

COASTS AND WETLANDS: DEVELOPING A NO NET LOSS APPROACH

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Summary

A basic definition of the *no net loss* concept is given by the US Wetlands Action Plan: *wetland losses must be offset by wetland gains*. The Habitats Directive aims to establish a network of protected sites in order to maintain or restore the favourable conservation status of listed habitats and species. Within these sites, we *must* take steps to avoid the deterioration of natural habitats and the habitats of species. However, many protected sites include dynamic coastal and wetland habitats, which under natural circumstance are subject to sometimes large changes in the nature, quality and extent of habitat, often over short timescales. This paper explores what needs to be considered if a no net loss policy is to be implemented.

Diagrams not included

Introduction

The UK coastline is of international, indeed global importance for its wildlife. This is reflected in the number of designated sites on the coast. For example, of the 256 wildlife areas in the UK, which should qualify for classification as Special Protection Area under the Birds Directive, 130 are coastal and 58 of these are estuaries (Pritchard *et al* 1992). In addition, more than 40 estuarine areas are likely to be included in Special Areas of Conservation to be designated under the Habitats Directive.

The Habitats Directive aims to establish a network of protected sites in order to maintain or restore the favourable conservation status of listed habitats and species (see Annex I and II of the Habitats Directive respectively). Within these sites, we *must* take steps to avoid the deterioration of natural habitats and the habitats of species. However, many protected sites include dynamic coastal and wetland habitats, which under natural circumstance are subject to sometimes large changes in the nature, quality and extent of habitat, often over short timescales.

In response to this issue, initially with respect to coastal flood defences, sea level rise and the need to work with coastal change wherever possible, the RSPB began to look at the concept of no net loss (Huggett 1996a).

This identified a number of issues, which needed to be addressed before a policy of no net loss should be considered for the UK. However, since this review, no one has taken up the challenge and begun to address the issues identified. Therefore, it is of considerable concern that the concept of no net loss appears to have entered the vocabulary of conservationists. Perhaps this is because it provides a convenient way out of the difficulties encountered in implementing the Habitats Directive in dynamic systems.

Some of the key issues, which must be considered further, include:

- What do we mean by no net loss?
- To what should a policy of no net loss apply?

- When is no net loss acceptable?
- What constitutes acceptable habitat replacement?
- How do you achieve no net loss rather than net loss followed by net gain?
- Is habitat creation a realistic proposition?
- How do you know when no net loss has been achieved?
- Where do we go from here?

These questions are considered briefly in this paper. However, if we desire to implement a policy of no net loss for dynamic coasts and wetlands, then these questions must be addressed.

What is no net loss?

A basic definition of no net loss is given by the US Wetlands Action Plan: *wetland losses must be offset by wetland gains* (US Fish & Wildlife Service 1990). However, most definitions are more refined, referring to some measure of wetland extent or quality particularly in terms of wetland functions and values (e.g. Conservation Foundation 1988). Some also identify the criteria by which the no net loss policy is triggered (e.g. habitat loss must be unavoidable, Fisheries and Oceans Canada, 1986). However, the basic premise remains - to take something away, you must put it back.

A significant problem with this approach is that it suggests all wetlands are 'up for grabs' (O'Donnel 1988, Lynch-Stewart 1992). In other words, no net loss by itself implies the continued loss of habitat. One way of getting around this problem might be to prioritise wetlands and the management policies, which apply (e.g. Moller 1995). For example, the Ontario Government has developed the concept of no loss of provincially significant wetlands and no net loss of other wetlands. However, the fact remains that some wetlands would be seen as expendable. To address this, no net loss policies have been developed whose objectives go further than just to maintain the status quo. For example:

- the National Wetlands Policy Forum, USA, national wetlands goal was to achieve no overall net loss of the nations remaining wetland base, as defined by area and function, and to restore and create wetlands, where

feasible, to increase the quantity and quality of the nation's resource base (Conservation Foundation 1988)

● the European Commission's principles for implementing a no net loss policy (Commission for the European Community 1995):

- ◆ no further loss of wetlands except for reasons of overriding public interest
- ◆ no further wetland degradation
- ◆ wise use of wetlands
- ◆ improvement and restoration of wetlands

To what should a no net loss policy apply?

Successful implementation of a no net loss policy requires the identification of habitats to which the policy applies, how much habitat there is and its quality. Without this, it will be impossible to assess whether the no net loss policy is being successfully implemented. In effect, the habitats to which the policy applies, need to be delineated. However, there are a number of risks involved in going down the delineation route and large sums of money and a great deal of time can be spent for little conservation gain.

