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UTILITARIAN AND RIGHTS-BASED ALTERNATIVES FOR PROTECTING SITES OF SPECIAL SCIENTIFIC INTEREST

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Current legislation in Great Britain has set up a class of protected land under the designation Site of Special Scientific Interest (SSSI). However, what values are to be protected, and how, are questions largely left unanswered. Areas which are designated as worthy of protection can still be threatened by gradual erosion due to rural development. The designation of a site as being of conservation value requires an agency which enforces protection from development. We highlight the conflicts which have arisen between landowners and conservationists over SSSI management and analyse the role of a conservation agency under alternative environmental philosophies. We show how the values underlying the motive for conservation will affect the environmental management process chosen. This provides contrasting views as to the future for countryside management, and focuses concern on the current trend towards the free market in which trade-offs based upon the anthropocentric usefulness of nature are fundamental.

1. Introduction

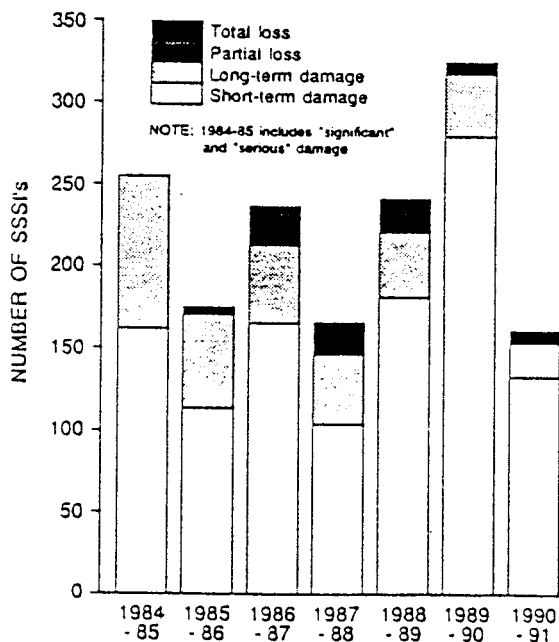
Sites of Special Scientific Interest (SSSIs), originally introduced as Areas of Special Scientific Interest with the 1949 National Parks and Access to Countryside Act, provide the foundation for a major set of mechanisms protecting sites of high conservation value in Great Britain (Nature Conservancy Council (NCC), 1989; NCC, 1990a). In 1991 there were 5,671 SSSIs covering a total area of 1,778,474 ha, designated by reason of their flora, fauna, geological or physiographical features (NCC, 1991). The vast majority of these sites are in private ownership. Three national statutory conservation agencies, English Nature, Scottish Natural Heritage and the Countryside Council for Wales, are responsible for the selection, designation, protection and management of SSSIs. Prior to the Environmental Protection Act of 1990, which introduced these three organisations, the Nature Conservancy Council (NCC) had responsibilities for SSSIs within Great Britain.

The mechanisms by which SSSIs are protected from development are contained within an assortment of legislation. Two classes of development are covered: urban-industrial development, which requires planning permission;

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and rural development (agriculture, forestry), which bypasses planning permission unless an environmental impact analysis is required under EC legislation. This legislation reflects the piecemeal fashion in which SSSI protection has evolved. Despite these mechanisms, a continuing degradation of SSSIs is taking place, as is clearly shown in Figure 1. Such degradation is causing growing disquiet within the conservation community over two aspects of SSSI protection. The first concerns the adequacy of planning legislation to protect sites from urban-industrial development (Bain *et al.* 1990; Nash, 1990), particularly where "statutory undertakers" are involved (e.g. public utilities). The second concerns the costs and effectiveness of the Potentially Damaging Operations (PDO)-management agreement mechanisms implemented where SSSIs are threatened by rural development (Ghazi, 1992). The second of these concerns is addressed in this paper. Two new models of protecting SSSIs from rural development are proposed and contrasted with the current process, with our analysis pin-pointing increasing tension between rights-based and utilitarian value systems.

