

**U.S. Department of the Interior**

**Natural Resource Damage Assessment  
and Restoration Advisory Committee**

**Final Report of Subcommittee 3 – Interim Losses**

**January 26, 2007**

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## **Executive Summary:**

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Clean Water Act (CWA) authorize natural resource trustees to recover damages not only for the cost of restoring injured resources to the “baseline” condition that would have existed had the hazardous substance releases in question not occurred, but also for the loss of natural resource services that otherwise would have been provided to the public by the resources pending the re-establishment of baseline (“interim losses”). Under the existing CERCLA/CWA Natural Resource Damage Assessment and Restoration (NRDAR) regulations promulgated by the Department of the Interior (DOI), damages for interim losses are equal to the economic value the public loses until the baseline condition is re-established. The existing regulations call this “compensable value” (*See* 43 CFR 11.83(c)). CERCLA and the CWA require trustees to spend any compensable value recoveries to restore, replace, or acquire the equivalent of an injured natural resource.

In 1990, the NRDAR regulations under the Oil Pollution Act (OPA) required trustees to identify the restoration actions they intend to take to address interim losses before a demand is presented to potentially responsible parties. Damages for interim losses are then computed based on the cost of those actions, rather than on the monetary value of the interim losses. This promotes an early focus on feasible restoration rather than monetary damages, and can result in lower over-all restoration costs when high-value, cost-effective projects are utilized to address interim losses.

In 2005, DOI convened a NRDAR Federal Advisory Committee (NRDAR FACA Committee) to provide advice and recommendations on issues related to DOI’s authorities, responsibilities, and activities under the natural resource damage provisions of CERCLA and the CWA. One of the questions posed to the NRDAR FACA Committee was whether DOI should revise the CERCLA NRDAR regulations to provide flexibility to compensate for interim losses through restoration actions that address those losses in lieu of the monetary value of the losses themselves -- as per the “restoration-based approach” outlined in the OPA NRDAR regulations. The question has arisen because some suggest that this alternative approach can promote more timely restoration, lower restoration costs, and avoid costly investigations and potential litigation concerning the complicated question of how to monetize lost services. Key issues include whether this flexibility to extend a “restoration-based approach” to calculating damages for interim losses is good public policy, and if so, whether it is necessary to amend the CERCLA NRDAR regulations to clearly permit it.

The Committee asked Subcommittee 3 to analyze these and related questions. After considering and discussing both the CERCLA and the OPA NRDAR regulations, numerous peer reviewed publications, judicial decisions, other materials which are made available as part of the record of the subcommittee’s deliberations, and presentations by practitioners and tribal representatives, Subcommittee 3 members believe that the current regulations provide a useful framework for conducting natural resource damage assessments. Subcommittee 3 members also think that the full Committee should

consider a recommendation to DOI to clarify that it is appropriate to base the measure of interim loss damages on the cost of restoration projects that can provide services equivalent to those that have been lost, as an alternative to measuring interim losses by the monetary value of the lost services. All of the Subcommittee members agree that the flexibility to adopt a restoration-based approach on interim losses should not, however, modify the current CERCLA/CWA NRDAR regulation's focus on the concept of services (both human and ecological), baseline, causation and utilization of reliable assessment methodologies.

### **NRDAR FACA Committee Question #3:**

*Should DOI revise the CERCLA NRDAR regulations to permit flexibility to allow for compensating for interim losses with restoration projects in lieu of monetary damages for the value of the loss?*

*If so, how should project- based interim loss claims be calculated?*

### **NRDAR FACA Question #3 Subcommittee Members:**

Alex Beehler (alternate - Larry Groner), John Carlucci, Pat Casano, Barry Hartman, Nancy King, Jon Mueller, and Steve Polasky.

*(Subcommittee 3 members have discussed and considered these questions in many telephone conferences and in the exchange of many draft papers. In addition, on June 5 and 6, 2006, the Subcommittee met at the National Conservation Training Center in Sheperdstown, West Virginia to discuss and analyze Question #3. Shannon Work, a FACA Committee member representing tribal interests participated in these meetings. Dr. William Desvousges, an economist, consultant, and NRDAR practitioner also participated in these meetings, as did Dr. Bruce Peacock, an economist and NRDAR practitioner from the National Park Service. The Subcommittee discussed and considered comments on drafts of this report at public meetings of the NRDAR FACA Committee on July 26-27 and November 29-30, 2006.*

### **Analysis:**

***I. Should DOI revise the CERCLA NRDAR regulations to permit flexibility to allow for compensating for interim losses with restoration projects in lieu of monetary damages for the value of the loss?***

