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Preserving Old-Growth Forest Ecosystems: Valuation and Policy

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ABSTRACT: If valuation processes are dualistic in the sense that ethical values are given priority over instrumental values, and if old-growth forests are considered to be valuable in their own right, then the cost-benefits approach to valuing old growth is inappropriate. If this is the case, then ethical standards must be used to determine whether preservation is the correct policy when human material needs and ecosystem preservation are in conflict. Such a standard is suggested and evaluated in the context of the policy debate over the preservation of spotted owl habitat in the Pacific Northwest region of the U.S.

KEYWORDS: Environmental ethics and economics; old-growth forest policy; valuation of ecosystems

How should old-growth forest ecosystems be valued and what specific policies should be instituted for preserving or exploiting old growth? In responding to this question, many economists would argue that the appropriate framework for valuing old growth should be cost-benefit analysis. If the benefits of preservation exceed the cost, preservation should be undertaken; if not, old-growth forests should be exploited. However, if ecosystems are valuable in their own right and for this reason have moral standing, then the cost-benefit approach may no longer be appropriate. Individuals giving testimony in congressional field hearings on the preservation of old growth in the Pacific Northwest section of the United States have over the past 40 years increasingly expressed the view that old-growth forest ecosystems are valuable in their own right and are of moral concern.

A central goal of this paper will be to argue that cost-benefit analysis is an inappropriate valuation criterion when individual old-growth ecosystems are viewed as morally considerable. The essence of the argument will be that cost-benefit analysis treats old-growth ecosystems as instruments that provide utility to human beings, and that this is inconsistent with viewing old-growth as having value in its own right. Instruments can have a price, but moral beings are priceless.

Rejecting cost-benefit analysis as a valuation criterion does not solve the issue of whether or not old growth should be preserved. It simply re-casts the problem as a moral dilemma. Should old growth be preserved and those who would gain their livelihood from its exploitation be harmed? Or, should such harm be avoided through the exploitation of the ecosystem? For a concrete approach to policy in the case of old growth, or any other ecosystem preservation issue, an ethical standard is needed to resolve this moral dilemma. The final goal of this paper is to suggest such a standard and to offer possible measures for implementing it in the case of old-growth ecosystem preservation in the Pacific Northwest.

THE CYCLE OF VALUATION

The valuing of forests has historically gone through a cycle. Prior to European contact, Pacific Northwest Indians appear to have treated nature generally and forests specifically with deference and respect, and to have exercised restraint in their exploitation of nature's resources. European settlers, on the other hand, looked at Pacific Northwest forests in instrumental terms and were primarily interested in harvesting the wealth of timber the forests provided or in clearing them away for agriculture. Timber harvesting since settlement has resulted in the elimination of old-growth forests containing very large trees, some of which were more than 600 years old, the replacement of old growth with young stands permitted to grow no older than 40-90 years prior to harvesting, and the disappearance of a biologically unique old-growth ecosystem type. With the relative decline of the timber industry beginning as early as the 1930s, a strict adherence to an instrumental evaluation of forests solely for the wood fibre they contained was no longer an economic necessity. With declining timber dependency in the Pacific Northwest, alternative views of old-growth forests became possible, and a movement to preserve wilderness and old growth emerged (Booth, 1994).

In the beginning years of this movement, wilderness and forests were seen to be instrumentally valuable as recreational resources; as places for the enjoyment of natural beauty, solitude, and spiritual reflection; and as watersheds and habitats needed for the preservation of valuable species, such as the salmon. Later on, wilderness and old-growth preservationists also began to see forests and the species they contain as valuable for noninstrumental reasons, and, in addition, they began to look upon forests as ecological wholes and to see that the preservation of whole ecosystems is necessary for the continued health of all living species including human beings (Booth, 1994, 173-224). Specifically, old-growth forests were recognised as having unique ecological characteristics that supported dependent and increasingly endangered species, such as the northern spotted owl and the marbled murrelet. The dominant feature of old growth is its large, old trees, ranging up to two metres in diameter and 80 metres

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in height. These large trees, whether dead or alive, or standing or downed, serve unique ecological functions and provide habitat for a wide range of species. Large Douglas fir with broken tops provide nest and perch sites for spotted owls, snags provide homes for cavity nesting birds, and downed logs in streams create the pool and riffle habitat favoured by juvenile salmon and trout (Franklin et al., 1981). Many old-growth preservationists by the early 1990s looked upon forests as valuable in their own right and valuable as a part of an ongoing evolutionary process from which all life has emerged. Like the pre-settlement Pacific Northwest Indians, preservationists now want to see nature treated with respect and restraint.

