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THE ALPINE ENVIRONMENT

About The Authors

The League is grateful, not only to those whose names appear as authors in this number, but also to those who supplied photographs, and to all who contributed their efforts to the running of the Alpine Forum — Mr. A. O. Lawrence, who chaired the session at the Herbarium; Dr. W. H. Connolly, who filled that role at Mt. Beauty; and officers of the Soil Conservation Authority, the State Electricity Commission and the Forests Commission, who were responsible for the Field Day.

The following brief notes are to introduce our authors.

Professor John S. Turner, M.A., Ph.D. (Cantab), has been head of the School of Botany, University of Melbourne, since 1938. He is a Fellow of the Academy of Science and a Council Member of the Australian Conservation Council and of the Victorian National Parks Association. He was a founder of and Chairman of the Landscape Preservation Council of the National Trust, is a consultant to the Department of the Interior, on land use in the Northern Territory, and was recently appointed to the Land Conservation Council of Victoria. He led an Academy group which reported on grazing and soil erosion in the Snowy Mountains, and also reported, for the Australian Conservation Foundation, on the Conservation of Norfolk Island.

Mr. R. E. Kelly, D.D.A., M.A.T.A., is Senior Conservation Officer of the Soil Conservation Authority (North Eastern Region). He gained extensive experience in the mountains whilst District Officer at Tallangatta, and is now responsible for most of Victorian alpine country, including the major ski resorts. He represents the Upper Murray Regional Planning Committee on the Falls Creek Tourist Area Management Committee, and represents the Soil Conservation Authority on the Mount Hotham Alpine Reserve Committee of Management and on the West Kiewa Forest Management Committee.

Dr. J. G. Mosley, B.A.(Hons.), M.A., Ph.D., has been Assistant Director of the Australian Conservation Foundation since July, 1968. Dr. Mosley has been involved in the study of natural resources, land use, conservation, and outdoor recreation for a number of years, and has developed a special interest in national parks. In 1959/60 he was employed on the New Zealand National Resources Survey. He is currently also Technical Adviser to the House of Representatives Select Committee on Wildlife Conservation.

Dr. R. J. Grose, B.Sc. For. Melb., Ph.D. Melb., is Chief, Division of Forest Management, in the Forests Commission, Victoria. From 1964-1968 he was Research Officer and Officer-in-Charge Research Branch. From 1965-1969 he was Chief, Division of Education and Research. His doctorate was gained on studies of the ecology of alpine ash association, and subsequently he carried out post doctoral studies for 18 months in Canada, as a National Research Council Fellow. His subject then was silviculture of white spruce.

Cr. D. K. Richardson, an Omeo Shire Councillor, is Manager of Cobungra Station, Omeo — a station of roughly 100,000 acres, at an altitude between 3000 and 5000 feet. For ten years he has been the Omeo cattlemen's representative on the Bogong High Plains District Advisory Committee, which controls the numbers of stock and the periods of cattle grazing in the area. That committee, established by the Soil Conservation Authority, consists of representatives of the Authority, the State Electricity Commission, the Lands Department and cattlemen (3 in all). He has also been the Omeo representative on the Tambo District Advisory Committee for the last 7 or 8 years, and is the Omeo representative to the Graziers' Council of Victoria and the Mountain District Cattlemen's Association, being Vice-President of the latter.

Mr. Maurice Harkins has been Director of Tourism since 1958, prior to which he was Manager of the Victorian Government Tourist Bureau. He is a Commissioner of the Australian Tourist Commission and has had a long association with tourist development in Victoria, and with the Australian travel industry.

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Postal Address: Box 104, Springvale, Vic., 3171 **Editor: C. SIBLEY ELLIOT**

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FRONT COVER: Snow gum *(Eucalyptus pauciflora)* in the Brindibella Ranges, A.C.T.

Forestry and Timber Bureau
Photo by A. G. Edward, A.I.A.P.

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EDITOR'S NOTE:—

The views and opinions expressed by writers of articles in this publication are not necessarily those of the League nor of the Editor.

THE FUTURE USE OF ALPINE REGIONS

WHAT LIES AHEAD?

It was to provide an opportunity for public consideration of this question that the Natural Resources Conservation League arranged a forum that began with the presentation of papers at the National Herbarium on February 13th and continued with an evening session at the Mt. Beauty Chalet on February 19th and with a field day in the "High Country" the following day.

The papers presented and the opening remarks of the Hon. W. A. Borthwick, M.L.A., Minister of Lands and for Conservation, are published in full in this number of "Victoria's Resources", preceded by a summary report by Professor J. S. Turner who, as Rapporteur, gave the Mt. Beauty meeting an overall report on the earlier session at the Herbarium. In spite of increasing the size of the number by four pages it has not been possible to include even a cursory report on the very valuable field day.

At the sessions at the Herbarium and at the Mt. Beauty Chalet, as well as on the field day, there was an attendance of more than 200, representative of a wide range of ages and of varied interests in the use of the alpine country. Because of the variety of interests, some of which run counter to others to some extent, the forum was, as Professor Turner has indicated in his report, not entirely a matter of "preaching to the converted". This made it, perhaps, one of the most challenging and worthwhile gatherings of this type in which the League has ever been involved.

Only those who are content to admire it from a distance are guiltless of making some impact on the alpine environment, though the impact of some uses is, of course, much greater than that of others. In a generation when what the Minister has referred to as "legitimate interests" in the alpine areas are increasing their impact so markedly, it is our responsibility to strive for a practical, reasonable approach that will give due recognition to all interests and at the same time assure the integrity of the areas in perpetuity.

Perhaps the Alpine Forum helped a little towards that end.

THE ALPINE FORUM

Rapporteur's Report

by J. S. TURNER
Professor of Botany, University of Melbourne.

At the session held at Mount Beauty on the evening of Friday, February 19th. Professor Turner reported on the proceedings of the session held in Melbourne the previous Saturday. The following report summarizes what he prepared for the occasion and includes some comments arising from the questions and answers at the Mount Beauty session. The papers referred to are published in full in the following pages.

Cr. H. A. Boardman, President of the N.R.C.L., who has welcomed those attending both sessions of the Forum, is well known for his conservation work in the Brisbane Ranges, and is a Shire Councillor with a real knowledge of and interest in natural history, landscape and conservation. His remarks on mining the farm, and farming the mine, were well taken.

Following Cr. Boardman's welcome, the Forum, under the Chairmanship of Mr. A. O. Lawrence, was opened with a felicitous and sincere speech from the Minister of Lands and for Conservation, the Hon. W. A. Borthwick, M.L.A., who stayed for much of the meeting. He outlined the new legislation setting up the Land Conservation Council, and made it clear that he was well behind this unrivalled opportunity to create a well balanced system of reserves in Victoria.

Amongst the good features of the Forum were the absence of colour slides (excellent in their place, but not here), of preaching to the converted, and the presence of an exceptionally keen and responsive audience with many new and young faces. The Natural Resources Conservation League had brought together five speakers covering important aspects of the Alps, but had necessarily to omit contributions from other interested parties.

It was, however, a great pity that a statement on Alpine National Park policy was not provided by the National Parks Authority. This is no reflection on its Director, but rather points to the fact that the Authority has not the staff, as yet, to tackle all its manifold problems. A joint contribution by the Australian Conservation Foundation and the Victorian National Parks Association would have been appropriate, as the Association has had a sub-committee working on this problem for many years.

There is a much greater degree of collaboration between the relevant Victorian State Departments than in the nineteen fifties, but at the Forum each Department put forward its own views and it will be the task of the new Land Conservation Council to reconcile these.

Mr. Kelly's contribution from the Soil Conservation Authority is dealt with first because that Authority has overall control over the whole alpine region, in its responsibility for all land use over 4,000 feet.

Its main responsibility is to ensure that the catchment values are not impaired by grazing or by earth-moving activities. As early as 1945, Miss S. G. M. Fawcett was seconded from the Botany School, University of Melbourne, as an officer of the then Soil Conservation Board. She was stationed at Omeo and reported on the incipient erosion of the Bogong High Plains. This report resulted in the setting up of the experimental plots, which have been maintained ever since by the Botany School, the Soil Conservation Authority and the State Electricity Commission. The work there has been instrumental in getting the hydro-electric engineers conservation minded, and it led in 1950 to the formation of the joint Soil Conservation Authority-Cattlemen Committees, which meet regularly and control the time of entry and the total number of cattle grazing. The number has been markedly reduced since 1950. There is little doubt that improvement to the cover of the High Plains has resulted from this control, but the experimental work has shown that recovery is extremely slow and especially in the mossbeds.

From the point of view of catchment values alone, the Soil Conservation Authority is apparently satisfied with the present level of grazing, and will continue to exercise a close control over it.

The Soil Conservation Authority has a policy that all ski villages should be kept at or below the snowline, but it has been less successful in controlling skiing development. In Victoria there is a powerful skiing lobby and an extraordinary system of divided control. The Authority is not satisfied with, (for example), the current methods of sewerage disposal in some villages. It is clear that greater control of skiing development is necessary, especially in the interests of summer visitors. [The planning and landscaping of Falls Creek, regarded by some as a model, came under strong criticism on the field day.]

Mr. Kelly pointed out that the Soil Conservation Authority is not merely concerned with the prevention of soil erosion; it is an important land-use department which played a key part in the old Land Utilisation Advisory Council. Its excellent published land-use and ecological reports on many parts of Victoria are especially commended.

Mr. Kelly dealt briefly with the possibility of improving the catchments by planting trees as snow fences. [On the field day there was much vocal opposition to using exotic conifers for this purpose.]

Mr. Richardson of Cobungra Station, speaking on behalf of graziers, received more sympathy (if not more support) from the audience than he perhaps expected. It was realised that he, like many of the cattlemen, had a real love of the Alps and considerable knowledge of them and their agricultural traditions. He was not looking at the High Plains grazing merely in terms of dollars. Some of his points reinforced those made by Mr. Kelly — for instance, the well recognised fact that much of the serious damage in the Snowy Mountains region and in the Victorian Alps was due to the high concentrations of cattle and sheep allowed there in drought periods in the early days. He stressed that since 1950 there had been a 35 per cent reduction in the grazing of the Plains and that the area had greatly improved. In his view "we should make full use of our land", and if grazing can be carried out without damage to the other interests it should continue, even although the number of farmers is very small. [In this connection, the fenced plots on Pretty Valley indicate that if cattle were removed, the grassland would probably revert to a colourful herbfield.]

Mr. Richardson stated that, with the present economic need to bring cattle rapidly to maturity, High Plains grazing may become of less importance except as a means of giving condition to the animals, and occasionally in drought relief. He did propose that we should consider not only conservation of wildlife but (as does the National Trust) conservation of Australia's old ways and traditions, including the pioneering efforts in the Alps. He pointed out that to some tourists the presence of cattle, with the salting and round-up, was actually an attraction.

Dr. Grose, speaking as deputy for Dr. Moulds, began with an explanation of the modern role of the Forests Commission. It does not mine the forest but conserves it, after logging, by silviculture and by controlling forest fires; it helps in the management of water catchments; it plays a part in provision of skiing facilities. It is a large department with many trained staff experienced in handling multi-purpose reserves, and has recently set up a new Division of Forest Recreation. It has been responsible as a fire authority for the complex network of access roads in the region, and these are valuable to some walkers and to tourists. He was the only speaker who gave some sympathetic attention to strictly controlled activities of the four-wheel drive clubs and trail riders — regarded by many as a menace to the small surviving wilderness.

Dr. Grose argued that it was essential to utilise (for timber) much of the enormous area of valuable forest in the Victorian alpine region. This includes extensive areas of maturing ash-eucalypts, some of our most important timber trees, and a very large area of stringybark/peppermint forest protecting the catchment and providing valuable timber for the rural and building industries. He explained that, in alpine and mountain ash forest, clear felling followed by seed regeneration on an 'ash bed' is the only practicable way of regenerating these forests after logging — although the operation appears most destructive, there is rapid regeneration of trees, and overall the aesthetic aspects are not destroyed. In the mixed forest at lower elevations regeneration is possible without clear felling, but there is still a need for protective burning. He pointed out that whatever is done with the whole region, the extensive fire-protection system must remain. The Forests Commission has plans for a number of large forest parks within the sub-alpine reserved forests. A map indicated that the Commission had been looking into the possibility of recommending wilderness areas and forest parks even on Crown land outside the reserved forests, and it was unfortunate that there was no mention here of collaboration with the National Parks Authority.

Very little was said in these three talks about the effects of cattle grazing in the quarter of a million acres of reserved forest of the alpine region.

The paper by Mr. Harkins of the Ministry of Tourism contained a number of unexceptional statements with which all would agree. For example, it

Field day talk at fenced-off experimental plot, Pretty Valley.
Photo — L. H. Smith

supported the concept of wilderness areas; referred to the need for determining the tourist carrying capacity of an area; criticised some aspects of the ski villages and recommended that they should be below the snowline and that their development be subject to examination by an appropriate body concerned not only with winter use.

The statistics quoted seemed of doubtful value. Thus, the two activities most actively supported by the tourist industry are motoring, the most popular (21%) and skiing, the least popular (0.7%).

The impression gained from the audience reaction to this speech, and from the numerous questions asked, is that the Ministry of Tourism is at present the odd man out, suspected, if not actively disliked, by conservationists. This is a pity, because tourism is a growing force and if Mr. Harkins had been present he would have been able to point to the substantial help given the walking clubs by his instrumentality. Nevertheless, it must change its image if it wishes to get support from the growing number of what he terms "recreationers". Certain phases in the talk were obviously distasteful to the audience, e.g. "the informed tourist-operator (sic) is regarded as a **major** interested party: he regards the scenic beauty of the landscape as the raw material of a successful tourist industry." In other words, he equates beauty with dollars, and how often, in getting the dollars does he destroy the beauty?

There appears to be a tendency for the Ministry of Tourism to identify itself with the tourist promoter. It is obvious that many feel that it does not yet regard itself, as does Forestry in relation to the logging industry, as a department which supports industry but at the same time controls and educates it for the benefit of all.

Dr. Mosley gave the first talk, but its discussion has been left until last. It could be argued that he spent too long in putting the case for national parks, particularly in terms of the "mountain experience", to a group of people most of whom were already converted. This philosophical approach may have led to an underrating of his contribution. However, a study of the last seven pages of his report shows that he dealt fully with the real topic of the Forum, i.e. to advise as to what should be done with the Alps in relation to conservation. He attempted to follow D. H. Burnham's inspiring advice which begins, "Make no little plans . . ." In terms of this advice one could grade the plans submitted during the Forum, in magnitude at least, as follows: Graziers, Ministry of Tourism, Forests Commission, Soil Conservation Authority, Australian Conservation Foundation.

Dr. Mosley recommended the adoption of the Kosciusko Park plan for Victoria. He suggested that there should be a multi-purpose alpine conservation area above, say, 4,000 feet, and within this a really large true national park incorporating all the High Plains in two major areas, one close to the New South Wales border and the other centred on the Victorian Alps. They could be joined by the tri-State walking track, and in this park he recommended exclusion of grazing and logging. All the great national parks of the world are more than one million acres in extent, and the same applies to several United States national wilderness areas, which come under the Forest Services. Both of these are in the highest form of legal dedication. He reminded us of the success in the Snowy Mountains region attending the abolition of timber cutting in 1944 and of grazing in 1969. He was in favour of this large national park coming under one authority, possibly Forestry or the National Parks Authority, but did not exclude the possibility of joint control. He made it clear that if the National Parks Authority is to control such an enormous area, then it will need to be upgraded in terms of finance and staff. He presented a map of his new national park, and another map showing the very extensive system of roads and jeep tracks which already give access to our Alps. He felt that once a national park was established some of these would have to be closed. In the discussion it was pointed out that the map was misleading, and that although the distance between most tracks, as the crow flies, was perhaps only four miles, on the ground the time spent passing from one track to the other was often more than four hours.

There are some objections to Dr. Mosley's proposals. One is that the Kosciusko State Park already serves the people of Victoria as well as of other States, and that if we are to get a million and a half acres as an alpine national park (single purpose), we might be faced with the prospect of meeting all other urgent conservation requirements in Victoria — on the coast, in forests and the Mallee, the Grampians and the Otways — by reservation of only half a million acres of Crown land.

Planning the conservation of the alpine region will be difficult and time-consuming. We have four authorities which clearly should co-operate in planning and managing a multi-purpose national park, especially for the highest elevations — the Soil Conservation Authority, Forests Commission, Fisheries and Wildlife, and the National Parks Authority. The real danger at the moment is the divided control and the urge to "give access to the Alps". As illustrated in the Baw Baw controversy, the divided control could allow Councils and the Country Roads Board (a construction, not a decision-making authority) to drive roads along coasts and into mountains where real land-use planning is non-existent. It is relatively easy for engineers to plan and construct roads, and they have the money to do it; it is much more difficult to plan and implement multiple-land-use. The Forum has shown that we have men capable of doing it; the Land Conservation Council provides the machinery. What we now need is the goodwill and the drive.

Minister's Opening Address

On 13th. February, 1971, the Hon. W. A. Borthwick, M.L.A. as Minister of Lands, and for Conservation and of Soldier Settlement, opened the Alpine Forum reported in this number of "Victoria's Resources". He impressed his audience with his sincere interest in conservation matters, as indicated in his opening address.

It is a very appropriate time for this Forum because on Monday next, February 15th., the Land Conservation Council of Victoria comes into legal operation. The independent Chairman has been appointed — Mr. Sam Dimmick, whom many of you will know — and I have received from the Conservation Council of Victoria the panel of names from which two will be selected. I have received names from other interests for the third person from outside public administration and excluding the Chairman. In my view there could not be a better start for the Land Conservation Council of Victoria, unofficially, than this Forum today.