Subcommittee 3 believes that the current regulations provide a good framework for conducting natural resource damage assessments. Subcommittee 3 members also think that the full Committee should consider a recommendation to DOI to clarify the appropriateness of compensating for interim losses with restoration projects that can provide services equivalent to those that have been lost, rather than requiring the monetary value of the lost services as the measure of damages

#### **A. Primary Issues Considered:**

1. What advantage is gained by using restoration actions to compensate for the interim loss of natural resource services rather than collecting the monetized economic value of those services as damages? What are the disadvantages to a restoration-based approach? What are the technical and cost considerations? Are there any legal impediments to use of a restoration-based approach?

a. Advantages of Using Restoration Actions to Compensate for Interim Loss:

- Better comports with CERCLA’s overall restoration objectives.
- Promotes earlier focus on feasible restoration options to address natural resource injuries.
- Allows flexibility to use simpler, cost-effective, and transparent methods in some cases.
  - Easier to explain to the public and other interested stakeholders how restoration projects compensate for interim losses than do monetary recoveries
  - Some restoration project-based analyses are easier to conduct and understand
  - Example: Easier to determine and explain enhanced fishing access as compensation for lost recreational fishing days than a monetary recovery
- Can encourage settlements by providing opportunities for more creative and/or cost effective restoration.
- Allows for the integration of CERCLA and OPA concepts of interim loss damages.

b. Disadvantages

- Some potentially responsible parties and economists believe that some restoration-based valuation methodologies – such as Habitat Equivalency Analysis (HEA), Resource Equivalency Analysis (REA), and Conjoint Analysis -- are not as reliable for determining interim losses as methodologies that measure and value the public’s actual preferences regarding resource use and enjoyment. They note, for example, that HEA has been described in recent professional literature authored by some trustee representatives as a “developing” method (Cacela D., Lipton J., Beltman D., Hauser J., and Wolotira R., “Associating Ecosystem Service Losses With Indicators Of Toxicity In Habitat Equivalency Analysis,” *Env’l Management*, Vol. 35, No. 3 (2005), p. 343), and that, to date, Conjoint Analysis has been used in relatively few damage assessments.
- HEA and REA are designed to measure ecological service losses and equivalents. They do not directly address the *value* of services provided to humans and thus, are not mentioned in the National Research Council’s most recent report on *valuing* ecological services.

- Some potentially responsible parties and economists believe that since HEA and REA are unable to take into account the existence of available substitute resources, they can potentially bias damages estimates upward.
- Project-based approaches may not be appropriate to all situations. Accordingly, the option to quantify the monetary value of public interim losses should be retained.

c. Technical and Cost Considerations

- Monetary and project-based methodologies can have various technical and reliability issues that need to be considered. The existing CERCLA NRDAR regulations list specific methodologies that trustees may use when measuring the economic value of interim losses – including travel cost, hedonic pricing, and contingent valuation. As outlined below, the Subcommittee believes that the Committee should consider a recommendation that DOI not require or bar the use of any particular methodology – whether value- or project-based – and instead provide general technical and reliability factors to consider when selecting both a methodology and specific inputs for assessing interim losses. Illustrative examples of project-based and monetary loss value methodologies currently in use could, however, be helpful.
- Increased flexibility to select cost-effective methodologies or compensation options within the structured framework of the regulations could result in potential cost savings in some cases.

d. Legality of Restoration-Based Approach

- Under the current CERCLA NRDAR regulations, “compensable value” is the amount of money required to compensate the public for the [interim] loss in services provided by the injured resource.” 40 CFR §11.83(c)(1). This definition encompasses the cost of a project to provide the equivalent of the lost services, and therefore appears to authorize the use of a restoration-based approach. Since the late 1990’s, the restoration-based approach has been used to resolve claims arising from interim losses at a number of sites, including Lavaca Bay, Fox River, Saginaw River, and Grand Calumet River.
- The rule also provides, however, that “[c]ompensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by a federal or State agency or an Indian tribe . . . and any economic rent accruing to a private party....” *Id.* Arguably, the cost of a restoration project is not a measure of a “change[] in consumer surplus”, “economic rent”, or “any fees or other payments collected by a federal or State agency or an Indian tribe.” There is some concern that this provision could be read to preclude use of restoration-based approaches to resolve

claims for interim losses. There is no evidence, however, that anyone has objected to use of the restoration-based approach on this ground.

