

# **REVIEW OF THE TAXATION TREATMENT OF PLANTATION FORESTRY SUBMITTED BY**

**SNOWY RIVER INTERSTATE LANDCARE,  
DELEGATE PROGRESS ASSOCIATION,  
AND NIMMITABEL ADVANCEMENT GROUP**

**JULY 2005**

Minister for Revenue and Assistant Treasurer, Minister Mal Brough, MP  
Minister for Fisheries, Forestry and Conservation, Senator Ian McDonald  
C/- Department of the Treasury  
Langton Crescent  
PARKES ACT 2600

## **INTRODUCTION**

Snowy River Interstate Landcare, Delegate Progress Association, Delegate Community and Nimmitabel Advancement Group thank the Australian Government for the opportunity to comment upon the Taxation treatment and consequent outcomes of the Plantation sector for our immediate locality and for the Nation as a whole. Apart from processing facilities (mills), these areas comprise rural settlement of farming and associated communities with the timber sector traditionally involved in harvest from the adjacent Great Divide.

The effect of the 2020 Plantation Act and NSW Plantation Act 1999, has been to allow an exponential expansion of soft wood plantations on an ad hoc basis throughout the area. All State planning standards have been sidelined for this one industry, and no genuine attempt has been made to answer community angst re: hydrology, fire, socio-economic, environmental, infrastructure, etc concerns. Suffice to say, you can expect our submission, to be less than favorably disposed to the status quo.

When looking for comparisons, we have discovered Scotland, and the realization that actually we are history repeating itself! Economic development sponsored by the State must be accountable, its direction, aims and achievements must be audited and above all, must be acceptable to the people. We believe this has not and is not happening.

Contact/Spokesperson: Robert Belcher  
02 6458 0244  
email: rbelcher@warruga.com.au

## **SUMMARY**

- Community believes MIS schemes in Agribusiness fail to achieve desired outcomes but the damage to rural and regional sector is profound. The tax system loses a lot of credibility! As an economic development tool, it can no longer be tolerated.
- The net result of MIS schemes for plantation, can only guarantee one result, a massive land grab at tax payer expense. Land price distortion will have long term negative effects for Agriculture.
- Further tax incentives and subsidies will only compound the problem of lack of clear production purpose. Free market forces must be able to allocate the resource.
- Planning and environmental outcomes are a total failure.
- Socio-economic outcomes are also contrary to the promises of the 2020 Vision.
- 2020 Vision has failed to integrate forestry into farming enterprises due to MIS scheme high jacking the Vision.
- Water issues are going to haunt the Vision. A water plan is needed first before any natural resource development proceeds.

## **RECOMMENDATIONS**

1. The MIS tax scheme should cease as the preferred method of industry development.
2. Government involvement must shift to processing from plantation establishment, to secure the economic benefits needed to justify the whole exercise.
3. Accept Senate Review Recommendation 1 now.  
Ref: Recommendation 1, 3.35  
The Committee therefore recommends that the revised 2020 Vision be amended by deleting all references to trebling the acreage by 2020 or plantation acreage of 3 million hectares. This should be replaced with the target of increasing the acreage of plantation forests at a sustainable and economic level.

*Reference Senate Review Plantations for Australia, the 2020 Vision, Sept 2004. Rural and Regional Affairs and Transport Reference Committee*

4. A full Audit to exclude the prospect of fraud to satisfy tax payer commitments.  
Accept Senate Review Recommendation 2, 3.40  
The committee recommends that the Government commission an independent assessment of how the plantation prospectus industry relates to the 2020 Vision, including an evaluation of prospectus assumptions against returns likely to be achieved.
5. A full Water Audit by independent and scientifically qualified personnel.
6. Tax treatment must at the very least exclude capital as a deduction and preferably a serious examination of change of incentive as practiced in the United Kingdom should be considered.
7. Federal Government must review planning failure at all levels of Government.
8. The Water Initiative must be applied to this industry.
9. The Montreal Agreement needs to be adhered to by the Federal Government.

***Reference a) the commercial viability and current tax treatment of plantation investment;***

The current tax scheme disguises completely the commercial viability of plantation investment. In fact it could be argued that the 2005 Budget's removal of the superannuation surcharge will have more impact upon investment than any commercial viability assessment of plantation performance.

<sup>1</sup>“It's beautiful because the companies are selling trees, but their customers are buying something else – a TAX DEDUCTION. This mismatch between the sale and the purchase motivation means that the price is unrelated to the product”.

Such a situation cannot deliver a soundly based national industry with finely tuned economic prospects.

<sup>2</sup>“Next question: are they good investments? Answer, only because of the tax deduction, and even then they're ordinary. The big winners, of course, are the promoters.” What is really happening is a transfer from Government Revenue to private prospectus based management companies, and a product with insufficient incentive beyond planting.

MIS (Managed Investment Schemes) do not possess any price indicators or incentives to invest for maximized economic outcomes rather, simply the prospectus based product ruling minimum standards. This is a best outcome; we contend that many developments actually fail the prospectus, for yield in particular. An over supply is too expected in the lowest quality sector of the commodity. Further, as the incentive is to plant rather than harvest high quality timber, that is exactly what is happening.

Commercial viability is dependant upon the establishment of infrastructure. This is supposed to occur via industry levies, yet to the best of our knowledge, this is a total failure; Ref, page 23/24 of the Review of the Plantations and Reafforestation NSW Code, 2001 Discussion Paper. We are also aware that even by point of harvest in the SA/Vic Green Triangle area, Penola in particular, the infrastructure development is zero. Is this another area for the taxpayer to increase subsidies for an already subsidized industry?

We can obviously quote many other examples such as the above, where the Plantation industry is escaping any accountability for cost that all other sectors of the economy must bear, eg; cost recovery for Development Application approvals, hydrology and water consumption cost, fire prevention and suppression, etc.

Commercial viability must be assessed in comparison to the opportunity cost involved in allocation of the natural resource to Plantation rather than all other possibilities. To a large extent this means a comparison between commodities. No economist can predict reliably the prospects for any commodity in the long term let alone the reasonably short term; there are too many variables. However, we would require independent advice that the resource is not now quiet sufficient and that the real prospect of income earnings looks toward falling prices in both hard and soft wood market products over the long term.

<sup>1</sup> *Alan Kohler – The Age June 26, 2004*

<sup>2</sup> *Alan Kohler – The Age June 26, 2004*

The change and time required for the production of this commodity is such as to be a reasonable deterrent to investment, together with poor price prospects, increased supply and to be expected decreases in demand (wood demand per capita is falling with increased economic growth and technology has reduced quantity of wood required to produce same level of output). Thus this policy represents a significant gamble with the potential to accrue significant national opportunity costs or losses.

To remove market forces from this allocating process really stacks the odds against a good economic outcome. Processing to achieve better price outcomes is now a priority if the existing resource is to return anywhere near the investor's expectations.

The experience in Scotland by 1988 was that the tax benefit arrangement was leading to an economic, social and environmental outcome that was not in the national interests. The decision was taken to stop investment in plantation based on the desire to avoid tax. The plantation industry did not stop, but it changed towards outcomes that better satisfied the triple bottom line – see attachments.

The 2020 Vision to establish timber on cleared land may appear logical, but a large percentage of this land, **never** carried commercial timbers. A consequence of this, is that up to 50% of Western Victoria Blue Gum, will not go into a 2<sup>nd</sup> rotation, because they cannot achieve commercially acceptable yields.

