LIABILITY FOR DAMAGE TO NATURAL RESOURCES

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Executive Summary

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Preface
This background paper is the result of a short research into aspects of liability for natural resource damage. The aim of the study is to explore the various problems that may exist when recovering natural resource damages (i.e. standing, damage assessment, type of natural resources covered) and to identify possible solutions. The project started July 1997 and ended 15 September 1997.
LIABILITY FOR DAMAGE TO NATURAL RESOURCES

I. Introduction
In establishing directives containing emission norms, quality standards, obligations regarding assessment of environmental effects of certain projects, requirements for operation of certain sectors of industry and others, the European Community aimed to prevent and avoid damage to the environment. Unfortunately, and despite these Community acts, pollution incidents and other harmful events can never be entirely prevented. As a consequence, damage to the environment will occur. An environmental liability regime might in such cases be a useful tool to recoup the damage and restore the environmental damage done. It is a mechanism to complement the current EC environmental protection policy. A Community liability regime would also support international efforts to prevent further deterioration of the environment and to preserve nature.

In most Member States, environmental damage cannot be compensated in the absence of any personal damage or damage to property. An environmental liability regime at EC level needs to address this issue, thereby remedying some of the gaps in the environmental protection regimes of the Member States. This background paper focuses on the compensation of damage to natural resources, irrespective by what activity (inherently damaging or not), incident or event, the damage is caused. It does not deal with traditional types of damage, such as personal injury, property damage or pure economic loss caused as a consequence of the damage to the environment and unrelated to personal injury or property damage.

Although many questions are raised with respect to the coverage of this type of environmental damage, the limited size of this paper permits analysis of only a limited amount of issues. These include standing, assessment, threshold criteria and the identification of elements to be considered when applying a cost-benefit analysis in choosing restoration alternatives (see below). Unfortunately, no reference can be made to relevant issues such as, the type and scope of liability (strict or fault-based), proof of causation and clean-up standards.

Furthermore, there is tried to link the envisaged liability system with existing EC legislation. This may contribute to the effectiveness of the overall environmental protection policy of the EC and prevents differentiation in levels of environmental protection between the different EC directives.

Regarding the use of terms in this document, it is important to note that, at least so far, there are no uniform definitions or standards available of important terms such as: environment, environmental damage, ecological damage, remediation, restoration or clean-up. Although this paper tries to bring some clarity in the discussion, it should be noted these terminological difficulties was of influence on the paper. For instance, also the McKenna Report\(^1\) is not always clear with respect to the use of terms like ‘clean-up’ and ‘restoration’ and the differences between them. This makes it difficult to compare the laws of Member States and the case law based on these statutes. EC

legislation is not always clear either as to the meaning and extent of relevant terms, as for example ‘restoration’ and ‘compensation’.

II. Kinds of damage to be covered

1. Introduction
Presume that a coastal area is used for recreational activities like fishing and swimming and that the wetland habitats located in this area, support significant bird and wildlife populations. If, as a consequence of for instance an oil spill (cf. Sea Empress spill) or a release of toxic substances (cf. Sandoz), damage is caused to this area, then this may have serious effects. Injuries may be caused to natural resources, such as fish, birds, marine mammals and other wildlife, and the marine ecosystem of the area. The spill may also result in a (temporary) loss of recreational uses for people visiting the area. In addition, the spill may also have an effect on the related industries such as tourism, fisheries and for instance, oyster production.

Apart from the property damage and pure economic loss, the question is now what kind of damage is compensatable. The clean-up cost are most often recoverable under the law of the EU Member States. Clean-up itself is however not always enough to support the full restoration of all damaged natural resources. Other measures are then necessary to accelerate the natural recovery. Without these measures it might well be that the recovery takes much longer. During this period of recovery the ecological services as provided by the damaged natural resources are affected. As a consequence, the public suffers a loss. What types of damage are recoverable? In the following chapters there is dealt with this question.

2. Scope of the regime with regard to damage to natural resources
This background paper concerns liability for damage to natural resources. The scope of the Community liability regime there is dealt with here, is limited to those injuries to natural resources that are not fully remedied by response actions, including clean-up, removal actions and preventive actions taken to limit environmental damage. This is not motivated by the fact that such measures are not of importance - they can greatly influence the extent of the restoration measures necessary - but by the fact that they are of a different nature than measures taken to restore damage to natural resources. Restoration measures are taken in addition to response measures and are aimed at the returning of the damaged natural resources to their baseline condition. Efforts to clean-up polluted and damaged sites may not fully address the harm to natural resources. Furthermore, most Member States already have laws authorizing public authorities, public interest groups and/or others to recover damages for clean-up costs

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2 It might be possible for instance, that clean-up measures are so successful that restoration measures are unnecessary or can remain very limited. There are however, also examples of cases in which clean-up measures themselves caused significant environmental damage. When selecting clean-up measures, it is therefore necessary to take into account e.g., the potential of further damaging the natural resources by such actions and the predicted recovery times under various alternatives (compare chapter III.2.3). It should be noted that the distinction between clean-up measures and other response actions on the one hand, and restoration on the other, is not always clear.
and costs of preventive measures taken to limit damage, provided that these costs are reasonable.\(^3\) The starting point here is that the person who is responsible for the act, incident or event that caused damage to natural resources, is liable for the injury to or destruction or loss of, natural resources, in addition to the liability for clean-up costs and preventive measures. However, this paper only deals with the first issue.

2.1 Definitions of environment, environmental damage and ecological damage

In the Green Paper it is stated that ‘[a] legal definition of damage to the environment is of fundamental importance [..]’, since such a definition determines the type and scope of the liability and the extent of the compensation to be paid.\(^4\) Unfortunately, no uniform definition of environment or environmental damage exists at the moment in either national or international law, or under Community legislation. Therefore, various approaches are taken. The term environmental damage is often used to point out that various types of damage, including injury to property, pure economic loss and personal injury, are caused via the environment. The term as such is therefore not very useful. Here there is dealt with environmental damage, but the scope of the liability regime is more limited and concerns ‘only’ damage to unowned natural resources and owned natural resources, but only insofar as these natural resources have a specific value to the public (see below).