Figure 1 SSSI Loss and Damage, 1984-91



Source: Adams (1993)

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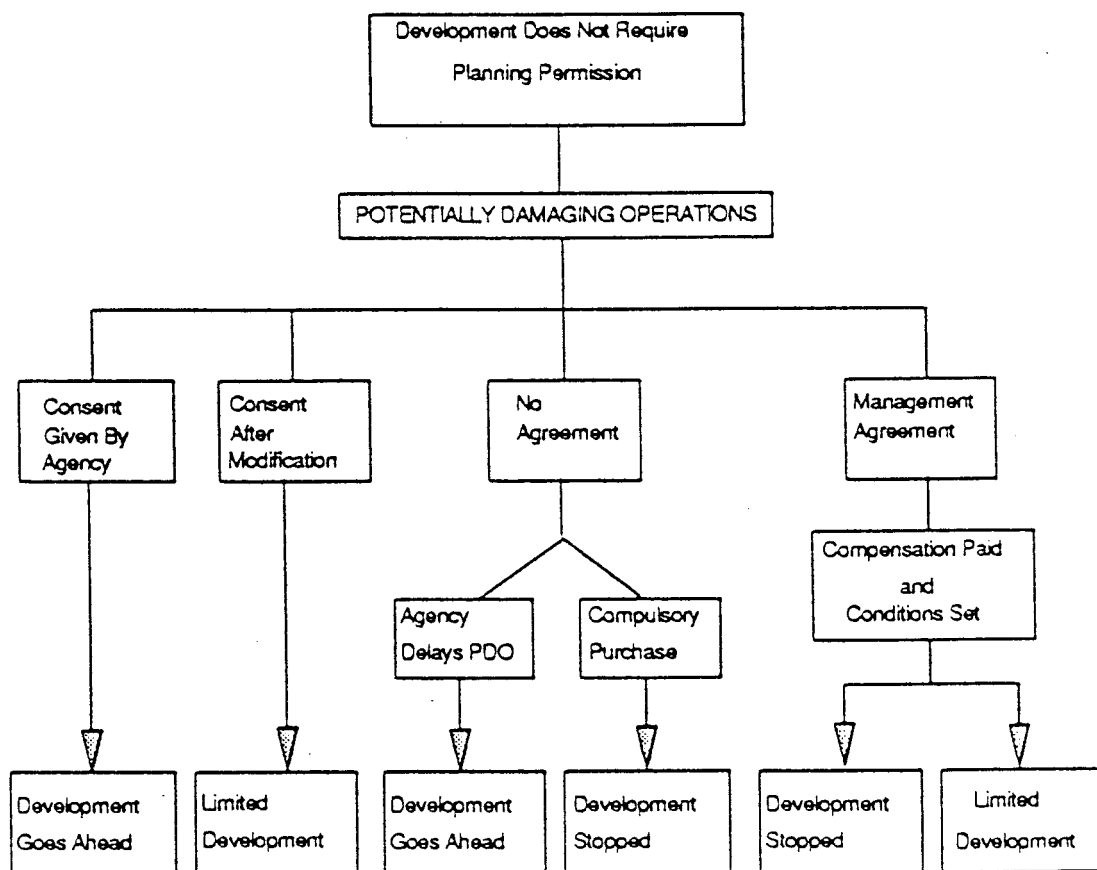
2. Emerging Pressures on PDO-Management Agreement Mechanisms

Protection of SSSIs from rural developments which do not require planning permission occurs via PDO-management agreements as explained in Figure 2. The provisions of Part II of the Wildlife and Countryside Act 1981 are activated in response to the landowner/occupier informing the conservation agency of a proposal to carry out a PDO, a list of which the landowner/occupier is given upon the site being notified. Section 28 of the Wildlife and Countryside (Amendment) Act 1985 allows four months for the conservation agency to persuade the owner/occupier to abandon or modify the proposed PDO, and prevents the PDO from proceeding for this period of time. Most PDO notifications are of a minor nature. For example, Livingstone *et al.* (1990)

estimate that 75%–90% of all PDO notifications in Scotland are consented to by the conservation agency with, perhaps, slight modification. In more major PDO cases, the conservation agency may offer a management agreement in accordance with Section 15 of the Countryside Act 1968 and the Countryside (Scotland) Act 1967. Landowners or occupiers are not obliged to enter into a management agreement with the conservation agency although the number of such refusals in Scotland has been very small. Brotherton (1990) points to the importance of landowners being well disposed towards the statutory conservation agency in securing management agreements.