What does all this mean for the question of how old growth should be valued in the modern world? Should we use the cost-benefit approach suggested by economists in valuing old-growth forests and in deciding whether they should be cut or preserved? Or, should we use some sort of ethical principle in this decision, and if we do, how do we ethically compare old-growth forests and spotted owls with the livelihood of timber industry workers? The first step in answering these questions will be to consider the cost-benefit approach as a valuative procedure. The limitations of cost-benefit analysis will suggest the need for an ethical standard in valuing old-growth forests. The second step will be to describe and evaluate a holistic environmental ethic applicable to resource decisions, such as the issue of old-growth preservation. The final step will be to address the issue of the need to mitigate the human costs of old-growth preservation in order for it to be a valid ethical choice.

THE ECONOMIC APPROACH TO VALUING OLD-GROWTH AND ITS LIMITATIONS

The economic justification for harvesting old growth is relatively simple. Old-growth forests are decadent in the sense that increments to woody biomass through growth are offset by death and decay of trees and tree branches. Also, old-growth timber is highly valued because it is contained in large trees that produce high-quality, defect-free wood. Old-growth forests thus have large volumes of valuable wood, but additions to wood volume are no longer occurring. Young forests, however, add wood at a comparatively high annual rate up to approximately 100 years of age. Consequently, to maximise the amount of woody material available for human use, old-growth forests should be harvested and converted to managed, even-aged forests that are harvested every 40 to 90 years. By harvesting old-growth now, there will be an initial pulse of high-quality timber and then, after a 40-90 year gap, a steady flow of timber production in the future. By leaving old-growth forests standing, there will be no net production of new wood, the standing wood will go to waste, and future timber flows from managed second growth stands will be foregone (Dowdle and Hanke, 1985).

If attitudes toward forests are strictly instrumental and the only instrumental value in forests is wood, the above analysis would be sufficient. However, when other instrumental values are recognised in old-growth forests, the analysis needs to be expanded. Such values, as previously noted, could include hunting, observing, or photographing wildlife that find habitat in old growth; hiking, scenic observation, and scientific research; and the storing of genetic diversity and exotic compounds for society's future use. An example of the latter is the recent discovery that taxol found in Pacific yew bark and needles can be used for the treatment of cancer. These uses of old growth are not normally obtainable through market transactions and thus require public sector intervention to assure their supply.

To determine whether the economic value of these uses of old growth in a preserved state exceeds the value of timber harvesting requires a method of evaluation that mimics the assignment of value in normal market processes. Natural resource economists have devised an approach called the contingent valuation method involving the use of surveys to estimate the amount individuals would be willing to pay to preserve specified amounts of natural areas, such as old-growth forests. These surveys are constructed as carefully as possible so as to elicit reasonably accurate, unbiased responses. Additional old-growth forests ought to be preserved under the contingent valuation and cost-benefit methodology so long as the total of society's willingness to pay for preservation exceeds the present value of added land in timber production. To the extent that values, such as preserving old growth for future generations or preserving old growth for itself, motivate willingness to pay, the willingness-to-pay criterion could be said to have an ethical content. However, this approach, as we will see, is not equivalent to the application of an environmental ethic.¹

Some of those who favour the preservation of old growth do so on the grounds that it is valuable in its own right (Booth, 1994, 173-224). To make this claim is equivalent to a moral commitment to preserve whatever it is that has this kind of value. Given such an attitude, the moral sphere not only encompasses human beings, but the world of nature as well. To view old-growth forests as morally considerable is to be committed to their continued existence and well-being even if they will never be observed or provide any kind of benefit flow. The idea of commitment goes beyond the notion of utility interdependence, implying an abstract commitment to a being of a particular kind, not just to an arbitrary individual that happens to generate a sympathetic emotional response (Sen, 1977; Etzioni, 1986). Judging some being outside the self, such as spotted owls or old-growth forests, as morally considerable is the ultimate altruistic act, suggesting a willingness to defend that being's existence and make personal sacrifices in the process without expectation of reward. Given the logical possibility that natural entities are morally considerable, what are the consequences for the economic approach to valuing the natural world generally and old-growth forests specifically?

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The standard goal of cost-benefit analysis is to discover those allocations of natural resources that will maximise net benefits. When net benefits are maximised, those who receive benefits in excess of costs will be able to compensate any losers (who experience costs in excess of benefits) and still be better off than if resources were not efficiently exploited. This is the central justification for seeking the net benefits maximising solution. Once a morally considerable nature is admitted, however, compensation for losses is no longer possible where a particular resource allocation results in the destruction of something in nature that is held to be morally considerable, such as spotted owls or an old-growth forest. Neither the destroyed entity nor the moral agent who holds that entity to be worthy of moral consideration can be compensated. If one holds, say, the spotted owl as a species to be of moral concern, it is obvious that the species itself cannot be compensated for its destruction. If it could, the moral problem would disappear. If the moral agent could be compensated, the moral problem would also disappear, at least for the moral agent. However, a moral agent cannot be compensated in the form of instrumental values for such a loss, as we will now see.