A forum dealing with the alpine regions of the State is dealing with one of the most difficult areas from the point of view of land use, because there are very many legitimate but quite divergent land uses to consider. To name a few:— firstly, to me the most important of all is water supply: it is a valuable area for hydro-electricity: it is a particularly valuable area for forestry: some mining companies might think it is a valuable area for mining, as yet unproved: the Government has had a great interest in the area for generations: I know the National Parks Association of Victoria has a great interest in it: the tourist has a great interest in it: the recreation man, whether he be a bush walker, or a skier, or a fisherman, or in some areas a hunter, has a great interest in it: a person who just wants to be, or have his soul rejuvenated passively, experience and look at the glory and wonder of that area and the many attractions of it, has a great interest in it. I would know of no area of the State that has more divergent interests than the alpine area.

I mentioned that in my view the variations of interests are legitimate. Their legitimacy has been established by practice and many people are involved in the areas. For instance, the Forests Commission. The ex-Chairman, who endeavoured to train me in some aspects of what foresters are doing, in various conversations in years gone by, said — if I can recall what he said to me correctly — that there are species of timber only available above 4,000 ft. elevation. You can see from the point of view of proper farming of our forests, the Forests Commission has a very, very keen interest in a long term determination of land use in that area.

As Minister of Water Supply I learned something of the great value of these areas in the very vital resource of water. The north eastern part of this State is already over 70% harvested on average stream flow, and there are many people who believe that if and when the Dartmouth dam is constructed, the economic harvesting of water in that area will be almost completed. Take that thinking a step further and realise that water in the long term could be the one resource that could hinder the growth and development of this nation. It becomes apparent that in looking at the alpine areas and how we treat them, ever uppermost in our minds and a first pre-requisite of study must be how we can handle them in a manner that will for all time give to this Commonwealth of ours the maximum of high quality water.

It is tremendously important. We have not got vast natural reservoirs of permanent snow fields. Man can make dams. He makes them to cater, in the main, for average stream flow, but the vagaries of Australian rainfall are such that we have the greatest variabilities in stream flows of any continent in the world. Nature to a large degree, in our High Plains areas, has provided us with something akin to permanent snow fields. The growth that we have naturally in our High Plains tends to act as a sponge and hold water, and provide water even through the driest of our droughts. It is that water, that comes down in summer time, which to my way of thinking is the most valuable water. Because we so frequently design dams for the average stream flow, due to the variations of our weather we can have a succession of seasons where man-made dams cannot hold all the water that comes in the winter time. Consequently, when you are dependent upon it and feeding it out during the dry summer months, the water that flows in during those summer months becomes an extremely important factor in calculations of water availability and the provision of water for towns, farms and irrigation.

That is why I say that in any consideration of our alpine regions and their future use, that one factor alone must have a very great bearing on people's thinking.

We have had plenty of examples in recent times of a changing attitude to our land — and I am speaking of land generally and not alpine areas only. To me it is one of the most remarkable things that has occurred in our history. Not many years ago the person who saw this land of ours as ours into the unlimited future, and wanted to study it and work with it, and conserve it or preserve it, in various ways, was in the very small minority — the voice in the wilderness. But there has been a remarkable change, and I was reminded of this when Cr. Boardman today mentioned mining — "farming the mine and mining the farm." Only a few weeks ago I spent two weeks in one of the more remote alpine areas of this State, almost untouched at yet, al-

though most of it was alienated 30, 40, perhaps 50 years ago. There I met an Austrian who came to this country 15 years ago as a very senior, experienced and brilliant engineer with one of our largest firms in this State. He gave it all away three years ago and took up some 5,000 or 6,000 acres. He is a very experienced man in forestry and he used the very term that Cr. Boardman used and which I had not heard used before — that so frequently Australians as a race have an attitude of mining towards its resources. He himself thought we had this attitude even in forestry.

Why have we had that kind of attitude? Why have we gone in and settled land in the past with the view of exploitation rather than conservation? I am not being disparaging of our predecessors or our fore-fathers, or our pioneers, but thinking about it I recall that my late father, a third generation Australian, still referred to another land as "home". "Home" to Australians up until relatively recent times, meant another land. It did not mean this one, and consequently we went through this relatively long period in our history, of "colonial" exploitation. I know when you say the word colonial today it almost seems a dirty word, but there is no doubt in my mind that a great number of our earlier settlers, right up until relatively recent times, came to this country to get what they could from it as quickly as possible, and if possible go home. Fortunately in the 1850s my family went broke and could not go home. If you look at your own families three or four generations ago, that was the philosophy of life, and it has taken a long time for us as people to break it, and we have not completely broken it yet, I am quite sure of that. But the exciting thing about it all is that no longer is it just a few that are thinking about this land for a thousand years ahead — no longer just a few; more and more are doing it.

It is tremendously important that we should, and that we are, and that people such as yourselves are prepared on a nice sunny afternoon, a balmy afternoon, to come into this hall and to give your time to think about this valuable area — one of the remarkably large areas in this relatively small State as yet largely untouched.

You will be able to participate publicly in future decisions of land use. To me this is one of the most important factors of all — to get a public involvement. I do not believe that the politicians know all the answers. I do not believe that public administrators themselves, expert and devoted as they are, know all the answers. There are skills, and interests and knowledge, and above all feelings within a community that need to be able to be expressed in the community's interest — particularly in this field of what we want for the future with our public lands.

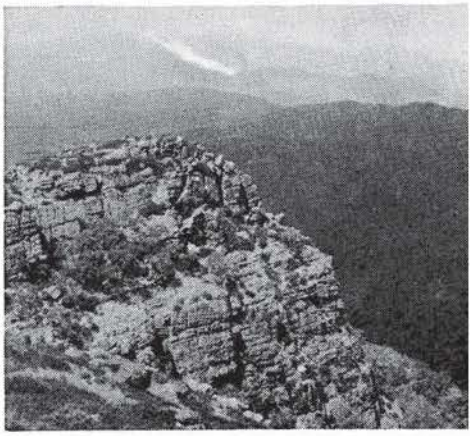
The Land Conservation Council is required by statute to advertise its intentions for investigation, not only in metropolitan press and Government gazettes, but in local newspapers. People in any particular region who have an interest, have an idea, have a value that they want expressed, will have the right to express it to that Council.

The Council will bring out proper studies of land. It is required by statute to publish those studies and to make them available to interested people, and it is required by statute not to make even a tentative decision on the use of that land for sixty days after the publication of the study. It is required then to consider all points of view that are expressed after the publication of the study, and required by statute to inform people who have submitted views, of the Council's tentative recommendations.

In other words, interested people, regardless of their interest, and provided they have made their interest known, will have an opportunity, even after the Council has formed some conclusions, to bring forward further views in case there has been some oversight, some interest over-looked, some value incorrectly judged, or not given sufficient strength in the recommendation. Only after that can the Council make a firm recommendation to the Minister of Lands, and in the public interest that recommendation of the Minister of Lands must be tabled in the Parliament of the State, where it immediately becomes a public document.

In drawing up this legislation there were two things in particular that I was interested in. Public involvement was one, and the other one was that the wording of the Council's function should be sufficiently broad to allow the Council to take into consideration what has happened in the past. I have done that purposely because there is no doubt that in many areas of the State already there is an imbalance in land use. For instance, I have no doubt that without very much care you could drive from Melbourne to the South Australian border and not find any public land left.

Mount Cobbler. The severe cold and damp climate of the high mountain catchments is shown by the distant cold fog river pouring into the Upper King river valley.
Photo — Soil Conservation Authority



To try to make this possible for the Council these are the words:—

"The Council shall carry out investigations and make recommendations to the Minister with respect to the use of the public land in Victoria, to provide for the balanced use of land in Victoria".

If you look closely at the phrase "to provide for the balanced use of land in Victoria", you will understand that that allows the Council to say, "Well, in this area too much emphasis in the past has been given to this type of use. How can we rectify that in studying land still owned by us, the people?" I could go on and read its charter and the matters that it must investigate and look at prior to making a recommendation. It is statutorily required, for instance, to see whether there is sufficient bushland for recreational purposes. I am not speaking of tennis and football, within reach of cities and towns, but of areas for national parks, of ecological significance, and for a whole list of other purposes involving conservation. These uses must be looked at before the Council can make a recommendation.

One of the great pleasures for me as a human being, rather than as a politician, was the receipt of my appointment by the Premier, enabling me for the first time to meet many of you who are here today. I see many familiar faces, people that I have got to know, people that I have been able to work with, in drawing up this legislation. I thank you for it, those of you who have helped me and expressed points of view. I hope you are satisfied with it. I hope it functions the way you want it to function, and the way I want it to function. If it does not I will do my best to alter it to see that it does, because the results of it, if it is handled properly by men of vision and love for this land, can cause this otherwise accused, selfish generation to be thanked by generations to come.

ALPINE CATCHMENTS

by R. E. KELLY
Senior Conservation Officer, Soil Conservation Authority.

Paper delivered at Alpine Forum, Melbourne, February 13th, 1971.
Photos by Soil Conservation Authority

Description

Although the term "Alpine Catchment" is used for the purpose of the forum, it is taken that both the sub-alpine and alpine environments are under consideration. The sub-alpine areas lie within the approximate altitudinal range of 4,500 feet up to 5,500 or 6,000 feet. The true alpine country of open grasslands, herbfields and heaths usually exists above 5,500 feet.

However, reference to alpine areas as alpine catchments is usually taken to mean all land over the altitude of 4,500 feet onto which snow is precipitated for long periods each year. On this basis the areas of the principal Australian mainland alpine catchments are approximately:— New South Wales, 1,000 sq. miles; Victoria, 900 sq. miles; Australian Capital Territory, 140 sq. miles — a total of 2,040 sq. miles.

In Victoria, the responsibility of all land use matters above an altitude of 4,000 feet has been given by the Premier to the Soil Conservation Authority. The largest open alpine plains involved are the Bogong High Plains. The next largest contiguous area over 4,000 feet is the Mt. Pinnibar - Mt. Gibbo Plateau but this area contains little open plain and is predominantly tree covered with snow gum and alpine ash.

The ridge tops of Mts. Feathertop, Hotham, Howitt, Skene, Wellington, the Dargo and Snowy Plains and the Cobbler Plateau comprise most of the additional areas. The balance are scattered mountain peaks and plateaux such as Mt. Buffalo, Lake Mountain, Mt. Buller, Mt. Wills and Mt. Cobberas.

Value

Alpine land in Victoria is used for a number of purposes but the most important is that of water production. For this one purpose only, alpine land would probably have one of the highest values per acre of any rural land in Australia. Because winter precipitation is held as snow and ice to be released into streams months after it has fallen and because it is situated at a high altitude which gives it a head of energy that may be utilised for hydro-electric power generation and later for irrigation, water production from these areas imparts a high value to the land.

High yielding alpine ash forests occur in altitudes up to 5,000 feet. With modern machinery and the current demand for high quality timber, logging operations are moving into these high areas. Forestry in these areas is a legitimate form of land-use which must be carefully controlled and supervised especially in water supply catchments.

The recreational and aesthetic aspects of alpine land are of great value to the community. The development of the main skiing resorts is at present booming as access is improved by the provision of better roading and snow clearing facilities. Use for summer recreation is also increasing, probably because of the better roads, and of the public becoming aware of the fishing, wild flower, scenic or even remote grandeur of the alpine lands.

Since their discovery in 1851 by James Brown and John Wells, the Bogong High Plains have been used extensively for cattle grazing. This practice has declined over the past 20 years and is now carefully controlled.

With the current upsurge of interest in minerals there has been some revival of prospecting and exploration, and even active mining is being carried on in the alpine areas.

When all these uses are evaluated and compared, it can be well appreciated that the function of alpine catchments as water producing areas is paramount. All the other uses are subordinate and therefore must be managed in such a manner that they do not impair or damage the catchment for this prime function.

Effects of Different Land-Uses

The conservation of water for irrigation and for hydro-electric power generation requires engineering works. In constructing dams, diversion weirs and channels there is disturbance and even complete loss of native vegetation over relatively large areas. The construction of roads and access tracks into these installations has a significant effect in altering the natural run-off characteristics.

Roading to and within alpine ski resorts, and for tourist access into alpine country, also changes the natural run-off pattern. The road drainage concentrates water and increases its speed of flow, reducing the time that it has to infiltrate into the soil and thus increasing its capacity to cause erosion.

Within ski resorts and alpine villages vegetation is destroyed when excavations are made for buildings, and excess earth must be disposed of, usually covering vegetation elsewhere. The provision of water supply and sewage facilities is also associated with considerable vegetation destruction. Ski runs and ski tow lines have, in the past, required only the removal by hand of tree and heath cover, but in recent years the re-shaping of natural slopes, sometimes quite extensively, is being practised. This shaping is to allow machine packing of snow to extend the skiing season and also provide easier slopes for beginners.

All these changes involving earthworks are subject to investigation by the Soil Conservation Authority, and where approved a stipulation is now made that finished earthworks must be revegetated to provide future stability.

The history of the Bogong High Plains shows that grazing has been carried out in alpine areas for over 100 years. During droughts and following lowland bushfires alpine grazing was practised extensively in early years. Sheep, cattle and horses both from adjacent Victorian areas and also from New South Wales caused numbers of stock to be grazed on the High Plains. It is quoted that in the drought of 1901 there were 100,000 sheep on the High Plains and also heavier than usual concentrations in 1914, 1926 and 1939. These very high grazing pressures, especially on the more palatable areas and at reliable watering points during times of drought, gave rise to several reports that the plains were 'eaten out'. It cannot be denied that serious damage did result from this past uncontrolled heavy grazing.

The bushfires of 1939 were widespread in mountainous areas and during the hearings of the Royal Commission which followed, burning in high mountain areas to improve grazing was severely criticised by Mr. Justice Stretton.

Land-use and Conservation

It may be thought that little can be done to change the rainfall or precipitation onto alpine areas, that rain or snow that falls will be deposited irrespective of vegetation or ground surface conditions. Early observations as far back as 1912, and experiments conducted recently, have shown that openings in tree cover can, by altering the aerodynamic character of the ground surface, affect the location and amount of snow deposition. The management and strategic planting of trees can help to increase the precipitation onto alpine catchments, thus enhancing their value for water production.

The most important factor of the alpine environment is the vegetation. Upon this factor the whole efficiency of the catchment depends. Depletion of vegetation by fire, grazing or earthworks can significantly affect both the quality and yield of water from a catchment. The interception of rain by trees, shrubs, herbs or grasses protects the soil from direct raindrop impact, and by retarding run-off, allows for maximum time for water to infiltrate deeply into the soil. By acting as an impedance to water flow, complete grass cover promotes widespread and slower sheet flow. When channellised in tracks, roadside table drains, or on a bare eroded surface, flow speeds are higher, resulting in faster movement of water from the catchment. This may lead to sheet, rill, or gully erosion. Protection from the erosive

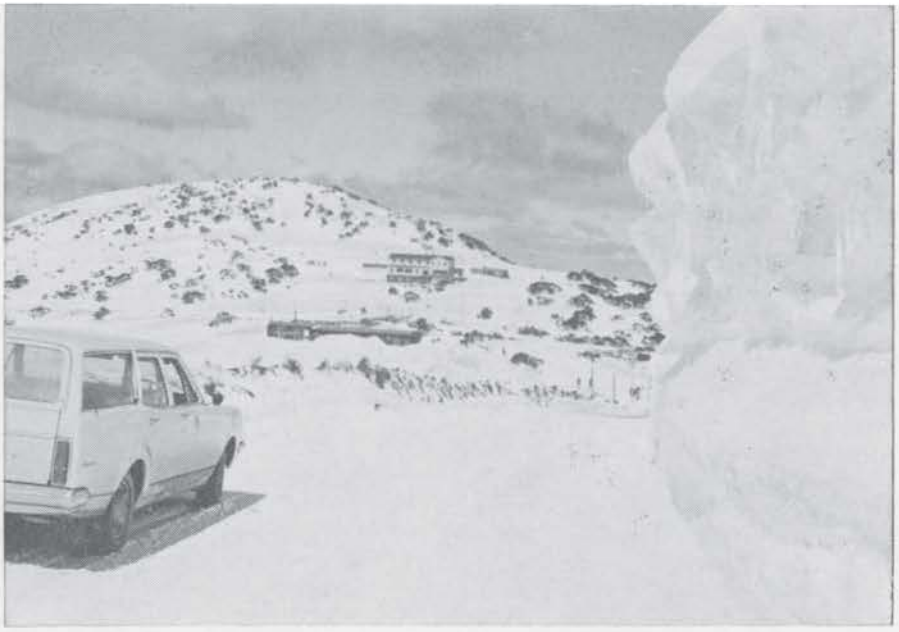
Extensive re-shaping of ski slopes should be permitted only if re-vegetation is carried out. The re-shaping of earthworks and graded furrows to prevent erosion, mulching with hay and bitumen, seed and fertilizer, can cost as much as $4,000 per acre.

action of wind, water and frost, so important to catchment hydrology, is therefore provided by complete ground cover.

The devastating effect of denudation by a major uncontrollable fire in inaccessible alpine country, is reported by the Snowy Mountains Authority. The Wallace's Creek (16.8 sq. miles) and Yarrangobilly River (87.5 sq. miles) catchments had been gauged, together with detailed sediment sampling, for a period of 8 years. Following a severe bushfire, run-off characteristics were dramatically altered. A peak of 1300 cusecs was recorded from rainstorms which from previous records would have produced a flow of 200-300 cusecs. At a flow of 100 cusecs the sediment load had increased by 100 times that prior to the fire. Even 7 months after the fire a storm produced a flow in Wallace's Creek of 334 cusecs carrying a sediment concentration of 14.4% (by weight). This is equivalent to 115,000 tons per day. The Snowy Mountains Authority estimates that the total sediment load in Wallace's Creek is probably 1000 times greater than it was before the fire.

The effect of the earlier high concentration grazing by cattle, horses, and particularly sheep, during drought periods, was this:— through selective grazing of the more palatable herbs that usually grow between snow grass tussocks to provide a natural and complete ground cover, these inter-tussock species were severely grazed, close to the point of extinction. (Most of these species have survived and can be seen in fenced enclosures and are showing up in the lightly grazed areas). The less palatable snow grass tussocks were left isolated and surrounded by bare spaces.