It is surprising to see the current circumstances where a largely unsubsidized, unprotected market force directed industry (agriculture) is being subjected to full on competition for the resources (land) by a fully subsidized very protected industry. The agricultural sector believes there is a distinct lack of equity in this situation. Given that decisions to produce commodities are based upon climate, markets and our economic comparative advantages, we are amazed and disillusioned by the locating and quality of many plantations. A common view is that the MIS tax scheme again does not provide appropriate signals to prevent totally inappropriate developments. We have plantations of pine in *natural grasslands* with rainfall figures around 19 to 20 inch mark. A look at prospectus for these plantations does not match the reality of the development on all the fundamental economic determinants, eg; rainfall growth rates? A comparison of commodity outcomes from such a resource could not answer that the plantation has optimized the national wealth.

Of course the impact on agriculture really could not be worse, land price distortion, the inability to compete on price, funds, legislative hurdles and indirect incentives. The expansion into the Agriculture sector directly reduces enterprise participation thereby decreasing all ancillary income earning potential. That is a contraction of the Agriculture sector is inevitable. The agricultural industry infrastructure is based on scale thus viability is threatened. Employment replacement is transitory (as quoted in 2020 Vision) whilst establishment occurs. But long term decline is obvious. This appears to suit current State Governments!

We have noticed that Government inspired MIS “agricultural” schemes, seem to consistently fail to achieve Demand and Supply optimal outcomes. Perhaps the grape glut at the moment should sound warning bells. But even these schemes no longer benefit from the “13 month rule”. Yet a “12 month rule” is enjoyed by the plantation sector on the basis of seasonal planting problems! As if this does not apply broadly

throughout Agriculture? The real reason of course is to allow the avalanche of tax avoidance funds close to June 30<sup>th</sup> being claimable. We do not believe that tax avoidance is a sound investment basis. No other entity enjoys such benefits from the tax act.

Senator Shane Murphy, Tasmania Senator, as quoted from the Minority Report of the Senate Review of Plantations, September 2004: “In the area of taxation, the current application of the taxation system as an incentive for private investment in the plantation industry has led to an influx of managed investment companies with little or no experience in plantation or, indeed, forestry matters. They have been more interested in fees and charges than developing a long-term, viable and sustainable industry. This has also led to excessively high costs in plantation establishment. Many companies have used monies paid by investors to buy land for themselves. Indeed, it was the evidence of at least one company to a different committee inquiry that at least half of the money paid by an investor was used to buy land. However, had the investor bought the land, the purchase would have been considered a capital purchase and therefore not deductible under existing tax laws. It should therefore be of concern that investment companies are using monies that an investor has claimed a 100 per cent deduction to buy land at often very high prices. This seems to provide an unfair advantage over other land purchasers who do not have the advantage of claiming the purchase cost as a tax deduction.” Yet, the investor now claims a deduction for land lease over the 25 year period on top of 100% entry payment deduction, part of which is used to buy the land. We note that the Treasury has an obligation to protect the Nation’s Revenue base.

The real commercial benefit from the tax treatment for plantations accrues to management, who acquire vast land areas at no direct cost. **NOT** as is intended by the 2020 Vision for a viable profitable and optimized natural resource commodity.

***b) whether the operation of the Income Tax Assessment Acts impedes investment in longer term forest rotations which produce higher value products;***

MIS generated investment in softwood plantations 25 to 30 year rotations appears to attract large amounts of funds. There is no shortage of money, yet our observations on the Southern Monaro indicate that a long term rotation does not necessarily result in saw log outcomes. According to forester advice (multiple), much of the resource will not amount to more than pulp. This represents a massive waste of resource. Why? Because the MIS scheme gives incentives to plant as much area as possible, not to grow via management, or location.

Whilst it is argued woodchips are the most profitable wood outcome, a desire to produce saw logs would require proper incentives. We would refer to the Scotland example, where reward is given at the end of the production process, to do otherwise will guarantee further exploitation of tax arrangements and failure of production outcomes.

Likewise changing arrangements to enable trading in plantations after receiving MIS benefits, would in our view do nothing to change the current poor production

outcomes. Again we would refer to the Scottish example, for a far more equitable and productive outcome.

It appears that the Plantation Industry is subsumed by tax incentives rather than the prospect of production profit. In the National interest, perhaps the tax benefit should be generous to the profit outcome, and ignore the current demand to pay them all the way through the growing process. This would allow a closer resemblance of free market forces, at least for the production process if not for the treatment of end profit. Again, we also draw your attention to the desire to produce saw logs or any other product; this is rational provided the opportunity cost to the nation by allocating resource does not result in us losing money.

If New Zealand can produce a saw log cheaper than us, perhaps we should look to another commodity to square the ledger. What is an acceptable cost to the tax payer to produce wood?

Long term movements in wood price are determined by commodity and technology factors. Both indicate lower demand and price. Product substitution for wood also acts to constrain the potential to increase wood price.

Industry forecasts increasing prices but this has not been statistically the case. Unless wood is processed to value add we cannot recoup the benefits of government subsidy.

Low quality wood exported as logs or chips provides low employment and income outcomes to the region and the nation. It appears that technology has now made short and medium term timber the most profitable to process.

***c) the role of State and Territory Governments in plantation industry development as investors, growers and land managers, and any implication this has for competitive neutrality with regard to tax liabilities and incentives;***

State Governments obviously have planning, environmental and assets responsibilities in the area. In terms of competitive neutrality, NSW for example is considering privatizing its plantation resource. This will have big impacts upon communities, and infrastructure maintenance. The question is, if timber is worth investing in, why does the Government wish to shed it's ownership of the assets?

In terms of price competition from native and plantations resource, it could be argued that price discounts or poor management may be removed, but with a 2020 Vision of at least doubling the resource now of private plantations, surely over supply looms no matter what price competition exists, and given that export must take place to clear supply, price discounting will inevitably occur.

Perhaps State Government want to cash the asset now because the assets worth can only fall? Otherwise a transfer from public to private would cheat the tax payer out of the benefit of the States investments?

On the question of planning, the NSW 1999 Reafforestation Act is an abrogation of responsibility. Ad hoc development which disregards, environment requirements, water entitlements, fire planning and socio-economic outcomes as admitted in their current review discussion paper, flies in the face of nation resource management to say nothing about social equity. In fact the planning process amounts to “Social Engineering” of communities that do not normally vote for them. It should be noted that the State has no concern re: production outcomes of plantation (as admitted by DIPNR) this should be of concern to Federal Government. Likewise CMA’s have failed to address water quality and quantity outcomes at this point of time, in regard to the plantation development issue.

The Federal Government must ensure that the Montreal Agreement is lived up to. At present, this is not the case.

<sup>3</sup> “Taxation is a very blunt instrument and substantial planning must be done by the local government.” The NSW Plantation and Reafforestation Act, 1999, has removed all local government input, further we know that at point of first reading, sections of the draft; re fire regulations were removed. The Federal Government should be concerned about the State’s implementation of the 2020 vision.

*d) the capacity to adapt existing tax policies to contribute to achieving the Australian and State Governments’ desire to achieve a greater integration of plantation and natural resource management policies to improve the management of salinity and water quality;*

Hydrology is fundamental to the planning and environmental impact assessment of plantation development. Hydrology to date is not accepted by the State Government or the Industry as an issue of immediate significance. The State still prefers ad hoc development and the industry refuses to accept user pays and environmental impacts from water usage. See Attachment Philip Hoskins, The Age, May 17, 2005.