A moral position is a commitment to some end that is not readily given up by the holder. A true moral position cannot be bought off in exchange for something of instrumental value (Etzioni, 1986, 168). Attaining a moral end is always preferred to not attaining it no matter what the level of income received for instrumental uses. In other words, no increase in income is sufficient to render the individual indifferent between the income gain and the loss of a moral end. Indifference between a moral end and an instrumental value is ruled out, and compensation for the loss of a moral end is not possible. A wedge is driven between personal well-being and moral choice.² If I view old-growth forests as morally considerable, then there is nothing of instrumental value you can give me to convince me to alter my position. Moral ends are commensurable, but moral ends and instrumental values are not, except to the extent that instrumental values can be a means of achieving moral ends.³ If I control the fate of old-growth forests, then no amount of money would convince me to permit them to be destroyed, unless doing so allowed me to achieve some more highly ordered moral end. Even if the latter were the case, it would not really be a form of compensation because it would force me into a moral dilemma, to choose one moral end over another. Even though they are commensurable, moral ends are traded one for the other with great reluctance.

In using cost-benefit analysis to determine the disposition of a publicly owned, exploitable natural resource such as old-growth forests, the normal procedure would be to determine the sum total of the public's willingness to pay to have the resource preserved or willingness to be compensated for the exploitation of the resource, and then compare that with the market value of the exploited resource. Willingness-to-pay is the maximum payment the public is willing to make for preservation of the resource and assumes the public has no

prior right to use the resource. Willingness-to-be-compensated is the minimum amount the public is willing to accept for giving up the resource in a preserved state and presumes a prior right of use. If the market value of the exploited resource is larger than willingness-to-pay and if no prior use right is judged to exist, then the resource should be exploited rather than preserved. If there is a prior use right for the preserved resource, then the market value of the exploited resource would have to be greater than the willingness to be compensated for cost-benefit analysis to support exploitation. If preservation is perceived as an instrumental value, then the maximum payment by each individual to preserve the resource in the willingness-to-pay case leaves the individual indifferent between preservation and the higher income level in the absence of the payment. In the willingness-to-be-compensated case, the minimum acceptable level of compensation leaves each individual indifferent between preservation and compensation for exploitation.

If preservation is instead a moral end, in the willingness-to-pay case the individual is willing to sacrifice income up to some maximum amount where other moral ends take precedence, such as the survival and well-being of one's self and one's family.⁴ If preservation requires such a payment, then the individual will be rendered worse off by the resulting loss of income, being forced in effect to pay tribute in order to preserve something that ought not be valued in instrumental terms (Kelman, 1981). If exploitation prevails because payments offered for preservation are insufficient, those holding preservation to be a moral end will be rendered worse off and cannot be compensated for their loss. Remember, moral ends cannot be bought off by instrumental values. The question of a prior right of access is moot because access is irrelevant to the attachment of moral considerability to a natural entity. Thus, the normal procedure of cost-benefit analysis cannot yield a solution where some can be made better off without making others worse off; resource exploitation will always cause someone to be worse off where at least one person views the resource destroyed to be morally considerable. In the willingness-to-be-compensated case, if the natural entity in question is morally considerable, then there will be no acceptable level of compensation, and the costs of resource exploitation cannot be defined. Again, moral ends are not exchangeable for instrumental values.

To summarise, whenever anyone views old-growth forests or any other entity in nature as morally considerable, the premises of cost-benefit analysis are violated. Cost-benefit analysis cannot be legitimately applied. In recent testimony on whether to preserve or cut old-growth spotted owl habitat in the state of Oregon (USA), a significant proportion of those favouring the preservation of old-growth were found to do so on noninstrumental and ethical grounds.⁵ Consequently, cost-benefit analysis is not the right approach to use in evaluating whether old-growth forests ought to be preserved or cut down. The cost-benefit approach presumes that everything in nature, including old-growth ecosystems,

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is an instrument capable of being valued through quasi-market processes. To place morally considerable entities in the flow of commerce or to value them through quasi-market processes is essentially to treat them as instruments or things. Much as those who hold human beings to be morally considerable object to the institution of slavery, those who hold the natural world to be morally considerable object to its being placed in the stream of commerce and treated strictly as an instrument. Cost-benefit analysis is designed for the allocation of instrumental values; ethical standards of conduct are needed for decisions involving anything deemed to be of moral concern, including old-growth forests.