With the opening of the natural sward the inter-tussock bare areas were left open to wind, frost and rain. Strong wind blast has a significant effect in moving soil, sand, and rock particles, and coupled with raindrop action and water erosion the tussocks become what is referred to as "pedestalled" by the removal of surrounding soil. With the protective vegetative cover gone, frost heave leaves the soil surface in a fluffy, easily eroded condition.



Deep snowdrifts on roads through alpine resorts, and at altitudes near 6,000 ft., make snow clearing and access difficult. The Soil Conservation Authority has recommended that future alpine villages should be built near the lower snow-line with chairlifts to take skiers to the main slopes.

To be efficient, therefore, catchments must have an adequate and complete ground cover to intercept raindrops and provide retardation to water flow and to allow more time for infiltration. A complete vegetative cover of scattered trees, heathlands, herbfields and open tussock grassland can also have a significant effect on overall precipitation. By slowing wind velocity or creating turbulence, trees can cause snow drop. Low temperatures cause rime ice build-up on vegetation, and the extra moisture deposited from fog and low cloud can also be attributed to the vegetative cover. On parts of the Central Plateau of Tasmania these effects have given significant increases in annual precipitation.

In 1945 control of grazing on the Bogong High Plains was introduced by the departments concerned with Crown lands and soil conservation, together with representatives from the cattlemen. This body decided to reduce and control the number of animals, restrict grazing to cattle only, to ban the use of fire, and to determine the dates of entry and withdrawal from the plains in order to allow for early establishment and later regeneration. The usual grazing period is from the end of December to mid-April. Concurrently, investigations were established by Miss Fawcett and Professor Turner of the School of Botany, Melbourne University, to determine the effect on the vegetation if grazing were not practised.

The Bogong High Plains District Advisory Committee was established by the Soil Conservation Authority in 1950 to assume the role of the earlier committee in that area, whilst the Mansfield cattlemen formed a committee to give similar control in the Mounts Cobbler, Speculation, Howitt, Stirling and The Bluff area.

Areas that were vulnerable and upon which regeneration was proved to be slow were constantly observed, and stocking was either lightened or in the worst cases grazing was prohibited. In 1953 the summit area of Mt. Bogong was closed to grazing and this was followed in 1958 by the Mt. Hotham, Mt. Loch, Mt. Feathertop areas.

With the policy of not re-issuing grazing run licences once they have been surrendered and of gradual reduction in cattle numbers when requested by a cattleman the grazing pressure has been reduced from 9,000

grown cattle in 1950/51 to the present allocation of approximately 5,000. In 1966 the Lands Department introduced a uniform system of charging on a per head basis and from this a reduction of cattle entering the Bogong High Plains resulted. Last season (1969-70) with an allocation of 4989 head, only 2940 grown cattle were sent up. This number is less than the number of cattle that one of the many cattlemen used to graze on the plains early in the century.

This policy of controlling cattle numbers has produced a gradual and noticeable change and improvement in catchment condition. On the more severely eroded areas that have been excluded from grazing for 12 years at Mt. Hotham the changes have been measured by the Authority since 1960. Results show an increase in the percentage composition of major species and a total reduction of bare ground by about 10%; i.e. 1% per annum. (Bare ground 48% in 1960 was 38% at last reading 1968). These measurements were taken on the severe erosion pavements at Mt. Hotham where recovery would be slower than on the deeper soils of the High Plains.

By virtue of its land-use responsibility for areas above 4,000 feet, all proposals to construct earthworks for roading and ski resorts (access, site excavations, water supply, sewage etc.) above that altitude are required to be referred to the Soil Conservation Authority for approval. If this is given it is usually stipulated that the applicant is held responsible for any reclamation or revegetation that is considered necessary. By the re-establishment of complete ground cover as nearly as possible to, or better than the original, safe overland flow of water can again be achieved.

The areas of commercial timber, predominantly alpine ash, seldom grow above 5,000 feet altitude, and soils within this forest unit are usually permeable, well structured, and do not erode readily. Although logging operations can be highly destructive to ground cover, the practice now established by the Forests Commission is to concentrate all activities in a small area that can be logged in one year. Better class extraction roading can be provided economically, as all the commercial timber within the determined area is removed and the tree heads are left as ground cover. The following year the heads are burnt to leave an ash bed essential for successful regeneration, and seeding is immediately carried out by hand or by aircraft. In this way ground disturbance is concentrated into an area that can be handled and resown over a 2-year period and it is usually found that alpine regeneration of the ash and other ground species is rapid. This type of logging operation can be pre-planned for sound roading design, and logged areas can be protected by blocking off snig tracks and any channellised flows before winter snowfall.

Alpine vegetation is sensitive to mechanical pressure and can be easily killed by vehicle traffic. Coupled with water run-off, gully erosion can easily be started.

The forestry operations in the West Kiewa Valley — a catchment to the State Electricity Commission hydro-electricity installation — are controlled by a committee of nominees from the Forests Commission, Soil Conservation Authority, State Electricity Commission and sawmillers.

This committee prescribes the forestry practices that may be adopted and regularly inspects and reviews the operations.

Future

The policy of the Soil Conservation Authority has been and remains one of multiple use of catchments. The initial determination is made on the prime function of an area of land and in the case of alpine land there is no doubt that its most important use at present, and in the future, is for the production of water which becomes available to river systems after the winter flows have passed. All other uses of the catchment must be considered and then permitted only if they would not have significant detrimental effect on the catchment.

When considering proposals for recreational and tourist development it is not sufficient to study a project to develop a particular site. Rather it is a problem of the whole environment, and all factors such as climate and micro-climates, topography, vegetation, soils, and geological structure, must receive full consideration. At the commencement of any proposal for alpine tourist resorts the initial consideration should be the location — should it be above or at the edge of the snowline? The Authority has expressed the view that all future alpine villages should be at the snowline and that transport to the ski slopes should be provided by chair lifts. The problems of water supply, sewage and garbage disposal, roading and car parking, subdivision and topography for lodge sites are so

much easier to handle at these lower altitudes. The development of Thredbo in the N.S.W. Alps is a good example of a well sited alpine village.

With the existing high altitude villages the cost of road construction and snow clearing is falling unfairly on the shoulders of the community rather than on the skiers, who of their own free will desire to participate in that form of recreation. In determining the location of future alpine villages, consideration should be given to available water supply, sewage and garbage disposal, roading and car parking, subdivision and topography for lodge sites, the availability of ski slopes and the sites for lifting installations.

When changes in land-use for purely commercial or tourist interests are being studied, the effects on the environment are of paramount importance. In the public interest, where no really useful purpose would be served by a project that would destroy relatively large areas of an existing environment, such developments should not be sanctioned. The setting aside of areas in the alpine environment as national parks, wilderness or primitive areas for scientific research or public enjoyment is considered to be entirely compatible with the use as water supply catchments. This is a legitimate form of land-use and one which is significantly lacking in Victoria's alpine regions.

The grazing management at present practised on the alpine plains is controlled by allocation of stock numbers which may be run on each grazing run, by the determination of entry and withdrawal dates set each year according to seasonal alpine pasture conditions, and by a fixed charge per head of cattle grazed. Reduction in cattle numbers and other controls have caused a gradual improvement in catchment conditions since 1945. Areas where deterioration continued after the controls were introduced have been excluded from grazing. The present grazing system is however rather primitive, and the Bogong High Plains District Advisory Committee is currently investigating a system of rest-rotation grazing. This proposal allows for further areas at the higher and vulnerable altitudes to be excluded from grazing. Other areas such as the subalpine woodlands can be grazed safely.

Grazing in the past has undoubtedly caused deterioration of the catchment but the present system has stabilised and is giving a gradual improvement. To condemn future grazing without further investigation of other grazing management methods would be a negative approach. The effects of grazing in reducing a potential fire hazard in lightning-prone country is also a consideration.

Engineering works and tourist or recreation development can seriously upset catchment hydrology. These can cause changes to run-off pattern, accelerating run-off and carrying sediment into streams if they are not properly designed and rehabilitated. Approval for new works is given by the Authority only on the agreement to carry out reclamation. In the future the Authority will insist that a monetary bond be deposited against the satisfactory completion of reclamation measures.

Finally, the policy of multiple-use in alpine catchments under the existing controlled system has resulted in catchment improvement. Continued experimentation and research may reveal methods to speed up this process. Deterioration of the catchments was caused over about 100 years of unsound land use, but twenty years of control are showing a definite improvement. Let us therefore not condemn this policy of multiple-use, but look to the future to provide the answers to existing problems whilst still managing the land for improved catchment hydrology.

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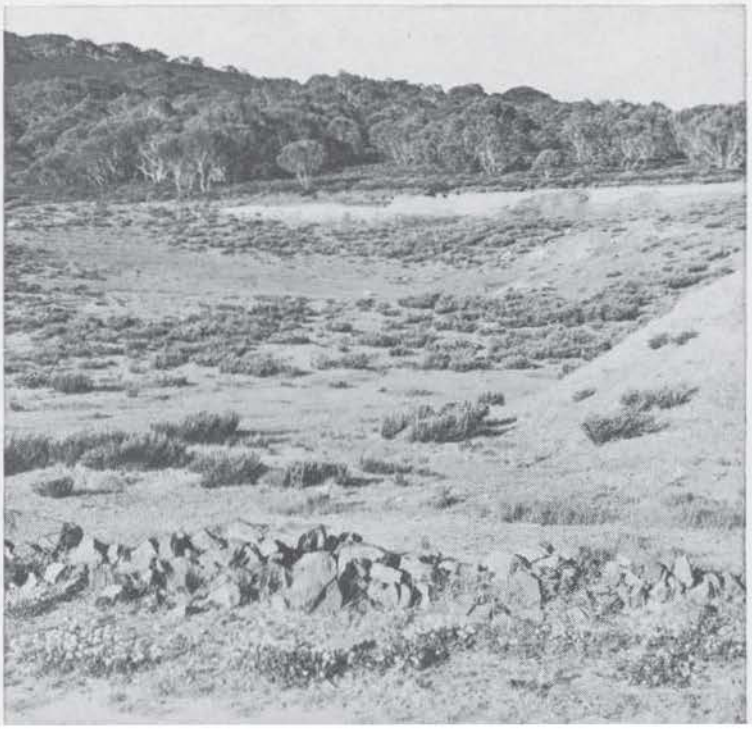


This borrow pit, from which earth was taken for Rocky Valley Dam, was sown down and mulched in 1960. Sown species are now giving way to native heaths and herbs.

A CATTLEMAN'S POINT OF VIEW

by D. K. RICHARDSON
Grazier and member of the Bogong High Plains Advisory Committee.

Paper delivered at Alpine Forum, Melbourne, February 13th, 1971.

Speaking as a cattleman, and in view of the adverse publicity that has been given to mountain grazing, Mr. Richardson admitted that he found it rather difficult to speak to what he obviously expected to be an unsympathetic audience. Claiming to be only a student of the situation, as he had only lived at "Cobungra" for the last ten years, he then proceeded to give a reasoned address that undoubtedly impressed his hearers. It would have been too much to expect that he would convert all present to the virtues of mountain grazing, but he must surely have gained his expressed hope that opinions about cattlemen would be at least slightly changed because of his contribution.

Over the vast area of the eastern Dividing Range and its foothills cattle have grazed for the last 120 years. This is quite a long time and considering the intensity of grazing at some periods, especially when used with sheep and the practice of burning, it is remarkable how small the damage really is. It gives one great faith that the whole area will recover naturally with lighter grazing of cattle, whose eating habits are far less damaging than those of sheep.

It was traditional, with our early forebears, to be a good husbander of the land and to live **with** nature rather than at its expense. In the settlement of Australia I feel that many of the older traditions were lost, due perhaps to the fight for survival in an unknown, strange environment. Over-grazing, fires, over-cultivation and rabbits have caused much damage in the past. I am sure the future generations of farmers will be more aware of the necessity to foster nature and its habits. This should be encouraged to the point of tradition so that people may be proud of their association with the land.

To me the principle of freehold tenure has historically proved to be the most satisfactory method throughout Australia. The efficiency of Victorian farmers and their production is a pertinent example of the results of this system. To-day, when many expert viewpoints of our mountain regions are being put forward, I feel it is imperative that this method of tenure be discussed in the light of past history and present modern methods of farming. Limited land tenure has never been conducive to good husbandry, and the freeholding of the more stable fertile sections of our mountains would naturally help their preservation.

There are areas in the mountains where continuous grazing by wild horses has completely changed the environment, making it unsuitable for cattle grazing, and far more open to erosion and rapid water run-off. Given the opportunity, perhaps cattlemen could fence these areas and revert them to cattle grazing. This could be quite an economic proposition especially when coupled with fire tracks and bush fencing in conjunction with the Forests Commission. The argument used by some that the mountain cattle industry is small and insignificant economically is a negative one, as all natural resources that can economically be used while not damaging the environment should be harvested. Vast areas of the eastern fall of the ranges are of sound soil types. With vastly different economic factors influencing the grazing of cattle to-day I am sure that grass cover in the area would improve, especially with, in some instances, rabbit control, and the free-holding of some areas.

Modern beef farming is becoming geared to much more efficient use of animals. Their value and the interest thereon over a year demands constant growth and production. A well fed and grown heifer calf may be worth $100; if the animal is large enough she will conceive at 15 months and then be worth $150. An ill-nourished heifer may be worth $75-$100; by the time it is 3 years old, $150.

Cattlemen are well aware of these figures, consequently their grazing practice is aimed at maximum growth of the beast. Obviously this does not ally itself to over-grazing of poorer native pastures, especially in the early spring or late autumn. I am quite sure these economic factors are changing the pattern of grazing throughout the mountain areas; in general there is less grazing over a shorter period.

To the uninformed the practice of leasehold grazing may seem archaic and unimportant. To the cattlemen there are many benefits. They are generally operating from a base close to, or in the mountains where the climate has a severe winter limiting effect on the carrying capacity. However with the green native pastures over the summer and early autumn the cattle are put into first-class hard condition while back on the lower country summer and autumn feed is conserved to help the cattleman over his limiting period. Other cattlemen prefer to graze the native mountains because their cattle become too soft and fat on lower freehold areas and they lose stock from various factors associated with lack of exercise and too much condition.

Drought alleviation is another reason for the retention of leases. A percentage of the herd may be taken annually to them so that in times of need some animals will lead the rest through the runs and home again.

If land tenure were more secure I think fewer cattle would be grazed in the mountains, as some cattlemen fear that if they do not use them the numbers permitted will be reduced and they will not be able to use them again. Over the last two

good years, as an individual I have reduced the use of our higher areas by 50%. However I am well aware of their value in hard times. To many, any sudden change or loss of their grazing rights would be disastrous. They are very dependent on their use and with rising costs and the decline of the sheep enterprise it could mean the end of their economic viability. Much literature has been written regarding the abolition of grazing, a little in relation to the aid necessary for economic adjustment of the cattlemen involved. This subject should surely be under more scrutiny.

To-day there are many varied interests in the mountains — water resources, timber, recreation, mining, cattle etc. The multiple use of these areas is under much discussion and at times it is obvious there must be conflict of interests. However in many ways they do combine to make a satisfactory arrangement.

Cattlemen over many years have associated with the Forests Commission in mutual use of areas, use of tracks and their maintenance, and in fire control. Controlled burning of the forests has the blessing of the cattlemen as we feel it is necessary to preserve the area from a huge hot fire, apart from the danger that will exist to all surrounding areas. To-day nearly all fires in the mountain area are started by lightning and not man. They are generally soon extinguished due to the threat to our natural resources when burning in bad weather. This action itself is unnatural. However, the scientific control-burning system we feel is very necessary and to some cattlemen the type of thing they have been advocating for up to 50 years. Cattlemen naturally associate with the Commission with actual fires while often the grazing of cattle keeps areas in reasonable vegetative cover, which is an aid in controlling fires. Cattle tracks etc. help in their extinction, and Soil Conservation Authority and Forests Commission officers are well aware of this fact. If the Forests Commission has any argument with the cattlemen I would be interested to hear of it.

Cattlemen's association with skiing interests was very important to the latter body when things were far more primitive than they are today. The use of their horses for access and for transport of supplies was common years ago. Rescue operations by cattlemen must have saved quite a few lives in the past. Today there is little association, and this mostly between the lodge operators and the cattlemen at lower levels and there is little cause for friction between the two parties. The majority of the hiking fraternity use our tracks and huts on their tours of the mountains. To some the complete absence of man or his animals when hiking through the mountains seems necessary. Completely primitive areas within the mountains exist in many places, as the heavy undergrowth and the rugged terrain have completely checked entry of cattle. Cattlemen's tracks and local knowledge are of interest to fishermen and campers who wish to find their way to some secluded spot. In future, will tourism in general conflict with cattle grazing? In general I doubt this, in fact I suggest tourism will be aided, because tourists like seeing cattle in the scrub. However, general grazing of all accessible areas would be to the detriment of the wildlife population

The development of the ski resorts seems to be badly organized. The inconvenience and high expense seems to be matched by the disfigurement of the landscape and untidiness exposed to public view in the summer. It is my opinion that if half the public money spent on skiing were spent on projects to encourage tourism the whole area would be much more appreciated by the general public. One of the most important needs is for low access roads which would be safe in both summer and winter. At present, due to severe weather conditions in winter, access from the north to Gippsland and vice-versa is often unsure and tourism is thus hindered.

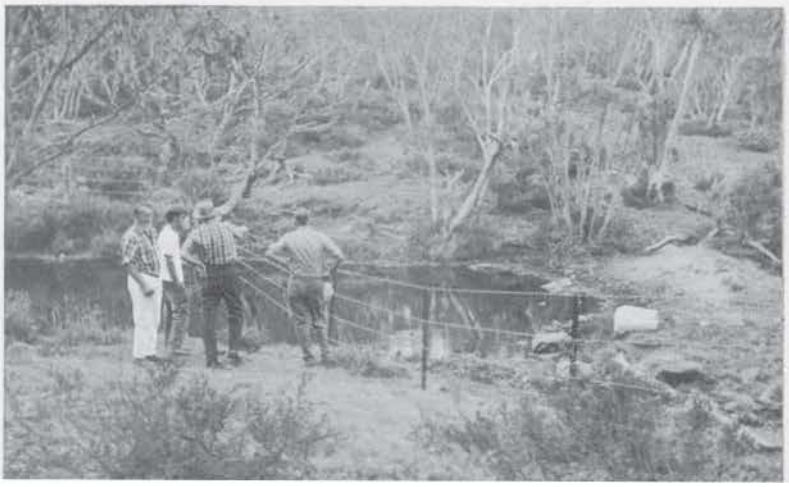
Water Resources

Cattle grazing of the mountains has been condemned by many experts of catchment hydrology, their arguments being that it:

1. gradually denudes the area of its natural undergrowth;
2. ruins the sphagnum bogs and their sponge-like action of releasing water;
3. silts up catchments;
4. generally speeds up the flow of water from the area due to the depletion of humus supply in the soil.