First, the definitions of habitat must be consistent and their delineation must be based on scientific, not political criteria. If coastal wetlands are delineated using political criteria, changes in policy will change the yardstick against which no net loss implementation is measured. For example, in the USA, it was estimated that changes to the definition removed approximately 10% of the US resource from protective measures (San Francisco Chronicle, no date but circa 1992).

Second, even when consistent definitions are developed, problems can remain due to the difficulty in applying them on the ground. To address this, the US Army Corps of Engineers have developed wetland indicators (US ACE, undated). However, any system of defining habitats must be easy to apply in the real world, out in the field and by non-experts. There is absolutely no point in developing a set of criteria for the identification of different habitats if the criteria can only be used by experts and if a number of the indicators used are often missing or difficult to identify.

Finally, a full assessment of habitat resources requires an analysis of a range of variables including habitat function and characterisation according to type, stress, condition, value and importance. This is essential in order to ensure that any new habitats are more than just cosmetic replacements but they provide as near as possible, the same functions and values that are lost. In the past, perhaps less so now, there has been much confusion about habitat wetland function and values. Yet defining these as part of a no net loss policy is essential.

When is no net loss acceptable?

Having defined a no net loss policy and the habitats to which it applies, one needs to decide when habitat loss, balanced by gains elsewhere, is acceptable. In general, no net loss policies from elsewhere in the world start from the basic premise of no further loss - habitat loss should not be condoned unless it is the last resort when all attempts to avoid damage or loss have failed. The difficulty for decision makers is in deciding when this point has been reached.

The USA Federal Clean Water Act Section 404 Guidelines defines unavoidable as:

where a project is not water dependent then the developer must demonstrate that there are no alternative sites, that the project is in the public interest and that all means to mitigate the damage have been taken.

These criteria are similar to those outlined within the Habitats Directive relating to SPAs and SACs. Any project not directly related to the management of an SPA/SAC and likely to have a significant effect must be subject to an appropriate assessment. A damaging project should only proceed if there are no alternatives, it is imperative for reasons of overriding public interest and all compensatory measures necessary have been taken. Attempts to define acceptable loss criteria currently raise more questions than they answer. However, there are useful examples of how such concepts might be built into decision making procedures (e.g. US Fish & Wildlife Service draft principles for implementing a no net loss policy, 1990).

In general, these examples adopt a dynamic approach to the decision making process which begins with the ideal

replacement habitat on offer constitutes an equivalent habitat to that being lost? Like the dynamic decision-making process above, decisions concerning habitat equivalence involves a dynamic process.

At one end of the scale is replacement habitat which is exactly like the habitat being lost—the same in area, function and value, and as close as possible to the impact site. At the other end of the scale is replacement habitat, which is of a different type to that being lost - it is smaller in area and doesn't replicate the function or value of the impact site. There is an inverse relationship between equivalence of the wetland and compensation—the more unlike the replacement wetland is, the greater the justification for compensation. Superimposed on this relationship must be the degree of risk that the replacement habitat will

and moves through a sequence of less and less preferred options when the ideal cannot be implemented. The process of sequencing applies to a number of facets and defining the sequence of preferred options is critical. The sequence should begin with avoiding impacts entirely. If this is not possible, then impacts should be minimised by reducing the magnitude of actions, rectifying adverse impacts, reducing or eliminating impacts over time or compensating for adverse impacts by replacing lost habitats. The sequence of planning solutions should range from project relocation, through to alteration of project plans with careful design and implementation, and the reduction of on-site and off-site impacts.

What constitutes acceptable habitat replacement?

Whether it is part of the mitigation process or as part of a compensation package, a significant problem arises when alternative habitats are being considered in order to achieve no net loss. How do we decide when a

fail to provide the expected functions and values. The greater the risk, the greater the amount of compensation required as 'insurance' (Fig. 1).

Having decided what type of habitat replacement is appropriate under the particular circumstances, one must then decide how best to deliver it. Mitigation and compensation procedures from elsewhere in the world, and

particularly the USA, indicate that there is a hierarchy of preferred approaches (for example, see Fish & Wildlife Service 1981, Fisheries & Oceans Canada 1986, Illinois Interagency Wetland Policy Act 1989, Maryland Non-tidal Wetlands Protection Act 1989). This sequence is based on the contribution the approach makes to maintaining the overall stock of habitat and the probability of success.

There is the option of habitat restoration—restoring the functions and values to an area, which once was the same habitat as that being lost. This means that the overall area of the habitat is maintained, or even increased and because a number of the physical attributes of the old habitat may still remain (such as soil chemistry), the likelihood of success is good.

