equipment to be used, and provisions for erosion control on snig tracks, cull removal, flattening or windrowing and burning of debris, and the planting of log dumps.

Where the management of a forest for multiple purposes is an important objective, provisions to maintain or enhance non-timber values should be documented. Where substantial clearcutting must be practised, these provisions could include the preservation or selective logging of existing forest along roads and waterways, and in other parts of the forest where wildlife maintenance, development of recreational facilities or preservation of landscape vistas is planned. Wherever selective logging can be effectively used in timber production management, the weighting given non-wood values in making this decision should be stressed.

Finally, it should be recognized that much of the deterioration in the public-forester relationship stems from a failure of the forester to demonstrate the ecological justification for some forest practices, and that the apparent devastation of forests may be an essential but temporary phase in the reproduction of vigorous commercial forest stands. Hence, provision should be made for public notices on logged over forest explaining procedures, regeneration methods, the likely duration of apparent devastation, the anticipated character of the regrowth forest, and the sources of finance for these works.

CONCLUSION

The foregoing resource use and management planning standards are designed to cover those situations where a major environmental disturbance, particularly forest clearcutting, is regarded as essential, despite the weighting given non-wood values in the decision and the evaluation of alternative silvicultural regimes. The adoption of such planning standards would not, of course, resolve all issues or prevent conflicts. No resource use decision can be made in an entirely objective way, and value judgements will inevitably reflect the particular philosophy and background of the person making the judgement. However, the preparation and publication of resource use and management planning statements would at least raise the level of debate, and reduce criticism stemming from ignorance of objectives and proposed management practices. The attainment of high standards of planning will be expensive, yet it may be a small price to pay to retain a professional independence of approach, that is, the right of the forester to continue to make and implement management decisions on public forest land.

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