A management agreement comprises two components. First, a set of management objectives are negotiated, normally consisting of restrictions on land use. Second, a compensatory payment is negotiated which will reflect the financial loss the owner/occupier is expected to sustain due to the restrictions placed on land use change by the management agreement. The financial guidelines issued by the Department of the Environment (1987) set out the rules by which claims are negotiated. These provide for the separate negotiation of each claim on the basis of profit forgone by the owner/occupier as a result of accepting the management agreement. A major criticism of management agreements is that owner/occupiers are compensated for not developing (i.e. for doing nothing) rather than for any positive conservation management activity. As of 31 March 1991, 2,032 management agreements protecting 48,545 ha at a cost of £7,238,932 were in place within Great Britain (NCC, 1991).

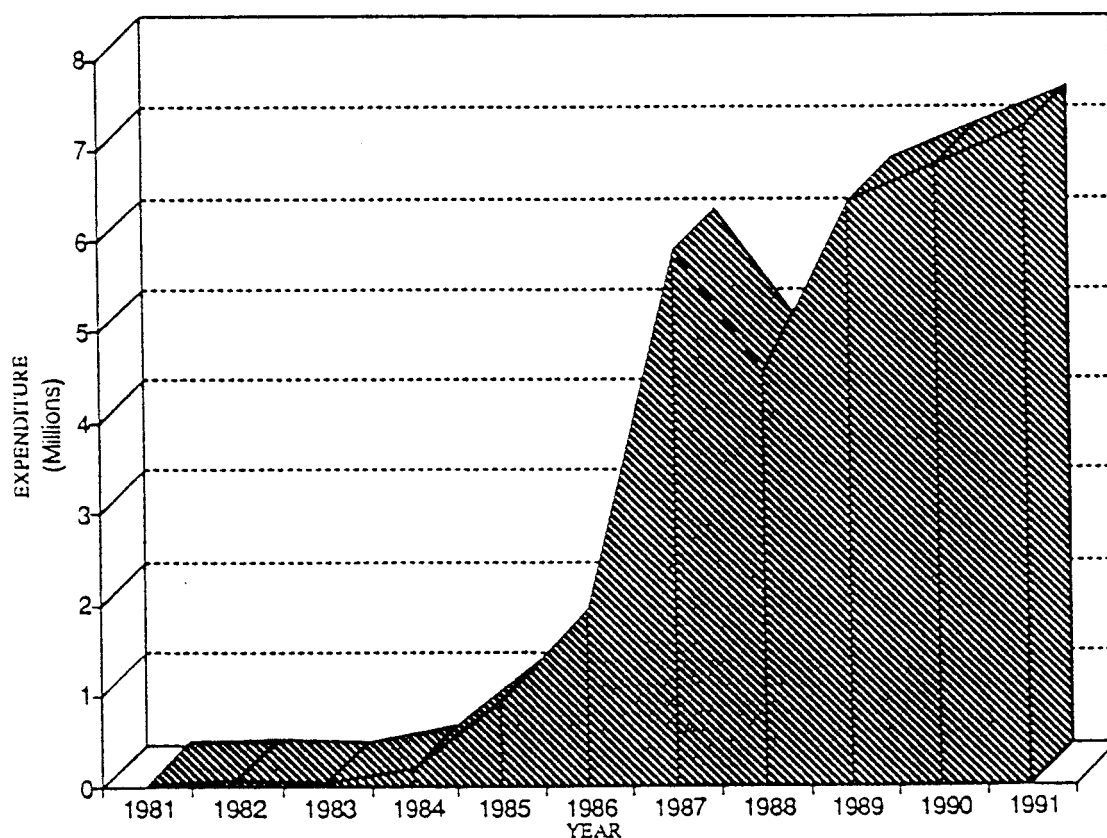
Figure 2 Protecting SSSIs From Potentially Damaging Operations



If no agreement is reached within the four month negotiation period the conservation agency can, if they wish to pursue the case, seek a Section 29 order (under the 1981 Act) from the Secretary of State extending the negotiation period to 12 months. If the 12 month period expires without an agreement being reached the owner/occupier is free to carry out the damaging operation, unless the conservation agency makes a compulsory purchase order before the end of the negotiating period. Compulsory purchase will only be undertaken if the conservation agency considers the land should be acquired in the national interest as a National Nature Reserve. There have been only two compulsory purchases in the last ten years (NCC, 1991). As an alternative to compulsory purchase the conservation agency may offer to lease the land or provide grants so assisting voluntary groups or charities to purchase the land.