2.1.1 Elements

Although no uniform definition exits, it is possible to identify elements that can be included. The term natural resources includes living and non-living natural resources like land, habitats, fish, wildlife, biota, air, water, ground water and ecosystems.\(^5,6\) Whether these resources have a direct commercial value or not is immaterial. Damage to natural resources is then to be considered as the alteration, modification, injury to, deterioration, destruction or loss of such natural resources. The loss or impairment of public uses or services as a consequence of the harm to these natural resources is also to be considered damage. Examples in this respect are the loss of uses or services caused by the impact of the damaging activity on natural resources like fisheries, wildlife, waters and land accessible to the public. Examples are wildlife viewing, hiking, camping, boating, recreational fishing, swimming, hunting and other recreational services provided by the damaged natural resources.

It should be noted that not every change in the quantity and quality of natural resources or the services provided by such resources, is to be considered as damage. Certain threshold criteria have to be taken into account (see further chapter II.2.).

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\(^3\) See e.g. McKenna Report, 246 (France), 252 (Netherlands). However, to prevent distortions of competition and differences in liability regimes in Member States, inclusion of a provision in the EC regime to the effect that the responsible party is liable for clean-up and removal costs and for the costs of preventive measures taken to limit the damage should be considered.

\(^4\) COM(93) 47 at 10.

\(^5\) Art. 2 of the 1992 Biodiversity Convention defines an ecosystem as a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

\(^6\) Compare the US Oil Pollution Act, CERCLA and the 1993 Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment.
2.1.2 Owned and unowned natural resources
A distinction is to be made between damage to persons and purely private property on the one hand, and ecological damage on the other. Ecological damage is defined here as damage to unowned natural resources and natural resources subject to property rights but only insofar as these natural resources (owned as well as unowned) are of particular value to the public (see figure I. and chapter II.1.1.3). Thus damage to persons, purely private property and pure economic loss is not included here, although such damage might be the result of environmental damage.

For the proper functioning of the liability regime it is necessary to attempt to define as precisely as possible the scope of the liability regime and the person(s) liable for the damage caused. Especially with regard to the owned parts of the environment, it is necessary to have a very clear picture because the EC liability regime might limit property rights and influence the freedom as regard to the way compensation is spent by the claimant (see below).

2.1.3 Linking the liability regime with community legislation
Many EC directives, including the important Environment Impact Assessment directive, are of a preventive nature and support the overall EC environmental policy directed at sustainable development and maintenance of biodiversity. Some of these EC directives are focused in particular on the preservation of threatened and endangered species and the habitats they depend on. For instance, under both the Wild Bird directive and the Habitat directive, Member States are required to take certain management, conservation and protection measures regarding such species and habitats.\(^\text{8}\) One of the

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\(\text{Fig. I Scope of the liability regime}\)

Unowned natural resources

Owned natural resources

natural resource of particular value to the public

Scope of the liability regime

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measures is the designation of special protection areas and special areas of conservation to safeguard threatened and endangered flora and fauna species. With regard to these areas and species, Member States have to take steps to avoid pollution, deterioration and significant disturbances. These effects can be caused by a whole range of activities, events and incidents, including adverse habitat modifications. These disturbances and damaging events may have negative effects on natural habitats, wild birds and other species, and can endanger important behavior patterns of species such as breeding, feeding and other physical and biological factors essential for their life and reproduction. The efforts of the public authorities to control and manage these resources are not only for the benefit of the species and habitats themselves, but also for the benefit of the public.

The natural resources subject to the Wild Bird directive and Habitat directive are managed by and controlled by the Member States irrespective of the possible existence of private property rights. The inclusion of privately owned land and waters containing valuable nature habitats can be explained by referring to the overall objective of the regimes: protection and conservation of nature. The legal status of its elements is of little relevance to this objective. It may also be explained by the interest the public has, in natural resources in general. Damage to owned valuable natural resources may concern the public to the same extent as injuries to unowned natural resources.

If damage is caused to the species and habitats protected by these directives, the efforts of the EC and its Member States to protect and conserve nature, are frustrated. As a consequence, measures have to be taken to restore the natural resources in order to meet (again) the conservation needs of the habitats, birds and other species and the level of protection required by the directives. However, who is paying for this? The directives contain already obligations regarding the taking of restoration measures, but an explicit provision on liability is not included.

As pointed out earlier, only those owned and unowned natural resources are included insofar as these are of particular value to the public. Under both directives Member States have to designate special protection areas. These designated areas can be used as a point of reference. The nature habitats and other natural resources located or dependent on these geographical areas are because of their importance to be qualified as of particular value to the public and fall therefore in within the scope of the regime. A special problem concerns nature habitats subject to private property rights. In case damage is caused to private property, it is in principle up to the owner to seek redress and restore the damage done. However, not in every case the owner will be willing to press claims or spend the compensation on restoration of the damaged natural resources. It might also be that the owner himself caused the damage. In the light of the objective of the Wild Bird and Habitats directives, something also needs to be done if damage is caused to habitats located on private property in these cases. Various approaches regarding the recovery of damage to particular privately owned natural resources are then possible. One is, to give the state or a public interest groups - depending on the choices made regarding locus standi (see § II.3) - standing to bring a claim. Nevertheless, a state or public interest group should not be getting involved in

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9 See Art. 3 and 4 of the Wild Bird directive and Art. 3 of the Habitat directive.
the claim and restoration-process, unless this has a significant benefit for the public. It is not the intention to include all natural resources that are subject to private property. Hence, only those natural resources should be included that are of particular value to the public. Here, there is chosen to link the liability regime with the Wild Bird and Habitat directives. However, in line with the subsidiarity principle, it could be considered to leave it to Member States to extent the scope of the regime to other areas that contain or support natural resources of particular value to the public. For instance, almost all Member States have designated nature reserves. It should be noted however that it is unclear if this approach is useful. There might for instance exist a difference between Member States in the requirements necessary to appoint an area as a nature reserve, or the extent of the control and management of the public authorities over the resources located in these areas may differ. It might also be that the geographical boundaries of these areas are not as clearly drawn as the areas appointed under the Wild Bird and Habitat directives. This may lead to differences in the application of the liability regime between Member States.

Outlook. The benefit of the approach chosen here, is that the environment is more qualified as unity. However, since under this approach property rights may be affected, it is necessary to carefully consider the consequences for the owner. At least the owner should be able to identify the habitats and biotopes concerned and foresee his legal rights and obligations regarding these nature habitats and biotopes. It might also be considered by Member States to establish mechanisms to compensate the owner for the consequences of the regime.