THE ETHICS OF OLD-GROWTH FORESTS

Human ethics deals with the human individual. The focus of moral concern is the individual, not groups of individuals or society as a whole. Societies and cultures in the context of human ethics are evaluated on how well they treat human individuals. In his book *Respect for Nature*, Paul Taylor (1986) extends the idea of an individualistic human ethic to encompass the whole of the natural world. He does this by arguing that all biotic organisms, like human beings, have goods of their own and are teleological centres of life. Given an attitude of respect for nature, and given that all organisms in nature have goods of their own and as a consequence are intrinsically valuable, all such organisms are morally considerable and should be treated as ends in themselves. The good of a spotted owl or a Douglas fir can be discovered through observation of their life cycles, and human beings can thus learn how to act in ways that preserve and promote the good of those organisms (Taylor, 1986, 60-80).

The central limitation of an individualistic ethic is that nature is not always very kind to individual organisms. The sick and the weak are culled from deer populations by predators; Douglas firs are often destroyed by fire or disease; rabbit overpopulation may be resolved by a hard winter and starvation; millions of salmon fry emerge each year, but very few make it to adulthood. These events, however, may function to preserve life in the longer term. Douglas-fir snags and downed logs become the source of life for a variety of organisms; natural limits on deer and rabbit populations reduce habitat damage; reproductive strategies involving a large number of offspring are an adaptation to harsh and constantly changing environmental conditions. Ecosystems function to protect their own integrity, not necessarily the well-being of a particular individual organism. Human societies, on the other hand, often function differently. Even where overpopulation may be a problem, the natural human inclination is to supply the starving with the food they need. In human society, the concern is generally with the well being of individuals. In the world of nature, priority is given to the preservation of the ecosystem and the species as opposed to the individual organism.

This suggests that a holistic ethic may be more appropriate in the case of natural systems than an individualistic ethic.⁶ While preserving the full life cycle of all individual organisms is probably an impossible task, we can attempt to preserve the well-being of ecosystems and species (Booth, 1992). Wilderness and old-growth preservationists have justified their position, with increasing frequency over time, by arguing for whole ecosystem preservation (Booth, 1994). Because an old-growth, Douglas-fir forest is disturbance generated, a holistic ethic is more appropriate than an individualistic ethic. In order to perpetuate old-growth Douglas fir, patches of forest will have to be opened up to sunlight in order to allow shade-intolerant Douglas-fir saplings to flourish. If fires are not allowed to play this role, some artificial form of disturbance will have to be employed that will destroy individual organisms.

A holistic environmental ethic, like any other, needs a philosophical underpinning. Preservationists themselves often refer to human membership in the larger biotic community, as did Aldo Leopold, or to our common origin with other species in the evolutionary process as the philosophical basis for their views (Leopold, 1966; Callicott, 1989). They hint at the idea that we should as a consequence feel a sense of identity with whole ecosystems and the evolutionary processes that created them, and for this reason should project noninstrumental value onto them and treat them with moral concern. We find that we have an 'evolutionary kinship with all living things' and for this reason judge that the processes that create life are valuable for themselves (Harlow, 1992). A holistic ethic does not rule out moral concern for individual organisms, although it does suggest that wholes take priority over parts. We may be passionately committed to the perpetuation of a given landscape partly because we want to see particular individual animals or plants we encounter live a full life. We may also be committed to the perpetuation of a given landscape because we understand and marvel at the complex physical and biological interconnections that exist therein. In order to protect individual organisms in the natural context, however, the context itself must be preserved.

To claim that ecosystems or landscapes are of moral concern does not in itself help much in resolving conflicts that arise in the political arena between ecosystem and human well-being. What is really needed is a principle of behaviour that reconciles an individualistic human ethic with a holistic environmental ethic. This principle should be structured so as to indicate the circumstances under which human need takes priority over ecosystem survival or vice versa. One such principle that does this is as follows:

- Natural ecosystems and species should be preserved unless doing so reduces the material well being of individuals below levels necessary for the leading of a decent human life.