While the current site safeguard process has had some success in protecting SSSIs, pressures on the system are beginning to emerge. In particular a major source of concern arises from the increasing financial costs of the PDO-management agreement mechanism, as shown in Figure 3. Despite a rising total budget the proportion of agency expenditure on management agreements has risen from under 0.5% to over 15%. This issue has been brought into sharp focus by the recent case of the Ben Heasgarnich and Meall na Samhna SSSIs in Glen Lochay, Scotland. These sites were first notified in 1955 (4064 ha) and 1961 (2960 ha) respectively. Both sites are part of the series of upland sites on calcareous schists, and contain a complete altitudinal range of semi-natural

Figure 3 PDO-Management Agreement Expenditure, 1981-91



Source: NCC Annual Reports 1981-91

communities from river bank and deciduous woodland through to diverse arctic-alpine and montane. Several species within these areas are nationally rare including *Salix lanata* and *Cystopteris montana*. They also contain one Red Data Book species of dragonfly, *Somatochlora arctica*.

The present landowner purchased the Glen Lochay estate, including the SSSIs, during autumn 1986 for just over £0.5 million. In October 1986 an application was made to the Forestry Grant Scheme (Forestry Commission) to support the afforestation of 643 ha, in seven separate blocks, within Glen Lochay. The Nature Conservancy Council received written notice from the landowner of his intentions under the PDO arrangements during November 1986. After consultation with the Forestry Commission, and internal consultation with the Chief Scientist Directorate, the NCC concluded that the conservation value of the two SSSIs would be seriously damaged if the forestry proposal went ahead. Objections to the proposal were also made by local government, environmental pressure groups and charities during the early part of 1987. As a result, the Forestry Commission rejected the Forestry Grant Scheme application on the grounds that the proposal was incompatible with the objectives of the SSSIs. Consequently, the NCC was obliged to offer the landowner a management agreement.

Later in 1987, the landowner gave notice of his intention to carry out agricultural improvements over the remaining area of the SSSI not already covered by forestry proposals. These improvements involved liming and fertilising the low ground, the creation of paddocks and increasing the number of sheep in the area. Again the NCC objected to these proposals on the grounds that they would damage the conservation interest of the SSSIs.

In December of 1987 a lump sum, profit-forgone, claim on the two development proposals of just over £1 million was submitted to the NCC by the landowner and referred to the District Valuer. The NCC, after consulting forestry and agricultural advisors, initially offered £110,000 in August 1988. Both claim and compensation levels shifted over the next few months, but the negotiation failed and the case was referred to the Land Tribunal for Scotland (hearing January 1991). The outcome of the Tribunal hearing, delivered in June 1991, was to award the landowner £554,800, which with interest backdated to October 1987, and costs gave the landowner over £1 million.

Such cases involving such large sums of money are still comparatively unusual and, furthermore, the conservation agencies are no longer obliged to offer a management agreement when a capital grant application affecting a SSSI has been turned down on conservation grounds. Nevertheless such cases are symptomatic of the rising costs of management agreements, with this level of rent extraction already beginning to have an impact upon the way in which conservation agencies manage and defend SSSIs. Positive conservation management grants on SSSIs have been restricted and delayed by the Glen Lochay settlement. There is anecdotal evidence within the conservation agencies of an unwillingness to designate new SSSIs in sensitive locations for fear of having to defend them with expensive management agreements. The Dorset heaths provide a case where there is evidence of the failure to defend existing SSSIs because of the predicted management agreement costs. Clearly the existing PDO-Management Agreement mechanism is under some strain not least because the compensation costs are well beyond the levels originally envisaged when the mechanism was established (Adams, 1993). Change in the existing arrangements appears inevitable and serious consideration must be given to the options for change.