Other organizations who prefer the landscape untouched have exaggerated and advertised in part some of these findings to further their own interests. It has caused the subject to become a political football and made the truth far harder to find on paper than on horseback.

As a cattleman I will leave the subject of past damage due to fire, over-grazing, and engineering works to other speakers, and concentrate on the factors I consider important to the future management of the area.



Safe cattle access to water can be provided by properly constructed dams located to protect more vulnerable soaks and bogs.

Photo — Soil Conservation Authority

Today there is gradual improvement of ground cover over most of the area. The critical areas open to erosion are mostly not grazed, and with the expert knowledge of the Soil Conservation Authority officers administering the area and controlling its stocking rate the actual grazing pressure if expressed in cow days would have decreased 35% in the last ten years. In short, smaller numbers over a shorter period.

This gradual decrease would grow if some safer areas were made freehold, especially with the aid of some scientific and economic investigation. Elemental sulphur and molybdenum may be the main controlling factors needed to increase production for some of these lower basaltic areas. If the uncertainty of tenure were reduced it would encourage graziers to use these areas only as drought reserves, and the whole process of improvement would be accelerated. The small areas where total damage is too great to be helped by relief from grazing is such an insignificant fraction of the whole that it is not important when taking an overall view.

The continued interest in and advertisement of the high country's problems has overshadowed the problems at lower levels. I gather this is the case in the Glenmaggie area, while at Omeo in the Livingstone Creek catchment little interest is shown in the erosion that is the cause of 80% of the siltation of the Hume Weir. A few facts—there are 12 miles of gully erosion over 12 feet deep and a much longer length at a lesser depth. Meanwhile a new dam at Dartmouth is planned.

It is this sort of situation which turns men into cynics, where for years most local people have been aware of the clear mountain streams and the dirty lower ones. It appears to the local population that public opinion has been misdirected and it is imperative that bodies such as the Australian Conservation Foundation realize the importance of an impartial and scientific approach to their problems. I suggest that there is a lack of impartiality on the part of the A.C.F. in its bulletin on the High Country. Meanwhile the outcry has continued against mountain grazing. I hope the lower areas receive the expert attention that the mountain areas have.

Expert manipulating of public opinion is a common sport and is often dangerous to administration. As a student of the situation over the last ten years there are still many factors I do not understand. If the High Country is losing its water far too fast due to damage, why haven't the lower streams cut their banks and why isn't there more stream discolouration? Perhaps the water is absorbed through the rock strata gradually. Sphagnum bog destruction is a favourite subject. Surely the damage took place in past years when there was extreme grazing pressure. As a horseman I avoid these areas and so do the cattle. Where bog damage is continuous surely odd dam construction would have halted this action.

The value of mountain water is often stressed in arguments concerning cattle grazing — stressed for its value to irrigation areas and for hydro-electricity. Irrigation is now more prone to public examination by economists. Two of the most outspoken critics have been Dr. Bruce Davidson and Professor Wadham. I would also be interested to read of the cost of hydro-electricity versus the cost of power by other modern methods.

To summarize this section of my talk I contend that the whole concept of efficient management has been confused by over-publicity of particular points, that the hydrology studies are inconclusive, that the arguments associated with the Snowy Mountains area are out of context when applied to the Victorian Alps, and that there is a gradual improvement taking place over the catchment area.

There **is** a group of people who would like the mountains unmarred by man and his activities, but they are a minute minority with an impractical approach to the situation as it exists. Man is an unfortunate animal; he can't have his cake and eat it too. However over such a vast area I am convinced there is room for all types of people's interests and activities and that with patience and knowledge it would be quite possible to plan so that most people would be satisfied to a big degree with areas set aside for their particular type of interest, be it commercial, recreational, or scientific. The botanical species have obviously been changed by the influence of man. The declaration of a national park over such a huge area as that proposed by the National Parks Association I feel would not be in the best interest of the majority of people of Victoria.

There is a tendency for the public to be carried away with such a proposition. One immediately imagines that all wrongs will be righted and all opinions heard under a new banner. Myself, I would back the actual improvement of existing organizations who have a wide knowledge of the area under discussion as a more practical and logical approach to its future planning. The Soil Conservation Authority and the Forests Commission have some very experienced men, while cattlemen have probably the most intimate knowledge of particular areas. Between these groups management is not all that difficult. Perhaps as an individual I would sooner back the devil I know than the one I don't. However with the growing urbanization of our society it is obvious that there is a need to organize for better and more recreational facilities in the mountains. To the man in the city it is natural to wish to explore rugged areas as the complete opposite to his everyday life.

Finally I consider the Soil Conservation Authority the natural body to control the area, and that the cattlemen are an asset to the majority of the public. In short it is the public that we have to consider.

FORESTRY IN ALPINE REGIONS

by R. J. GROSE
Chief, Division of Forest Management, Forests Commission, Victoria.

Paper delivered at Alpine Forum, Melbourne, February 13th, 1971.
Photos by Forests Commission

What is Forestry?

The greater part of the community appears poorly informed on the subject of forestry as a form of land use. This ignorance is particularly evident in urban areas, and with the trend to urbanisation this sector of the community constitutes an increasing proportion of our population. To many, forestry means little more than "mining" for wood, and to others, perhaps, fighting forest fires. They recognise the need for wood because it is a significant component of their homes. They read about forest fires because they are spectacular, endanger property and human lives, and provide good copy for mass media.

The many other elements of forestry are either not recognised or are taken for granted. Protection of catchments and their management for water supply; conservation of vegetation, environment, and habitat for fish, native animals and birds; and grazing of domestic livestock — these go largely unnoticed. The same can be said of development of roads and facilities for touring, picnicking and the various other forms of intensive and extensive forest recreation; conservation of soil; the special reserves for preservation of scientifically important flora and fauna habitats; and the socio-economic support provided by forestry to rural communities.

Forestry is planned management of a resource to provide a multiplicity of uses and services for the maximum benefit of the community. In its multiple-use management of forested public land, the Forests Commission integrates effectively with other authorities to provide all these benefits at levels clearly required or at those it predicts from trends in public demand, and, of course, as provisions of public funds permit.

A major problem in forestry is that of rationalising all demands and integrating them into a multiple-use management programme to provide a balanced yield of all benefits for the greatest total good of the community. This objective of seeking balance and harmony in land use is unchallengeable and tremendously important. The management programmes that the Commission develops are never popular with everybody, and this cannot be expected. People as individuals or groups seldom seek balance, they seek something that tips their way. However, over the years foresters have come to regard themselves as keepers of the public conscience in matters of resource conservation and resource use. By training and professional philosophy the forester is peculiarly fitted to the role, as he has the ability to set the long term public interest over the short term sectional interest.

What is Multiple-use?

According to Encyclopaedia Brittanica "multiple use" means, "the management of a given area (usually an administrative unit of considerable size) for several different purposes such as watershed protection, timber production and recreation. Since some uses are incompatible under certain circumstances, and since maximum yields from all uses are physical and biological impossibilities, a decision has to be reached as to which uses will be given priority. In effect this means determining the use or combination of uses to which the different **zones** of a forest are adapted in the light of the natural environment and of social and economic considerations".

In many instances, management of a zone for one or two compatible primary uses must affect its ability to supply maximum levels of other uses. In forestry practice, the forest resource is divided into use zones, a few of which are single use zones, most have a primary use and secondary uses, and some have two or several more or less equal uses. I emphasise that multiple use does not preclude single purpose management of specific areas, and some such exclusive one-purpose areas are as essential to maximising public benefit as are multiple-use areas. However, large scale single use is inimical to best community interest, as, in most instances, forest land is not fully serving the people if used exclusively for a purpose which could be achieved in combination with other uses.

Summer equestrian recreation in reserved forest.

Forest Land Resource of the Alpine Region

The alpine region under review comprises a substantial proportion of the forested public lands of the State, namely 3.13 million acres of hilly and mountainous land straddling the Divide and extending from Baw Baw Plateau in the south west to the New South Wales border and the Snowy River Gorge in the north and east.

Of this total area of State forest, 551,000 acres are reserved forest and the balance is protected forest. Reserved forest is land set aside and permanently dedicated for forestry purposes. Apart from small exchange provisions of the Forests Act 1958, its status can be changed only by Parliament. Few people appreciate the status and inviolability of reserved forest. Protected forest is unoccupied Crown lands on which the Forests Commission manages and protects the vegetation and forest produce.

There is little national park in the region and there are relatively small areas controlled by the State Electricity Commission, and others set aside as special purpose reserves under the Lands Act 1958.

The region has tremendous importance to the State as a forest resource and most of it must continue to be managed for forestry in its broadest sense. It contains a substantial proportion of the mountain ash, alpine ash and high quality mixed species eucalypt forests which are so important in meeting the State's demand for wood and wood products. As importantly, it contains much of the forest so vital in conserving soil, climate and wildlife habitat and in protecting catchments and controlling stream flow of many of the State's main rivers. It also comprises much of the State's resource for forest-oriented forms of intensive, extensive and remote outdoor recreation. Parts of it also have importance for summer grazing of cattle.

Forestry Practices

(i) *Water production*:— The alpine region encompasses the headwaters of many of our major rivers which provide much of our water for domestic, industrial, stock and irrigation purposes. Hydro-electric and recreation elements of this water resource are also quite important to the State. The greater part of these catchments carries protection forest which is a cover of mixed eucalypt forest varying in height from about 10 ft. to 100 ft. Part carries alpine woodland of snow gum, candlebark and mountain gum around areas of alpine herbfield and grassland. The balance lies in the taller forests largely managed primarily for wood production.

The main value of the protection forests is their ability to protect and stabilise soil, reduce run-off and, to some extent, control stream flow. Working prescriptions applicable to harvesting and development activities on catchments proclaimed under the Soil Conservation Act and those which apply elsewhere in these mountain catchment areas ensure that harvesting operations are not inimical to catchment values.

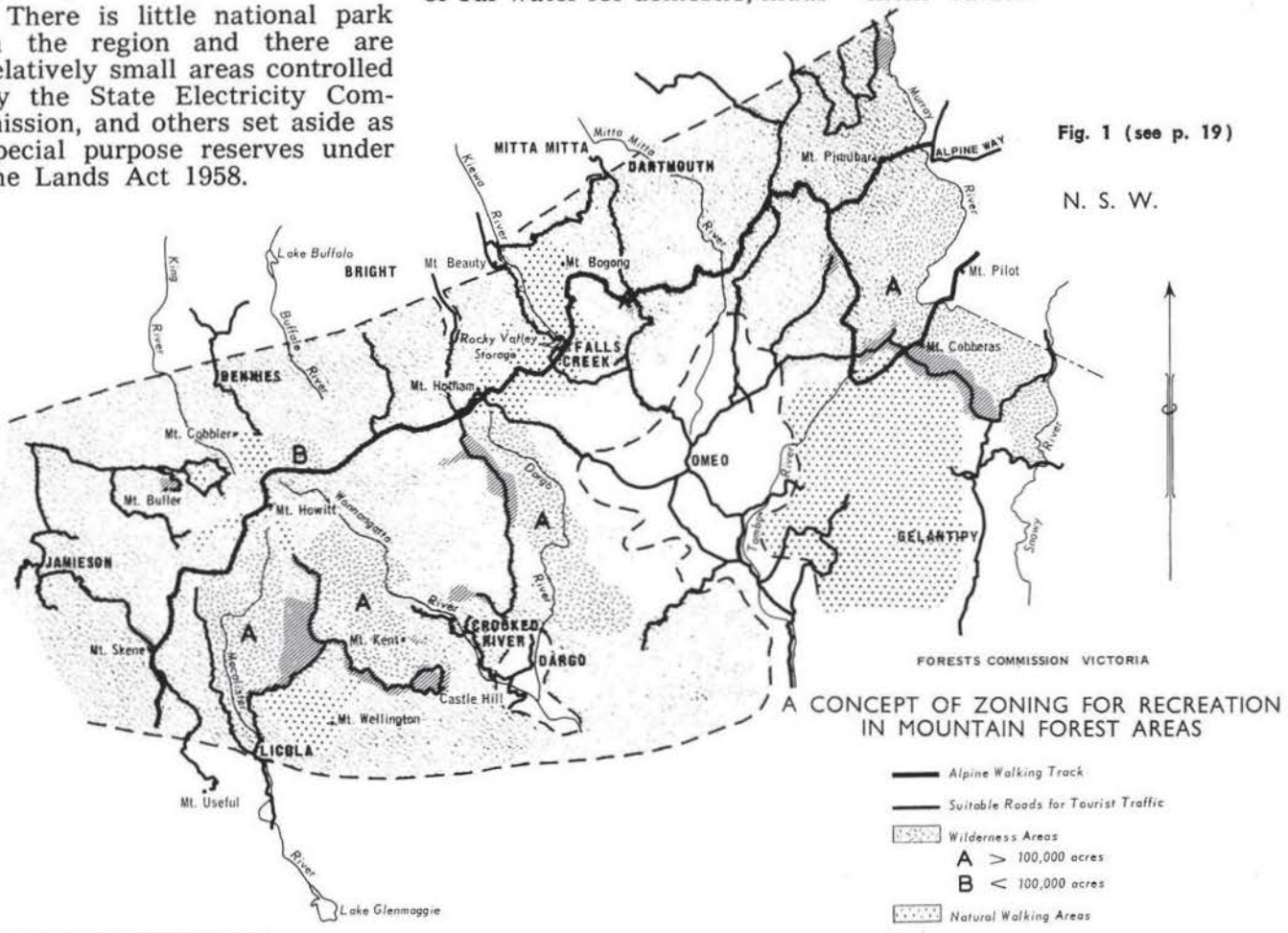


Fig. 1 (see p. 19)

The most important duty of the Forests Commission in its management of these forested catchments is to protect the vegetation from destruction, mainly by fire, and to some extent by insects.

(ii) *Protection from fire*:— As well as constituting catchment cover, the forests of the region comprise wildlife habitat, scientifically interesting if not unique ecosystems, and a mass vegetation that is a key component of the total environment on which more and more urban dwellers are coming to depend for recreation and enjoyment. Its protection from massive destruction is vital.

A fire protection helipad in an alpine area.

In its endeavour to achieve this protection the Forests Commission has expended hundreds of thousands of dollars on road and track construction and maintenance, in establishing air strips, helipads, fire retardant depots, fire spotting lookouts and a communication network, and in protective and fuel reduction burning.

The Commission will continue to maintain a vehicular and aircraft access system throughout the alpine region. Intensity of its development will be compatible with values sought from the various use zones. Opportunity for early attack on fires started by lightning or by people must be provided, whether the areas are wilderness, national park, reserved forest or protected forest. We are all well aware that expansive fires are part of the history of this region. They represent tremendous cost to the community and every rational endeavour must be made to prevent such holocausts as we saw in 1939, or even such as the fire which burnt 350,000 acres in 1965.

Forest wildfires are harmful to almost every value sought from the forest. They kill the fire-sensitive ash eucalypts and damage all other species severely. Catchment properties are greatly impaired, as are wild-life habitat and recreation opportunity and satisfaction. If fire has been part of our ecology for centuries, as history suggests, it may be compatible with the scientific (evolutionary and successional) objectives of wilderness. However we cannot allow fires to get beyond manageable size to satisfy this latter objective, because once a fire has scale there is little man can do to control it.

(iii) *Wood production*:— The alpine region is managed to supply 130 million super feet of the sawlogs and 7.5 million super feet of the pulpwood required annually from State forest. Its importance as a source of wood will increase, particularly as the regrowth stands of ash eucalypts, of which there are about 200,000 acres in the zone, near maturity.

About 400,000 acres of the region carry ash forests. These forests have very high growth rates and most of them will be managed intensively for wood production as the primary objective. In certain places recreation is a primary objective of management, and in others it has parity with wood production.

These ash forests comprise pure stands of mountain ash and alpine ash. They are our major source of seasoning quality timber and long-fibred hardwood pulp. Because of their ecological requirements, a full-sunlight method must be employed to regenerate stands after final harvest. With these two species, final harvest is as a clear felling, preferably followed by burning of the slash to provide an ash-bed seed bed which is part of the ecological requirement of these two fire-climax forest types.

Seed is then sown on this seed bed either from aircraft or manually. Perennials, annuals and the young eucalypts quickly revegetate the site and grow rapidly. After a year the young regeneration is 1 ft. - 3 ft. tall. It reaches 30 ft. - 40 ft. by age 5 years and 90 ft. - 140 ft. by age 20 years. Because of these fast growth rates and rapid revegetation, the results of good forest management for wood production can be aesthetically acceptable. It is also true that bad forest management can visually be an anathema — for example, poor regeneration, or "bulldozer" engineering in road building.

A further 150,000 acres of the region carry forest that will be managed for wood production on a less intensive programme, mainly because of slower growth rates and poorer wood qualities. These are the better stands made up of various species of the stringybark - peppermint - gum forest type. At final harvest these may be regenerated by procedures similar to those used in ash forests. However, much more commonly a seed-tree method is used with or without the debris being burned, the latter depending on intensity of cut. These species are not so dependent on full sunlight or on a burnt seed bed as are the ash

species, although in the wetter high quality areas it is usually wise to burn slash and sow the areas.

These mixed species forests help to support the scantling industry which is the major component of the State's sawmilling industry. Opportunity for employment in these and the ash forests and in associated industry contributes importantly to the economy and viability of rural areas.