The science of salinity and carbon credits is yet to be definitive with both potential for positive and negative outcomes. However the hydrology research is all heading one way! A national water plan together with local and regional planning is essential. The current development regime is inconsistent with water planning.

Using trees as the panacea for environment problems is simplistic if not misleading. As a long standing proactive Landcare community we take issue with soil stabilization biodiversity and water quality and quantity claims. Our observations reinforce our opinion that plantations far from fixing, actually exacerbate these issues. When you have natural treeless plains covered in native grasses being destroyed to develop plantations, it is not able to be environmentally claimed as positive.

<sup>3</sup> *Treasury official – name known*

We do not have salinity problems! This district has more trees now than when white settlement occurred. Government revenue should be directed to real scientifically justified water plans rather than a popular dogma fix all exercise, as is the case at present.

When it comes to water quality, the chemical issue is of paramount importance. There is systemic failure to recognize and remedy a potentially serious environmental and human health problem.

To associate plantation development with good environmental outcomes for water seems to ignore the hydrology and pollution facts of this industry. If any other industry was doing this all hell would occur. Perhaps this is the result of “protection” but the consequences of this as the “Water Initiative” is beginning to identify will prove to be very costly to the nation. We note our Federal Member, Gary Nairn, publicly asked the industry to sign up to the Water Initiative; he was met with stony silence. This is not an industry you can partner for good environmental outcomes.

*e) the relative roles and effectiveness of tax system and expenditure programmes in the delivery of assistance to the industry.*

This issue requires a full independent audit to ascertain what the taxpayer has obtained as a national benefit.

The checks and balances from ASIC and ATO appear to be stymied or ineffective, yet full accountability is essential to evaluate assistance programs. Competition policy must be applied for social equity purposes and clear sunset clauses are needed to relieve the community of assistance burdens. A clear estimate of what it has cost, and in what areas the Plantation Industry has been assisted directly and indirectly is needed.

Subsidization of an industry is a very sensitive issue; it costs the community and thus must have open and transparent accountability. We are concerned when we hear comments like the following;

<sup>4</sup> “the difference between real establishment cost in an MIS plantation and the amount that the investor is allowed to write off as a tax deduction is the incentive to the industry”

Assistance has a sad history of poor outcomes and abuse.

<sup>4</sup> *Treasury Advisor, name known*

Robert Belcher  
Chair, Snowy River Interstate Landcare  
WARRUGA, VIA DELEGATE 2633

02 6458 0244

## THE GOVERNMENT VIEW

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BY LORD SANDERSON

*Minister with responsibility for Agriculture, Forestry and Tourism,  
Scottish Office*

Ladies and Gentlemen, let me begin by saying how delighted I am to have this opportunity to give the opening address to this Conference. However, I might add that I was somewhat puzzled to learn that the theme for the Conference was *Scottish Forestry—The Crossroads*. From where I stand I do not see that forestry is at the crossroads. This conjures up an image of a forestry industry that has somehow lost its way and is faced with a number of roads it might take—all leading in different directions and to different destinations. However the Government is quite clear about the destination which it sees for forestry and the road it wishes to follow. It set out on that road in December 1980 when it put its support firmly behind an expansion of forestry in Great Britain. Nothing has happened in the intervening years to change our view or to send us off in a different direction.

Of course there have been changes along the way. One of the biggest, and in forestry circles one of the most controversial, was the removal of tax reliefs from forestry in the last Budget. In addition, the Government has a mandate to reduce taxation so that people are allowed to keep more of what they earn. In this connection, the reduction of the top rate from 60 to 40% has been widely welcomed and by itself would cause many investors to review their programmes. I know from my postbag how some of you feel about that, and I also know that there are problems to be tackled as the industry adjusts to the new situation, but let me say a few things about that. First of all, the change was inevitable. Forestry tax reliefs, for all they had achieved over the years in the way of encouraging new planting, were widely seen—and not just by the ultra-conservationists—as an unacceptable form of Government support. You may very well say, and I would not disagree with you, that the picture was distorted by misinformation and emotive argument. But the fact remains that forestry was in great danger of losing public support. It is noticeable that in recent months the scale and virulence of attacks on forestry have diminished. That is no accident. The fact that our support for forestry is now seen as being out in the open, by way of enhanced grants available to all, has to be in the best interest of the industry in the longer term. We have, of course, introduced transitional tax arrangements which were designed deliberately to allow for a period of adjustment. These will go some way towards cushioning the effect of the Budget changes. They buy some time. I do know however that many of you in the industry already face problems. I cannot offer you instant solutions, but what I can do is to assure you that the Government is looking carefully at what is happening in the industry and listening carefully to what you have to say. I know that the industry is actively

pursuing positive ideas for encouraging investment and maintaining the expansion we all wish to see. This is not a time for looking back. There are ways ahead and I am sure that you are seeking them.

May I add something to that. When I say that I want to hear the views of the industry, I have in mind the whole industry. The wood processors, for instance, have a vital interest in planting that will provide them with their raw material in the future. The forestry industry must see itself as one, with a common interest. I welcome the opportunity for an ongoing constructive debate between the industry and Government.

What I must emphasise is that the Budget changes did not herald any fundamental change in the Government's commitment to forestry. This was made abundantly clear in a statement by the Secretary of State for Scotland on the day following the Budget.

There are those, of course, who take a very pessimistic view of the situation and forecast that planting will now go into terminal decline and they are entitled to their opinion. There may well be a dip in the level of new planting. Indeed it would be surprising if the changes did not have this effect. However I am confident that—as has been clearly demonstrated in the past—the forestry industry is quite capable of adjusting to the changes. The planters may be different people—and it is in our interests to seek to identify who they will be for the future. For the present however, by the end of October, applications for grant under the Woodland Grant Scheme covered over 25,000 hectares of new planting and restocking. This figure includes transfers from the older schemes, of course; but the number of first time applications has been substantial, covering 10,000 hectares of new planting—8,500 of them in Scotland.

Let us not forget the underlying strengths of the industry. Its greatest strength lies in the vibrancy of the markets for timber. These markets are vibrant, so much so that the challenge in the future will be to keep them supplied with the timber they need, at competitive prices. The debate on forestry tends to centre around new planting—and there are obvious reasons why this should be so—but it must not be allowed to obscure the important question of how successfully our existing forests have supported and can support the expanding processing industries, with all they represent in terms of added value and employment. That is the crucial issue. In this connection may I say that we fully recognise the central role which the Forestry Commission has been able to play in guaranteeing the supplies of timber that have made a number of the major new investments possible. In terms of efficiency and modern practice our wood-processing industry can stand comparison with the best in the world, and the same can be said of our forests. The forestry profession by its endeavours and skill over the past 70 years or so, have brought us to the stage where we can see the pay-off in terms of rising industrial production made possible by home supplies of timber. I am confident that a considerable success story is now unfolding and deserves to be told.

So where does this leave our policy of expanding the forest estate? Am

I saying that it does not really matter? Far from it. The main justification of Government support for afforestation is that it gives a clear signal to Industry that we are planning ahead and that we intend to make sure that expanding timber supplies are available in the next century. We are saying to industrialists that they can make long-term investments with confidence, because the raw material will be there. In giving planting grants to landowners we are not wet-nursing them, as some people think; we are investing in a primary resource of importance to the nation.