3. Agency Decision Making Process

The current SSSI designation procedure forces the conservation agency (formerly the NCC) to accept all sites which pass the criteria and implies a certain minimum series of conservation sites is essential. Thus, these criteria can be regarded as providing a threshold, dividing line or standard of measurement for conservation value. This view was supported by the NCC (1990b section 4.17) who saw their level of notification and designation and the protection of individual sites as a *minimum* environmental safety standard for nature conservation. Under these circumstances any PDOs will take society below the minimum standard. These sites are irreplaceable, according to this position, which implies that sites need to be protected in an absolute sense. "Once such sites are damaged or lost they cannot be retrieved" (NCC, 1990). In order to capture these concepts we advance the intrinsic value model of SSSI protection. First, however, a utilitarian model is developed because this seems to reflect the current situation facing the conservation agencies and the model which the central government seems to favour.

4. A Utilitarian Model of Conservation

The process of SSSI conservation has two stages; site selection and designation, and site protection. The first step under the utilitarian model is to recognise that no site can have absolute protection and therefore the selection process must be unconstrained in terms of choice. Under a utilitarian approach site selection would be made by the regulating agency with the aim of meeting specific conservation desires. These desires would include species preservation, habitat diversity, and maintenance of unique ecosystems. The greater the number and extent of such desirable features a site possesses, the greater the preference of the agency to designate the site for conservation. Thus, the agency can be viewed as selecting sites based on numerous characteristics which determine the preference for conservation given to the site. There is no longer a threshold above which all sites must be protected.

Thus the agency is put in a position whereby it must rank sites. Central to the need for ordinal ranking of sites is the fact that society has limited resources, and the agency in charge of conservation very limited resources. Thus, the decision to designate a SSSI will need to consider the additional burden that site will place upon the agency's budget. In economic terms the agency faces a constrained maximisation problem; maximise conservation values given a fixed budget constraint.

Any given site will have a minimum size below which the ecosystem is no longer sustainable. For example, a peat bog will become unstable and deteriorate if the area being preserved is too small and extraction of peat occurs on unprotected sections. Thus, when the agency is making a decision on site designation it has a discrete choice to make concerning the inclusion of a new site. Either the minimum site size is designated or the ecosystem is not conserved. Once a specific site is included into the SSSI scheme, the choice the agency faces is continuous in the sense that additions to the site area can be made so as to increase site integrity. Thus, a peat bog can be designated as a SSSI and then additional hectares of surrounding land added to increase the conservation value. In this way the agency has a choice between selecting new sites and making additions to established sites.

Next, consider the role of the current landowner of the proposed SSSI. The owner has an opportunity cost to having the land used for conservation. This is the revenue gained in the alternative use. In the case of the peat bog, this could

be the profit from peat extraction. The agency is then in a position of having to pay the owner the opportunity cost per hectare. The agency will only be willing to pay up to a certain amount for a given site. The total amount will initially be the minimum number of hectares to sustain the site intact times the marginal willingness to pay. This marginal willingness to pay is dependent upon the discrete choice decision. Above a certain price per hectare, the agency will purchase nothing, but rather use the budget on additional hectares elsewhere. More formally, the budget (B) of the agency can be spent on new site selection (N) or current site maintenance and integrity. Site conservation can be obtained for an annual payment r . If we restrict the analysis to a single period, the budget constraint can be written:

$$B = rN + pA \quad (1)$$

where p is the price of additional hectares at other sites and A the number of hectares. If a site is conserved then $N=1$ and if the site is not conserved $N=0$. The agency, as hypothesised above, has a utility function which can be written:

$$U = f(N, A) \quad (2)$$

The choices made by the agency will be 0 or 1 depending upon the indifference curve or preferences of that agency. If the agency rejects the site, their land area for conservation will be B/p . If the agency adopts the site for conservation, the land area of other sites falls to $(B-r)/p$. Thus, the utility levels associated with adopting the site U_1 or rejecting the site U_0 can be written:

$$U_0 = f\{(B/p), 0\} \text{ and } U_1 = f\{(B-r)/p, 1\} \quad (3)$$

Where the utility of adopting the site is greater than that of rejecting it ($U_1 > U_0$), the site will be conserved. Both these are conditioned on the number/size of sites already protected via (2).