(iv) *Recreation*:— The Forests Commission, as required by its Act, has had a long and respectable history in providing opportunity for the public to enjoy many forms of forest recreation, and much of its activity has been in the alpine region. Until recently the work load for this was spread over various sections. However, anticipating a rapid increase in demand by the community, a Forest Recreation Branch has been set up with a minimum of six professional specialist officers to lead the Commission's program to provide the public with more and better opportunity for satisfying recreation experiences.

Population growth, increasing urbanisation, increasing affluence and leisure, higher educational standards, improved highways and cars, and social awareness of the need for conservation of the human environment have all been variously responsible for the rapid increase in participation in outdoor recreation. It seems certain that recreational use of forests will increase many times before the turn of the century.

The alpine region has much to offer. Skiing, fishing, bush walking, touring, picknicking, trail-bike riding, 4-wheeled-drive touring, camping, solitude, pioneering challenge, etc. are some of the experiences available.

Alpine and similar reserves declared under the Forests Act — for example, Mt. Donna Buang, Lake Mountain, Mt. Baw Baw and Mt. Buller — provide skiing and other snow sports and alpine experiences for many people, as evidenced by over 120,000 visitors to Mt. Buller during 14 weeks of winter 1970. It is interesting to note that these areas are fast becoming popular for summer recreation.

While there are no forest parks in the alpine region, I am confident they will form a major component of a balanced system of reserves in the State and, together with reserved forest, will provide most of the community's enjoyment of the forest environment. Forest parks as they are set up have zoned primary use areas ranging from intensive recreation to hardy recreation with limited access, natural areas, wilderness, wood production, water production etc.

Roads built for extraction of wood and for fire protection provide recreation satisfaction for car-borne people and picnickers, allowing many people to enjoy the sense of freedom and the vistas which characterise the high country. Bush walkers, fishermen, hunters and amateur naturalists all use the forest road and track systems throughout the alpine area. Trail-bike riders and 4-wheeled-drive clubs also depend heavily on the Forests Commission's jeep-track system for their peculiar pursuits.*

The need for the Forests Commission to provide recreational opportunity and facilities in the alpine region is increasing rapidly and will continue to do so as the demand for relief from

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* Reference to the control of their activities is made elsewhere in this number. Ed.

Young crop of alpine ash seedlings from a full-sunlight method of regeneration.

Winter recreation in an alpine area.

urban living and the desire to enjoy natural environment increase.

(v) *Grazing*:— Grazing in protected forest is controlled by the Department of Crown Lands and Survey, while that in reserved forest is controlled by the Forests Commission. Over a quarter million acres of reserved forest in the highland country is grazed under a licence system which provides for control of stocking etc.

Conclusion

What will be required of the alpine region in future? Crystal-balling is a little fatuous but there are useful guidelines to what the future will demand which assist in predictions.

In Victoria we are now starting to feel the first really significant stresses and strains of a dynamic population growth on a static or diminishing resource base of public land. This situation occurred in North America at least 20 years ago and in old world countries much longer ago than that. Victoria with 30% of its land area forested and a population of 3.5 million contrasts with say West Germany, which has about the same land area of which about 30 per cent is forested but which has a population of 60 million. In West Germany the demands on forested land have been maximal for a very long time, with shifts in emphases in management from one major use to another being the only changes occurring; and integration of uses of their forest area in a highly refined multiple-use programme has been developed to a marked degree to meet the heavy demands placed on it.

Similar intensive multiple-use planning and management must ultimately be applied to the alpine region to provide all the benefits sought from forestry by the community. Extensive use zoning already applies. Changes between now and the ultimate will involve refinement of the zoning and intensified integration of uses within zones, that is, away from single purpose or predominantly one use zones. These changes in use emphases will of course be accompanied by changes in management techniques and procedures. Figure 1. shows how broad management zones for recreation and wilderness could be readily imposed in the alpine region right now with little conflict with other values sought from the region.

There will be need to make some provision for the preservation component of conservation in the form of single use primitive areas as sanctuaries for fauna and vegetation. However, most of the region will have to be managed on a sound multiple-use base to sustain unimpaired, and where possible, enhanced supplies of the many benefits that these forested public lands can provide the community. This dynamic component of conservation or "preservation through wise use" to sustain human benefit, is equally applicable to all the objectives of forestry, namely:—

- water and soil conservation;
- production of wood and other commercial products;
- preservation of scenery;
- continued provision of opportunity for outdoor recreation.
- maintenance of wild-life habitat and of scientific values.

Trout fishing in the Kiewa River. *Photo — Ministry of Tourism*

TOURISM AND RECREATION IN ALPINE AREAS

by Maurice Harkins
Director of Tourism.

Paper delivered at Alpine Forum, Melbourne, February 13th, 1971.

Tourism and Recreation in Alpine Areas concerns the "use" of such areas, and in this regard a clear definition of the terms is necessary for planning purposes.

An important consideration is that tourism is a promotable industry which offers opportunities for income-earning enterprises, and in many instances is the support for townships adjacent to remote alpine areas. Providing recreation for large concentrations of population is a major social service which is vital to the well being of the community and will continue to grow in intensity and importance as population increases.

For the purposes of this discussion, the following definitions are suggested:—

"A TOURIST is anyone who travels away from home for pleasure purposes".

"A RECREATIONER is one who makes active use of his leisure — for example, a fisherman, a skier, a hiker or a climber and requires special facilities and skills".

There is a point at which the tourist and recreationer meet and that is, where their interests involve adding to their stock of knowledge and experience.

The alpine areas of Victoria are the State's natural heritage, which must be carefully used for tourism and recreation. We cannot afford, by either unwise action or neglect, to lose or impair the scenic, scientific and historic resources which are contained in the Alps. From the tourist point of view, it is equally important to preserve and promote in alpine areas the opportunities for a wide variety of tourist and recreation uses that do not, too greatly, interfere with the preservation of the natural environment.

There is no doubt that our expanding population and leisure will make increasing demands on our limited resources for tourism and recreation. The alpine areas of Victoria offer an opportunity for all Australians to know and enjoy the pleasures, and health benefits, of out-of-doors holidays in the high Alps. Provision of reasonable access to alpine areas will be one of the major problems of outdoor recreation and tourism, over the next 30 years.

The alpine areas of Victoria have always represented a tourist attraction, as well as a recreational attraction, because of the beauty of the scenery, the atmosphere of space and freedom from congestion and because of the opportunities they provide, particularly for hiking, skiing, trail riding and adventure holidays.

ACCESS

Access to the alpine areas is of prime importance. It has been demonstrated by many surveys, particularly in America, that the easiest forms of outdoor recreation are the most popular. For example, swimming is very much more popular than snow skiing. The latter falls to the very

lowest level in the American scale of recreation. Less than 1% of the American population is interested in skiing and only 4% would ski if they were able to afford the sport. On the other hand, motoring for pleasure is the most popular activity in America for persons 12 years and over — 20.73% of the population express their interest in this form of recreation. Then in order of preference follow walking for pleasure 17.93%, playing outdoor games or sports 12.71%, and ranging down the scale through hiking .42%, water skiing .41% and snow skiing .07%.

What do these figures convey to the study of the relativity between tourism and recreation and alpine areas?

Firstly, the number of motor cars registered increases each year, and will double by the year 2000. Therefore, some means of access by motor car to our alpine areas is desirable. It is undesirable and uneconomic to suggest that great tracts of alpine country be locked away from the majority of the population because of inaccessibility.

It may be that some areas, for a particular scientific or conservation reason, should be retained in a primitive or wilderness state. Such areas may be declared "primitive" or "wilderness" areas, in order to present challenges to walkers and climbers, as well as to preserve a particular type of wilderness or rare flora and/or fauna. This contention would be accepted by all those interested in tourist promotion and recreation development.

On the other hand, the growing demands of an increasing and ageing population must be taken into account, and large areas of attractive open space cannot be reserved only for the physically active, thus leaving the less active members of the population without the opportunity of enjoying the spiritual and physical refreshment of the high places.

Surveys have shown, for example, that participants in swimming reach a maximum in the 18-24 age group, whilst in the 65 and over age group, the number of swimming days per person per year drops as low as 1.

TOURISM

The tourist operator has a two-fold interest in the use of alpine areas. In winter, he is interested in the attraction of visitors to the snow slopes.

Visits to the snow country can become a passive holiday as well as an active recreation in that many people enjoy the beauty of the attractive snow-covered mountains, the pleasure of crystal clear days of sunshine on the snow and the enjoyment of the social life of ski lodges and chalets. Many of these visitors do not participate in skiing and are content to watch and marvel at the expertise of others who are highly proficient at the sport.

OUT-OF-DOORS TRADITION

Australians have always been concerned with the out-of-doors — the great open spaces, the river valleys, the tangled tree covered ranges that lie just beyond the horizon. These things have had an important part in forming the character of the Australian. The urge to travel "beyond the sunset" has drawn established farmers to sell their farms and set forth to look for green pastures on the other side of the range. It has beckoned explorers, pioneers and adventurers with its promise of excitement, achievement and prosperity.

It is reasonable to say that all of Australia is known, if not intimately, at least in broad outline. But there is still adventure, and there are still adventurers who push out into the mountains and the plains "because they are there", and some still lose their lives in the process.

The expanding population with more leisure, better travel facilities and more discretionary disposable income is using up more and more of our resources for outdoor recreation and as a result areas for tourism and recreation are heavily taxed.

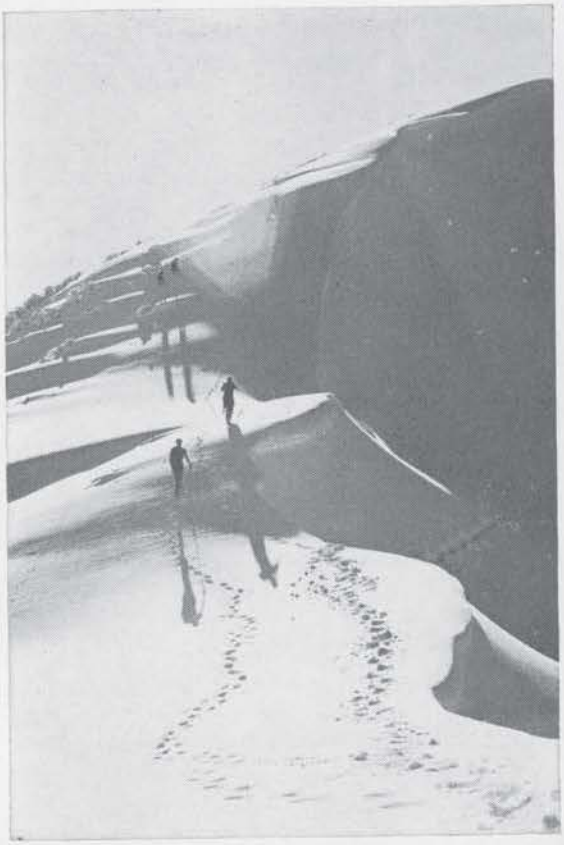
MULTIPLE USE

Fortunately, recreation and tourism need not involve the exclusive use of an area, and it therefore should be considered in planning for water resource development, forest and alpine management.

Although the chief reason for State development of outdoor recreation opportunities such as skiing, fishing, boating, climbing, hiking etc. is the broad social benefits it produces, it also brings about desirable economic effects. Catering for hundreds of thousands of recreationers and tourists that generate in Australia an estimated $2,000 million a year market for goods and services is big business.

American studies indicate that population will double by the year 2000 but the participation of people in out-of-doors pursuits will nearly triple. The reasons for this will be:

a shorter working week;
higher incomes with more discretionary disposable income;
increased educational standards;



Walkers skirting a giant cornice on the summit ridge of Mount Feathertop in winter.

Photo — Bob Chappell

greater urbanisation of population;
higher proportion of white collar workers.

The physical and locational aspects of an area strongly influence the types of activities that can be carried out and management of the area must determine, in the final analysis, what particular industrial resources are to be developed and what particular resources will remain undeveloped and available for recreational use.

Management must also determine the "carrying capacity" of the area in determining the range of recreational and tourist possibilities.

The alpine areas of the State do not provide opportunities for "labour intensive" industries and consequently the development of tourism and recreational facilities is not hampered by large scale industrial or agricultural enterprises. Tourism and recreation go hand in hand with the timber and cattle industries. The recreational and tourist possibilities are increased because winter snows close down some alpine industries for several months of the year.

CARRYING CAPACITY

Therefore, good tourist and recreational management guidelines are determined by the "carrying capacity" of the alpine areas.

The term "carrying capacity" must be taken to mean the capacity of an alpine area to physically support numbers of visitors together with the developments for recreation and also the desirability of creating "living areas" either by way of villages or camp grounds. Against these factors must be weighed such factors as the degree of disturbance of wilderness conditions, which could destroy the scenic resource that the tourist promoter features in his selling programme and the recreational adventure associated with wilderness and primitive areas.

In other words, the tourist and recreational impact on alpine areas requires a broad range of consideration of resources in varying combinations, from intensively developed alpine villages, providing diversified recreation opportunities for large numbers of people, to undisturbed primitive areas providing enjoyment for limited groups.

Cattle on the High Plains — an important alpine industry.
Photo — L. H. Smith

SUPPLY OF OUTDOOR RECREATION AND TOURIST SPACE

The problem of the supply of outdoor recreation and tourist space is not necessarily geared to the number of acres available, but to the effective acres — acres of land available to and usable by the public. If the alpine areas are to be effective as a resource for the spiritual, physical and mental relaxation of the people, they must be made accessible so that the public may take advantage of the resources available.

The proper use of alpine recreational and tourist resources needs to be delicately balanced so that the car driver and his family (and 60% of vacationing car drivers are accompanied by their families) may enjoy the scenic wonderland; so that the primitive and wilderness environment is not unduly harmed; so that there is ample provision for youthful, energetic adventurers to follow trails and enjoy the experience of "venturing" through untracked wilderness where bushcraft and self sufficiency satisfy the demand for adventure recreation.

Briefly, the supply of alpine outdoor recreation and tourist space may be considered under three general categories: —

1. the resources now available for general use— controlled forest, alpine villages and other road accessible areas.
2. the areas which are at present not readily available to the public, but could be made so, if desirable.
3. special areas that require particular treatment as wilderness or primitive areas.

The management decisions taken on these matters are vitally important to the preservation of the alpine environment for tourism, recreation and science.

SKIING

The use of many of our most scenic Alpine areas for skiing has to a great extent dominated the tourist and recreational management of these areas. This stems from the fact that they:

are the only areas where skiing may be enjoyed;

must have considerable development in order to provide ski runs and facilities;
are subject to heavy spasmodic traffic volume during the skiing season.

Whilst the necessity for careful and adequate provision for skiers is an essential and desirable recreational development, management must also look closely to the needs of tourism and recreation during the spring, summer and autumn when, by far, the larger part of the population is seeking holiday opportunities.

ALPINE VILLAGES

The development of skiing facilities necessarily concentrates in one area the accommodation, machinery and general services required for the sport.

It is debatable whether such villages should be permitted above the snowline. This question is associated with the cost and difficulty of providing access in winter. On the other hand villages below the snowline, without merit of alpine views and touring opportunities, will undoubtedly tend to become "ghost towns" after the snow season.

The development of alpine villages, as we have them in Victoria, looks d i s p e r s e d and ragged once they lose the kindly cover of winter snow which helps to conceal the evidence of unco-ordinated planning and lack of landscape beautification. All of the factors in relation to alpine village development should now be examined by an appropriate body, concerned not only with predominently winter use but also with "year-round" use. The findings should set the guidelines for future development of existing and new villages.

SUMMER TOURISM AND RECREATION

The impact of summer tourism and recreation in alpine areas has been, to an extent, limited by access facilities. These vast scenic alpine areas will receive greater attention as population increases and resources of land for recreation decrease.

The greater use of alpine areas for tourism and recreation does not require emphasis. If facilities are provided and promoted, greater use will undoubtedly follow. As a management guideline the following suggestions are made:

Access should be planned to provide through ways which eliminate dead ends.
Picnicking facilities should be provided at appropriate places where beautiful views, forests and wild flowers provide appropriate stopping places.
Penalties should be applied to motorists driving off established roads. Use of land rover type vehicles to penetrate declared wilderness areas should be banned under penalty.
A classification of wilderness, primitive, tourist and recreation areas should be established.

A summer (and winter) ranger and management service providing for guides and interpretative services should be introduced.

Hiking trails should be established to encourage adventure travel through the alps.

SUMMARY

The impact of tourism and recreation on alpine areas is determined by the management of the areas.

The establishment of informed management services can eliminate the undesirable features and ensure that alpine areas make their contribution to the physical, social and mental well being of the community.

There is no room in a consideration of the impact of tourism and recreation in alpine areas for an "us and them" approach. The only criterion is the best use of the alpine resources in the community interest.

So far as the impact of tourism and recreation is concerned, the informed tourist operator regards the scenic beauty of the landscape as the "raw material" of a successful tourist industry. He will co-operate but he is entitled to be consulted and regarded as a major interested party in the decisions made.

Mount Beauty in the Kiewa Valley — a picturesque township at the foot of the Victorian Alps. *Photo — Ministry of Tourism*

NATIONAL PARKS IN ALPINE REGIONS

by J. G. MOSLEY
Assistant Director, Australian Conservation Foundation.

Paper delivered at Alpine Forum, Melbourne, February 13th, 1971.
Personal contribution, not necessarily expressing the opinions of the A.C.F.

Introduction

There can be little doubt that the preservation of the Victorian Alps is the most exciting nature conservation challenge in this State. Many people have a more detailed knowledge of the region and of the difficulties of achieving conservation than I have, and my main qualification for introducing this subject is that, as a newcomer to Victoria, I may be able to help you through my eyes to take a fresh look at the problem.

At the outset I should make it clear that I am one of many people who believe that the Alps can make their greatest contribution to human welfare if they are preserved in a natural condition for use for recreation, study, and protection of the mountain catchment. My task is twofold — to put the case for protection of the region and preservation of part of it, and to discuss how this objective might be achieved. This necessarily involves a discussion of what part legally secure parks and reserves should play in the programme of nature conservation, and of whether some of the aims of the nature conservation and encouragement of recreation can be met in some parts of the region by improved management of areas which are also used for the taking of crops of trees and animals, and for the other commercial purposes.