I hold no brief for some of the quite unjustified attacks that are made on forestry, but I do recognise the widespread concern that forestry should not expand in ways insensitive to our countryside. We are entitled, therefore, to expect forestry to recognise this, with full regard for landscaping, nature conservation and other land use interests. These are not add-on requirements; they must be an inherent part of forest planning. These high standards will be expected in applications under the Woodland Grant Scheme. There is a great deal of guidance available—on landscaping, on nature conservation, on the need to take account of possible archaeological interest and on the care to be taken when planting near watercourses. These are but a few examples, and the commitment of Timber Growers to these standards is well demonstrated by their Forestry and Woodland Code. I would hope that all owners of potential woodlands would look carefully at their proposals and ask themselves the question, "How would they stand up if an Environmental Assessment was required?" I mentioned EA deliberately. Many people regard the development of EA as another nail in the coffin of forestry; that any request for an EA is a call to stop forestry. This is far from the case. An EA will be requested where the Forestry Commission believes that the proposals will be particularly sensitive in environmental terms. In other words that it requires the information provided by an environmental statement to enable better informed decisions to be reached. Of course it could result in the application being rejected but, equally, it could result in modifications being made and a first class scheme going ahead.

It is important to ensure that forestry takes place in harmony with other interests. By and large I think this is the case and that the consultation procedures, administered by the Forestry Commission as the Government's forestry authority, are doing their job. These procedures have been steadily improved over the years in the light of experience and we must never close our minds to change—particularly that aimed at improving confidence, effectiveness and efficiency. A case in point is the change which was introduced to allow greater public participation in disputed cases. We must ensure, however, that our resources are concentrated where they will do the most good. Bureaucracy costs taxpayers money and we must always have an eye to obtaining value for that money. The consultation procedures help to determine not only where forestry takes place but also the modifications necessary to take account of other interests.

This leads me on to say something about the relationship between

forestry and agriculture in Scotland—as you know, I have responsibility for both. Agriculture in Scotland, as elsewhere in the UK, is going through a period of major change, with various estimates being made of the amount of land that will have to be taken out of production if we are going to get on top of the problem of surpluses. Scotland is, however, caught up by these general measures to reform the CAP, without being guilty of adding much to these surpluses. That is a story for another day, but its relevance is that we intend to maintain a viable hill-sheep industry in Scotland and to continue to protect farming structures in socially fragile rural areas. I make no apology for this—quite the reverse—agriculture is one of Scotland's most important industries and it is our policy that it should remain so.

Nevertheless, there is now a new emphasis on encouraging planting "down the hill" and, although we will continue to protect prime quality agricultural land—a scarce and valuable resource in Scotland—areas of less productive arable land are now being cleared for forestry under arrangements worked out between the Department of Agriculture and the Forestry Commission. This offers exciting opportunities for forestry—opportunities for higher production, for planting a greater diversity of species, and for integrating with farming. A whole new chapter is being opened up, and one of which, I hope, many will take advantage.

Farmers themselves are being encouraged to plant trees under the Farm Woodland Scheme and the woodland provisions of Set-Aside. The Farm Woodland Scheme has only recently been launched and, while it is still early days it has attracted a great deal of interest and there has been an encouraging initial response in Scotland. The aim is that throughout Great Britain as a whole, some 36,000 hectares of planting will take place over a three year period. At the end of that time the scheme will be reviewed. All this means that farmers are now giving a great deal of thought to forestry and the multiple benefits which increased woodland cover on farms can bring in terms of shelter, landscaping, nature conservation as well as wood production. We in this country—unlike the Continent of Europe—do not have a recent strong tradition of farm forestry. That is now set to alter and I think it is a very exciting prospect. Encouragement for the planting of better land is also being given under the Woodland Grant Scheme in the form of a supplement of £200 per hectare for planting on arable or improved grassland. It remains to be seen what effect this will have but, on occasions, whole farms in the lowlands may come out of agriculture altogether and go over to forestry. I do not see this becoming commonplace but we have already seen examples of this in north east Scotland. The move of forestry down the hill will bring a double benefit—not only will forestry be allowed the use of better land but a better balance will be achieved between planting in the uplands and planting on the lower ground. Nevertheless, the Scottish uplands will continue to be the place where much new planting takes place. And a large part of this new planting will be with conifers which grow well and

can find a ready and eager market. Comparisons have been made with the uplands of England where the Secretary of State for the Environment and the Minister of Agriculture, Fisheries and Food have decided that the planting of forests consisting predominantly of conifers will not normally be allowed. Some commentators have called for a similar decision to be taken for Scotland. I see no justification for such a step. Scotland's uplands form three-quarters of its land area compared with only one-quarter in England; it is my belief that we can encourage forestry to develop further in the Scottish uplands in a way which takes the environmental interests fully into account.

As well as forestry and agriculture, I also have tourism in my portfolio. Mature, well-designed forestry schemes play their part in adding richness and diversity to the Scottish countryside. The Forestry Commission has gone out of its way to encourage people to visit and enjoy its forests, not only in creating Forest Parks—which themselves attract visitors in their tens of thousands—but by their network of visitor centres, viewpoints, forest trails and camping sites. I know that many of the Commission's sites have won prestigious awards which bear testament to their design and popularity. The visitors to Forestry Commission forests run into many millions per year. Their visits range from merely walking in the woods to those who use the Commission's commercial recreation facilities, which show a healthy return on investment. Of course the Commission has a depth of experience to call upon in encouraging public access to its forests and a high profile here has helped to bring about a wider appreciation and understanding of the multiple-role which forestry can play. In this particular area, the signs are that the private sector is prepared to play its part, but it has a bit of catching up to do, and I hope that at the very least more woodland owners will be prepared to open their forest gates to members of the public. Do not underestimate the value of attractive forests to tourism and recreation, and equally do not underestimate the benefits that tourism and recreation can bring to forestry. The public's perception of our forests and what they have to offer will matter very much in the future.

I see no reason whatsoever why forestry should not continue to expand steadily in Scotland. It is already an important industry, creating thousands of jobs and supporting a considerable amount of downstream processing, and it will become more important in the future. People still speak of the traumas of recent changes, but I am sure you are channelling your minds along positive lines. The opportunities are there and exciting new initiatives are beginning to show. Substantial Government support is in place, and now it is up to you. You cannot expect the Government to do it all for you. What I will certainly be looking for is constructive thinking on the way ahead, and evidence that the excellent opportunities for forestry in Scotland have been recognised and will be seized.

My message therefore is—you have the understanding and the encouragement of this Government—so go to it!

## DISCUSSION

*Roger Can (Chairman)*

It is the intention that we should lead the questions and discussion by a person nominated by the Royal Scottish Forestry Society from the floor and I am calling on Mr Bloomfield to do that. Mr Bloomfield comes from the other side of industry and he wears many hats but one is to represent the processing side of forestry industry.

*Mr A. Bloomfield (Caberboard)*

Chairman, I very much welcome the positive response from Lord Sanderson this morning with regards to forestry and the forest industry generally. As a processor and as representing large-scale wood processors, we are concerned regarding the loss of confidence in forestry planting in certain sectors due to the recent changes in taxation and the forestry grant situation. It is very reassuring and very necessary that Government is monitoring the situation closely. We as processors also view any possible diminution in the rate of planting for a period of X years until adjustments are made as being very negative, and the situation developing—where a window of lost production appears at a future point in time, which could cause problems to a wood processing industry. I certainly welcome Lord Sanderson's point regarding the constructive debate that ought to take place between industry and the Government and I think various processors have always been very anxious that that situation should occur. As has been indicated, the general increasing processing capacity has very much market driven the situation in the UK as one where we have a very large proportion of imports and there is ample scope for import substitution, and ridding the limiting factor to an increase in this import substitution over the next few years is really the important area of wood availability, so we come back to planting. It is very important of course to get the very clear signal of Government's commitment this morning to the industry of long term investment, with the confidence coming from the Government being instilled into the industry. I think it is very necessary that forest planting does go ahead, but importantly that it does go ahead as has been indicated taking account of other land uses and interests, and Lord Sanderson this morning has indicated a number of areas in which that situation can be improved. I am sure that as processors and also in the area of private woodlands there are improvements to be made and some initiatives to pick up. I would ask therefore that the planting situation is monitored very closely indeed and following from that that a positive response is made to the situation if it seems necessary.