Component parts of this principle are subject to interpretation, but this will be the case for any ethical principle. Clearly, there will be differences of opinion over what constitutes material well-being adequate to the leading of a decent human

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life. We do devise such standards in the political process, however; the U.S. government, for example, has an official income standard it uses in measuring the extent of poverty. Disagreement could also arise over the definition of an ecosystem. The old-growth ecosystem in the Pacific Northwest, for example, is made up of a number of forest types that could be interpreted as being separate ecosystems (Booth, 1994, 25-44). Some suggest that ecosystem preservation should be approached at a landscape level. This might mean that certain habitats could be exploited or altered within a landscape area so long as certain other habitats were left alone or allowed to return to natural conditions in order to maintain a diversity of species and ecosystem types (Norton, 1991, 148-83). The point is, any political decision making process will necessarily involve coming up with appropriate definitions of the terms in any ethical principle.

Why accept this principle for determining whether an ecosystem should be preserved or exploited? It does provide a standard for reconciling an individualist human ethic with a holistic environmental ethic. Deep ecologists might object to it on the grounds that it is anthropocentric, and indeed it is. It gives priority to human beings when their ability to lead a decent life is threatened. It does, however, recognise the moral status of ecosystems and species. Some might argue that it is tilted excessively in favour of human individuals because it will always be the case in resource allocation decisions that someone's income will suffer excessively if ecosystems or species are preserved. On the other hand, some will argue that it is tilted excessively in favour of ecosystems for precisely the opposite reason – it will seldom be the case that incomes are reduced to the point where leading a decent life is impossible. The best way to judge an ethical principle is through its application, a task to which we now turn.

AN ENVIRONMENTAL ETHIC AND THE OLD-GROWTH DEBATE

In order to retain the northern spotted owl as a self-perpetuating species, the best scientific evidence available suggests that many of the remaining stands of old growth will have to be preserved. If the idea of the spotted owl as an indicator species is valid, then preserving the spotted owl is equivalent to preserving the old-growth ecosystem in Oregon and Washington. Given that these points are not at issue, the only question remaining to be resolved under the ethical standard of behaviour described above is whether the decline of human material well-being that could result from old-growth preservation is acceptable. Will individual material well-being, as a result, be reduced to the point where people can no longer live decently? In answering this question, there are two possible approaches. One is to assume that no other measures will be taken to alleviate the economic suffering of those who would lose employment as the result of spotted owl protection. The other is to assume that measures will be undertaken to alleviate economic suffering.

Estimates of timber harvest and employment reductions resulting from preservation of the spotted owl vary widely depending upon assumptions made about the spotted owl conservation strategy chosen and other variables. The most credible strategy developed so far and the one that is likely to determine future public policy is contained in the Interagency Scientific Committee report entitled 'A Conservation Strategy for the Northern Spotted Owl' (Thomas et al., 1990). The Committee was created by Congress for the express purpose of devising a strategy for preserving the northern spotted owl. The authors of the report found that forest habitats chosen by the owl

exhibited moderate to high canopy closure; a multilayered multispecies canopy dominated by large overstory trees; a high incidence of large trees with large cavities, broken tops, and other indications of decadence; numerous large snags; heavy accumulations of logs and other woody debris on the forest floor; and considerable open space within and beneath the canopy. (Ibid.)

While the committee noted that young forests sometimes exhibit such characteristics, it suggested that they are most commonly found in old-growth forests. The committee also noted that habitats containing these characteristics had declined significantly in the past century, and that as a result of timber harvesting methods much of the existing habitat was being fragmented, reducing the ability of spotted owls to disperse and exposing them to competition from other species. As a key part of its strategy, the committee mapped networks of habitat conservation areas with each area containing a minimum of 20 pairs of owls and being located no further than 12 miles from another area. The committee indicated that logging should be prohibited in these areas and that forests around them should be managed such that 50 percent of the land base contains trees 11 inches or greater in diameter with at least a 40 percent canopy closure. The Committee argued that if this strategy were carried out on public lands, it would conserve around 1,465 pairs of owls. (Ibid.)

Estimates of employment losses in the timber industry assuming that this strategy is applied to public lands only range in three different studies from a low of 12,383 to a high of 29,421, with a figure of 16,341 in the middle (Mead et al., 1990, iii; Lippke, 1990, 8; Beuter, 1990, 23). Authors of two of the studies also provide total employment loss estimates taking into account secondary employment losses outside the timber industry that roughly double the timber industry figures. Two of the studies also included employment losses assuming that the spotted owl strategy is applied to private as well as public lands. However, since there is no concrete reason to believe that this will be the case, this option is not considered here. The timber harvest reduction estimates underlying these figures range from 2.3 billion board feet to 3.0 billion board feet per year (Mead et al., 1990, iii; Beuter, 1990, 19). One study suggests that the social value of the old-growth timber harvest reduction would be \$591 million in the first year and would have a present value of approximately \$24 billion for 50 years of foregone

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harvests (Mead et al., 1990, v). These are rough estimates of what society loses by not harvesting in terms of the value of the timber itself. The U.S. per capita value for the first year loss would be approximately \$2.50, while the per capita present value for the full 50 years would be approximately \$100. In practical terms, the loss will be reflected in lower government revenues from timber sales and higher timber prices. The latter will ultimately result in slightly higher housing costs. The final burden of the social cost from the foregone timber harvests should be relatively widespread, and given that the per capita cost is not very large, it is not likely to cause a reduction of living standards below levels needed to live decently.