2. Threshold
The liability regime authorizes the compensation of damage to natural resources as a result from all kinds of activities, incidents and adverse events. However, not every change to the quality or quantity of natural resources or the services provided by these resources, should be qualified as damage and give rise to liability. To determine what level of damage or degree of impact should be considered damage as defined under the Community regime, is difficult. In national, international or European law no uniformity exists as regard to threshold criteria. Often, reference is made to the terms like ‘significant’, ‘appreciable’ or ‘considerable’, but it is not entirely clear what level of harm is necessary to meet these criteria.

For the well functioning of the liability regime it might be beneficial to identify threshold criteria below which the responsible party will not be liable. However, the threshold should not be too high, since that could be used as a defense against claims for natural resources damage. The approach chosen here is to list a number of factors that could be used to guide the damage determination process. The factors given, are to be valued as a starting-point in proving that a measurable adverse changed is caused

10 It might also be considered to extent the scope of the regime to other (future) directives. The Water Framework directive might be useful in this respect. See COM(97) 49 final, proposal for Council Directive establishing a framework for Community action in the field of water policy.
11 In Annex III to the Council Directive amending the environmental impact assessment directive (OJ No L 73/5, 3 March 1997), criteria and thresholds are listed that may give some guidance as to valuing the potential significant effect on the environment of certain activities. Notice is taken of these criteria and thresholds.
to natural resources and services. The following factors can be helpful to proof that
damage is caused to natural resources and that the nature of the damage is more than
minor. The list is not exclusive and the factors can be used in combination. Whether
the threshold is exceeded, is to be decided on a case by case basis. In each case, the
situation existing after the injury should be compared with the one existing before the
damaging activity, incident or event (see further chapter III.2.1).

The factors proposed are:
- is the damage observable and/or measurable;
- are there changes in the growth, reproduction, viability and condition of the natural
resources taking into account the natural variation and fluctuation (e.g. distortion of
the ability to function or reproduce, diseases, death, etc.);
- is there a change in the quality and quantity of natural resources;
- is there a change in the level and quality of human services provided by the natural
resources (e.g. beach closure, fishing ban);
- what is the physical and chemical quality of the species and habitats (are statutory
tolerance levels exceeded or not);
- are any endangered or threatened species affected;
- are any commercially or recreationally significant natural resources affected;
- are the habitats, surface water, sediments, and other still ‘able’ to support other natu-
ral resources and relevant public uses (is there a serious interference with uses of the
environment);
- does the interest of the protection of the environment and the population require
measures to limit and prevent further damage or pollution;
- is there a significant mortality of species of flora and fauna;
- are there any specific biological responses to the damage (e.g. thinning of eggshells);
- is the natural resources expected to recover fully or to acceptable extent within a rea-
sonable amount of time;
- are there any infringements of quality standards, excesses of tolerance levels or vi-
olations of emission norms (compare with criteria established in state laws and regu-
lations).

With respect to the quality standards and emission norms mentioned in the last factor,
reference can be made to various relevant EC directives. These directives contain
quality standards for instance for the use of surface water intended for the abstraction
of drinking water and for certain species used for consumption and other purposes. Other
directives contain discharge or emission standards for hazardous and dangerous
substances, laying down the maximum permissible concentration or quantity of a sub-
stance in a discharge, sometimes related to particular environments into which the

surface water intended for the abstraction of drinking water in the Member States (amended); Council
Directive 76/160/EEC of 8 December 1975 concerning quality of bathing water (amended); Council
Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improve-
water intended for human consumption (amended). See also the Proposal for Council Directive estab-
ishing a framework for Community action in the field of water policy, COM(97) 49 final, 26 February
1997.
substance is discharged. However, the quality objectives and emission standards are not always useful. Quality standards have not been set up for all relevant natural resources and services provided by such resources. Moreover, some of the current quality standards are too lenient for some substances and do not necessary reflect levels at which no environmental damage will occur. In some cases it is therefore necessary to adjust the levels and to establish them for resources for which they do not yet exist. A violation of emission standards might be useful as supportive proof, but the violation itself does not prove that damage is caused. Finally, the monitoring and inspection system as created under some EC directives might also be helpful and can provide useful data to support proof of damage. In addition, national legislation addressing the quality of certain natural resources and emission norms might also prove to be useful. The same goes for the monitoring and inspection systems as set up under the national law of Member States.

3. Standing and access to justice. Who can sue for damage to natural resources?
Under civil law only the person whose rights have been infringed is entitled to compensation. At least a part of the natural resources that are falling within the scope of the liability regime as discussed here (fig.1), are not assigned to anyone; they are either res nullius or res communis. In principle therefore, no one has standing to claim compensation for damage to such natural resources. Since the liability regime is aimed at compensating this kind of damage, it is necessary to determine who is entitled to seek legal redress, i.e. monetary compensation. Apart from this, it is necessary to create a competence for certain actors to assert claims for damage to owned natural resources if the owner is unwilling to raise claims if damage is caused to his property, is not willing to use the compensation for restoration purposes or if the owner himself caused the damage.

Since it is probably unpractical to give everyone a right to claim compensation, choices have to be made. The designation of the public authorities, public interest groups or both, to act on behalf of the public in case of damaged natural resources and to recover damages for these injuries, is of crucial importance in order to ensure that restoration can be undertaken. Such a designation gives them a certain responsibility for the protection of the natural resources and the restoration of the resources if damage is done. In addition, if Member States are left to decide on this matter, the harmo-

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14 Some Member States have for instance clean-up standards for soil pollution and water quality standards, both relating to services provided by the natural resources involved; as drinking water, recreational uses, etc. See e.g. McKenna Report at 254-56 (Netherlands), 249 (Germany).

15 Apart from administrative laws requiring owners to clean-up his polluted land or to restore specific resources such as trees or a forest, there is only very limited experience in Member States regarding this issue.
nized application of the environmental liability regime might be diminished which may cause distortions in competition.

As far as the standing question is concerned, there are a number of options. Four of them are listed here:

- the public authorities can be given the right to claim for natural resource damages;\(^\text{16}\);
- public interest groups can be given the right to seek compensation if damage is done to natural resources;
- public authorities and public interest groups can both be given the right to seek redress in case of natural resource damage;\(^\text{17}\);
- public authorities can be granted the primary responsibility to claim ecological damage and public interest groups the right to challenge the public authorities if they fail to exercise their powers.