*Lord Sanderson*

I think that you have raised some very important points. I am glad that you as a processor are satisfied with the line that I have taken this morning. I am very encouraged by the determination of the industry to look at the future. I think perhaps in the past the different sections of the industry have looked at the problems separately and I notice over the last twelve months there is definitely a mood to look at it as one. This gives the Government a great deal of encouragement because it can say ah! the whole industry and that means the processing industry as well as the planters are saying X or Y or whatever the things may be. However, I am only too aware, having been in industry myself, that the accurate forecasting of supply is something that one has to build one's investment decisions on and that is why, although it has been an enormous sea change decision of a budgetary nature that the Government has taken, I tried to indicate also that it would perhaps come anyway with such a sizeable reduction in the top rate of tax which would make people influence their decisions as well, but I welcome what you say. Yes indeed we shall monitor; we shall listen; we shall try to get to the right answer, but I do think that with the industry as a whole looking at the problems it faces and you knowing very

well that import substitution is something that the Government would welcome under normal circumstances that you can then say, I think this is what we can do, what will you do to help? I welcome what you say and hope you can take the debate forward in a positive manner.

*Roger Carr (Chairman)*

I now take questions and points from the floor, it would be helpful if you say who you are and who you represent and keep your points as brief as possible....

*Capt. Neil Baillie-Hamilton (Cambusmore Estate)*

I am the Regional Chairman of Timber Growers U.K. for the West of Scotland. First of all I would like to welcome the fact that Lord Sanderson is here and secondly to be very grateful that he is in fact the Minister responsible for forestry. My own member of Parliament, Michael Forsyth, has made it quite clear that he believes that all commercial forestry is to be deplored. He likes a certain amount of environmental planting of broadleaves and I spent a whole day trying to persuade him, but at the end of the day he was in no way convinced that Sitka spruce was a sensible thing to plant. Unfortunately, I am afraid that the Government's planting target of 33,000 hectares hasn't a cat in hell's chance of being met in 1989... I am not just being difficult, but the figures that we have are that there isn't a cat in hell's chance in meeting the target, moreover there isn't a cat in hell's chance of meeting half that target. We shall be lucky if 11,000 hectares are planted in 1989 and of that about 4,000 will be planted by the Forestry Commission and a large part of the remainder will be fag ends of Forestry Grant Schemes and other schemes. Can I go on just a little bit. I speak with some experience. I have been planting for thirty-two years. I have built up a forest of 4,000 acres. I shall be planting again about 250 acres in 1989 and the same again in 1990 and thereafter I cannot see myself planting at all and the reason is that for thirty-two years I have had to go to the bank and borrow money. The interest on that money was allowed against tax. It isn't just the cost of planting allowed against tax which is important; it is also the cost of borrowing. Existing landowners are not going to plant; if they were going to plant they would have done it. If people who are going to buy land and borrow money are going to plant, then with the present grant and tax structure they cannot afford to buy land and plant it.

*Lord Sanderson*

Yes, I am very interested in what you say; the lead minister happens to be the Secretary of State for Scotland and as Minister of State I have responsibility. Michael is doing other things like education and health. I know his views but of course these are personal and do not reflect official policy.

As far as your point of planting, I did in fact indicate what the direction was going to be in the immediate future but what I did also say is that it is up to the industry to try to identify how they go to the next stage, and I do think it is important that industry should do this and not get the Government to tell them how to do it each time. It happens in other industries you know.

What I am very encouraged about, and Jamie Galbraith knows much more about this than I do, is that the positive reaction of the whole industry to look at the future is very important indeed. It may very well be that what you say is true and I wouldn't dispute it, but what I would say to you is that the Government would like to see new investors, perhaps smaller investors. What are the schemes that are going to come forward? How are they going to be structured? How is one going to bring money into the industry? I do honestly think that this is something for the whole industry to look at, not least the processors.

*Mr D. W. Williamson (nurseryman, J. W. Christie Ltd., Forres)*

I would like to put to the Minister this question. I don't wear rose-tinted spectacles in this matter. This is the month of November in 1988. What message can I give to my staff for this coming year since our nursery is already stocked with the plants for this season's planting? I have heard nothing today to suggest that there is any immediate future for us. I would like to get the message across that, as a result of the tax changes, there isn't any long-term future.

*Mr Len L. Yuill (Economic Forestry Group)*

I am General Manager for EFG Highland Division. Lord Sanderson mentioned that he thought perhaps the title of this meeting was not quite right. "Scottish Forestry...the Crossroads". I think many of us thought last March it was "Forestry in a cul de sac". I think probably now it's "Forestry Danger Road Ahead". I think the changes in the fiscal arrangements with regard to the forestry were inevitable. They had to happen for all sorts of reasons. Whether they were good reasons or not, they simply had to happen. I think the problem we've got is that the system which has been set up to replace it is flawed. It simply doesn't work and the reason it won't work, it seems to me, is that there has been a total failure of those that make the decisions to understand what is necessary to make forestry investment take place. They have not taken the time to find out, and to suggest that what we should do is to take on more changes and then think about how we are going to plan for the future, is quite extraordinary. Surely, the plans should be made first and then changes introduced.

There is no doubt in my mind that there is going to be a massive reduction in planting this spring for reasons that we all understand. I am afraid I have to say I believe that the reduction in planting effort will continue for the foreseeable future until the flaws in the present newly introduced scheme are rectified.

*Roger Carr (Chairman)*

I would ask you if you could indicate what the flaws are and how you would overcome them.

*Len Yuill*

I would very much like to do that Sir, thank you. Can I just continue—there is a proposal that, in fact, planting should come down the hill. This is something which foresters have been wanting to do for years, but there is a failure to understand that there is a price which forestry can afford to pay. If we look at where this low quality arable land may come out of production and essentially it is in the North East of Scotland, an area where I am very actively involved at the moment, for all sorts of reasons which farmers will understand. In fact we are thinking of 15,000 hectares of planting in Scotland as part of the 33,000 hectares to come out of agricultural production.

*Roger Carr (Chairman)*

You are suggesting that one of the flaws is... I think it is very important to try and get these points across to the Minister in the time he has got available. One of the flaws is price, another flaw?

*Len Yuill*

One of the flaws is price, the second thing is simply availability, but the flow of land available to the forestry just doesn't exist. The third thing is that forestry investment has to compete with other investment opportunities. Liquidity for the forestry investor has always been a problem which has been overcome by other

advantages and at the moment we are in at the sharp end of industry. We should not this week be trying to promote forestry, but have programmes in the bag. However we are already finding at this time of year, as Donnie Williamson was saying, the signs are extremely bad.

*Roger Carr (Chairman)*

Thank you, I will take one more point from the floor.