The burden from unemployment is another matter. As noted above, anywhere from 12,000 to 29,000 jobs could be lost in the first year from spotted owl protection. However, many of the workers losing jobs will find employment elsewhere, particularly since the Oregon and Washington economies have experienced rapid employment growth outside of the forest products industry in recent years (Booth, 1994, 127-32). In a period of large layoffs in Oregon sawmills from 1980 to 1982, 92 percent of those becoming unemployed held jobs one year later (Mead et al., 1990, 128). Nonetheless, workers suffering layoffs will lose wages during the period of unemployment, and, in all likelihood, new jobs will pay less than the old. Assuming that re-employment is at the average wage for the state, and that the typical worker has 20 years of potential employment remaining, the present value of the lost wages per worker for both the layoff period and the re-employment period is estimated to be approximately \$71,000. The figure per worker for the first year alone would be approximately \$14,000 (Mead et al., 1990, iv-v). These are clearly substantial losses of income, particularly in the first year, and such losses could conceivably cause incomes for some to fall below levels necessary to live decently. Moreover, in the more remote timber dependent communities, some may have great difficulty finding new jobs, and they may have to move to other locations where jobs are more readily available, breaking their community ties and experiencing significant capital losses on homes that would have to be sold in a depressed housing market.

Economic dislocations of this sort are not uncommon in market economies and are often looked upon as a necessary price individuals in society must pay for economic progress. The consequences of such dislocations can be serious, however, taking the form of increased family violence, illness, and death rates among those affected (Bluestone and Harrison, 1982, 49-81). Improvements in technology in the Pacific Northwest timber industry have resulted in significant employment losses in recent years. Between 1970 and 1988, for example, total lumber and plywood production in western Washington and Oregon was constant at approximately 13 billion board feet, while total employment dropped by 13,000 jobs (Mead et al., 1980, 124). Beyond unemployment insurance and welfare, little has been offered to help people deal with such economic dislocations. One could argue that dislocations caused by spotted owl preservation are

not fundamentally different from those caused by technological change or changing market conditions. If so, then nothing special needs to be done to alleviate any resulting economic suffering.

To accept this line of reasoning, however, would likely result in violation of the ethical premise that everyone should have the opportunity to gain a material standard of living that allows them to live a decent human life. Are there measures available that would significantly reduce the economic dislocation resulting from spotted owl preservation? If there are, then spotted owl preservation can be undertaken without violating the 'decent human life' ethical standard. If not, then preserving the spotted owl is open to question on ethical grounds.

The single most effective measure for reducing the impact of old-growth preservation on the timber industry is the banning of log exports from public and private lands in the Pacific Northwest. The annual volume of log exports in recent years from Washington, Oregon, and California has been approximately 3.8 billion board feet. An export ban would divert much of this volume to domestic processing, although some portion of it would not be harvested if lower stumpage prices (prices paid for uncut timber) resulted. Some of the additional lumber processed would be exported, some would enter the domestic market, and some would replace lumber imports from Canada. Taking into account the reduced imports from Canada, the international balance of payments deficit would increase by \$1.2 billion a year, although this would be offset, to some extent, by increased lumber exports. However, as many as 15,000 new jobs could be created by additional processing assuming the full volume of logs exported is eventually harvested each year. This would be the case if stumpage prices do not decline, and they most likely would not if stumpage is taken off the market because of spotted owl preservation (USDA Forest Service et al., 1990, 15-16). This measure alone would replace the bulk of the jobs lost from spotted owl preservation. The increase in the balance of payments deficit would likely reduce the value of the dollar in foreign currency markets somewhat. This could make imported goods slightly more expensive for U.S. consumers, but it could also stimulate exports by making them cheaper to foreigners and, in turn, increase domestic employment.⁷

A log export ban is a drastic measure. A number of other proposals for mitigating old-growth timber harvest reductions have been offered that could make a log export ban unnecessary. In a report that was not circulated very widely, the U.S. government suggested a range of options for offsetting the negative economic consequences of spotted owl preservation. These options included the development of a task force to ensure the rapid delivery of available government programs for education and job training, unemployment benefits, and employment services to timber-dependent communities; the expansion of government loans and grant programs for local economic development; increased national forest tax equivalency payments to affected communities from 25 percent to 50 percent of net revenues received by national forests from timber