- Given that (1) the restoration-based approach is consistent with the statutory directive to use all recoveries to “restore, replace, or acquire the equivalent of” an injured natural resource; and (2) multiple claims for interim losses have been resolved using a restoration-based approach, without any serious objection to the use of that approach, the Subcommittee believes that there is little need to amend the rule to explicitly authorize the use of the restoration-based approach for interim losses. Should DOI determine, however, that an amendment is necessary for the sake of clarity, the Subcommittee recommends that DOI simply add a fourth sentence to the text of 43 CFR 11.83(c)(1) to read as follows [new text in boldface]:

“Compensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by a federal or State agency or an Indian tribe . . . and any economic rent accruing to a private party. . . . **Alternatively, compensable value can be measured by the funds necessary to implement a project or projects that cost effectively restores the lost services.**”

2. If the CERCLA NRD regulations are revised to permit project-based scaling for interim losses, is it helpful to include a hierarchy of project-based interim loss scaling (resource to resource, service to service, value to value, etc.) as provided in the OPA NRD regulations?

A rigid hierarchy of methodologies, as per the OPA NRDAR regulations, can sometimes undermine the benefits of a flexible approach to selecting methodologies. Additionally, a hierarchy of methodologies may not reflect the nature of the interim losses experienced at a site. For example, it may not be appropriate to use a “resource to resource” methodology that compensates for lost recreational fishing opportunities with increased fish populations (resources), but does not consider human access to those populations. Access may be an important component of the recreational service provided. A set of factors to consider, or guidelines for selecting methodologies, can help strike a balance between a mandatory hierarchy of methodologies and unfocused discretion.

3. If the CERCLA NRD regulations are revised to permit project-based compensation for interim losses, should they explicitly provide for opting out of project-based scaling, and utilizing the dollar value of the lost services (i.e., the current CERCLA regulation valuation) as the measure of damages, as the OPA NRD regulations provide? Should criteria for opting out be specified, or should there be maximum flexibility?

As discussed above, maximum flexibility is desirable. Accordingly, as per the OPA NRDAR regulations, trustees and potentially responsible parties should be able to use any appropriate methodologies – including project- or economic value loss-based.

B. Secondary Issues Considered:

1. Should interim losses in the CERCLA NRD regulations remain explicitly discretionary, or should they be treated as part of a unitary claim, as in the OPA NRD regulations?

The Subcommittee believes that there is no compelling reason to alter the explicitly discretionary nature of interim loss claims as set forth in the current CERCLA NRDAR regulations. This is consistent with CERCLA's emphasis on restoration as the central measure of damages, and can help to encourage settlement of claims in difficult cases.

2. Can the CERCLA NRD regulations provide any useful guidance on the relationship between the measure of damages specified in the regulations and the measure of interim loss damages in settlement and/or cooperative assessment contexts?

Project-based natural resource damage claims can support cooperative assessments and negotiated settlements. Early scoping of service losses and feasible, appropriate restoration opportunities can be particularly helpful. Currently, the CERCLA NRDAR regulations provide for an early scoping mechanism in a "rapid review of readily available information" before a formal assessment begins. This "Preassessment" phase (43 CFR 11.23-25) focuses on determining the hazardous substances released, the resources potentially at risk, and a preliminary estimate of the services provided by those resources. The Committee should consider a recommendation to DOI to provide guidance on expanding the scope of the Preassessment phase to include preliminary development of a range of service loss estimates and identification of feasible, appropriate restoration alternatives. Such guidance could help ensure that trustees conduct studies focused on restoration, and not just damages. This preliminary restoration scoping effort – focusing on feasible, appropriate on and off site restoration alternatives -- could be undertaken in a cooperative manner, even before injuries are quantified. Since the CERCLA NRDAR regulations do not require public release of Preassessment phase determinations until the conclusion of the assessment, cooperation during the Preassessment phase could form the basis for settlement discussions with potentially responsible parties to resolve natural resource damage claims. The current CERCLA NRDAR regulations specific endorsement of the use of a "process similar" to the described preassessment screen seems to underline the flexibility that DOI has to provide additional guidance to encourage utilizing the early phase of the NRDAR process to promote negotiated settlements and cost effective restoration of injured resources.

This preliminary restoration scoping should not normally include monetary damage estimates, to avoid raising issues related to securities laws on corporate liability accounting. In fact, the Committee should consider a recommendation to DOI to look closely at the Preassessment phase determinations in the current regulations – particularly those related to predictions about "the reasonable probability of a claim" – to see if similar concerns are implicated by that language. It should also be clear that preliminary

restoration alternative scoping does not replace actual restoration cost estimating or publicly reviewed restoration implementation planning (including publicly available information on objectives and monitoring of restoration success) after a claim is resolved.