*David Goss (Forestry Consultant)*

I would like to point out that we are getting a double consultation process at the moment. The schemes which are approved under FGS and went right through the consultation process are now going back under WGS following a change of ownership. There is a double consultation—it costs the taxpayers twice as much and it delays things right through and probably postpones some of this year's planting.

*Roger Carr (Chairman)*

The Minister will have the last word and we have to move on.

*Lord Sanderson*

First of all, I do sympathise, Mr Williamson, with your problems. I was in business once and overnight I lost half my income because I was on commission, and because of a take-over in the textile industry and I know very well the position that you face when there is a change as dramatic as the budget brought about last spring. What I would like to say to you, as indeed I had to say to the White Fishermen yesterday, what the Government wants to do is to ensure that there will be an industry for the future. It may be painful in the short term but what I would say to you is that, and I know you will be doing this, you will be looking at every avenue you can to enable you to stay in business and give people in forestry the employment, which you have given. I do feel that tough decisions, at times, have to be taken and I do feel, as has been spoken of already, that the tax changes which came about last March were inevitable. Quite apart from that, I do believe that if you are to support a Government that believes that people are better able to look after their own money and to invest their own money than have Governments invest it for them, then you will understand the thrust that the Government is thinking in this area, and so I sympathise with the short term considerations which you have to face. I have faced it myself, it's very painful, but I am still here; you will be still there, if you've got a business, I am sure of that.

Now as to the questions which have been raised by the speaker on behalf of Economic Forestry Group and that he says there is absolutely no chance with the price of land ex arable of getting reasonable amounts made available. I don't think he is quite right in saying that the only place you can find it is in the North East of Scotland. There are other parts of Scotland, down the hill, which I do feel offer prospects for planting and which the Government would support. I have no doubt that this is something that you will want to talk to the Forestry Commission about as Forestry Authority. I do recognise that, and I was hearing this last year, because farmers were very upset that the price of land had fallen through the floor. I do understand that you have to compete for land just like anyone else, if you wish to plant trees on it. What I do think, however, is that there will be land which is suitable for planting; there will be people, for various reasons, that will want to buy that land and I think that to take a gloomy and pessimistic view as you do may not in fact be justified in the long term.

*Roger Carr (Chairman)*

Minister, thank you very much indeed; thank you again for your speech. One message I am sure we have all got is that the rules have been re-written; we are going to have to live with them, but we've got a Government that is prepared to listen or a Minister that is prepared to listen. One of the flaws that has been pointed out is the availability of land and our next speaker, Professor Dent, the Professor of Agriculture Resource Management, School of Agriculture at Edinburgh University is going to address that problem for us.

# The Fear of Forestry

by Donald M. Grieve, FRIGS,  
former Partner in Bell-Ingram

THIS IS NOT a forestry-bashing article. Far from it. Most readers of this journal will accept that the downturn in agriculture, the main land use in Scotland, necessitates a shift of emphasis to alternative land uses. With much of the hill and marginal land below 1500w apparently suitable for the production of timber of a reasonably satisfactory quality, forestry is obviously one such alternative use. And a further diversification towards forestry, which of course has been progressing on a substantial scale since planting took off in the sixties, would seem to be a useful safeguard to the future well-being of the countryside and those who live and work in it.

Having said that, it would be wrong to ignore the fact that there is a substantial and growing undercurrent of disquiet and distrust with the current development programme not confined to the urban population. Fears arise on several grounds.

## What are these fears?

Firstly, quite a large proportion of the land suitable for the growth of timber of a satisfactory quality — and some land not so suitable — has already been planted up, and a planting programme of 30,000 hectares or 115 square miles per annum continuing apparently ad infinitum is causing forestry to press more and more heavily upon other competing uses, such as farming, sporting, conservation and tourism. The fear is that the continuing expansion of the planted areas will have an ever increasing adverse effect not only on the waders of Caithness but also on the grouse of Perthshire, the red deer of Argyll and the fishing rivers of the north and west to name but a few very important alternative uses which are largely unique to Scotland and could be at least as valuable as forestry to the Scottish economy in the long term.

Secondly, as the planting programme proceeds apace in a quite haphazard way and seemingly without any end in sight the fear is that the forestry use may become excessively dominant in Scotland in general and in some areas in particular. This may be quite acceptable whilst forestry is maintained in a prosperous state by the taxpayer but, having regard to the virtual irreversibility of the forestry use, this may lead to a dangerous situation if the forestry market should become depressed or if government financial support should be withdrawn.

Thirdly, the Government does not appear to have a comprehensive policy for land use in Scotland and thus a policy which would have regard not only to the development of forestry but also to its impact on other uses. The fear is that in this vacuum such policy as there is will be largely decided by, or on the advice of, bodies and people with a special interest in and enthusiasm for forestry, and that it will be swayed to an undue extent by the various specialist environmental lobbies.

Fourthly, although a further extension of the forestry area can almost certainly be justified on the grounds of achieving a desirable balance of land use, some of the reasons commonly put forward for expansion are at best arguable and at worst misleading. For example it is commonly stated that there will be a world shortage of timber. Suffice it to recall that but a year or two ago there was to be a world shortage of oil. And, of course, a world shortage of food to

feed the multiplying millions. And then we are told that 93% of our timber requirements are imported at an annual cost of £4.5 billion, the implication being that we could grow most of this in Scotland. But those who know about these things seem to agree that no matter how much of Scotland is given over to forestry the amount of timber products imported could not be reduced below about 75%, giving a saving of, say, £0.8 billion per annum — but at what cost? And again, great stress is laid on the creation of jobs by the timber industry and this may be true. But it should be borne in mind that large scale forestry tends to employ contracting firms from a distance, which in no way makes up for the loss to the hard pressed rural communities of the farmers and their shepherds and their families displaced by forestry. The fear therefore is that the extension of the forestry area, which can almost certainly be fully justified on the grounds of achieving a desirable balance of land use, may be sold to the taxpaying public upon the basis of arguments which are to some extent dubious.

Finally, there is the great gulf between commercial forestry, which is said to be required to meet the world shortage, replace imports and so on, and amenity forestry which a large proportion of the taxpaying public appears to prefer. Not for them the serried ranks of sitka spruce, but instead rough Constable-type hardwoods which will be easy on the eye of the Sunday afternoon motorist. There is a deep fear amongst the public that if the present trends continue much of the upland countryside of Scotland will eventually be submerged beneath a dark green blanket of sitka spruce. The government has for many years now provided substantial financial incentives to encourage the development of commercial woodlands and to convince the public that commercial timber must be grown on an economically viable basis — sitka spruce in serried ranks if necessary — it is now attempting to appease the environmentalists by giving even greater incentives for the planting of hardwoods.

For all these reasons there appears to be some confusion and distrust over the present planting programme. What seems to be required is for someone in authority in the Government, after taking advice not only from forestry and conservation interests but also from responsible representatives of all other important land uses in Scotland and from those who can advise on rural communities, to spell out in unequivocal terms the objectives of land use policy in the countryside, covering not only forestry but all other important and competing land uses. And if the forestry use is to be substantially increased, to what extent is it to be increased, who is going to advise the Government when a sufficient proportion of the Scottish countryside has been planted and what measures will be taken to ensure that other important land uses will not be adversely affected to an unacceptable extent. Only when such a comprehensive statement on land use has been made can the public be reassured that the programme of land use development has been properly thought out and that our successors will be left with a Scottish countryside with the various uses in an acceptable state of balance.

