nothing subtle about clearfelling — and they can also see smoke out of the top of sawmills and pulp mills, and observe the sludge pools. They can also experience on a daily encounter logging trucks driving too fast. These are all important observations to be addressed by the industry if it wants to appear more understandable as well as being understood.

Fifthly: how effective has the forest industry been in enhancing its image and improving public understanding of the process? I'd give it 43 out of 100. To really compete in a new age, pluralistic society it needs to address some of the perceptions posed in my third question regarding forestry investment. It will all come off the bottom line but you'll have to mix up the plantings, log more carefully, drive slower, knock out pollution, support community projects, employ more women and generally exhibit caring attitudes. Plantation forestry is actually a winner in the new age — it's even "high fibre". You could do a lot better on this one. Credit where it is due — a company like Tasman has made some very enlightened decisions with respect to community projects under the Tasman Accord. These have been very real and appreciated moves.

My sixth and final point concerns wilding pines. I want to make a plea for keeping pines in their place. Pines have spread from plantations across the high country and the great deserts of Rangipo and Mackenzie, in the process creating unacceptable visual and ecological damage. Wilding pines on the South Island high country, for example, are both an aesthetic and threat to important ecological areas. I believe forest owners should accept some responsibility for preserving the character of the surrounding landscape by controlling wilding pines. Similarly the encroachment of pines from plantations into conservation areas (the Nelson Mineral Belt is one of many local examples) is a continual source of public annoyance and concern at the speed with which they are spreading. It seems to me that this spread is simply accepted and that DOC is expected to expend public money to remedy a problem created by the private sector. Landowners and exotic forest owners could definitely do more on this one.

Critique — Economics and Ethics: approaches to sustainable forest management

In his paper on sustainable forest management, S.D. Richardson (1994) makes several provocative remarks about, and interpretations of, economic theory and its application to his central topic. This note is one economist's reaction. A caveat: as will perhaps become obvious, I am not a forester, a forestry economist nor even an economist specialising in natural resource issues. Rather, I am a neo-classical micro-economist and my reactions are from that perspective. My overall position is that I agree that the application of economic analysis to the very difficult practical problem of forest management has its shortcomings. However, I do not think that these shortcomings have implications for economic theory that are significant as the author seems to believe, nor am I convinced that there are alternatives that suffer from fewer practical problems. The following remarks respond to Richardson's points in roughly the order in which he raises them. Unless otherwise noted, all quotations are from Richardson (1994).

In the very first paragraph he writes: "It is the preoccupation of economists with the short-run ...". True, the Keynesian model is a short-run macro model, but to pick that out and thence generalise to economics as a whole is like citing Lamarckism as a preamble to, "it is the preoccupation of biologists with the length of giraffes' necks ...".

"An implicit value judgement in classical cost benefit analysis is that irreversible consequences of action are no more important than if reversible." I suppose the word "classical" gets Richardson off the hook here, but the statement is simply not true of modern economics. As a fine example, see Dixit and Pindyck (1994) for a reworking of the theory of business investment in the light of irreversibility, using modern option pricing theory. In fact, the application of option pricing to non-financial contexts is increasingly widespread and what Richardson may be observing is the lag-gardness of economists practitioners behind theoretical developments.

A small historical note: the "Ricardian capitalist concept" Richardson notes as being close to the Marxist notion that natural resources have no economic value until there is a labour input, is more than close. The classical Ricardian model is exactly a labour theory of value. I know of no reputable economists who have expounded such a thing in the last 40 or 50 years. It has even been suggested that Ricardo's choice of such a model, in 1817, was not from any conviction about the labour theory of value, but rather because the model's implications are extraordinarily clear — one of his prime intentions was to mitigate against the Corn Laws, the main beneficiaries of which were powerful landowners, and he chose his model, so the argument goes, precisely because there are no losers from free trade in such a model.

Regarding Knetsch's comments on some differences between people's behaviour in practice and in economic models, the notion that discount rates are not constant over time is hardly going to upset any carts in the temple. Constancy is a convenient assumption but it is not an implication of theory in any way, nor is it a necessary part of the economic canon at all. I don't think that demonstrating that discount rates vary over time presents an "anomaly" of any sort. Two other points on this. First, Richardson cites Goddard and Leduc (1987), "even ... inaccurate estimates of environmental benefits and costs are better than none, because the alternative is to assume implicitly that these benefits and costs are zero."