3. Is it appropriate to have consistent nomenclature and definitions of categories of restoration and damages (e.g., baseline vs. primary restoration, compensable value vs. compensatory restoration, etc.) in the CERCLA and OPA NRD regulations?

Clarity is more important than consistency of nomenclature.

## *II. If so, how should project-based interim loss compensation claims be calculated?*

While it may be helpful to mention certain restoration-action scaling methodologies for illustrative purposes –such as random utility models, habitat equivalency analysis, and conjoint analysis – the Subcommittee members believe that the CERCLA NRDAR regulation should not specifically sanction or bar the use of any particular methodology, but should instead provide factors to determine the utility and reliability of both methodologies and specific data inputs to those methodologies. That would help trustees to select for use methods that “are feasible and reliable for a particular incident and type of damage.”

### A. Primary Issues Considered:

1. Should interim loss claims value only lost services to humans, as the CERCLA NRD regulation currently provides, or should it also calculate the value of interim ecological service (or “environment”) losses, without a requirement for a specific showing of a public nexus, as the OPA NRD rule provides?

The importance of natural resource services is not limited to human services. Subcommittee members believe that ecological service losses may provide a valid basis for determining interim loss compensation. However, some subcommittee members believe that there is no generally accepted method for valuing a service provided by a resource to another resource, and that such valuation is unnecessary, since baseline restoration is intended to restore the injured resources and the services that they provide to other resources.

2. Should the CERCLA NRD regulations specify suggested categories of interim losses for calculation?

DOI should consider developing guidance on the types of service losses likely to arise from, and reasonable to consider given a particular type of resource injury.

3. How reliable are available methodologies for valuing habitat or ecosystem service losses? Should the CERCLA NRD regulations specifically identify certain methodologies (such as Habitat or Resource Equivalency Analysis, Conjoint

Analysis, etc.) as “best available procedures” for calculating interim loss damages? More generally, should the regulation specify criteria for evaluating methodologies to allow for the development of new assessment tools?

Some Subcommittee members are convinced that “revealed preference” methods, which utilize data on how people actually use and enjoy natural resources, are the most reliable methods for determining compensable values. These subcommittee members think that “stated preference” methods, such as Conjoint Analysis and Contingent Valuation, are not as reliable for a number of reasons, including the fact that they utilize survey responses to hypothetical situations. HEA and REA are neither revealed nor stated preference methods for measuring economic value; instead, HEA and REA estimate ecological service losses and compare them to service gains from restoration projects, without necessarily assigning a dollar value. HEA requires a proper metric for scaling service losses and gains; clearly articulated baseline conditions, and replacement resources that provide services of a type, quality, and quantity that are comparable to those lost. In addition, HEA does not consider the availability of substitute resources, which is critical to the assessment of the value of interim losses. Nevertheless, HEA and REA have been frequently utilized to compare resource units that produce equivalent flows of ecological services.

Given such issues, the Subcommittee agreed that DOI should not specifically sanction or bar the use of any particular methodology, but instead propose that the full Committee recommend that the DOI’s regulations be amended, or that guidance be issued, to permit the use of any reliable methodology for calculating interim lost use values as set forth under subpart E of DOI’s regulations. *See* 40 C.F.R. §11.83. This proposal would set forth general principles that all methodologies are expected to meet, while preserving those currently set forth in the regulations, and permitting the use of others.

The purpose of this recommendation is twofold. First, the recommendation is intended to provide for the use of alternative methods for determining lost use, and to recognize that some methods may not yet exist but may nonetheless be developed, and may be appropriate and reliable. Second the recommendation is intended to provide guidance to trustees and assurances to PRPs that a proposed method is reliable. As explained below, the subcommittee has not reached consensus on how best to achieve these goals: through amendments to the regulations, or through the use of guidance documents. These issues are discussed below as well.

This recommendation is not intended to require that interim lost use valuation methods proposed during settlement meet a specific standard. Rather, the purpose of this proposal is to provide guidance to the trustees on what indicia of objectivity and reliability should be met with respect to any proposed methodology prior to the initiation of settlement negotiations.