Different preferences over site characteristics within the agency or a different composition of the decision-making body, e.g. the effect of the NCC being split into separate agencies, can be expected to change conservation decisions. This can be represented in the utility function by a vector Y . The utility function is then written:

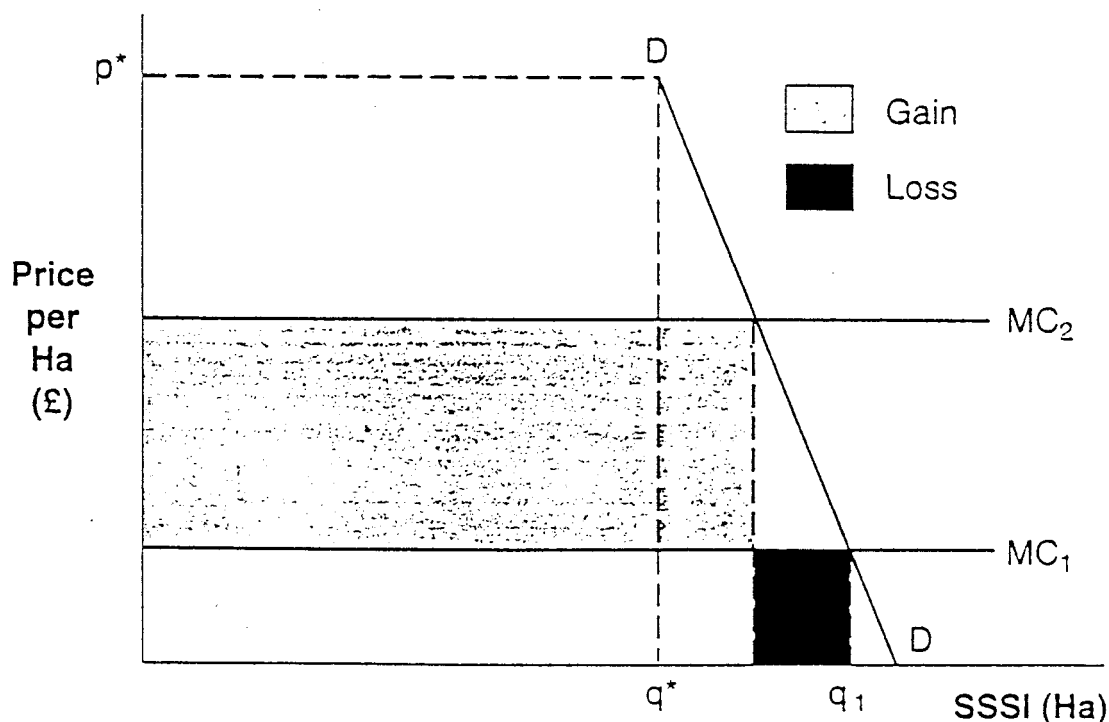
$$U = f(N, A, Y) \quad (4)$$

The utility function of the agency will be affected by differences in the SSSI characteristics. However, different experts and decision-makers will then designate different SSSIs due to their preferences expressed in Y . Thus, changing the composition of the agency will determine whether specific sites are designated or PDOs go ahead.

If the agency and circumstances are stable, so that Y is constant, and p is held constant (*ceteris paribus*) the only variable influencing decisions is B . When the agency budget is restricted U_0 is liable to be greater than U_1 . Under these circumstances the agency's demand for hectares for site integrity is low due to the budget and therefore the marginal disutility of a loss of this area is large compared to the gain from the new site. As the budget is increased, the hectares for integrity increase until the disutility of a decrease in B/p is outweighed by the benefit of new site conservation. Conversely, budgetary restrictions will force the agency to drop sites and compensate with increased hectares for integrity.