## Afforestation of the Scottish Highlands: The History and the Ecological Repercussions Highlands Under Siege: The Afforestation of Scotland and its Ecological Repercussions

One of the greatest rural land use changes in Britain has been the creation of large expanses of new forests or afforestation. While processes of afforestation have gone on throughout Britain a large proportion of the effort has been concentrated in Scotland. Tompkins (1989) writes that in 1975 after the forestry headquarters was moved to Edinburgh it was confirmed that forestry became "mainly a Scottish affair." At the beginning of the twentieth century, Scotland, like most of Britain, had largely been deforested. In 1905, Scotland consisted of only 4.5 percent forested land compared to 17 percent in 2000 (Forestry Commission, 2001). Since the early 1900's processes of afforestation have continued through to the twenty-first century despite changes in afforestation objectives, political, economic, and social climates. The following paper will discuss how large-scale afforestation in Scotland was able to maintain its momentum throughout the past eighty years and into the future and the ecological consequences that have accompanied it but have only recently begun to receive attention.

Before we can adequately discuss the history of afforestation it is necessary to discuss the structure and organization of forestry within Scotland and greater Britain. The Forestry Commission was created in 1919, after the First World War, during a time when forest cover in Britain was at its lowest. Much of Britain had been deforested in order to fuel the war effort. The Commission was created in reaction to the fact that Britain and Ireland, at the time, were the least forested countries in Europe and were almost solely dependent on timber imports for their wood supply (Mackay, 1994). The goal of the Forestry Commission was to establish strategic wood reserves in order to decrease reliance on imports in case of another war. The Commission had two main roles. It was to function as a 'forestry enterprise', which would acquire, plant and manage forested lands. Its second function was to serve as a 'forestry authority' that would administer policy instruments such as planting grants and felling licenses (Mather, 1993). The Forestry Commission was given cross-boarder public authority over all of Great Britain (including Ireland) and the legal status of a government department. It was the first state-controlled production industry (Tompkins, 1989). The powers and duties of the Forestry Commission were stated in the Forestry Act passed on August 19th, 1919. The ultimate goal of the Commission was to plant 2 million hectares of "well-managed, productive woodlands" by the turn of the century. It was estimated that 800 000ha could be obtained by restocking existing forests and the remaining 1.2 million ha would be obtained through afforestation of bare lands (Healey, 2002). The creation and structural organization would serve to shape the nature and distribution of forested lands in Britain and Scotland in particular.

The expansion of afforestation in Britain has almost exclusively been confined to uplands. Much of these uplands, especially in England and Wales were considered unsuitable for planting due to elevation, incline, infertile soil and high wind exposure (Table. 1). Therefore, planting was further restricted to only the sub-montane zone (a maximum of 500m above sea level) above which it became infeasible to plant due to harsh environmental conditions (Tompkins, 1989).

% Plantable upland Area	England	Scotland	Wales
	20%	34%	28%

Table 1: Shows the percent plantable area in the UK's uplands (Tsouvalis, 2000).

Afforestation was relegated to the uplands mainly to avoid competition with agricultural land uses, as food production was viewed as more important than forestry; and to minimize conflict with farmers (Tompkins, 1989). Furthermore, as the Forestry Commission began to acquire land, it could only afford to purchase cheap, marginal, upland areas that were dedicated mainly as grazing lands. In order to reduce the costs of forestry, the Commission also had to

carry out land acquisition at a large-scale to reduce unit costs, and the only place where inexpensive land was held in large unit ownership was in the uplands. Because Scotland had the greatest plantable land availability (34%) (Table 1); it became the obvious emphasis of the afforestation program (Tsouvalis, 2000). Afforestation in England and Wales, peaked in the 1950's and continued to press on through the 1960's, but soon after began to decline. This was partially due to high prices of land and public opposition to conifer plantations (Tompkins, 1989). The people of England were especially opposed to afforestation with conifer plantations, as their traditional landscape consisted of scattered broadleaved woodlands amongst a rolling open landscape. Finally, in 1988, the Secretary of State for the Environment announced that large-scale afforestation projects would no longer be permitted in the English highlands (Tsouvalis, 2000). Scotland became the center for the afforestation industry. However, this was not because it wanted to be there but rather because it less contentious to continue with afforestation concentrated in Scotland than to try to deal with the public opposition to afforestation in England and in Wales (Tompkins, 1989).

Afforestation was made even more appealing, especially in Scotland, by the introduction of a series of grant schemes and tax avoidance programs administered by the Forestry Commission in order to encourage continued afforestation. In 1947 a 'Dedication Scheme' was introduced to encourage landowners to enter into formal legal agreements with the Forestry Commission to dedicate part of their lands to forestry for use in timber production in exchange for grant aid (Tsouvalis, 2000). Tax concessions were also offered by the Forestry Commission in exchange for legal agreement by landowners to conduct forestry on part of their land. This tax concession was the driving force for afforestation in Scotland throughout the mid-20th Century (Tsouvalis, 2000). Forestry was normally taxed under income tax Schedule B. Under Schedule B, no taxes were levied on income received from timber sales, or on any grant money received for forestry from the Forestry Commission. Moreover, landowners had the option of being assessed under Schedule D. Under Schedule D loans taken to buy land for forestry were interest free. Any capital spent on forestry building (i.e. road and fence building) could also be offset against other income at a rate of 4 percent per year under Schedule D (Tompkins, 1989). The benefits of these tax concessions attracted many investors to forestry (i.e. Pension funds, corporations, new afforestation companies). The tax concessions had provided a tax loophole. First, investors would take advantage of the system by having, the money invested to purchase land for afforestation, assessed under Schedule D. Then the ownership of the land would be transferred to a spouse or child once it reached the productive stage and was reassessed under Schedule B. This was done in order to avoid paying tax on the profits that might come out of the forest once it reach the productive stage (Tsouvalis, 2000). Investors were not really interested in forestry or rural development rather they were seeking a means of tax avoidance on income they had generated elsewhere (Tsouvalis, 2000). Finally, the 1980 House of Commons Public Accounts Committee felt that forestry subsidies should not be "left to the fortuitous consequences of the exploitation of a tax loophole" (Tompkins, 1989). In 1988, the income tax advantages of tax concessions were discontinued (Mather, 1993). A new Woodland Grant Scheme was introduced which offered more grant aide; however, this scheme was not as financially appealing to investors as the tax concession and the end result was a drop in planting rates (Mather, 1993).

Changes in economic, social and political climates were not significant enough to totally halt afforestation of Scottish uplands so planting pressed onward. Annual planting rates have fluctuated throughout the afforestation process. The original target rates for Britain were 20 000 to 25 000ha per year. In March 1986, the annual planting target was increased to 30 000ha per year, and further increased a year later to 33 000ha per year (Tompkins, 1989). Table 2 shows Scotland's share of the new plantings taking place in Britain over the years.

Years	Forestry Commission	Private Sector
1950	48%	NA
1960	58%	NA

197181%74%  
 198090%83%  
 199099%80%

Table 2 : Scotland's share of new plantings in Britain (Mather, 1993)  
 From these figures it is clear that afforestation became "mainly a Scottish affair" beginning especially in the 1970's through to the 1990's where virtually all of the afforestation being done in Britain is taking place in Scotland. Much of this afforestation has been conducted in the Scottish highlands (Healey, 2002).