If habitat restoration is not a realistic option, then the next best thing is habitat creation. This means the overall area of habitat is maintained or increased. However, because many of the habitat attributes may be absent and will have to be recreated as well, the chances of success are less certain.

If creation is not possible, then habitat enhancement should be considered. This does not result in the maintenance of the overall habitat stock. However, by enhancing the value of existing habitats of the same type, the overall value of the habitat in a region can be maintained or increased. Finally, if none of these options are possible, then preservation of the remaining habitat stock should be the last resort. The overall area and value of the habitat resource will have declined but at least what remains will be protected in the long term. In effect, this means removing the remaining areas of that habitat from the policy of no net loss.

It is possible to link habitat restoration/creation criteria to the type, importance and level of impact of the habitat involved as well as to habitat function (e.g. in Alaska, category A wetlands require no net loss of functional values within the catchment, category B wetlands require no net loss of functional values within the community). However, many agree that in the short term, surrogate

measures such as area will have to continue to be used due to the absence of more definitive measures. This of course raises questions of what area ratio of new habitat to lost habitat is acceptable. This is likely to be dependent on the functional value of the impact site, the value of the replacement wetlands and the likely success of the replacement proposals.

How do you achieve no net loss rather than loss followed by gain?

Effective implementation of no net loss requires replacement habitats to be created in advance of the losses and shown to be an integral and functioning part of the site which will sustain a loss before the loss occurs. A major problem is that this requires the creation of replacement habitats normally many years in advance of losses. Therefore, no net loss must be a proactive policy rather than one designed to only react to proposals resulting in habitat loss.

Mitigation or Land banking

In the USA, large scale habitat creation is used to offset piecemeal habitat losses in the future. This is known as mitigation or land banking. The 'developer' does not have to restore or create habitats, rather they purchase 'credits' from another 'developer' who has restored or created habitats for this purpose. A detailed study of mitigation land banking in action in the USA concluded that, *as part of the sequenced decision making process*, it can provide ecologically sound and viable compensatory mitigation (Environmental Law Institute 1993). It can help to ensure that mitigation is more ecologically significant because it can:

- ensure that habitat is created and proved successful well in advance of habitat losses;
- facilitate larger scale one-off habitat creation which may provide for buffer zones which can increase the resilience of a site and ensure success;
- deliver economies of scale - reducing the number of EAs needed, the number of contract tenders etc.;

- be designed to specifically address regional or national biodiversity targets for habitat creation.

However, the study also concluded that successful mitigation land banking required a regulatory framework, which should be legally enforceable. This should include:

- production of national guidance providing clear standards for mitigation banking although such guidance should not establish a precedence for banking over on-site mitigation;
- development of standards for successful habitat restoration/creation;
- the production of habitat conservation plans which established specific goals for habitat restoration/creation; and
- support for pilot projects.

Mitigation land banking requires an agency with overall responsibility for establishing and operating a mitigation land bank, up-front financing, guaranteed return on investment for the developer possibly some years after the bank is established and a requirement that mitigative action is still carried out on site (Grenell 1993). In addition, firm and consistent regulation of developments proposing habitat loss must be a precondition and close attention is required to the terms and conditions of both on-site mitigation and mitigation banking. Due to the time scales over which habitat functions evolve, often the full functional performance of the bank will not have been established prior to their use in mitigation. Therefore it is essential that financial assurances exist to ensure successful completion of the bank. The signing of contracts or the deposit of money is not considered sufficient.

Is habitat creation a realistic proposition?

It is generally agreed that no habitat can be duplicated exactly. In addition, it is accepted that the protection of existing habitats is the cheapest and most effective way of conserving wildlife and must always take precedence over other means (e.g. Wildlife Ministers' Council of Canada 1990, Commission of the European Communities 1995). However, provided with quality information about the characteristics of

the original habitat, careful design and sufficient attention to monitoring and maintenance, many aspects of a wide range of habitats may be restored or created to provide many of the same functions as the original habitat (Conservation Foundation 1988). Indeed, much of the disagreement over success revolves around its definition (Stephens 1991). If success is defined in terms of a relatively small number of measurable objectives, then it becomes a more realistic proposition.

Many of the problems with delivery of a no net loss policy identified by practitioners stem from the lack of scientific certainty and predictability of habitat restoration and more particularly habitat creation. Some of the reasons why it is so difficult to create new habitats and in particular wetlands include (after Zedler 1988):

- wetlands are highly complex and develop as part of a larger, still evolving landscape;
- there are no blue-prints, we can see the end product but not the long-term processes;
- wetlands include mobile and responsive species;
- the inter specific and between habitat relationships and dependencies are incompletely understood;
- wetlands are highly dynamic, they accrete and erode, flood and dry out (raising the question of Limits of Acceptable Change);
- the required combination of functions to establish habitat persistence and resilience are not known; and
- regional wetland requirements must be accounted for but the linkages and corridors required, are poorly understood.