In assessing the merits of these alternatives, it should be kept in mind that practice regarding the involvement of public interest groups in the field of environmental protection is almost limited to claims for injunctions aimed at stopping the (potentially) damaging activity.\(^\text{18}\) Claims for compensation are extremely rare and often focused only on actions taken to restore specific natural resources in which the public interest group has a particular interest. An example in this respect is the restocking of fish in a lake or river by local angling associations.\(^\text{19}\)

Although it is necessary to think over these choices and to discuss the possible consequences of these options, there is not dealt with this issue any further because it falls outside the scope of this paper (see further the Background paper EC DG XI/Hans Lapatte). A few important remarks will nevertheless be made here.

First of all, if public interest groups are given the primary responsibility, a multiplicity of actions by public interest groups each seeking compensation for damage to specific parts of the environment should be prevented. The same problem may also arise if both the public authorities and public interest groups are appointed as having the right to claim natural resource damages, or if an owner is involved in a claim relating to damage to owned as well as unowned natural resources. In order to limit assessment and transaction costs and to prevent double recovery, co-ordination will be necessary in for example actions taken to clean-up, restore or assess the damage.\(^\text{20}\)

Secondly, public interest groups and other persons should be given the opportunity to comment on the assessment of the damage, the settlement (if appropriate) and the

\(^{16}\) See e.g. McKenna Report, at 244 (Finland) and 251 (Italy). In the Netherlands it is not entirely clear who is entitled to claim compensation for natural resources damages. It is left to the courts to decide on this matter, but there is no case law yet.

\(^{17}\) See e.g. McKenna Report, at 270 (Norway).

\(^{18}\) See e.g. McKenna Report, at 285 (the Netherlands), 296 (Belgium) and 301 (Portugal). Apart from injunctions prohibiting or correcting the damaging act, some Member States are considering giving public interest groups a right to bring a legal action for obtaining an injunction ordering the restoration of the environmental damage by the responsible party. See for instance McKenna Report at 246 (Belgium) and 285 (Netherlands). See also, the Amended Proposal for Council Directive on civil liability for damage caused by waste, OJ C 192/6 of 23 July 1991 and the Lugano Convention on civil liability for damage resulting from activities dangerous to the environment.

\(^{19}\) Only a few cases are known. See e.g. McKenna Report, at 241 (Denmark) and 210, 246 (France).

\(^{20}\) These problems may also arise in case of transboundary damage.
restoration plan for several reasons. Damage to natural resources involves often public interests because of the services these resources used to provide to the public. Furthermore, such groups and persons often have specific knowledge of the damaged environment and the restoration is for their benefit and that of the public they represent.

4. Other elements to be included in a liability regime for damage to natural resources
   
a. The way of spending compensation obtained. Compensation obtained by the state, the public interest group and/or the owner should be earmarked and used only to restore, rehabilitate, replace, or acquire the equivalent of, the injured natural resources. A comparable obligation with respect to the way compensation should be spent, is almost unknown in the civil law of Member States and others. Statutes of Norway, and the US contain such provisions, but this obligation is only found in environmental laws directed at the restoration of environmental damage. A comparable obligation is unknown in the relevant international environmental liability conventions. However, under some of these international conventions, a similar effect is achieved through the rule that compensation is only paid for measures of reinstatement actually undertaken or to be undertaken.

b. Pooling of compensation. In some cases, natural resource damage will exceed the threshold (see chapter II.2) but will be too limited, for economic and technical reasons, to restore the damage. Pooling of compensation is one of the possibilities to deal with such situations. It may take different forms. First, the responsible party could be allowed to participate in an appropriate and existing restoration project. Secondly, if monetary compensation is obtained, this should be earmarked and deposited into a fund. The money is only to be used for restoration purposes, but since restoration of the specific damage is not appropriate for technical and economic reasons, the money may also be used for other projects; i.e. the restoration of other sites. Under both alternatives there is a question as to the link between the resources originally damaged and the way in which the compensation should be used. How closely linked should the compensation be used? Preference should be given to areas closest to the place where the natural resources where damaged and to restoration of natural resources most similar to those damaged (see further chapter III).

c. Other costs. The responsible party should also be held liable for the reasonable costs of assessing the damage to natural resources. Assessing and valuing damage to natural resources can be very costly. Therefore, these cost should be limited to what is valued as reasonable. What is reasonable depends largely on the extent of the damage and is to be judged on a case by case basis. Other costs to be included in the regime are the reasonable cost of monitoring during the period of recovery.

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21 In some Member States the plaintiff can be ordered under administrative law to restore certain natural resources. The restoration obligation is often limited to clearly designated natural resources and is not necessarily linked to the plaintiff’s civil liability claim or the damages awarded to him under civil liability law.

22 Compare for example the 1992 Protocols to the Civil Liability Convention for Oil Pollution Damage and the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances.

23 There are several approaches regarding the reasonableness of assessment costs. CERCLA and OPA consider these costs to be reasonable if they do not exceed the expected recoveries.
III. Ecological damage; Techniques for valuation of damage to natural resources

1. Introduction

The nature of the proposed EC liability regime has a compensatory and not a punitive nature. As a consequence, it is necessary to assess the damages in such a way that it represents the value of the natural resources and the services lost. It is therefore a necessity to measure the injury and value the damaged natural resources.

Assessing damage to natural resources is a complex task, since many natural resources do not have a market value. Various methods have been developed by economists to value natural resource damages, but some of these methods are highly controversial. Experience with the use of such methods is limited. Experience with the use of such methods is limited. This section of the paper starts with a short overview of the economic methods available to assess damage to natural resources. It also discusses other approaches, and various components of natural resource damage claims including the compensation of interim losses and the reasonableness of restoration costs.