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sales; increased federal public works projects in affected areas; and improvements in land stewardship including trail construction and the construction of tourist facilities, the reclamation of roads in spotted owl habitat conservation areas, and increased timber presale work in areas where timber sales are permitted (USDA Forest Service et al., 1990, 3-5). Improved silviculture practices have been offered as a means to not only increase the productivity of second growth forests, but to create employment as well. One proposal is to increase the thinning and pruning of second growth in order to improve wood quality, and to then use the material removed in low-value wood products. This would lead to the creation of a new 'thinning and pruning' industry and the creation of a high-quality, second growth timber industry in the long run (U.S. House, 1990, 239). Others have suggested the creation of businesses that add significant value to harvested timber or use low-value abundant wood resources, such as alder or timber thinnings. One example is a furniture manufacturer that uses alder, and another is one that uses Douglas-fir thinnings (Ibid., 222).

Since old-growth harvest bans have been instituted by federal courts to protect the spotted owl, retraining programs have been very effective in shifting workers into alternative employment in Oregon, in many cases without significant pay losses and with increased job satisfaction. Also, second growth timber harvests have increased, filling in much of the gap left by reduced old-growth harvests (Egan, 1994). This suggests that a log export ban may not be necessary to prevent forest product worker incomes from declining to poverty levels. Whether second growth harvests are sustainable over the long run remains an open question (Ibid.; Maser, 1988), although the prospects for sustainability would be improved if the silviculture practices suggested above are instituted.

In all likelihood, then, spotted owls and old-growth forests can be preserved and incomes for timber industry workers can be prevented from falling below levels needed to lead a decent human life. Decisions to preserve natural areas often impose harsh economic burdens on a few people, but those burdens can usually be spread through appropriate public action to the larger society, which can bear them more readily. Preservationists who believe that nature is morally considerable and also accept the notion that human beings ought to be able to live decently should press for public sector intervention to offset the harm done to individuals as a result of the preservation of nature. In other words, full employment at decent wages is an environmental issue. To avoid unnecessary ethical dilemmas that pit the basic economic interests of human individuals against those of ecosystems and species, assured employment at a decent income is needed and ought to be a goal of the environmental movement.

To apply an ethical standard of behaviour such as the one just described is not unprecedented. In the court case *Seattle Audubon Society v. Evans* (1991), Judge William Dwyer went through an ethical balancing act not unlike the one suggested by the 'decent human life' principle. The Forest Service was enjoined in this case from harvesting old growth until it came up with a reasonable spotted

owl management plan that would satisfy provisions of the National Forest Management Act. In granting injunctive relief in cases of this type, there must be an irreparable injury and the injury must be serious enough to outweigh any adverse effects from the issuance of the injunction (*Seattle Audubon Society v. Evans*, 1991, 1086-87). Judge Dwyer noted that environmental injury can seldom be remedied by money damages and is often permanent and therefore irreparable. In his written court opinion, the judge went on to argue that irreparable harm was likely in the absence of an injunction because the spotted owl was threatened with extinction. While noting that the sales of timber from the national forests would be reduced more than 2 billion board feet during the period of the injunction, Judge Dwyer also indicated that programs and measures were available to mitigate the impact of sales reductions, including an export ban as well as programs for dislocated workers. He also noted that the industry is slated to lose upwards of 30,000 jobs in the next 20 years because of worker productivity increases, and that other industries in the area are now the major driving force in the economy (*Ibid.*, 1087-95). In concluding his opinion, the judge made the following statement:

To bypass the environmental laws, either briefly or permanently, would not fend off the changes transforming the timber industry. The argument that the mightiest economy on earth cannot afford to preserve old growth forests for a short time, while it reaches an overdue decision on how to manage them, is not convincing today. It would be even less so a year or a century from now. (*Ibid.*, 1096)

In sum, the harm to individuals employed in the timber industry was seen by the court as insufficient to outweigh the irreparable harm that would be done to the spotted owl from continued logging. The reduction of living standards for timber industry workers was indeed considered by the court, but not viewed as substantial enough to preclude imposing the injunction against logging and protecting spotted owls. While the spotted owl was not explicitly viewed in this decision as being a subject of moral concern, by virtue of the court seeing its extinction as an irreparable harm, it was implicitly treated as such.