How does one define the alpine regions? One limit which has some importance in present day management is the 4,000 ft. contour. The Soil Conservation Authority has a responsibility for vetting land use proposals on land over this height, mainly to ensure that no changes in use are permitted which would damage the catchment areas. This is a useful boundary for delimiting the alpine and sub-alpine areas. But, unlike the Snowy Mountains of New South Wales, the Victorian Alps are broken into a number of detached blocks and land over 5,000 feet is much less continuous. The open alpine tops are scenically so closely integrated with the timbered flanks and valleys that it would be unrealistic of me to confine my remarks about preservation to the higher areas. When we think of a mountain such as Mt. Bogong or Mt. Feathertop we think of the whole mountain from base to summit, not just the tops. In the same way the sub-alpine and alpine areas must be thought of in their setting of lower-lying timbered ranges and valleys. It is unrealistic to deal with one without reference to the other. To avoid misunderstanding, the term "the High Country" will be used to refer to the whole upland region of north-eastern Victoria, whereas "the Alps" will be used to mean the inner areas which are mainly over 4,000 feet.

The Value of the Natural Environments of the Highlands

Visitors from New Zealand often laugh when they hear the name "Alps" used for those generally rounded and only occasionally craggy mountains in the north-east of this State. But all things are relative. The Alps are high enough to have a severe winter climate and a distinctive natural vegetation, and whilst they are lower on the scale of scenic grandeur than many of the world's mountain areas they offer the type of stimulus to man which is common to such places the world over.

It is extremely difficult to describe and analyse the nature of the mountain experience and its benefit to man in terms of well being. Speaking of this the English mountaineer Alfred Mummery said:

"I do not pretend to be able to analyse this feeling, still less to be able to make it clear to unbelievers. It must be felt to be understood but it is potent to happiness, and sends the blood tingling through the veins, destroying every trace of cynicism and striking at the very roots of pessimistic philosophy".

To those who know the mountain experience it is not neces-

The Razor and the Viking from the Crosscut Saw, Barry Range. This is one of the few remaining areas in the high country which is more than three miles from a road. It is ideally suited for preservation as wilderness.
Photo — David Hogg

sary to try to prove the point. It is hoped that others who have not had this good fortune will accept the truth of two other passages I would like to quote.

In the first, W. H. Murray speaks about the elation and freedom which his party felt on reaching a mountain summit:

"For a moment dazzled, we suddenly saw spread before us a world made new. All the nerves of the soul were not so much refreshed as reborn, as though after death we were free men once again, for the first time in months really able to live the present moment".

Another effect which mountainous areas of wilderness have on men is to give them a clearer perspective of their place in the scheme of things both spatially and in terms of time. Another mountaineer F. H. Green, commented on this in these words:

"The mountains from the heights reveal two truths. They suddenly make us feel our insignificance and at the same time they free the immortal mind, and let it feel its greatness, and they release it from the earth".

Such a perspective is very good for man especially at this time when we are having to rethink many of our traditional attitudes towards our relationship with our environment. The view from the mountain is similar in many ways to the view of planet earth which we have vicariously experienced recently through the journeys of the astronauts.

I do not apologise for quoting so many mountaineer writers, because the point I am trying to get over is that the greatest value of the Alps is as a place in which man can satisfy his spiritual needs. The recreational value of the Alps is timeless, or perhaps it would be more accurate to say that it is difficult for us to imagine man at a future evolutionary stage at which such areas have no psychological effect upon him. The feeling of an intense need for wilderness exists in only a few people, but there are few who are unmoved by the experience.

The Bogong High Plains from Mount Feathertop.
Photo — Brian Cohn

Perhaps the real wilderness enthusiast represents the survival in the human race of genes which will prove of great value to mankind in some future crisis. Already we have seen how such people have made a relatively large contribution to ecology, to an understanding of environmental problems and to conservation.

The recreational value of natural mountain scenery cannot be described in any quantitative way. The same applies to the value of natural environment for study. Assuming that there is no limit to man's knowledge and what he can learn from the environment, then the value of the highlands for science must even more surely be regarded as timeless. The environment provides us with a store of knowledge about the past and a key to the understanding of ecological processes many of which are relevant to the problems of using the land for food production and to the maintenance of ecological stability. One of the special interests of Australian alpine environments is the light they can throw on climatic history.

Another value which is related to the preservation of the natural environments of the region, particularly the higher areas, is the maintenance and creation of effective water catchment areas as a result of the existence of stable conditions.

The current concern about pollution is drawing attention to the global scale environmental processes of the earth, and it is throwing light on another potential value of the earth's remnant forested areas, such as the north-eastern highlands of Victoria. The photo-synthetic action of the leaves of trees in reducing the carbon dioxide content of the atmosphere is now seen as a factor in maintaining large scale environmental stability. When Sir Frank Frazer Darling, in the 1969 Reith lectures, spoke of wilderness as "an active agent in maintaining a habitable world", he was referring mainly to the fact that such areas might one day play an important part in protecting man's habitat against some otherwise irreversible global process. The forests of the north-eastern highlands should be regarded as part of this, perhaps vital, world-wide environmental buffer.

Other eminent scientists have described the value of wild areas as sources of new plants and

as gene pools, available for use to meet man's unknown future needs in terms of food, fibre, and medicines.

The Future of the Region as a Whole: Protection or Maximum Production?

It has been mentioned how this part of the State can serve man as a recreational area, as a storehouse of knowledge, as a large scale water conservation mechanism, as a world-wide environmental stability agent, and as a source of new biological materials. Not all of these values depend upon the existence of natural conditions. Areas which are being used for cropping, for instance, are also capable of meeting recreational and scientific needs, although they do not offer the same type of opportunities as natural areas. Later I will discuss the allocation of land between preservation and other uses but first I will state my view that any approach which would permit or gradually facilitate a policy of maximum resource utilisation should be ruled out for the highland region as a whole. One way of judging the matter is to consider the values mentioned as positive advantages which would be lost if a policy of maximum resource exploitation were followed.

Nobody would claim that Australia has a shortage of grazing land, or that the value of the highlands for food production is of a very high order. Even with improvement most of the grazing lands in this region could support far fewer cattle per acre than can be supported by parts of Australia's extensive areas of lowland. Even if this area were brought into the highest possible state of agricultural production Australia's productive capacity would be increased infinitesimally.

The region is more important for wood production. Large areas are forested but only some parts have a high commercial potential. Because of our shortage of timber there seems to be a much better case for improvement of the timber producing capacity of the area than there is for improving grazing. Just how far we should go with the improvement of the timber cropping capacity and with the use of clear felling methods depends upon how we regard the recreational and amenity value of the native eucalypt forests in their present condition.

I believe the answer to the question of whether we should permit a situation to develop in which maximum production is possible depends in part upon what we believe should be the future of Australia, and particularly upon what we feel should be Australia's relationships with other countries and their problems. The factor which has dominated our approach to resources for many years has been the belief, shared by many other Western nations, in the continuously expanding economy and growing population, and it is only in the last few decades that this belief has been shaken by a dawning realisation that the ultimate consequences of such policies may be environmentally disastrous. If the current feelings of the people towards this new development can be summarised in a few words, it can be said that present thinking is a peculiar mixture of worried optimism and fatalism. On the one hand, while we still seem to believe that progress is to be equated with quantity, on the other hand we are worried that perhaps things are getting out of control. Nevertheless we still let predictions of future demand based on continuous growth at current rates determine nearly all our planning, including our land use planning.

Concern about the ultimate end result of such a policy is neutralised by the only partly reassuring recollection that man appears to have infinite capacity for adaption, and that he will in any case be able to keep himself out of trouble through his ability to innovate. Such attitudes may be compounding the peril. The problem is that although we are aware of the dangers, we may have allowed ourselves to become so immersed in the powerfully running stream of technology and population growth that we will be unable to act quickly enough to avert disaster. The conservation movement, which is in essence forward looking, counsels that we should take the danger signals very seriously indeed and act to reverse our policies and attitudes urgently. A conservation-oriented resource policy suggests we should concentrate on aiming at conditions which make for human happiness, which means striving for a stable and diverse environment. This implies maintaining and restoring balance in land-use — a balance in the land-use pattern of the State and the Commonwealth.

How does all this affect the north-east of Victoria? I have implied that it is in the best interests of the community to replace a policy aimed at continuous growth with one aiming at habitability based on the relationship between happiness and the nature of the environment. I believe it follows that areas of high amenity and recreational value should be declared not available for depletory forms of land-use — or, to put this more positively, that such areas should have some legislative and administrative guarantee that they will be managed for retention of their amenity values. Environmental objectives of this kind will in effect restrain our growth economy, helping to bring it under social control.

The Case for Preservation

There are probably few people who will disagree with this suggestion, because although it implies certain limits on resource use it would not result in the removal of any existing land uses. The next matter for consideration — how much land should be set aside for preservation — is more controversial because it **does** involve consideration of disturbing existing uses. I suggest we need to do the same sort of mental calculation as before to try to get some perspective on what is the best use of the inner parts of the region. If we accept the point that preserved natural landscapes have distinctive social

values then we need to compare the price we must pay with the losses we will suffer if there are no guarantees for preservation.

The Cobberas (6,025 ft.) from the south-east. This area has been included in several national park proposals.

Photo — Brian Cohn

The recreational and scientific values of the greater upland region of the north-east, already referred to, are particularly pronounced in the higher and wilder areas. What price would we have to pay for their preservation? Which uses that the area is physically capable of sustaining would have to go? Grazing would have to go because it is completely incompatible with the preservation of an environment for natural recreation, and for science, and unless it is strictly controlled, as at present, it may damage catchment values. Cattle change the vegetation, pollute the drinking water and camp sites, and introduce a civilised element into the scene which is out of place in a natural area reserve. At present they occupy all but the most erosion-prone open areas which have the greatest value for solitude and hardy recreation. In eliminating cattle from areas which are to be preserved in a natural condition, some thought must be given also to eliminating situations which facilitate the straying of cattle on to the reserved land. Timber getting, including the taking of selected trees, is also incompatible with the aims of nature preservation. Some of the commercially valuable trees, the mountain ash forests, are over 4,000 feet, and care will be needed to prevent all such forests from being excluded from the nature preserve area.

Another price which would have to be paid is the opportunity to change the natural environment of the alpine areas to increase water yield beyond the level ensured by stable natural conditions. A further economic opportunity which would have to be foregone in preserved areas seems remote, but needs to be considered — this is the making of commercial plantations in certain areas. To some extent also the opportunity for certain kinds of recreation would have to be foregone. However, there would be scope for most forms of recreation in the highland region as a whole. The main restriction would be on siting, on the extent of development allowed at certain places, and on mechanised access. New resorts are often spoken of by industry-oriented tourist bodies, but the building of new winter sports resorts at places such as Mt. Bogong and Mt. Howitt would conflict in a serious way with nature preservation and the conservation of wilderness.

Here again I believe there will be agreement by all but the vested interests, that a part, perhaps a large part of the region, should be given over to preservation in its natural state. No market price can be placed on the values we would be preserving, but we need the natural areas both for the people of today and as an insurance against the unknown needs of the future. The premium we must pay for such a policy is very small indeed when looked at in the context of the resources of the entire Commonwealth and the needs of its people.

Which Areas Should be Set Aside for Preservation?

The sixty-four thousand dollar question is not whether we should have nature preservation areas but how much and in what form. Some of the earlier proposals indicate some possible solutions to the problem of land allocation between areas for nature preservation and areas for multiple-use.

Ignoring Mt. Buffalo, the earliest national park proposal for the region was the scheme first published by the National Parks and Primitive Areas Council (a Sydney based body) in the mid-thirties, for a primitive area reserve including areas both in New South Wales and Victoria. In the early 1940's more work was done on this and it was renamed the Snowy-Indi National Park proposal. It was this proposal which gave Premier McKell the idea of creating the much larger Kosciusko State Park which was established in 1944. The Victorian Government was not interested in the proposal and nothing eventuated south of the border. The National Parks and Primitive Area Council's proposal was for a true national park but since grazing was continued on some areas, the Kosciusko State Park was for many years a multiple use reserve. The decision to terminate grazing throughout the Park was not made until 1969. State Forests were revoked and the timber industry was terminated in the Park in 1944.

This early proposal suggests that the Cobberas/the Snowy River Gorge, and the Mt. Gibbo/Pinnibar area all have high value for national park reservation purposes.

In 1952 the State Development Committee on National Parks, accepting a suggestion made two years earlier by the

Town and Country Planning Association, proposed the setting aside of a $1\frac{1}{4}$ million acre national park in the central and western parts of the north-eastern Victorian highlands. The committee did not detail the land use situation it envisaged in this particular park, but other parts of its report make it clear that it was thinking of a national park without grazing or timber getting but with planned resort development. The National Parks Association of Victoria was formed in 1952 and with the Federation of Victorian Walking Clubs it has kept the proposal alive. In its submission to the Government in 1969 the National Parks Association proposed a national park of about 900,000 acres but with logging, grazing and mining permitted. The reason for this change to a multiple use park was undoubtedly a feeling of despair — the belief that perhaps the proposal would never get anywhere unless it was made more palatable to the grazing and timber-getting interests, to local politicians, and to the Government of that day.

The proposals of 1949, 1952, and 1969 suggest some of the areas which today have an obvious national park potential. They include Mt. Bogong, the Bogong High Plains, the Hotham/Feathertop area, the Barries, the Howqua, the Snowy Plains, Snowy Bluff, Mt. Wellington and the Crinoline.

Since the submission of 1969 the Government has established a new conservation policy for the public lands of Victoria, and has expressed its intention of setting aside at least 5 percent of the State as national parks, wildlife reserves and forest parks. This in effect means that the Government intends to set aside nearly two million additional acres of park and reserve land. So it would be well within the scope of the Government's policy for a national park of about the same size as Kosciusko ($1\frac{1}{2}$ million acres) to be established in the Alps, still making it possible for a further half a million acres to be set aside elsewhere in the State. The National Parks Authority is now preparing an extensive proposal for an alpine national park. The Forests Commission has also collected information which could be used for zoning wilderness areas and forest parks of one kind or another. It is possible that with these two departments preparing rival proposals we could finish up with a number of small national parks and forest parks picking the scenic eyes out of the high country.

Such a policy would, in my opinion, not make the fullest use of the great national park potential of the region, and it would create an unnecessary duplication of effort, the virtual setting up of two national park services If extensive areas of forest parks are used to seek nature preservation and wilderness aims instead of national parks there will be another weakness. Forest parks are not securely committed to preservation. Although they are on reserved forest which itself is a legally secure category of reserve, forest parks can be changed from use for preservation to use for wood production by a decision of the Forests Commission. Zoning as part of a multiple use policy (and the forest park is little more than this as it is constituted at present) does not seem to be a safe enough form of protection for the values of the Alps described earlier. Multiple use areas and policies generally have a built-in flexibility to meet changes in demand, and it must be remembered that at present demands are to a degree related to the perhaps dangerous philosophy of ever-expanding growth.

I believe a large national park type reserve should be established under a single authority, and that it should be a true park or reserve aimed at permanently preserving the land and its plants and animals in a dynamic natural condition, and not available for conflicting uses such as grazing and timber cutting. To produce the best possible park it should include not only the two areas which have been the subject of earlier proposals but also the land in between which will lie on either side of a part of the Tri-State alpine walking track now being created. All the great national parks of the world are over a million acres in extent. Several of the units of the U.S. National Wilderness System on land administered by the Forest Service are well over a million acres in extent and have the highest form of legal protection, in that their purpose can be changed from wilderness preservation only by Congress. I also feel that the mood of the people is such that they would welcome the making of all lands surrounding the national park into a multiple use reserve with a distinctive name. Perhaps the combined national park and the outer multiple use zone could be described as the Greater Alpine Park or Alpine Conservation Area.

Administration and Management

The question of who administers the national park type reserve is less important than that it be established. So much of the land which is either in national parks or is suitable for national parks in Victoria is forested, and so much of the forested lands outside the national parks will be managed on multiple purpose lines with recreational land use and conservation as important objectives, that there would be very obvious advantages in associating national parks and forestry administratively, as in Queensland.

If national parks administration is not amalgamated with the Forests Commission I believe there will have to be a substantial strengthening of the national parks body not only in terms of men and money but also in outlook.