The economic methods available to assess natural resource damages include: factor income methods, market-based approaches, travel costs methodology, hedonic pricing methods, contingent valuation and conjoint analysis. Some of these methods are controversial, especially when connected with the assessment of nonuse values. As far as known, only the US uses these methods to assess the amount of compensation to be paid for damage to natural resources. In EC Member States as well as under most international environmental liability regimes, there is only limited experience regarding valuation of natural resource damage. Some Member States and most international environmental liability conventions prefer to use the extent of the restoration costs as a primary measure of damages. This is the case in for instance Italy. Only if - for whatever reason - restoration is infeasible, damages are quantified not on the basis of restoration costs, but by reference to principles of equity, taking into account the extent of the damage to natural resources, the economic benefits, and the extent of the damage caused by the claimant when taking response actions such as clean-up measures. Economic methods as mentioned above, were seldom used here.

With regard to the valuation of damage to natural resources various approaches are possible. Apart from the use of the above mentioned economic methodologies (and others) to put a price tag on the lost natural resources and services, one could develop abstract models (computer models, compensation tables) with standard procedures and taking account of only a limited amount of factors like, the type of injury, the mortality rate, place of the injury, the quantity and nature of the substance spilled (if any), etc. Another possibility would be the use of restoration costs as a measure of damages (or a combination of the approaches mentioned here).

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26 ERM Main Report, p. 28-29.
27 McKenna Report, at 251 (Italy).
2. Assessment of damages. Reparable and irreparable harm to natural resources

2.1. Restoration as the preferred method to assess damages and quantify the monetary compensation to be paid.

In order to establish the amount of compensation to be paid for the ecological damage, various approaches are available (see above). If restoration is technically feasible and the costs of such actions are reasonable, the cost of measures taken to restore the damage to natural resources is the primary and preferred method to assess damages. This method will often be cheaper than the use of economic methods to assess the damages. Furthermore, the results achieved with the restoration approach are less controversial - especially if a cost-benefit analysis is used (see III.3) - and this measure of damages directly corresponds with the objective of the regime; restoration of the damaged natural resources and the services provided by the resources. Restoration seems also to be the preferred measure of damage under most civil liability conventions and the law of some Member States.

The term restoration encompasses measures taken to restore, rehabilitate, and replace the damaged natural resources. These restoration measures are undertaken to return the damaged natural resources and services to their baseline condition, which means that such restoration measures need to be taken, as to reinstate the natural resources and services to what they would have been had the incident never occurred.

In some cases it might be difficult to determine the exact baseline condition. This is so especially if the incident occurred in a highly industrial area were it is difficult to distinguish the effects of the damaging act from the effects of previous releases and others harming events. In estimating the baseline, it might be helpful to use historical data, reference data, control data, environmental impact assessment data (if available) and information from areas unaffected but comparable to the damaged site.

In order to determine the amount of compensation to be paid, it is necessary to define the appropriate scope and extent of the restoration actions. In several EC directives reference is made to measures taken to restore or re-establish natural habitats, biotopes and the population of species of wild fauna and flora, but no guidance is given as to the scope of the measures. The same goes for the relevant international conservation treaties.

Restoration actions need to address the injuries to the natural resources and are directed at returning the damaged natural resources and services to what they would have been had the incident never occurred. The appropriate size of the restoration measures can be determined by valuing the extent and nature of the damage, the type, quantity and quality of the natural resources and services lost and determine the measures necessary to replace and restore the quantity and quality of these natural resources and services. The extent of the restoration measures is limited to measures necessary to recover the natural resources to its pre-injury condition and directed at providing equivalent services as existed before the damaging event.

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28 It should be noted that also in case the restoration approach is used as the primary measure of damages, the use of economic methodologies might be necessary is some cases. The extent of its use is however more limited.

29 See e.g. the EC Wild Bird directive, the Habitat directive, the 1979 Bern Convention on Conservation of European Wildlife and Natural Habitats and the 1979 Bonn Convention on the Conservation of Migratory Species.
Depending on the circumstances, restoration actions can range from intensive human intervention to no action or natural recovery (see further chapter III.3). The objective of the liability regime is restoration of the damaged natural resources and services to baseline condition, but replication of the quality, quantity of the natural resources and services will not always be possible or only against extremely high costs. In that case it is appropriate to take such actions as necessary to restore the injured natural resources and services to a comparable condition. A cost-benefit analysis could be supportive here (see further chapter III.3).

Outlook. It is not acceptable that a responsible party has a better position if the damage caused is of such a nature that restoration is impossible or becomes disproportionately costly. It is therefore necessary to broaden the scope of the measure of damages. As will be shown some solutions have been found to solve this problem.

2.2 What measure of damages can be used in case restoration is infeasible?
In some cases damage will be (partially) irreparable because restoration, replacement or rehabilitation is technically or physically infeasible. In other cases the cost of such measures are clearly disproportionate and unreasonable. How should the damage be measured in such cases?
Although some of the international environmental conventions and the law of some Member States permit compensation of natural resource damage, not many have paid attention to this problem and developed a solution for it.30 The Lugano Convention is among the few to make reference to acquiring the equivalent of the injured natural resource as a measure of damages, in case restoration is impossible or unreasonably costly. Acquisition of equivalent resources might indeed be a valuable and alternative measure of compensation. The Acquisition of equivalent resources should be aimed at returning the natural resources to baseline condition and the provision of the same type of services as the ones lost, and if possible, to the same users who suffered the loss. Again, costs of such measures need to be reasonable.

Acquiring equivalent resources is not always a feasible method. For instance, in densely populated areas it might be difficult to buy acres of wetlands because much is already privately owned so their acquisition is impossible or possible only at a high price. An alternative might then be to pay an amount to a fund. The amount should reflect the nature and significance of the damage to natural resources, including the loss of services, and reflect the estimated costs of a restoration action which would have been made, if this would have been possible. The cost of measures taken to restore a somewhat comparable site or resource can be used as an indicator. Another possibility is to assess the damage with help of economic methods and pay for the value lost. However, valuing natural resource damage is costly and complex. It should be noted that the money deposited in the fund is only to be used for restoration and other environmental purposes.

Under the law of some Member States other interesting alternatives have been developed for this problem. In Italy, courts may assess the damages in accordance with the principles of equity taking into account the seriousness of the fault, the profit obtained by the defendant and the extent of the damage caused by the claimant.31 It is unclear

30 See e.g. McKenna Report, at 244 (Finland), 270 (Norway).
31 See e.g. McKenna Report, at 251 (Italy) .
however, what is done with the compensation obtained. In the US and other States compensation tables and models have been developed to assess the damage. This also might be a valuable alternative.