43 CFR §11.83 describes the methods for determining damages based on valuation methodologies. The regulations describe methodologies for quantifying (a) the costs of a selected alternative for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources; and (b) the compensable value of the services lost to the public

through the completion of the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured resources and their services to baseline. For both calculations, the regulations list certain methods that are acceptable and provide for other methods as well. In the case of cost estimation methodologies, the regulations simply permit the use of alternative methodologies that are based on “standard and accepted cost estimating practices and are cost-effective.” For compensable value calculations, the regulations authorize the use of “Other valuation methodologies that measure compensable value in accordance with the public's WTP, in a cost-effective manner.” Neither description provides any more specific criteria for deciding if these methods are reliable and sound. This can result in delays in resolution of cases. Some potentially responsible parties, for example, have fiduciary responsibilities to their shareholders to ensure that if they are going to pay damages, the amounts to be paid are based on claims that have sufficient merit. They may be reluctant to settle cases until they have a basis for concluding that an asserted claim is based on a method that is sufficiently reliable that a reviewing court would have an adequate legal basis for upholding the claim.

As stated above and explained in more detail below, it is not the intent of this recommendation that every claim for interim losses meet all of these criteria. Rather, as the language reflects, it is intended that these criteria be used as guidance to the trustees and provide some measure of acceptability to the potentially responsible party(ies). Not all criteria will apply in every case. It may not be necessary that a majority of the criteria be met in every case. Each should be evaluated more holistically, so that one could conclude from all the facts and circumstances that the method is reliable. It is expected that those criteria most relevant to the fact pattern presented by the lost use claim and proposed methodology will be considered and met.

This proposal will retain the list of methodologies specified in the current regulations, and provide for others, while ensuring that whatever methodology is selected has the necessary hallmarks of scientific reliability.

The proposed language of our recommendation, which could be embodied in regulatory or guidance form, is as follows:

**Standards for cost and valuation methodologies. Any methodologies used to estimate the cost or compensable value of natural resource damages, including those specified below, should as a whole, comply with the following standards, however, it is not necessary that every standard listed below be met in every case:**

**(1) The methodology is capable of providing information of use in determining the compensable value appropriate for a particular natural resource injury;**

**(2) The methodology is reliable and valid for the particular natural resource injury and associated service loss in light of the nature, degree, and spatial and temporal extent of the injury.**

**(3) The methodology has been tested sufficiently such that any methodology on the cutting edge of scientific inquiry is not so speculative that it is unreliable;**

**(4) The methodology has been peer reviewed either through publication or otherwise;**

**(5) The methodology has a known error rate such that it can be expected to produce results with a reasonable degree of accuracy and precision;**

**(6) The methodology is subject to standards governing its application such that there is reasonable certainty as to how the methodology should be implemented and/or applied; and**

**(7) The methodology enjoys general acceptance by experts in the field.<sup>1</sup>**

**B. Discussion of Criteria**

As explained below, each of the proposed criteria draws from the standards that courts would use to determine the validity of a scientific methodology upon which a party's claim for interim damages would be based. See Federal Rules of Evidence (FRE) 702. Thus, this proposal merely identifies the standards required were a claim to proceed to court. As noted above, however, it is not intended that these criteria be an inflexible recipe for reliability that must be followed in each case. Just as the judicial decisions below reflect, these criteria are general principles that are expected to be followed where appropriate to provide certainty that a proposed methodology would meet the test that would be applied if a claim went to court.

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), the Supreme Court interpreted FRE 702 and balanced the need to admit progressive, cutting edge scientific testimony with the fundamental requirement that all such testimony must have its basis in the methods and procedures of science. Although the Court refused to adopt a definitive checklist or test to determine the admissibility and reliability of expert scientific testimony, it set forth certain factors that must be considered. The Subcommittee's proposal incorporates these principles into the process for selecting interim loss valuation methodologies, to provide similar reliability and soundness when such methodologies are used. If potentially responsible parties have greater confidence from the outset that their natural resource damage claims will be assessed with a scientifically reliable method, then they will be more likely to settle, conserving valuable private and government resources.

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<sup>1</sup> If DOI decides to adopt this proposal by an amendment to the rules, DOI could propose to add a new subsection (4) under 43 CFR 11.83(a), which contains the general standards applicable to all methodologies.