Not only did planting rates fluctuate throughout the process of afforestation, but so did the ratio of conifers to broadleaves planted. The native vegetation in Scotland was composed mainly of mixed oakwoods in lowland areas, pine dominated the highland regions and birch was found in the far north (Mather, 1993). Figure 1 shows the shift in species choice between the 1950's to the 1990's. The planting of other or exotic conifers increased dramatically from the 1950's through to the 1980's. Only beginning in the 1990's has there been a rise in the planting of broadleaved species.

Figure 1: Shows the shift in species choice between the 1950's to 1990's (Forestry Commission, 1998)

Species	Forestry Commission (%)	Private Sector (%)	Total Area (ha)
Conifers	99	80	765 633
Scots Pine	12	24	144 371
Lodgepole Pine	17	61	103 924
Sitka Spruce	52	31	364 601
Norway Spruce	7	6	54 707
Jap/Hybrid Larch	7	6	52 146
Broadleaves	1	2	76 567
Oak	1	1	16 551
Beech	<1	3	10 496
Birch	<1	1	16 647

Table 3: Scottish forested land area by species and ownership. Based on Forestry Commission census 1980 (Mather, 1993).

An account of the history of the British Forestry Commission makes reference to the major species planted in the afforestation process. Paradoxically, the Forestry Commission started out by planting the upland areas using the only native timber producing conifer- the Scots Pine (*Pinus sylvestris*). The species was widely used for its tolerance of harsh soil and site conditions. The Scots pine fairs relatively well compared to other softwoods on less fertile heather moors, which characterized the upland environment along with acid bogs (Healey, 2002). However, from the figures in Table 3 it is clear that the forestry commission decreased its use of the native conifer in favor of exotic varieties that were faster growing. The exotic, Sitka spruce (*Picea sitchensis*), was the overwhelming species of choice for afforestation of Scotland's highlands both in the public and private sectors (table 3). Approximately, 10 000ha of Sitka spruce were planted annually by the Forestry Commission throughout Britain (Mather, 1993). This exotic conifer owed its popularity to its ability to tolerate acid peats and heathy vegetation and for its ability to resist damage from exposure experienced at high elevations (Healey, 2002). Lodgepole pine (*Pinus contorta*) was another exotic species used in the afforestation of the Scottish uplands. It was planted extensively on poorer sites; however, it was less widely used compared with Sitka spruce due to its susceptibility to pest outbreaks (Mather, 1993). Other exotic conifers such as Japanese and Hybrid larch were also used in the planting of hillsides but to a much lesser extent. Hybrid larch, in particular, could not be planted extensively due to limited seed availability (Healey, 2002). Norway spruce was not used very much in afforestation although it is fast growing and a useful timber species. This is because it was much more sensitive than Sitka spruce and could not tolerate acid conditions or severe exposure both of which are prevalent in the highlands (Healey, 2002). Broadleaves were rarely planted by the Forestry Commission and

only slightly more so by the private sector (Table 3). This was because throughout most of the afforestation process timber production was the primary focus and broadleaves are typically much slower growing than conifer species. A recent trend towards the planting of more broadleaves illustrated in Fig. 1 reflects a significant underlying change in the objectives of afforestation. More recently, the focus on timber production has decreased in favor of trying to restore some of Scotland's natural heritage.

The landscape of the Scottish highlands is harsh, consisting mostly of heather moor and acid bogs. Afforestation of these areas typically involved drainage of peatlands and deep ploughing (60-90cm) (Tsouvalis, 2000). Trees would be planted in the upturned mounds of soil created by ploughing. Planting of trees was closely spaced (1.8 – 2.4 meters) and each site was planted to full stocking (Tsouvalis, 2000). Sites were fully stocked in order to reduce exposure and damage from windthrow. Application of herbicides, pesticides, fertilizers and phosphates was done via aerial sweeps (Mather, 1993). At the end of the first rotation, trees were harvested using the clear-cut method and the site was replanted once the area had been cleared (Tsouvalis, 2000). The following section will describe the ecological impacts of afforestation on the Scottish highlands as a result of the species planted, planting location and planting methods used.

The striking change to the Scottish rural landscape created through afforestation could not be achieved without leaving a, perhaps, irreversible mark on the natural environment. The process of afforestation has severely altered the hydrology of the highland ecosystem and that affects part of the watershed further downstream in lowland areas. As ploughing and draining of upland soils takes place during the process of afforestation, the rate of run-off tends to increase. Streams and rivers fed by headwater areas undergoing afforestation have experienced more irregular water flows. Flows tend to peak during a rainfall event due to run-off from uplands but quickly dissipate leaving lower than normal base flows in downstream areas (Tompkins, 1989). Furthermore, the amount of exposed soil and peat caused by ploughing results in increased sediment deposition in streams and lakes (Tompkins, 1989). A study by Robinson and Blyth (1982), as cited by (Tompkins, 1989), found that during drainage operations, the sediment loaded into streams was 50 times their original levels. Moreover, it took several years for the sediment loading to decrease to only 4 times the original amount of sediment loading experienced by downstream areas. Increased sediment loading destroys the spawning grounds of fish (Tompkins, 1989). Conifer plantations have also been shown to pollute watercourses. Conifer foliage has the ability to trap atmospheric pollutants on their leaves such as those in acid rain. As the needles fall to the ground and are washed by a rainfall event, these pollutants are washed into the streams. The headwaters of the Severn and Wye rivers have shown a 14 fold increase in acidity (Newson, 1985). Increased levels of acidity in waters adversely affect fish populations such as salmon and sea trout (Tompkins, 1989). In the river Fleet in Galloway, which is heavily forested, salmon populations were reported to have been reduced by one third and sea trout catches were drastically reduced within a decade (Tompkins, 1989). Finally, it is inevitable that the levels nitrogen, potassium and phosphorous in fertilizers used in conifer plantation forestry will enter watercourses and their concentrations will increase. This may result in eutrophication problems further downstream. Pesticides that are also used will make their way into streams contaminating them further.

Afforestation has also destroyed a lot of the peatland communities of the Scottish highlands. Draining of peatlands cause disappearance of wetland species such as sundew, butterwort and bog bean. Those that survive are quickly eliminated once plantations reach the thicket stage where they shade out ground vegetation (IPCC, 2001). It has been found that even after a clear-cut the original ground vegetation does not return rather species adapted to human disturbance move in such as brambles, foxgloves and rosebay willowherb (Tompkins, 1989). This is the result of the hydrology of peatlands being so severely altered by forestry practices. Native peatland bird assemblages have also been adversely affected by afforestation, although different species are affected to different degrees. Peatland birds tend to disappear as soon as plantation forests reach the thicket stage 10-15yrs when all semblance of the

former peatland habitat is destroyed (IPCC, 2001). In fragmented areas where plantations that are adjacent to residual peatlands, the plantation forest tends to attract predators such as foxes, carrion and hooded crows. Although these animals require a woodland habitat they rely on ground outside forests (e.g. adjacent boglands) for food. As a result, waterfowl, which use bog pools for nesting, and other moorland bird species are severely affected by this increased predation (IPCC, 2001)

Afforestation represents one of the most significant rural land use changes in Scotland's. The above discussion it is clear that afforestation within Scotland especially in the highlands has become so ingrained in the Scottish psyche that despite changes in political, social and economic factors, afforestation has maintained its momentum for over eighty years and it will most likely continue on well into the future. However, afforestation has not come without ecological repercussions to both the physical and natural Scottish environment. It has only been recently that such environmental repercussions have come to the forefront. The question is will past forestry practices continue into the 21st century or will Scotland and Greater Britain take responsibility for their actions and begin to bear the true costs of trying to reclaim their forests?

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