Outlook. If appropriate a combination of measures may be taken; restoration, rehabilitation, replacement and acquiring equivalent resources. The extent of these measures and the ability of the measures to speed up recovery and compensate the lost services is of influence on another relevant type of damage; interim losses.

2.3. Interim Losses
Depending on the type and scale of the damage, it can take years before natural resource damage is recovered. In some cases human intervention may accelerate the restoration of the natural resources and services provided by these resources. In other instances, restoration is not feasible or has only a small impact on the recovery time. In such cases, the public suffers interim losses. Due to the damage, human uses of the natural resources are lost or impaired from the time of the damaging event until the time of full recovery. In that case (temporary) measures may be taken to compensate the public for these losses. An example of such a measure is the (temporary) acquisition of a substitute that provides the same or almost similar services to the public. For instance, if a beach is closed or wetlands are seriously damaged due to pollution, it may be possible to acquire nearby located acres to compensate for the lost uses during the period of recovery. If this is not appropriate, other measures may be taken to compensate for interim losses; e.g., enhancement of access to the affected area, improvement of habitats of species located at some distance from the site of injury. In case of other types of damage to natural resources, interim restoration measures are available, although in some cases selection of an appropriate alternative might be more difficult.

The type and scale of the measures necessary to compensate the interim losses is dependent on the level and rate of recovery and this is again dependent on the ability of the natural resources to recover naturally and possibilities to speed-up restoration by human activities. The sooner the resources are recovered, the smaller the interim losses (see fig II).
The most complex aspect of compensating interim losses is to determine what actions have to be taken to replace the impaired and lost human uses. To assess this, one could quantify the lost and impaired services and develop measures that provide services of the same or comparable type, quality and quantity. In case this approach is inappropriate, one may choose to assess the value of the lost and impaired uses (consumptive and non-consumptive) with the help of the economic methods mentioned above, and take such measures to restore the interim losses that provide services of a different type and quality, but of almost the same value as the value lost.

It is unclear whether this type of damage is included in any of the recent environmental liability conventions or the law of some of the Member States. However, it is part of the natural resource damage regimes in the US.

3. Cost-benefit analysis
In chapter III.2 and following, reference is made to the clearly disproportionate standard and reasonableness of the cost of measures taken to restore the natural resource damage or acquire the equivalent of such resources (or a combination of those). Com-
Compensation is only to be paid if these measures are reasonable and their costs not clearly disproportionate. The reasonableness criterion is found in many international conventions and the law of some Member States. No clear criteria have been developed to guide the process of determining what is reasonable or not.32 What is reasonable is difficult to decide and depends on several factors, including the commercial and non-commercial value of the natural resources, the quality and value of the human services provided by the resources and the ability of the resources to recover naturally. The reasonableness criterion requires balancing of the economic and environment costs of restoration measures against the environmental benefits of the measures. The environmental benefits not only include the restoration and conservation of the natural resources, but also the restoration of services and the compensation of interim losses.

In order to determine whether costs of restoration measures are reasonable, one could assess the damage with help of economic methods and compare the value of the damaged resources with the costs of measures to reinstate the environment. However, the use of economic methods to assess the (commercial and non-commercial) value of the damaged natural resources is costly and not always adequate. Furthermore, balancing the value of the injured natural resources against the costs of restoration measures is not always the appropriate measuring stick and may only give an indication as to the reasonableness of costs. The test itself does not decide whether costs of measures are clearly disproportionate or not. A certain standard or limit could be introduced above which the costs of measures taken to recover the natural resources are clearly disproportionate. However, such standards are often arbitrary, but they have been developed and were used in some instances to decide on the reasonableness of certain costs.33 There are other approaches available to determine the reasonableness of restoration costs. They do not rely on economic methodologies (or only to a certain extent) and use factors and criteria to determine or indicate whether costs of measures taken to restore the injured natural resources or the costs of acquiring equivalent resources (or some combination) are clearly disproportionate or not. With help of these factors and on a case-by-case basis one could decide on this issue. The following might then be relevant:

After determining the nature and extent of the impacts of the damaging activity on the natural resources, the claimant should identify a range of restoration alternatives with a comparable level of benefits and select the most cost-effective one. The possible alternatives can range from intensive action to no-action and natural recovery. Cost effective would then be the least costly alternative taking into account the factors as listed below and comparing the environmental benefits of each alternative. It is not appropriate to select an alternative on the basis of the market value of the natural resources only. Relevant factors are:
- the technical feasibility of the alternatives;
- the costs of each alternative;
- the relationship between the costs and benefits/results expected;

32 See e.g. McKenna Report, 237-273 and 244 (Finland), 248-9 (Germany), 270 (Norway). In the Netherlands, costs of restoration are considered reasonable, even if they are higher than the market value of the natural resources in question. The upper limit of the restoration costs depends on the circumstances and is to be decided by the court.
33 See e.g. McKenna Report, at 248 (Germany), 255 (Netherlands).
- the likelihood of success;
- the potential of further damaging (other) natural resources and services;
- the extent/amount of benefits of each alternative;
- the time period required for restoration under each alternative (keeping in mind the interim losses (see fig. II));
- the services that are likely to be lost for the public during the restoration;
- rate of natural recovery if no restoration measures are taken and the ability of the restoration actions to accelerate natural recovery.

![Fig. II Restoration alternatives](image)

**Interim losses**

<table>
<thead>
<tr>
<th>Years</th>
<th>10</th>
<th>8</th>
<th>6</th>
<th>4</th>
<th>2</th>
</tr>
</thead>
<tbody>
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<td>III</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternatives</td>
<td>Restoration</td>
<td>Natural recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Natural recovery will often take a longer period of recovery compared to the other restoration alternatives. The natural recovery alternative is probably cheaper because no active restoration costs are made. However, one needs to take account of the interim losses and the costs associated with these losses under this alternative. These might well make alternative 2 more cost-effective and cost-reasonable than the natural recovery alternative.

Outlook. It should be noted that in many jurisdictions courts already have the ability to reduce the damages if awarding the total amount is unreasonable given the financial capacities of the defendant, the type of liability and the extent of the injury. This also may function as a safety-net.