It can be concluded that habitat creation can contribute to the overall goal of no net loss. However, many technical problems exist which affect the success of creation projects, making habitat creation a tool of limited application at this time. The scientific uncertainty surrounding habitat restoration and creation is a major impediment to the development of a no net loss policy (Conservation Foundation 1988, US Fish & Wildlife Service 1990). However, if the concept of a no net loss goal is considered valid, then current inability to achieve this is not necessarily a legitimate reason to dismiss the goal. Instead, it should

force us to define what we do and don't know about protecting and restoring habitats and to develop programmes to address the shortfall in information (Lynch-Stewart 1992).

How do you know when no net loss has been achieved?

The scale at which no net loss is measured will affect the interpretation of successful implementation. This is reflected in Canadian policy where the standard of no overall net loss does not require compliance on a case by case basis (Lynch-Stewart 1992). It is the nation's overall wetland resource that needs to reach an equilibrium between losses and gains in the short term, and to increase in the long term. In other words, it is accepted that losses cannot be stopped completely. However, it is clear that successful implementation of a no net loss policy requires a significant reduction in the rate of wetland loss and an increased rate of wetland restoration and creation.

Scale is also important in another aspect. Under the Habitats Directive, it can always be argued that an alternative exists to a damaging proposal (Huggett 1996b). The fact that the less damaging proposal may cost many millions of pounds more, is something, which arguably is not a matter for consideration under the Directive. However, this could lead to ridiculous situations where the cost of less damaging schemes not only is prohibitive in terms of the economic benefit gained but is also excessive in terms of the nature conservation benefit. A combination of a more damaging scheme and habitat replacement *could* achieve greater conservation gain in the long term.

If the no net loss policy is to work and alternatives issues under the Habitats Directive tackled effectively, the geographic scale on which alternatives are considered may need to be increased. In the USA, a regional approach to habitat management allows the area of search for replacement habitats to be broadened and potentially the interpretation of what constitutes an alternative to be relaxed.

However, irrespective of the scale at which success is measured, success criteria still need

to be developed. These should be defined in terms of habitat function and values in their widest sense (e.g. ecological, sociological etc. values). However, experience of translating general objectives relating to function and value into measurable targets, perhaps in terms of bird numbers or habitat area is still largely undeveloped in the UK. For example, whilst numbers and species of birds using new habitats can be easily compared to old habitats, the tolerances and how natural variation can/should be accounted for is still in its infancy.

The Future - where do we go from here?

It can be concluded from this brief paper that the development of a no net loss policy for habitats in the UK will not be easy. However, practitioners of existing no net loss policies have identified a number of key points which would assist in the potentially successful development and implementation of no net loss policy. Central to this is the development of a coherent delivery framework. Key elements of this framework should be:

- the establishment of a national goal and clear regional goals to guide all habitat protection and management;
- full and effective implementation of existing legislation;
- the modification of habitat regulation where gaps exist to provide more effective protection;
- the development of new strategies and tools (especially spatial development strategies) which involve a multi-disciplinary approach to meet the goals;
- to improve the Government lead by reducing habitat loss from Government action, increasing the rate of purchase of the most important habitats, improving the management of habitats in public ownership and restore habitats on public land;
- to increase incentives for wise management and protection of habitats in private ownership;
- to improve the quantity and quality of knowledge, especially basic research on habitat functions, values, habitat creation and restoration;
- to increase efforts devoted to habitat restoration and creation;

- to ensure adequate money and other resources to implement national habitat programmes;
- to develop full monitoring programmes; and
- the development of public awareness programmes.

No net loss must be delivered through advanced planning rather than on a case by case basis. Area wide multi-functional plans need to be developed which involve a process which engage all agencies in the setting of multi-functional objectives. These plans should have strong links with existing multi-agency integrated management plans already in existence. Specific objectives should be to:

- define habitats and delineation criteria;
- guide development to the most appropriate locations;
- identify priorities for acquisition;
- identify threshold levels, which trigger no net loss implementation;
- outline the sequence of required mitigation procedures
- prescribe specific compensation/mitigation options suitable for a range of habitat types;
- prioritise research programmes, monitoring and maintenance requirements.

Whilst these measures will not on their own necessarily provide a full and effective framework for the implementation of a no net loss policy, they should be considered as the basis upon which further deliberations and debate should be established. It is hoped that this debate can now begin.

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