As set forth in *Daubert*, none of the factors listed are controlling. All elements should be applied holistically to the facts and circumstances of each case. To better understand how these elements might be applied in practice, the following is a brief discussion of each element. For ease of reference, “scientific information” includes all opinions, studies, reports, and other scientific literature proffered during the valuation phase of natural resource damage assessments:

- Assessment information of use – This element boils down to traditional and common sense notions of relevance and should not require much explanation. In general, under FRE 702, if scientific, technical or other specialized knowledge will help a judge decide a fact, then an expert may testify using that specialized knowledge. Natural resource damage assessments are frequently complex, technical matters that necessarily involve the consideration of scientific information. If that information is relevant and helpful in valuing the level of injury, then it should be considered by the trustees developing the claim and by the PRPs as well, subject to the indicia of reliability set forth in the remaining elements. If such information is not relevant, then it is expected that all parties will recognize and not consider it, regardless of its scientific reliability and/or relevance in other contexts or cases.
- The methodology has been tested sufficiently – The Supreme Court in *Daubert* recognized that developments in scientific research are constantly evolving and well grounded, cutting edge theories should not be excluded solely because they have not existed long enough to engender widespread acceptance. Based on this concern, the Court required that, when scientific testimony is offered, the methodologies used to obtain the information must undergo enough testing and/or study to suggest it is in fact reliable. Recently-developed, complex methodologies that draw attenuated conclusions should be subject to a heightened scrutiny under this element, while simpler methodologies that draw more obvious conclusions should be more readily accepted.
- Peer review either through publication or otherwise – *Daubert* made it clear that publishing a scientific theory does not automatically correlate to reliability. Some well-grounded but innovative theories have yet to be published, and some published theories have subsequently been disproven. Publishing scientific studies and articles, however, is an important component of “good science” that provides other experts in the field the opportunity to discover flaws in the author’s theory, study methodologies, and identify potential biases, etc. Moreover, the process of peer review helps the scientific community distinguish “sound” science from “junk” science, as other credible experts express their views that might confirm or question the original proponent’s theory. When natural resource lost use claims are assessed using a new methodology, the fact that the methodology has been peer reviewed either through publication or otherwise suggests that the science behind the method is valid. If the proponent of the methodology published the theory or study in a well respected journal, as time passes, the scientific community has the opportunity to process the information and formulate a response. If few significant flaws can be found, then the information is more likely to be reliable. The trustee developing the claim should take this into account as the trustee evaluates the proper methodology to use. Similarly, the PRP evaluating the claim is expected to do the same.

- Known or potential rate of error – The rate of error is the likelihood that a methodology or study will produce an incorrect conclusion. Obviously methodologies with a higher rate of error should be viewed more skeptically. In addition, methodologies for which no rate of error can be calculated should be viewed more skeptically since it is more difficult to judge their reliability. This concern is equally applicable to the valuation of natural resource interim loss claims. Finally, the sample size and methodology chosen for a study should be evaluated, since these factors can increase the rate of error or create biased results.
- Standards controlling the use of the methodology – This element largely determines the difference between reliable scientific information and purely subjective opinions. It has two parts. The methodology must be capable of being judged in relation to an objective standard. For instance, the body tissue from various species within an ecosystem can be sampled to confirm that a contaminant has bioaccumulated. These studies are capable of nearly unlimited repetition, are amenable to the use of control groups, can be compared to other studies in similar ecosystems, and can be judged according to objective toxicity standards. Conversely, questionnaires that ask people to “value” a given natural resource monetarily can be more subjective and must be carefully designed and implemented according to established standards, to ensure that responses are meaningful and relevant to the goal of natural resource restoration. For all scientific methodologies, it is important to determine whether such standards exist, and if so, whether they were followed meticulously throughout the course of the study or other research.
- General and/or widespread acceptance – As noted above, it is not necessary that the methodology has gained general acceptance within the scientific community. Conversely, if there is general acceptance that a valuation methodology is unreliable, it should be approached with appropriate skepticism. Typically, scientific information will be valued more when the scientific community has had time to evaluate the basis of that information.

Again, as noted above, the Subcommittee does not recommend that every one of the criteria identified above be met in every case. It is intended that the trustees and potentially responsible parties consider these criteria in order to assure that the ultimate methodology chosen as the basis for a claim has the same kind of indicia of reliability that would be needed if the claim is not settled, and must proceed to court. It is both expected and intended that claims that are based on methodologies that generally meet these criteria will be more likely to result in quicker settlements, and fewer objections by PRPs.

### C. Illustrative Methodologies

1. Project-Based: Determines interim loss damages as the cost to implement restoration projects that provide services equivalent to those that have been lost

The advantage of project-based approaches is that they focus on restoration that replaces equivalent services without having to estimate the monetary value of lost

services. The disadvantage of project-based approaches is that it may be difficult to ascertain whether equivalent services have been restored. The important concept here is that the restoration project provides equivalent *services*. It may not be enough to state that a project will restore equivalent acres of habitat because an acre of habitat in a different location may provide a different level of service. For example, restoring habitat that supports a fish or game species but does so in an area far from population centers that engage in recreational fishing or hunting will not deliver an equivalent recreational service compared to habitat that was injured close to population centers, although equivalent ecological services might have been restored.