**IV. Insurance and other forms of financial security**

1. **The availability of insurance policies for natural resource damage**

Although it seems that there are not many insurance companies offering insurance for damage caused to natural resources including damage to unowned natural resources, insurance is available but its scope is limited. In general, the insurance industry’s ap-

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34 See <a href="e.g. McKenna Report at 243 (Finland), 252 (Netherlands), 248 (Germany).">e.g. McKenna Report at 243 (Finland), 252 (Netherlands), 248 (Germany).</a>
proach is that almost everything is insurable provided that the risk is reasonable calculable. This is exactly one of the difficulties here, and this is also one of the reasons for the insurance industry to be concerned about the increasing role of liability regimes in solving pollution problems.

There are two relevant forms of environmental insurance policies. First, insurance policies can be directed at compensating damage caused by the insured person himself to (other) people and property. Secondly, they can be aimed at compensating the costs made by the insured person for removing (historic or future) pollution on his own site. The first insurance form is of most value here. It covers both accidental and gradual pollution. In case damage is caused to parts of the environment that are property of someone, the insurance will only cover clean-up costs and cost made in restoring the damage. There is - as far as known - not much experience and no payments were made for restoration costs as yet. In case of damage to unowned natural resources, compensation will only be paid for clean up costs and other measures taken to minimize pollution damage.

The limit of the amount of the compensation to be paid, depends in principle on the sum the insured wants to be insured for, in other words there is no open-end insurance.

2. Voluntary liability funds
Another important issue is whether compensation should be provided through a compensation fund. It is the opinion of the Commission that industry and other sectors should be stimulated to set up voluntary liability funds. Although, no choices are made here with regard to the various forms of a fund could have, a fund could operate in combination with the liability regime and intervene only if damage exceeds a certain amount. It is left to industry and others to set up those funds and to decide on difficult issues like the funding; the extent of the contribution paid by the fund in case damage exceeds certain limits; the requirement of having an adequate insurance; and the influence of factors like the scale of the damage, whether the damage was done deliberately or not and the possible profits gained by the damaging activity.

3. A safety-net for uncompensated natural resource damage
Is the liability system as proposed conclusive or not? The liability instrument is probably not always useful for the damage at issue. Problems may arise where damage is caused by cumulative incidents, where the responsible party cannot be identified, where a causal link between the damaging act and the injuries cannot be proved and where the cost of restoration measures is unreasonable. It might therefore be considered by the Commission to establish, in whatever form, a safety-net (for instance a joint compensation fund). It could be considered to leave it to Member state to take initiatives in this respect (subsidiarity principle)?

36 Interesting examples in this respect have been TOVALOP and CRISTAL and, although of a different nature, the mutual insurance associations such as the Protection and Indemnity Clubs.
V. Concluding remarks and recommendations
The measure of damages under the EC liability regime as regard to natural resource damage should be: the cost of restoring, rehabilitating, replacing, or acquiring the equivalent, of the damaged natural resources, including compensation of interim losses and reasonable costs of assessing damage. Compensation should only be used for restoration purposes and is aimed at returning natural resources and services to their baseline condition. In this paper many different issues were addressed (some only very shortly). It should be noted that as regard to some of these issues further research is needed. It is therefore advisable to take advantage of the experience gained in the US with regard to these issues. We recommend to organize workshops for people directly involved in setting up a Community liability system. US experts could be invited to inform Community staff Members and others, on the loopholes and solutions found in the US as regard to the compensation and restoration of natural resource damage. It is also advisable to organize a conference on the extent of the proposed liability regime. This could stimulate the discussion in the EC and provide interested parties such as industry, public interest groups and the public authorities, with relevant and necessary information.

In our view, it is also necessary further to develop criteria and guidelines for the assessment of natural resource damage. Identifying the best available methods to value damage to natural resources is beneficial to the well functioning of the liability regime. A lack of guidance on the assessment of damage, could - because of the complexity of the issue - influence the motivation of the designated parties to claim compensation, hold the polluter liable and address the damage done. Furthermore, although it is probably unnecessary to make these damage assessment regulations mandatory, it might help to prevent differentiations in the legislation of Member States as to the assessment of compensation. We therefore recommend setting up a working group consisting of economists, lawyers, biologists and other relevant experts to develop these guidelines. It is also advisable to develop guidelines through a working group for the actual restoration of natural resources, which can in some cases be highly complex.

Another important issue concerns the scope of the liability regime (see fig. I). In view of the limitation of property rights and the restriction on spending compensation, it is necessary carefully to look at the implications of the path chosen and to limit property rights only if necessary and if there is a significant benefit to the public.

VI. Methods used in this research
The primary sources of this background paper have been the McKenna Report, the ERM Report and US legislation and practice as regard to the recovery of natural resource damages. Furthermore, notice is taken of relevant EC directives and case law of the European Court of Justice, IOPC-fund practice, international environmental liability conventions, drafts of relevant treaties and protocols and the law of Member States on liability for natural resource damage. Apart from this, a great many publications and other documents provided background material to this paper (see below). Of much help were also the frequent consultations with the staff of DGXI and the discussion meeting held at the beginning of June 1997.

During the short process of drafting this Background paper, staff Members of DGXI were provided with information on issues of relevance to the White paper but not necessarily forming part of this study or only to a limited extent.
Short list of references


Executive summary

Introduction
In establishing directives containing emission norms, quality standards, obligations regarding assessment of environmental effects of certain projects and others, the European Union aimed to prevent and avoid damage to the environment. Unfortunately, pollution incidents and other harmful events can never be entirely prevented. As a consequence, damage to the environment will occur. An environmental liability regime might in such cases be a useful tool to recoup, restore and prevent environmental damage (see also in this respect the Fifth Environmental Action Programme).
In most EU Member States, environmental damage cannot be compensated in the absence of any personal damage or damage to property (see McKenna Report, 1996). An environmental liability regime at EU level needs to address this issue, thereby remediying some of the gaps in the environmental protection regimes of the Member States. The background paper focuses on the compensation of damage to natural resources, irrespective by what activity (inherently damaging or not), incident or event, the damage is caused.

**Scope**
The scope of the proposed EU liability regime is limited to those injuries to natural resources that are not fully remedied by response actions, including clean-up, removal actions and preventive actions taken to limit environmental damage. Restoration measures are taken in addition to response measures and are aimed at the returning of the damaged natural resources to their baseline condition. The person who is responsible for the act, incident or event that caused damage to natural resources, is held to be liable.