CONCLUSION

If valuation processes are in fact dualistic in the sense that ethical values take priority over material values inessential to a decent life, then the cost-benefits approach to valuation must be rejected where ethical values are involved. Simply put, a price cannot be placed upon ethical values. This conclusion by no means renders the cost-benefits approach useless. In the case of old-growth forests instrumental use values and option values could be considerable and could be sufficient grounds for preserving old growth. Nor does it toss economics out the window. We need to know the cost of preserving the natural world to make a

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judgement about whether doing so would drive incomes down so far as to make a decent standard of living unattainable. We also need to know what preservation does to certain segments of society, like loggers and mill workers, to be certain that they are prevented from being pushed into the depths of poverty.

The dualistic valuation process described here provides an explanation for the concept of existence value so prominent in contingent-valuation studies. When asked, households often place a relatively high value on natural areas they are unlikely to ever use. Contingent-valuation theorists have created a default category called existence value to explain this. Individuals express existence value when they are willing to pay for the continued existence of natural areas, such as old-growth forests, even though they will never use them. This approach, however, begs the question of why people express existence values. The explanation for existence value suggested by dualistic valuation processes is that natural areas, and the species they contain, are seen by individuals as valuable in their own right. Defending old-growth forests and endangered species fulfils a moral obligation to preserve the world of nature. Contingent-valuation studies typically ask a household what they are willing to pay in additional taxes or other costs to accomplish a resource preservation goal. The question is asked as if the object preserved is a market-like commodity – an instrumental value. If the kind of valuation processes described in this article accurately portray human behaviour, then the appropriate question to ask would be whether or not society as a whole can bear the cost of preserving natural areas, such as old-growth forests, and still continue to produce enough material wealth to provide all with a decent standard of living. Some respondents to contingent-valuation questionnaires may be trying to answer the latter type of question. As Sagoff has noted, respondents may find the treatment of nature as a commodity objectionable, or at least confusing (Sagoff, 1988).

A contingent-valuation study of old growth has found that the average household willingness to pay, in the form of higher taxes and other costs, for Pacific Northwest old-growth preservation significantly exceeds the actual per household cost (Hagen et al., 1992). Since most of the respondents were not residents of the area, use and option value are unlikely to be of much importance, leaving existence value as the most probable explanation for willingness to pay. If existence value is really an expression of ethical concern, then the study suggests that such concern is significant and widespread.

While the courts appear to have adopted an ethical approach to the preservation of old-growth, the political realm is a different manner. To satisfy court injunctions, the Clinton Administration has adopted a modified version of the Thomas report described above as policy, although with features that permit too much salvage logging according to some environmentalists (Stone, 1993). Whether Congress will weaken environmental laws that underpin old-growth preservation in response to industrial interests remains to be seen. If an ethical view of the natural world is indeed relatively widespread, politicians at some

point may have to consider an ethical approach to questions of preserving species and natural ecosystems to insure their own survival in elections. Clearly, more research, including survey research that focuses on ethical values, is needed to determine whether the preservation of nature is viewed as an instrumental value or an ethical value. If an ethical view of the natural world is widely and deeply held, an ethical approach ought to be a matter of public discourse. At a practical level, deeply held ethical values foster the political organising needed to give those values public attention. This may explain the strength and durability of the environmental movement in the U.S., even in the face of intense attack from powerful economic interests.

NOTES

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¹ The economic approach and the concept of contingent evaluation are summarised in Edwards, 1987. A critique of the economic approach can be found in Sagoff, 1988. More recent critiques can be found in *Environmental Values*, 3(4), 1995. Sagoff correctly points out that the economic approach and many ethical approaches to environmental issues are not really equivalent or comparable. The incomparability of economic value and inherent value is also suggested in Regan, 1981.

² Drawing on Sen, 1977, other authors have made this point in their critiques of contingent evaluation methodology. See Edwards, 1986, 146-47, and Brookshire et al., 1986, 1509-18.

³ This presumes a dichotomy between moral and instrumental decision making. The ordering of moral preferences is independent of the ordering of preferences over instrumental values. This is exactly what is suggested in Etzioni, 1986, 166-70.

⁴ For a theoretical exposition of this point, see Edwards, 1986, 147-9.

⁵ The exact proportion of those testifying in favour of old-growth preservation on grounds that it is valuable in its own right was 31.5 percent. This figure was arrived at through content analysis of the testimony (Booth, 1994, 214).

⁶ One of the strongest advocates of a holistic ethic is J. Baird Callicott (1989).

⁷ An export ban could divert demand for logs to other countries and accelerate deforestation of natural forest habitat elsewhere. In order for this to be prevented, global agreements on forest ecosystem preservation are obviously needed. Higher global prices for wood fibre would then encourage conservation and divert demand to second growth sources.

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