Similarly, the notion of fluctuating discount rates may be appealing on the basis of introspection and experiment but, in practice, how does one determine the appropriate time-path for discount rates? If a project has high up-front costs but delayed benefits, a path of increasing discount rates will likely reject it, whereas one of decreasing rates might accept it. The alternative to constancy, one fears, is a pattern that supports the conclusion the analyst wishes to reach. Second, the issue of the appropriate discount rate is really only significant over the very same short-run that Richardson decries as being economists' myopic preoccupation. The reason is simply that costs or benefits occurring well into the future are substantially reduced by discounting, so the effect of using different discount rates is lessened. To illustrate, suppose I have a project with an up-front cost of $150 but a (certain) benefit of $10,000 that accrues in 50 years. If we assume a constant discount rate of 10 percent, this project is unattractive: the present value (PV) of the future benefit is less than $86. Suppose,
however, that we believe a discount rate of 10 per cent is appropriate for the first 40 years of the project, but thereafter we should use a discount rate of 5 per cent. While the PV of the project’s benefits rises to a little under $136—the project is still unattractive. This is a contrived example, of course, and there will be cases where changing discount rate time paths will be quite significant. However, the example does illustrate that changing discount rates even quite dramatically (here we cut the discount rate in half for 10 years) may not have as much impact as one might at first expect (here it increased the PV of a future $10,000 by only $50).

Similar remarks apply to the fact that the so-called “equivalent variation” and “compensating variation” for a change can vary dramatically—the only implication of theory is that they will be close for small changes and this is borne out in practice.

Regarding alternatives to current practices, I am rather confused by the practical implications of the Safe Minimum Standards (SMS) approach. Presumably there are decisions to be made in determining the SMS and one suspects that those involved with the process have around exactly the same criteria that are currently discussed—effects on livelihoods, values (financial and other) of preserving diversity, etc. That is, SMS does not seem to avoid any of the tricky trade-offs that are the source (quite appropriately, to my mind) of much angst over environmental policy.

Finally, the remarks regarding Lady Thatcher seem to dismiss the free-market approach to environmentalism. But the discussion of the Chinese experience with plantation forestry seems to acknowledge that an increased degree of “ownership” of a resource can do wonders for peoples’ incentives to maintain it. Although Richardson argues that China’s greatest achievement is providing “security of tenure without ownership” (my italics), his discussion suggests that it is uncertainty about that tenure that is the greatest threat to sustained forestry, an uncertainty that could be resolved, presumably, by tighter property rights (as acknowledged in the first of the three “fixes” called for in the State Council decision of 1981). One of last year’s Nobel winners in economics was an economic historian who, amongst other things, did some work on the economics of slave ownership. In a finding that was, naturally, highly controversial, he suggested that the material well-being and day-to-day comfort of slaves could be higher than their coeval wage earners. The reason was that their owners had every incentive to think about their long-term health and welfare, as opposed to employees of hired workers who suffered little if any economic interest in the survival of elephants (as opposed to an interest simply in harvesting illegal ivory) might be better, and more cheaply, preserve herds than outright prohibitions on killing.

In conclusion, while Richardson suggests that neo-classical economics is fundamentally flawed in its application to the environment, I disagree with the use of the word “fundamentally” and think that part of the problem may be that the practitioners of economics in this setting lag somewhat behind developments in economic theory. (Of course, this is not unique to environmental economics as a subfield, nor is it unique to economics as a discipline). Further, I do not see the practical significance of alternatives to current approaches, in particular the peculiar notion of a “new paradigm” of ecological economics. My suspicion is that the search for a “unified field theory” in this area—a grand theoretical paradigm that melds existing approaches and methodologies—is futile and of little value (and truly a case of filling a much-needed hole in the literature). I concur fully with Richardson’s concluding quotation suggesting that modern science (and I include economics here) is not the sole answer to successful and sustainable ecological management. I do feel, however, that it is likely to be a significant part of the answer and would caution against rejecting economic insights completely.

References

Professor M.D. Richardson, Department of Economics, Georgetown University, Washington DC 20057 USA

Recent developments in British Columbia forestry

Controversies and struggles over timber harvesting and forest land use continue in British Columbia (B.C.). The province has about 25 million hectares of commercially designated forest land out of 60 million, nearly all in public ownership. About 60% is in mature or ‘old growth’ age class, mainly in valuable conifers. As more federal conifer mature timber is tied up in the western US, the value of B.C. sawtimber has increased sharply. The current harvest of about 80 million m³/year on about 180,000 ha from 5000 to 6000 separate cut blocks generates about $14 billion a year. The B.C. Ministry of Forests is mandated to practise sustained yield. It is faced with the long-term problem of attempting to balance age classes in natural, usually virgin, forests, composed of old trees, often at high risk of loss, while meeting multiple-use objectives—a very difficult task!

Under the Social Credit Government a

Forests Commission was formed whose report and recommendations have been largely ignored by the current NDP Government. In coastal forests the low elevation forests were the first to be cut. As old growth reserves shrank, pressures to set aside more old growth from logging have escalated. Public response to large-scale clearcuts has been negative. Environmental pressure groups (Sierra Club, Western Canada Wilderness Committee, Greenpeace, Friends of Clayoquot) have mounted vigorous campaigns to reduce harvest rates, reduce or ban clearcuts, create more parks, preserve old growth and rationalise land use. Greenpeace has attempted to convince European customers to boycott B.C. timber. Clayoquot Sound, on the West Coast of Vancouver Island, became a focal point for national attention as over 800 people were arrested in 1993 as they blocked approved logging.

For public lands management plans