HEA/REA: Calculates equivalent habitat or resource units but not equivalent human service units (as described above). As noted above, HEA requires a proper metric for scaling service losses/gains; clearly articulated baseline conditions, and replacement resources that provide services of a type, quality, and quantity that are comparable to those lost. In addition, HEA does not consider the availability of substitute resources. Standards for HEA inputs and calculations have been developed, utilized, and accepted by some Courts as reliable tools for the estimation of appropriate restoration to address natural resource injuries.

Random Utility Model: Can be used to compare projects on the basis of equivalent services provided. This method has been used extensively for recreational services. Use of the method is dependent on the existence or collection of adequate data on recreational (or other relevant) choices.

Conjoint Analysis: A stated preference method that compares projects on the basis of equivalent services provided. Method can be used for any type of damages. Survey questions can be designed to see whether people prefer the situation prior to injury or the situation with the restoration project. Stated preference methods are based on responses to hypothetical situations, rather than based on observed choices. Because studies have shown that responses to hypothetical questions do not always match actual behavior, there is debate over the reliability of stated preference methods.

2. Monetary-Based: Determines interim loss damages as the monetary value of lost services

Random Utility Model: Can be used to calculate the monetary values (willingness-to-pay) for lost services. This method is especially useful for recreational services. For example, the method has been used extensively to estimate the value of damage to recreational fishing sites. Use of the method is dependent on the existence or collection of adequate data on recreational (or other relevant) choices. An extensive body of peer-reviewed literature describes the elements and inputs to RUMs.

Contingent Valuation: A stated preference method that can estimate the willingness-to-pay for lost services. The advantage of the approach is that surveys can be tailored to the case at hand and can estimate values for which there is no observed behavior (e.g., existence values). Contingent valuation, however, has critics who doubt whether respondents can answer questions about willingness-to-pay in a reliable manner.

Conjoint Analysis: A stated preference method that can be used to estimate willingness-to-pay for lost services. Respondents are asked to make tradeoffs among the cost of restoration projects and other characteristics, which allows an estimate of the dollar value of damages or the value of various attributes of restoration. As noted above, there is debate over the reliability of stated preference methods.

Hedonic Method: This method typically uses evidence on residential properties to estimate the willingness-to-pay for environmental quality. For example, one can estimate the willingness-to-pay for water quality by comparing sales prices for houses located on lakes with different water quality while controlling for other relevant factors (e.g., house size, lot size, year of construction, etc.). Other applications of the hedonic method involve comparing wage differentials for jobs with different levels of risk. Application requires data on property sales (or employment) and can be difficult to use in sparsely populated areas or for services that do not directly affect property values (or wages).

Benefits Transfer: Uses information generated in other contexts to estimate willingness-to-pay in a particular case. The advantage of this approach is that it can be done relatively cheaply with pre-existing data if it is reliable. The disadvantage of this approach is that it introduces questions about the degree to which other contexts are appropriate for the circumstances of interest. To accurately measure values, the effect of differences in timing, location, or attributes of services must be adequately accounted for in the analysis.

Factor Income: Values resources by measuring its contribution to the value of production of a good or service. For example, if coastal wetlands provide nursery grounds for fish, the value of the wetland could be calculated as the change in consumer and producer surplus attributable to the wetland. This methodology is also sometimes referred to as the production function approach, or valuing the environment as an input.

#### D. Regulation or Guidance

Although the Subcommittee provides suggested change to the regulations regarding the reliability of methodologies, in fact the Subcommittee did not reach consensus regarding whether DOI needs to undertake regulatory revision for this purpose, or if guidance is sufficient. The various positions that have been discussed are summarized below:

1. Amending regulations is a long, time consuming and challenging process, thus delaying the benefit that this proposal might have.

2. Amending regulations is an uncertain process; it could result in a final regulation that is far removed from the recommendation of the Committee.

3. This proposal is really an interpretation of a regulation and is therefore appropriate for guidance.

4. Regulations provide more certainty in that agency officials are required to follow them, whereas guidances are discretionary.

5. The current regulations specify certain methodologies already; amending them to also describe more generic criteria that would permit the use of other as yet unknown methodologies, is logical.