A bargaining process has been initiated. The agency is effectively facing a barrier to conservation in terms of the price per hectare negotiated with the landowner. Initially the agency will pay for a set tract followed by additions for integrity. These additions will become less important as the site increases beyond the minimum. Figure 4 represents the situation first described. Here p^* is the entry level price (i.e. the price of purchasing the initial block of land to make the SSSI feasible) and DD the demand by the agency for hectares of the site. Below p^* the willingness of the agency to pay for each additional hectare declines. The area of payment received by the landowner, assuming fixed exogenous opportunity costs, would be given by the marginal cost times the number of hectares. For marginal costs above p^* , nothing will be demanded by the agency. Below p^* the number of hectares will be determined by the point of intersection of the marginal cost and demand curve. For example, given a marginal cost MC_1 the number of hectares demanded is q_1 .

Figure 4 Rent Extraction Potential



However, if the landowner can withhold the land or exaggerate the loss, the agency will be forced to pay more than $MC_1 \cdot q_1$. That is, the landowner can extract a certain amount of rent because the site is desired for conservation. A bargaining process will then take place where the landowner threatens a destructive use of the site in order to extract the maximum willingness to pay of the agency (or ability to pay given the intrinsic values discussed next). This strategy will be most effective for the landowner where a large number of hectares is desired for minimum purchase, and additions are of little value to the agency but the alternative uses of the land have a low marginal cost, as shown in Figure 4. A landowner unable to prevent purchase would receive $MC_1 \cdot q_1$. However, if the landowner can withhold land or misinform the agency as to the true marginal cost, the gains are relatively very large. The agency would pay $p^* \cdot q^*$ for the initial minimum number of hectares of the site. If the landowner is successful in inflating the actual marginal cost a notional price such as MC_2 could be achieved. As Figure 4 shows, the loss in terms of compensatory payments from such a tactic is relatively small compared to the gain when a large area is required to make the site viable and net additions are unimportant.

The implications of this process of bargaining are that a conservation agency with few powers will find itself paying above the actual marginal cost. As a result the budget of the agency will be unable to meet the conservation goals of a powerful agency. This in turn holds implications for the selection of new sites in that maintenance of the current stock of SSSIs becomes a priority.

5. Utilitarian and Intrinsic Values

Underlying the preceding analysis of agency decision-making for SSSI designation is the value of the site being considered. We have argued that the agency would be forced to express a valuation of the site via its willingness to pay. This, in turn, leads us to claim that at some level the cost per hectare will exceed the agency's willingness to pay for the site. Such a process may be perfectly reasonable from a utilitarian perspective, but if the agency is trying to fulfil the protection of the intrinsic values of nature, a conflict arises. For any agency aiming to protect intrinsic values, willingness to pay is a redundant concept and a different SSSI designation procedure would be necessary. However, before exploring this issue, the meaning of utilitarian and intrinsic value systems needs some consideration.

A utilitarian philosophy sees not only instrumental value in acts but also intrinsic value in the consequences of those acts. Human welfare, or happiness, is then seen as the only intrinsically valuable thing. Under this homocentric view all other things are valuable only in so far as they serve to increase human welfare. The rightness or wrongness of an act is determined by the results that flow from it.

Site conservation or preservation under the utilitarian value system is judged by the results in terms of human welfare. Thus, the reasons for conserving sites will include the potential for scientific research, maintenance of genetic diversity for medicine and agriculture, recreation, solace, and aesthetic enjoyment (Passmore, 1974). These instrumental values by their influence on human welfare suggest the potential for the economic analysis of conservation benefits. Conservation is then only one possible alternative use of the site and must be weighed against others which may provide greater human welfare.

This raises many issues concerning environmental valuation, cost-benefit analysis and obligations to others (including other species or generations). However, without being distracted by other issues, the concern most relevant here is the potential for trade-offs. Conservation is but one goal in society and can, under a utilitarian philosophy, be overridden by other human interests. Where the value of a conservation site, compared to development use, is deemed relatively low the site will be destroyed by roads, housing estates, or resource extraction.

The utilitarian argument can be countered by an appeal to rights, deontological ethical theories and intrinsic value in things rather than humans. The first application of an ethical rights system in the modern tradition was in 1215 at Runnymede where the Magna Carta forced King John to recognise the "natural rights" of certain barons (Nash, 1989). The concept has since extended across classes, races, and now is applied to non-human species and ecosystems. The concept of rights for flora, fauna, and animals can form an absolute constraint on various forms of action regardless of the benefits. Deontological ethical theories attribute intrinsic value to features of acts themselves. Respectful treatment of natural entities and natural systems would then rule out certain types of exploitative acts on deontological grounds (Rodman, 1983). The use of natural entities and systems as objects and resources of instrumental value could be precluded on grounds of respect and the obligation of non-interference in anything with internal self-direction and self-regulation.