The national parks administration, not through its own fault, has become accustomed to thinking small, because it has had to deal with the problems of high visitor pressures on small areas. If it is to rise to the challenge of managing the preservation of the Alps it will have to adapt itself to dealing with extensive natural areas, as

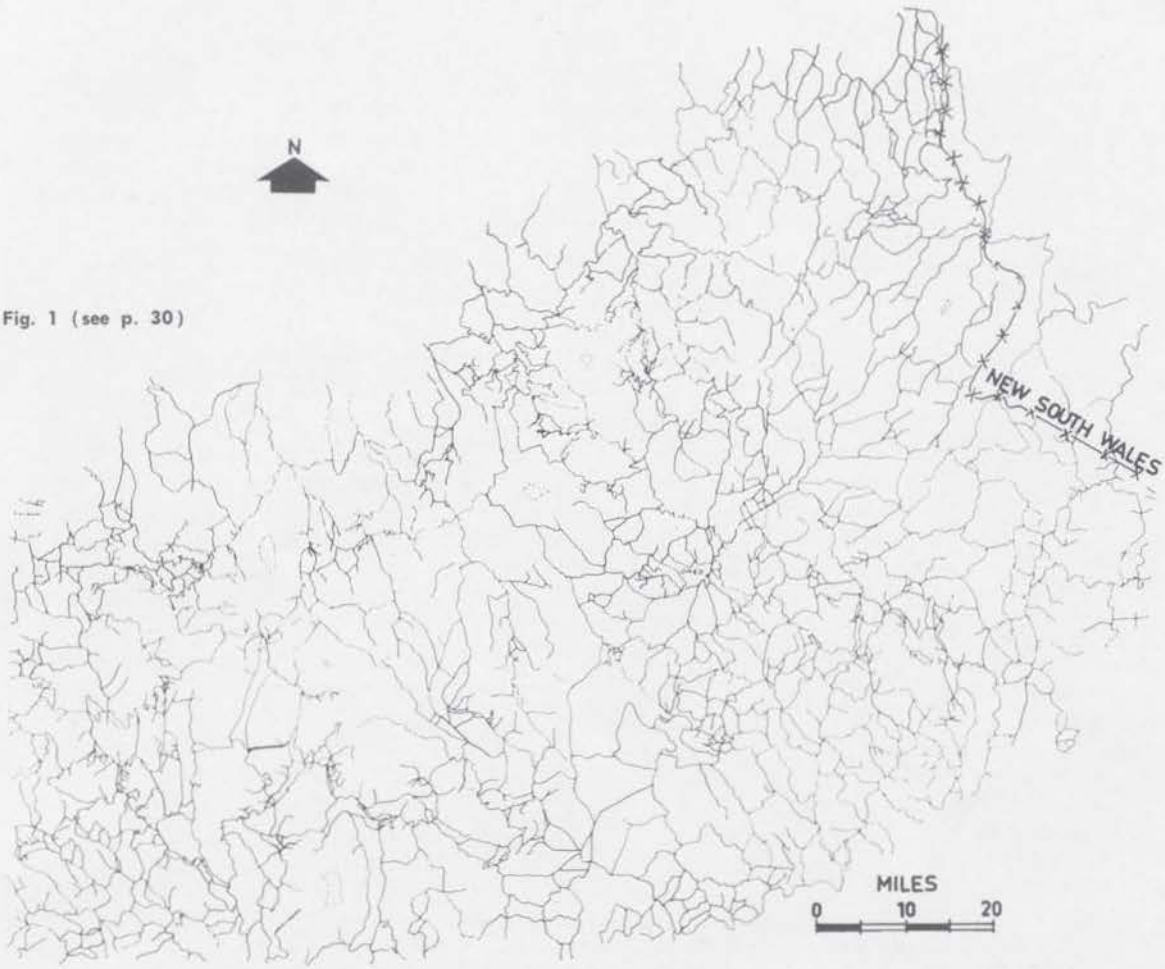


Fig. 1 (see p. 30)

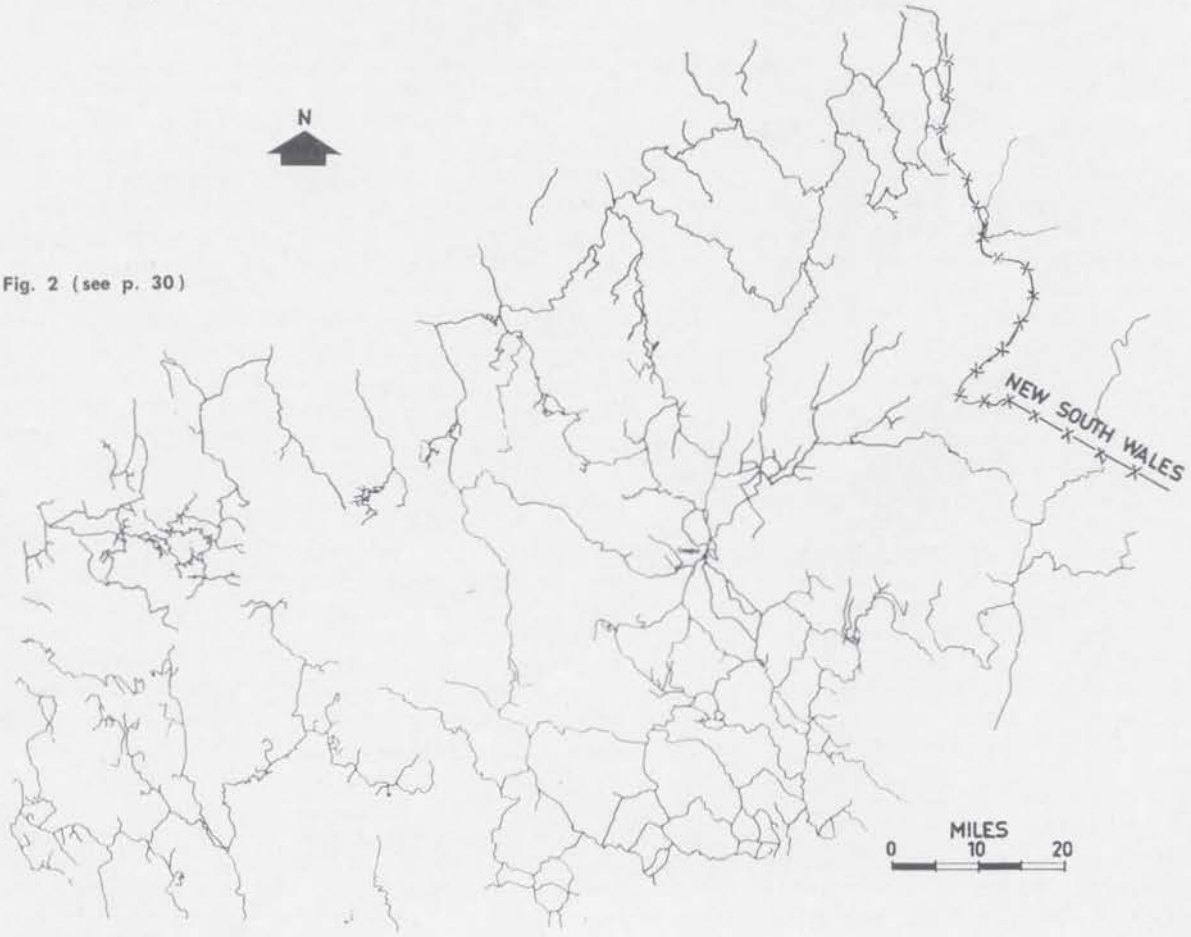


Fig. 2 (see p. 30)

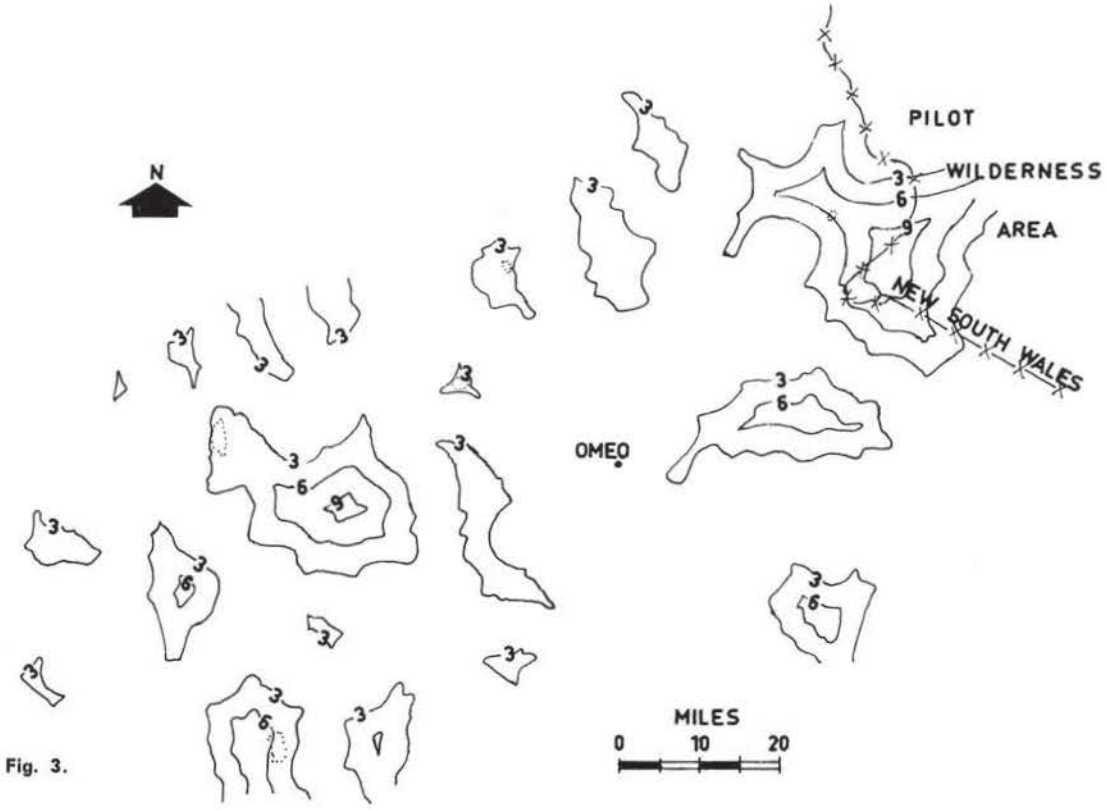


Fig. 3.

Figures 1, 2, and 3 relate to the same area in the north-eastern highlands of Victoria. Fig. 1. Two and four-wheel-drive roads. Areas over three miles from a road are shown by pecked lines. (See also Fig. 3). Fig. 2. Two-wheel-drive roads. Fig. 3. Lines of equal distance (3, 6, or 9 miles) from two-wheel-drive roads. Areas over three miles from any road are shown by pecked lines.

The author acknowledges the kind assistance of officers of the Forests Commission in providing information for these maps.

the Forests Commission did long ago. Given the chance, the officers of both bodies are capable of meeting the challenge of managing this great heritage area, particularly if they are combined administratively.

There will be many management problems to tax the body or bodies responsible for nature preservation in the Alps. These will include restoration of damaged areas, the planning and orderly development of the ski resorts, control of fire in a way which does not involve too much departure from the aim of allowing the land and its plants and animals to evolve naturally, and the protection of unique features and wilderness areas. A master plan such as that used at Kosciusko National Park will be needed to ensure both conservation and the preservation of the conditions required by different kinds of park visitors. The key planning method for the determination of the type and density of recreational land use will be the access plan.

Unfortunately, from the wilderness preservation point of view, so many fire roads have been built in the Alps that there is hardly any real wilderness left. Unlike the situation in New South Wales it is not possible any longer in the north-east to find any place which is four miles away from a road. Even in England there are places which are more than six miles distant from a road. To some extent the position can be retrieved by closing selected fire roads to public vehicle access. This has already been achieved in Kosciusko National Park. If this were done in certain areas in the highlands some areas would become over nine miles from public vehicular access.

Conclusion

The main object of this paper has been to stimulate discussion by giving my personal views. It will be the job of the Land Conservation Council to make detailed studies which will be the basis of their determinations. But mountains deserve the most imaginative treatment possible and when the Council comes to deal with the north-eastern highlands, and the Alps in particular, I think they would do well to heed these words of D. H. Burnham, quoted in the introduction to the South Australian Metropolitan Development Plan:

> "make no little plans; they have no magic to stir men's blood and probably will not be realised. Make big plans; aim high in hope and work, remembering that a noble logical diagram once recommended will not die, but long after we are gone will be a

living thing asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us".

No part of Victoria has so much to contribute to the spiritual well-being of man as the Alps, and in my view, any approach which does not guarantee the future of the region as a great national park will be wasteful of its resources.

THE ALPINE FORUM

Question and Answers

Below are published the answers to a question received in writing at the end of the session on February 13th. Because of lack of space, answers to three other questions cannot be published, but they have been sent direct to the questioners.

The question, directed to the Minister of Lands and all members of the Panel, and sent also to the Director of the National Parks Authority, was:—

> What consideration is being given to controlling the use of trail bikes, mini bikes, 4-wheel-drive vehicles, snowmobiles, dune buggies etc. particularly in "wilderness areas", national parks and wildlife sanctuaries?

Answer by the Minister*

The answer to this question is that the Government has been giving a great deal of consideration to this troublesome matter. As an interim measure, Regulations pursuant to Land Act were promulgated on the 23rd. December, 1970, prohibiting the misuse of beach buggies and similar vehicles on foreshore reserves around the coast of Victoria under regulations which provide for penalties of up to $100. Any person who damages any vegetation or disturbs any sand by driving such a vehicle or driving in a manner dangerous to the public will be liable to prosecution. The driver of any beach buggy or similar vehicle causing unreasonable noise would also be guilty of an offence. The regulations came into force on the 23rd. December, 1970.

As a precautionary measure all Committees of Management of foreshores to Port Phillip were sent a special memorandum setting out the types of damage which can occur as a result of the activities of these vehicles. Committees of Management were urged to keep a close vigilance on Beach Buggy activities in their respective areas and to take all necessary steps within their regulations to prevent any further damage to reserve areas.

However, it is clear that the Regulations under the Land Act do not go far enough insofar as the control of these types of vehicles is concerned and at the present time a research team of representatives of the Soil Conservation Authority and the Department of Crown Lands and Survey is investigating the matter of possible legislation to control all these new hazards to the conservation of our natural resources.

Answer by National Parks Director

National Parks Regulation No. 24 reads as follows:—

> "No person without the permission of the Committee first obtained, in writing, shall drive any vehicle in any National Park except on the roadways or areas provided for that purpose".

The National Parks Authority recognizes such mechanical contrivances as vehicles and does not permit them to be used in national parks except on roads or tracks normally open to vehicular traffic. "Fire protection" tracks and walking tracks are barred to such vehicles.

Answer by Dr. R. J. Grose

I can respond from the Forests Commission viewpoint on rail bikes, 4-wheel-drive vehicles and snowmobiles on reserved forest and particularly in special purpose reserves, such as forest parks and alpine reserves. In zoned wilderness area in existing forest parks the only vehicular traffic permitted is for departmental management purposes which is mainly fire protection. In these areas as would be the case in the extensive wilderness areas in the alpine region suggested in my address, all recreational type vehicles would be excluded. As a matter of policy, use of snowmobiles as pleasure vehicles is not permitted in the Forests Commission's alpine reserves. The Forests Commission permits responsible 4-wheel-drive clubs to use forest roads to provide their recreational experience; however this approval is dependent on club consultation with the local district forester to determine which roads and tracks, if any, can be used without detriment to other forest values. Trail bikes have similar opportunity, but to date the existence of responsible clubs or individuals appears to be minimal.

Answer by Dr. J. G. Mosley

Australian Conservation Foundation has no jurisdiction over land; however the following comments may indicate that we have a watching interest in the problem.

The problem does not appear to have been tackled in any concerted way in Australia. Soil conservation bodies have drawn attention to these vehicles as a cause of soil erosion. Some national park authorities have banned these vehicles in certain areas, examples being restrictions on rough country vehicles (including trail bikes and snowmobiles) in wilderness areas in

* This answer also covers the Soil Conservation Authority and the Ministry of Tourism.

the Kosciusko National Park, and the ban on beach buggies in Royal National Park. A number of local authorities have also used their powers to ban beach buggies.

However, understanding of the recreational ramifications of the use of cross country vehicles does not appear to have developed very far. Little attempt has been made to provide for or control this activity on Crown land.

The Australian Conservation Foundation is preparing a statement on the management of wilderness areas, which will deal with the question of vehicular access to areas so designated, but this will only deal with one specialised type of area. The problem needs to be approached positively through zoning of much wider territories.

BOOK REVIEWS

It is regretted that it is not possible to publish any book reviews in this number. Books received, each to be commended in its own particular sphere, are:—

"Some Garden Birds of South East Australia" by Tess Kloot & Ellen McCulloch. (Collins $2.50).

"Beautiful Australia" by John Ross. (Lansdowne Press – $4.50).

"Kookaburras" by Veronica Parry (Lansdowne Press – $4.25).

Periwinkle Colour Series (Lansdowne Press – $1.50 each). "Wildflowers of the East Coast", "Wildflowers of Western Australia", "Wildflowers of the North and Centre" all by Michael and Irene Morcombe.

"Australian Ground Orchids" by Densey Clyne.

"Australian National Parks" 1, The East: 2, The South: 3, The Far North: 4, The West and Centre: all by Michael Morcombe.

Now available from and published by the Australian Institute of Parks and Recreation, Box 18, Northcote, Vic. 3070 — Price $2.50 — "Man in the Park Environment", the theme of the first Australasian Regional International Congress of Park Administration held at Canberra 1970.

This publication does not contain the full proceedings of the Congress, which are also available, but is a special enlarged issue of its quarterly journal "Australian Parks" issued so that readers unable to attend the Congress can "share some of this experience".

N.R.C.L NOTES.

50TH. ISSUE

Someone has drawn attention to the fact that this is the 50th. issue of "Victoria's Resources". Looking forward, that means that we are just one quarter of the way to our 50th. anniversary. Advance subscriptions up to and including the golden anniversary number will be accepted!

ANNUAL MEETING

At the Annual Meeting of the League, held on April 15th., there was an attendance of 62 apart from staff. Two decisions of special interest were as follows.

Soil Conservation Group: Following the response to enquiries made by Cr. A. Jones during the year, the meeting agreed that the League should proceed with Cr. Jones' proposal that a Soil Conservation Organization, of a name to be determined, should be formed as a group attached to the League.

Associates' Group Discussions. The meeting supported a proposal by Mr. W. L. Grauer that group discussions should be organized for Associates and Farm Members, both in and beyond the Metropolitan area.

DEATH OF MR. W. FLEMING

The Annual Meeting began with a period of silence in tribute to the late W. Fleming, a former President. From the inception of the League until his retirement on account of failing health in 1969, Mr. Fleming had represented the Victorian Dairyfarmers' Association, and he played an important part in the formative years of the League.

During his long period of association he had maintained a constant and enthusiastic interest in all League activities, and had won the esteem and affection of his associates.

C.C.V. NEWS

CONSERVATION COUNCIL OF VICTORIA

ANNUAL GENERAL MEETING

The Council has successfully completed its first year of operation. At its first A.G.M. held on 26th March 1971 the first President was elected. Members and supporters are delighted that Mr. A. O. Lawrence, O.B.E., who was Chairman of the first Council and successfully led it through its birth pains, has now been elected the Council's first President.