6. Guidance is nonbinding, thus providing greater flexibility to the trustees.

*Is it appropriate to scale the value of interim loss projects that provide for additional natural resource services to the public (such as boat ramps or hiking trails) but do not directly restore, replace, or rehabilitate natural resources? Does CERCLA permit this type of compensation for interim losses?*

CERCLA's restoration focus requires that all recoveries be used to restore, replace or acquire the equivalent of injured natural resources. CERCLA does not limit recoveries, however, to the cost of restoration – which allows for the collection of damages to compensate for interim losses. (CERCLA § 107(f)(1)). As practice under the OPA NRDAR Regulations has shown, sometimes projects that provide for human access, use, and enjoyment of resources more directly address certain categories of interim losses. Accordingly, given the similarity in requirements for the use of damages under both the CERCLA and the OPA statute (*See, e.g.*, CERCLA § 107(f)(1) and OPA § 006(f)), the Subcommittee believes that the Committee should recommend that DOI explicitly provide for the consideration of interim loss restoration actions that provide natural resource services to the public through access, use, and enjoyment opportunities, in addition to projects that address resource units, populations, or habitats. Factors to consider in determining the appropriateness of such projects can include cost, the nexus to the loss, the nature of the benefits provided, and, most importantly, potential resource impacts of the project.

#### E. Secondary Issues:

1. What is the appropriate point in time for the initiation of interim loss calculations – From the date of the enactment of CERCLA? From the date of the release, if later, until restoration or replacement? From the date trustees notify PRPs of their intent to undertake and assessment, etc.? Should the rule discuss flexible approaches to setting this time period?

As previously set forth, The Subcommittee believes that the CERCLA NRDAR regulations should provide the maximum discretion to trustees on whether to seek interim loss damages at all, or in part. However, it might be helpful to clarify that interim loss damages cannot be calculated for losses occurring *before* the date of the enactment of CERCLA.

2. How specific and/or feasible do project-based interim losses compensation claims need to be? Are abstract units of habitat, such as “acre-years” sufficient, or should projects for scaling employ specific or generic project descriptions.

Projects to provide the equivalent of the interim lost services should be feasible and may be categorically described by service loss type and/or location. Restoration feasibility should be addressed early on in the process, in the preliminary scoping and assessment work plan.

**Conclusion:**

Our review and analysis of the CERCLA and OPA statutes and regulations, relevant literature, and more than twenty years of NRDAR practice, leads us to the conclusion that providing the flexibility to utilize restoration actions to address interim losses could encourage cooperative assessment and negotiated settlements that focus on restoration of public resources, rather than on monetary damages for harm. The Subcommittee members recommend that DOI clarify and encourage this flexibility.

## References:

- CERCLA – 42 USC 9601, *et seq.*
- OPA – 33 USC 2701, *et seq.*
- CERCLA NRDAR Regulations – 43 CFR Part 11
- OPA NRDAR Regulations – 15 CFR Part 990
- *Ohio v. DOI*, 880 F2d, 432 (1989)
- *Kennecott v. DOI*, 88 F3rd 1191 (1996)
- *The Use of Habitat Equivalency Analysis in Natural Resource Damage Assessments* (Dunford, Ginn, and Desvousges, 2003)
- *Assessing Natural Resource Damages Using Environmental Annuities* (Unsworth and Bishop, 1993)
- *Exploring Welfare Implications of Resource Equivalency Analysis in Natural Resource Damage Assessments* (Zafonte and Hampton, 2006)
- *The Potential Role of Conjoint Analysis in Natural Resource Damage Assessments* (Matthews, Johnson, Dunford, and Desvousges)
- *Scaling Environmental Restoration to Offset Injury Using Habitat Equivalency Analysis* (Allen, Chapman, and Lane, 2005)
- *Valuing the Environment: Courts Struggle with Natural Resource Damages* (Thompson, 2002)
- *Integrating Biology and Economics in Seagrass Restoration: How Much is Enough and Why* (Fonseca, Julius, and Kenworthy, 2000)
- *Quantifying Natural Resource Injuries and Ecological Service Reductions: Challenges and Opportunities* (Barnhouse and Stahl, 2002)
- *Response to DOI's Questions to FACA Subcommittee #3* (Desvousges and Michaels, 2006)
- *Twenty Years of Damage Assessments: What Have We Learned? Where Should DOI Go From Here?* (Power Point Presentation, Desvousges, 2006)
- *Interim Loss Damages: Project Based Approaches vs. Monetary Approaches* (Power Point Presentation, Peacock, 2006)