This is reflected in Aldo Leopold's land ethic which implies a basic right of natural beings to continue existing in a natural state (see Leopold, (1949) 1987). Rights operate to provide those individuals or things that hold them with moral standing. That is, status is an end in itself rather than a means to an end. There are then two aspects to the argument for species or site preservation; the instrumental values recognised by utilitarianism and in addition intrinsic values (Callicott, 1989, pp. 134-5; Norton, 1991). This view of rights can be relaxed and perhaps made more acceptable when based upon interests and allowing for ranking of rights, see Attfield (1986).

So, in returning to the decision-making problem of the conservation agency, the recognition of non-human intrinsic values provides reasons for preventing economic exploitation of SSSIs. Under the utilitarian philosophy there can never be absolute or permanent protection. If the arguments of those favouring the existence of intrinsic values in nature are adopted, such protection can take place, and these sites would be excluded from economic calculations. The agency's problem is then altered into identifying sites to protect natural objects and species on grounds of what Hargrove (1989, p. 104) calls intrinsic beauty and interest.

Thus, sites might be selected as they are now but the arrangement for PDOs would have to be changed. In order to achieve preservation, sites could no longer be subject to the decision-making process described in the previous section or any part of that process. If the budgetary constraints were to remain and landowners allowed to bargain, economic utilitarianism would be the result. For example, as the value of timber or sheep rises the more SSSIs will be developed, unless the utility value they possess increases.

6. Bargaining Over Conservation

The process of bargaining described above is one in which trade-offs are an essential part. This would be unacceptable to the NCC which stated that SSSIs

“should not be subject to bargaining and trade-off” (NCC 1990b Section 4.20c). The current situation forces the regulatory agency to express its preferences when protecting SSSIs from damage. That is, the decision-making process concerning the protection of conservation sites is closer to a utilitarian consumer model than to a regulation by which our heritage is taken out of development and preserved. The position taken by the NCC was one which favoured the intrinsic value model. They expressed the opinion that there is intrinsic value in site characteristics (NCC 1990b Section 4.10). This is most clearly conceded by the following statement (emphasis added):

Many sites, notified as SSSIs or not, such as ancient woodland or ancient meadows, are considered to be irreplaceable and incapable of re-creation in any meaningful way. In such cases the site should act as a constraint on a project development *at any cost*.

This will not occur under the current process which allows for trade-offs under PDOs. If the utilitarian approach is followed this maintenance of an exogenous constraint on development is explicitly excluded.

The setting out of a threshold to identify the minimum stock of sites for conservation implies a belief in the need for absolute protection. Currently, landowners are allowed to bargain over compensation and the agency is in a weak position to prevent either (i) potential damages, or (ii) large compensation payments. In the first case the whole purpose of SSSI designation is brought into question. In the second case the agency is forced to rank sites by “importance” and protecting the most “valuable”. For example, a landowner could successfully extract the agency’s entire budget through threatening actions totally unrelated to the true opportunity cost of land. The agency would then be unable to protect other sites. Thus, implicitly the agency is forced to trade-off and bargain.

Under a system which recognises the need to protect conservation sites absolutely there would be no bargaining over PDOs. This system would be based on the need to remove land from potential damages. The cost to society of doing so is the opportunity cost of that land in alternative uses. A case might be made that landowners are the ones who lose this alternative use of the land if private property rights are taken as absolute in a Lockean sense. Currently, compensation is paid because landowners rights take precedence over those of society at large. The conservation agency is paying the social opportunity cost to landowners as income maintenance plus the rent because these sites are scarce. Thus, landowners are in the position of finding themselves in possession of conservation-gold-mines. As with other scarce, finite, natural resources the rent can be taxed and is no more the right of landowners than of society in general. In this case compensation would be set at the level of forgone earnings. However, as the utilitarian model shows, there is a large potential for rent extraction by landowners confronted by a powerless and weak agency.

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