The new Executive elected at the A.G.M. comprises:

President: Mr. A. O. Lawrence, (N.R.C.L.):
Vice President: Mr. H. R. Johnson, (B.O.C.):
Secretary: Mr. A. L. Godfrey, (N.R.C.L.):
Dr. D. M. Calder, (Botany, M.U.): Mr. R. Champion, (Y.V.C.L.): Dr. G. N. Christensen, (L.P.C.): Mr. J. Ros. Garnet, (V.N.P.A.): Mr. D. W. Goode, (Upper N-E.F.N.): Mrs. N. Graham, (Hampton Beach): Mr. D. J. Lee (F.N.C.V.): Mrs. D. Sargeant, (W.P. & P.P.C.):

The new Executive has a wealth of experience and should carry on to serve its member organ-

isations as effectively as it did last year. Mr. G. T. Thompson, who had been so involved with the concept and inauguration of the Council, declined to stand for election. However, he has agreed to remain as its Treasurer.

Mr. Lawrence in his Report spoke of the recent legislation that has been passed, of the Metropolitan Region Conservation Report requested by the M.M.B.W. and now completed by the Council, of the requested Western Port Regional Survey, and of various other aspects of the Council's work.

The State Development Bill and National Parks Bill have now been enacted, the only alteration of significance being an advisory committee for National Parks, to be appointed by the Minister. The Council submitted a panel of five names to the Minister of Lands in accordance with the Land Conservation Act 1970. The five were decided by ballot of the Executive from the twenty-eight nominations received. Professor J. S. Turner and Mr. J. Landy were the two persons subsequently appointed members of the Land Conservation Council.

The C.C.V. has completed the first stage of its Metropolitan Region Conservation Report. It was formally presented to Mr. A. H. Croxford, Chairman of the M.M.B.W., on 5th March 1971. This Report will not be released for publication until the Board has advised the Council accordingly. More details of this Report are given later in this news.

The Council has been requested by the Western Port Regional Planning Authority to undertake a similar study in respect of its entire region and a committee has been appointed to consider the feasibility of doing this study.

MELBOURNE REGION CONSERVATION REPORT

The Report presented to the Board of Works by the C.C.V. contained 16 maps prepared to show conservation significance in the planning region controlled by the M.M.B.W. This region extends for about 30 miles in radius around Melbourne. Thirteen maps were prepared showing areas having conservation significance in the following categories viz:— Botanical Quality, Botanical Rarity, Mammal Survey, Bird Habitat, Bird Rarity, Landscape and Scenic Places, Water Quality, Agricultural Amenity, Geology and Terrain, Historic and Prehistoric, Recreation Areas, Public Accessibility.

Each one of these categories had an accompanying schedule which listed all the areas of significance indicated on the map. The category maps were incorporated into three combined maps. The first five categories were combined to show the biological categories only, and areas of significance on this map can be interpreted as ecologically significant areas. The eight remaining categories were combined to show areas having land forms and features with conservation and cultural significance according to subjective and objective criteria. The final map combined all thirteen categories together. The combined maps showed by the increase in density of the shaded areas the degree of combined conservation significance which occurs in those areas. It is to be hoped that when the Board of Works releases its planning for the Melbourne Region the plans prepared by the Conservation Council will be made public and will be available in some publication. The Report included details of the method of preparation of the plans, and criteria by which the various categories were evaluated, as well as commentary on the broader issues involved in planning policy for conservation.

Some 45 organisations interested in conservation, numerous Government departments, and many individuals contributed or assisted in the preparation of the plans. The C.C.V. circularised all its member organisations interested in the Melbourne region, and many other organisations who are not members, to obtain information for the preparation of the plans. The response was extremely gratifying, especially considering the limited time available. Each organisation contributed information in its specialised field. This information was then collated into the category maps.

Each category map showed areas having significance ranked according to their importance. Broadly, those areas given 1st rank were of supreme value or had features to be conserved at all costs. Rank 2 areas had major conservation value of features that were rare, and rank 3 were areas of importance or uncommon features and likely to be of greater importance in the future. Criteria used were based on either the quality of the feature or characteristic to be evaluated or on the scarcity of such features or characteristics. The synthesis of the categories was based on techniques developed by Ian McHarg, and presented in his book "Design with Nature". The 13 category maps resulted from the assessment of the 23 categories proposed in the original survey. Some of the original categories were combined for presentation, others had too little information available, whilst a few could not be satisfactorily differentiated.

This report has collated together, for the first time, information available about areas and features of conservation interest around Melbourne, and as more information becomes available it may be updated.

The report itself will provide a basis on which to direct investigations into finding out more about the conservation significance and conservation needs of the Melbourne region.

Now that the factual basis for conservation in the region has been collated, the C.C.V. is continuing work on the further study of what measures should be taken to maintain such conservation significance and the appropriate development guidelines and constraints.

Keeping The Earth Fit For Man

Editor: P. A. PRITCHARD

Part 11. — OUR DETERIORATING ENVIRONMENT

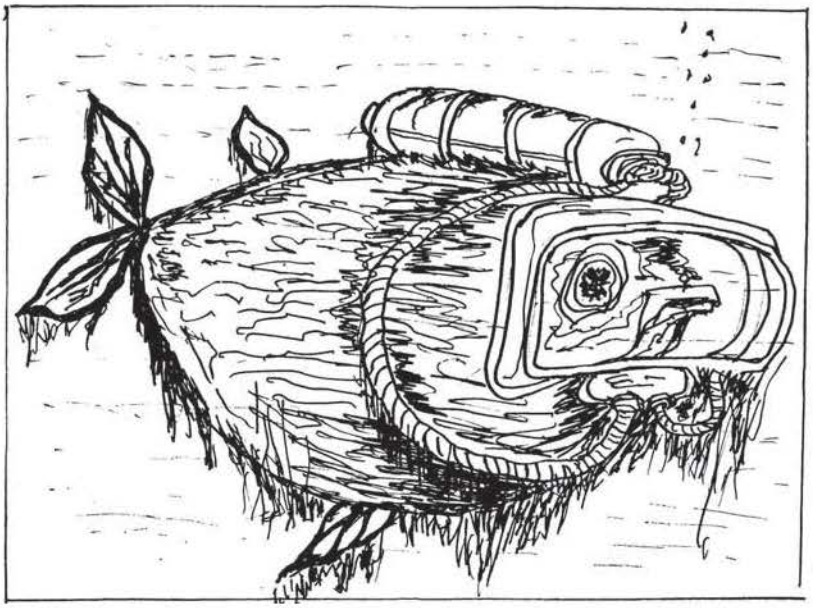
Ever since he first appeared on the earth man has been attacking and altering his environment. At first he was a hunter and food gatherer and was little more than another wild creature. But as soon as he burnt wood to keep warm he was consuming it in a different way from natural decay and thus was altering his environment.

At first, because men were few and because their environment was rich, the changes wrought in the environment were local and of little importance. All that man had to do, when his immediate surroundings deteriorated, was to move to a new area, and, in time, the ruined area recovered. Eventually, man the hunter-gatherer learned to use fire to assist in hunting. With fire he was able to drive wild animals into places where they could be killed more easily and, by burning the bush, he could produce succulent young grass which animals liked, and which induced them to graze in areas where they could be more easily captured. This burning of the bush in which the animals lived was a great expenditure of organic matter in order to capture a small amount of food. Man was then, and still remains, a wasteful animal. As the human species increased, more men resulted in more burning, and when the same ground was burnt too frequently some species of plants and animals were lost to the area. Man was engaged in his ceaseless destruction of the natural wilderness.

With increasing skill in making and using tools man gradually changed from a hunter-gatherer into a herder-cultivator. With fire, axe and goat he continued, with increasing effect, to exploit his natural environment to gain food, shelter and comfort for his steadily increasing numbers. As necessity arose he moved ever outward to settle in new and unspoilt lands. His ceaseless destruction of the natural wilderness went on.

Within the last two hundred years man has progressed to a third stage in his cultural evolution. He is no longer the hunter-gatherer or the herder-cultivator but the technologist, and the impact of his activities upon the environment has increased tremendously. With it are two closely-linked aspects. The first is the dramatic and continuing increase in his numbers, and the second is the development of a great diversity of human activities, human demands, and human products. Increasing numbers of people result in increasing demands upon the environment as they seek the essentials for survival. But increasing technology has also led to increasing affluence and more comfortable living, with still greater demand upon the natural resources in order that these new activities and interests may be pursued. Where technological man is faced with a shortage of resources in his own land he imports from other places. The most affluent of all nations, the United States of America, with only 2 per cent of the population of the world, uses over half the world's resources, and produces 30 per cent of the wastes that are put into the atmosphere. Of the 100 minerals most important to its industries, the U.S.A. possesses adequate supplies of only a dozen or so, and has to draw upon the resources of other countries for the remainder. What is going to happen when all the foreign supplies have been used up?

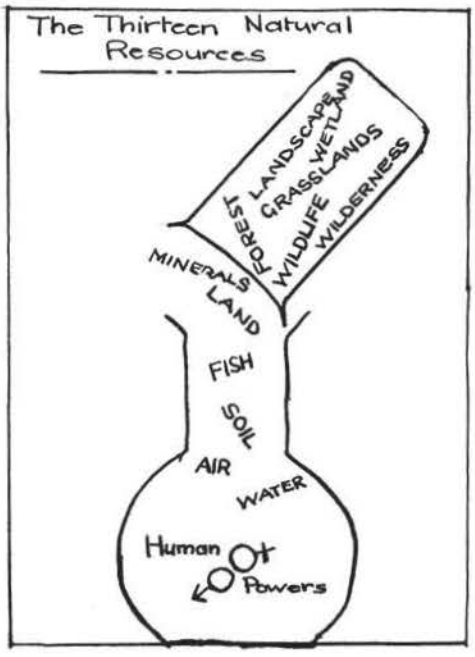
Unlike the hunter-gatherer or herder-cultivator, technological man, with his machines for harnessing power, is able to make extensive alterations to his environment with great rapidity. Whereas once a man might spend a life-time clearing his farm he now engages a bulldozer which performs the operation in a matter of days. To gain his immediate goals during war he may destroy thousands of acres of forest by aerial spraying, or he may bomb to destruction bridges, dams or buildings that have taken years to construct. Many of his goods, e.g. machines, cars and clothes,



Fish find themselves in desperate straits in some waterways.

are designed to wear out fairly rapidly, or to become obsolete, so that after a few years of use he must replace them with new ones. Wasteful creature that he is, he pursues his ceaseless attrition of the natural environment.

The end, however, may not be far off. In the words of Professor Charles Birch: "If men were mice we would say that there was a plague of men on this planet. Perhaps not many parts of the earth actually look very crowded with people. What we fail to take into account is the tremendous demand each single person makes on the environment. No other creature on earth has such enormous demands, and these grow as man becomes more 'developed'. Industrial man requires hundreds of times the amount of resources that non-industrial man could get along with. This applies to minerals, fuels, housing materials, and food. In filling his complex needs he produces vast quantities of wastes that foul the air, the rivers, the sea, and the soil. Not long ago we thought there were plenty of resources to go around and plenty of air and water to soak up the wastes. We are discovering that the reverse is true. The new discovery of our time is that the earth is not like that at all. It is a spaceship with limited resources and with limited capacity to absorb the toxic wastes of civilization."



Man's Influence on the Natural Resources

There are thirteen natural resources upon which human welfare depends. Let us take stock of these:—

Land. It is estimated that the earth has about 25 million square miles of habitable and cultivable land but vast areas of this, especially near the great cities, are being taken out of cultivation for factories, housing, quarrying, roads and railways. In England and Wales urban development is estimated to take an average of 37,500 acres of farmland out of production each year. It has also been estimated that in western countries each person consumes, on average, the produce of $2\frac{1}{2}$ acres of land. On this basis the world will be able to support only 6,500 million people, a figure which will be reached before the year 2000 A.D. And this is assuming that all goods can be evenly distributed so that each individual receives his fair share.

Air. An average person requires over thirty pounds of air a day, or about six pints every minute, and he has to take it as it comes. He would not readily stand in sewage or drink dirty water. Yet daily the individual draws 26,000 breaths, between 18 and 22 each minute, many of which — if not in all cases — are of filthy air.

The heaviest air pollution is in the big cities and in the vicinity of industrial operations where smoke and chemical fumes are poured into the air. Many cities, including London, New York, Los Angeles and Tokyo have serious air pollution problems. Traffic policemen in Tokyo do not stay at a busy cross-road longer than 30 minutes, and 40 junctions have oxygen machines available. Generally the health and well-being of all individuals who breathe polluted air is affected. Part 5 of this series dealt in detail with this resource.

Minerals. Modern industries and agriculture require many kinds of metals and other minerals. These are non-renewable resources and the earth's

The rope course at Axedale Camp, Campaspe River.

supplies are limited. The United States National Academy of Science has estimated that the world's supply of coal will be exhausted within 400 years and that at the present rate of use the great bulk of the world's supply of recoverable petroleum and natural gas will be exhausted within 50 years. The time it took to form these fossil fuels was about 600,000,000 years. What do you think should be done to make the earth's supplies last as long as possible? Should we keep some for future generations, or should we leave future generations to look after themselves?

To maintain a high material standard of living, man requires not just food and energy but materials in great variety and quantity. We have long since left the age when stone and wood provided for most material needs. However, through exhaustion of our more concentrated mineral sources, we may be returning full circle to a period when stone and wood must once more supply most of our material needs.

Soil. This is the thin layer of highly complex material found on the surface of land. It is composed of many substances

and harbours a large number of living organisms; in fact the weight of tiny animals below the surface of a pasture usually exceeds that of the cattle grazing upon it. It takes nature centuries to create the productive soil which is the main feeding zone for plants and on which all life ultimately depends. Agriculture is about 6000 years old and in that time a great deal of soil has been destroyed, and is still being destroyed, through mismanagement. Part 3 of this series dealt more fully with this important resource.

Water. Man's use and abuse of this resource was treated in Part 4.

Fish. Fish are end-products of food chains in aquatic ecosystems. The base on which fish populations are supported consists of microscopic floating green plants, usually algae, which are collectively termed phytoplankton. These plants are the photosynthetic organisms which maintain the other life in oceans, streams and lakes. The ability of the water to supply nutrients to these plants varies with the fertility of the soils in the catchment and determines in large part the productivity of the water in terms of pounds of fish per acre. If the water is low in nutrients. it will support either a few large fish or many dwarfed or stunted fish, depending on the type of lake or stream and the conditions within it.

It is generally accepted that there are fewer fish in our streams and lakes, and along our shores, than there were a century ago. A. D. Butcher, who investigated the Gippsland Lakes population of Southern Bream, found that there had apparently been a gradual fall in population size since 1919. Such a decline was due both to despoliation of the environment and to overfishing. The history of freshwater fishing in America can be traced through a period of early abundance when streams ran clear and fish could be easily taken, to a time of serious depletion. When forests were cut, streams which once supported abundant fish life deteriorated. When farm lands were mismanaged, erosion silted up lakes and streams. Pollution from mill and factory wiped out fisheries for miles below the source.

The great fisheries of the world are marine and are located, for the most part, on continental shelves where the waters are rich in nutrients, or in currents carrying nutrients which have upwelled from the ocean depths. Because they are exploited for food and profit, much attention has been given to devising efficient gear for locating and catching fish quickly and easily. Increasing demands for fish have caused the industry to grow, and developing technology has brought more efficient means of exploiting fish populations, with consequent danger of overfishing.

One group of marine organisms known to be seriously depleted through continuing efficient pursuit consists of the various marine mammals. Three major groups of whales, the right, humpback and sperm whales, have been threatened with extinction. Other more rare species are now seldom recorded.

Wetlands. Wetlands are usually defined as areas of marsh and

Wide expanse of wind-eroded country in the Mallee in 1944, the result of incorrect land use.
Photo — Soil Conservation Authority

Thinning mountain ash in 11-year-old plantation. Average height 52 ft., diameter 5 to 7 inches.
Photo — Forests Commission

water less than twenty feet deep (six metres). They include lakes, lagoons, gravel pits, rivers, swamps and estuaries, which serve as natural water reservoirs. They constitute a valuable and scarce resource which maintains a wide range of animal and plant life. Many wetlands have been, and are being, drained by man for agriculture, with consequent loss of animal and plant populations. Part 10 dealt in more detail with this fast-disappearing resource.

Wilderness and Wildlife. These two vanishing resources were discussed in Parts 7 and 9.

Grassland. Grasslands and dry shrub vegetation, in their native state, provide little food or products of commercial value to man. To become economically useful the native vegetation must be converted into animal protein through the agency of wildlife or domestic grazing animals. Man the herder-cultivator has domesticated goats, sheep, cattle and other animals. However, through his failure to realize that each pasture has a carrying capacity, he has wrought a great deal of damage to many of the grasslands of the earth. Carrying capacity is the number of animals that can be carried and kept in good condition without damaging the grassland. It depends on the soil and climate, the type of native vegetation, the type of animal, and the ability of the vegetation to hold up under grazing. It varies greatly from one site to another, being high in well-watered areas with deep soil, and low on rocky, arid slopes. Abuse of grasslands carries not only the consequences of lowered livestock carrying capacity and a diminished economic return from the land, but affects other natural resources as well. In some areas a valuable wildlife resource is destroyed to make room for livestock; the area is then damaged so that it is no longer suited for either wildlife or livestock. Such damaged areas are a source of erosion and disruption of stream flow which can in turn affect still wider areas than those originally damaged.

Forests. Man and the Forests was the subject of Part 6 of this series. Clearing, careless destruction and exploitation of forests remain common throughout Australia but are becoming less so in certain States. Some re-afforestation is taking place.

We have reviewed eleven of the thirteen principal natural resources and, for considerations of space, will leave the treatment of the remaining two until the next and final article in this series. At this stage you may feel despondent about the future of mankind, and a great deal of evidence does support the view that there are indeed hard times ahead for future generations. However, if man is to survive he must reject a counsel of despair. There are one or two rays of hope, and we shall look at these in our final part. In the meantime, would you think about ways in which man the technologist might reduce waste and thus lessen the demands upon our natural resources?

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Detergent pollution of the Molonglo River, Australian Capital Territory.
(Photo — Colin Totterdell) by courtesy A.C.F.