The term natural resources is defined here as including living and non-living natural resources like land, habitats, fish, wildlife, biota, air, water, ground water and ecosystems. Damage to natural resources is to be considered as the alteration, modification, injury to, deterioration, destruction or loss of, such natural resources. The loss or impairment of public uses or services as a consequence of the harm to these natural resources is also to be considered damage. However, not every change in the quantity and quality of natural resources or the services provided by such resources, is to be considered as damage. Certain threshold criteria have to be taken into account (see below).

**Owned and unowned natural resources**
The scope of the liability regime is limited to ecological damages and concerns damage to unowned and owned natural resources, but only insofar these have a specific value to the public. The Habitat and Wild Bird directives can be used as a point of reference in this respect. Under both directives Member States have to designate special protection areas. The nature habitats and other natural resources located or dependent on these geographical areas are because of their importance to be qualified as of a particular value to the public. It could be considered to give Member States the right to extend the scope of the regime to other areas that contain or support natural resources of particular value to the public, such as national nature reserves.

A special problem concerns the natural resources subject to private property rights. In case damage is caused to private property, it is in principle up to the owner to seek redress and restore the damage done. However, not in every case the owner will be willing to press claims or spend the compensation on restoration of the damaged natural resources. It might also be that the owner himself caused the damage. In the light of the objective of the Wild Bird and Habitats directives, something also needs to be done if damage is caused to natural resources subject to property rights. Various approaches regarding the recovery of damage to particular privately owned natural resources are then possible. One is, to give the state or a public interest groups - depending on the choices made regarding *locus standi* - standing to bring a claim. Nevertheless, a state or public interest group should not be getting involved in the claim and restoration-process, unless this has a significant benefit for the public. It is not the
intention to include all natural resources that are subject to private property. Hence, only those natural resources should be included that are of particular value to the public.

Standing
A part of the natural resources that are falling within the scope of the liability regime, are not assigned to anyone; they are either res nullius or res communis. The designation of the public authorities, public interest groups or both, to act on behalf of the public in case of damaged natural resources and to recover damages for the injuries to these natural resources, is of crucial importance in order to ensure that restoration can be undertaken. As regards the natural resources that are subject to property rights, it is in principle up to the owner to seek redress and restore the damage done. In case the owner is not willing to press claims, caused the damage himself, or is unwilling to spend the compensation on restoration of the damaged natural resources, choices have be made regarding locus standi (see above). Again, the limitation of property rights and the restriction on the spending of compensation, should however only be considered in case it concerns damage to natural resources that are of a particular value to the public.

Threshold
The liability regime authorizes the compensation of damage to natural resources as a result from all kinds of activities, incidents and adverse events. However, not every change to the quality or quantity of natural resources should be qualified as damage and give rise to liability. For the well functioning of the liability regime it might be beneficial to identify threshold criteria below which the responsible party will not be liable. In this respect, a few factors can be identified that are starting-point in proving that a measurable adverse change is caused to natural resources and services. The quality standards and emission norms that are included in some of the EU directives can be helpful in this respect. At least in every case, the situation existing after the injury should be compared with the one existing before the damaging activity, incident or event.

Earmarking of compensation awards
In general, compensation obtained should be earmarked and used only to restore, rehabilitate, replace, or acquire the equivalent of, the injured natural resources. Pooling of compensation is a possibility in case natural resource damage will exceed the threshold but will be too limited, for economic and technical reasons, to restore the damage.

Assessment
The nature of the proposed EU liability regime has a compensatory and not a punitive nature. As a consequence, it is necessary to assess the damages in such a way that it represents the value of the natural resources and the services lost. It is therefore a necessity to measure the injury and value the damaged natural resources. Assessing damage to natural resources is a complex task, since many natural resources do not have a market value. Besides existing economic methodologies, one could develop abstract models with standard procedures, or use restoration costs as a measure of damages.
If restoration is technically feasible and the costs of such actions are reasonable using a cost-benefit analysis, the cost of measures taken to restore the damage to natural resources is the primary and preferred method to assess damages. Restoration measures are undertaken to return the damaged natural resources and services to their baseline condition. This is to reinstate the natural resources and services to what they would have been had the incident never occurred. In some cases it might be difficult to determine the exact baseline condition. In that case, it might be helpful to use historical data, reference data, control data, environmental impact assessment data (if available) and information from areas unaffected but comparable to the damaged site. The appropriate size of the restoration measures can be determined by valuing the extent and nature of the damage, the type, quantity and quality of the natural resources and services lost and determine the measures necessary to replace and restore the quantity and quality of these natural resources and services.

In some cases it will be difficult to decide on reasonableness of the cost of measures taken to restore the natural resource damage or acquire the equivalent of such resources. The reasonableness criterion requires balancing of the economic and environment costs of restoration measures against the environmental benefits of the measures. After determining the nature and extent of the impacts of the damaging activity on the natural resources, the claimant should identify a range of restoration alternatives with a comparable level of benefits and select the most cost-effective one. Cost effective would be the least costly alternative taking into account relevant factors and comparing the environmental benefits of each alternative.

In case the costs of restoration measures are clearly disproportionate and unreasonable, the acquisition of equivalent resources could be a valuable and alternative measure of compensation. Another solution might be to pay an amount to a fund, only to be used for restoration and other environmental purposes.

**Interim losses**
It can take years before natural resource damage is recovered. Due to the damage, human uses of the natural resources are lost or impaired from the time of the damaging event until the time of full recovery. Compensating these interim losses, is to determine what actions have to be taken to replace the impaired and lost human uses. To assess this, one could quantify the lost and impaired services and develop measures that provide the same or comparable services.

**Fund**
Compensation could also be provided through a compensation fund. It is the opinion of the Commission that industry and other sectors should be stimulated to set up voluntary liability funds. It could also be left to the initiative of the member-states to establish a safety-net in case problems arise where damage is caused by e.g. cumulative incidents.

**Outlook**
Concluding, the measure of damages under the proposed EU liability regime as regard to natural resource damage should be: the cost of restoring, rehabilitating, replacing, or acquiring the equivalent, of the damaged natural resources, including compensation of interim losses and reasonable costs of assessing damage. Compensation should only
be used for restoration purposes and is aimed at returning natural resources and services to their baseline condition.