

Collaborative Research Programme On River Basin Management Planning Economics

Report on CRP Strategic Approach to Benefits

28 June 2006
Benefits Workshop Report
(Project 4a)



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SCOTTISH EXECUTIVE



UK Collaborative Research Programme on River Basin Management Planning Economics

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Executive Summary

The Collaborative Research Programme (CRP) on River Basin Management Planning Economics has been set up to develop the methodologies needed to undertake the Water Framework Directive (WFD) economic analysis and to provide the guidance on these methodologies in the UK. The CRP involves 14 parties and is chaired by Defra¹.

The CRP's strategic approach to benefits (Project 4) consists of eight projects, 4a-h, that cover both the work that can reasonably be expected to be complete by March 2008 to inform the first River Basin Management Plan (RBMP) in 2009, as well as work beyond 2008 which will inform later cycles of RBMP.

This long-term outlook recognises that a number of technical challenges and missing information (e.g. the precise scientific links between pressures and impacts in some instances) inhibit widespread commissioning of new studies to generate monetary estimates in the short-term. This is due to the lead times necessary to get the pre-valuation 'building blocks' rights.

The proposed workplan for Project 4 aims to address the major gaps and uncertainties regarding the assessment of benefits. The Benefits Workshop (Project 4a) aimed to further refine and modify the principal projects (Projects 4b-h) within the proposed work plan and define the short-term and long-term plans for benefit analysis, to ensure the plans are coherent, robust and make the best use of available resources from CRP partners and elsewhere. Specifically, the Workshop posed key questions such as:

- Is the overall approach coherent?
- Are the project outlines methodologically sound, and are the projects achievable in the timeframe and with the budget proposed?
- Have we got the areas of work and priorities right (short-term vs long-term, direct/ecological services/ non-use balance, overall vs detailed assessments)?
- Have we got the timing of the various components correct (i.e. short and medium-term divide) & how best can we inform the first round of RBMP within the work plan set out?
- Have we got the linkages between the seven projects correct enough to avoid duplication and facilitate good programming of the work?
- What current research is going on in these areas that we should be complementing and building on?

¹ Parties to the CRP are: Department of Environment, Food and Rural Affairs (Defra), Scottish Executive, the Environment Agency, Scottish and Northern Ireland Forum for Environmental Research (SNIFFER), Scottish Environment Protection Agency (SEPA), English Nature, Department of Trade and Industry (DTI), UK Water Industry Research (UKWIR), Royal Society for the Protection of Birds (RSPB), Welsh Assembly Government (WAG), Department of Environment Northern Ireland (DOENI), British Ports/UK Major Ports Group (UKMPG), Countryside Landowners and Business Association (CLBA), National Farmers Union (NFU), and Joint Environment Programme (JEP).

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- What are the key risks and uncertainties?
- Does the work meet the needs of the Water Framework Directive?

The one day workshop comprised the CRP Programme Steering Group (PSG), key environmental economic and RBMP practitioners, policy makers, consultants and leading environmental economic academics (a list of attendees is provided in the Annex). The objective was to refine and agree a work plan on benefits assessment for the WFD with stakeholders. A panel of four peer reviewers was set up that comprised two academics (Prof. Ian Bateman and Prof. Kerry Turner), one RBMP practitioner (Mr. Tony Heaney), and one environmental economic consultant (Dr. Rob Tinch).

The pre-workshop report, project scope documents, overall logic diagram and background material were issued to all invited guests and speakers and these were used as a basis for discussion and debate. Presentations were followed by discussions in the morning. In the afternoon breakout groups further discussed, refined, identified linkages and dependencies and modified, where justified, the principal projects. In summary, the key decisions regarding the projects are as follows:

Project 4b - Context study - should be undertaken as it is seen as a vital precursor to valuation and preference exercises. Inputs from projects 4f and 4g are considered important.

Project 4c - Overall benefits survey - a stated preference survey approach should be used for this project. This approach will allow elements of use and non-use values (i.e. some disaggregating of total value) to be captured within the same coherent framework for use in the first round of River Basin Planning. The options within stated preference are contingent valuation (CV) and choice experiment (CE).

Project 4d Survey of preferences/attitudes to risk – no agreement was made to go ahead with this project in the format detailed in the pre-workshop report (i.e. pairwise comparison). Nevertheless, it was suggested that a stand-alone project might not be necessary, the idea required more elaboration and clarification, and that combining a suitable discursive method with projects 4b and project 4c may be more beneficial.

Project 4e - Direct benefits study – there was agreement that this study should proceed on a smaller scale using a literature review and expert consultation, with a research agenda to follow from gaps. It was suggested that this might form part of project 4g (science support), but no agreement was made.

Project 4f - Waterbody use and access – there was agreement that this study should proceed but be expanded to comprise a staged approach based on existing data; construction of GIS map of use and access; integration of travel cost into surveys; construction of a network of sites for visitor counts

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and the use of panel surveys to track changes in behaviour (actual and intended) over time.

Project 4g - Basic science support – there was agreement that this project should go ahead but an **interim version** of this project should take place immediately in order to set the environmental change impacts on a sound scientific footing and to inform 4b and 4c.

Project 4h - Non-use benefit work – there was agreement that this project should go ahead and, given the challenging nature of the project, to start at a fundamental level.

Next steps include the revision of project specifications, development of specifications for those projects required in the short term, evaluation of proposals, management and monitoring of projects and project interdependencies.

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1. Introduction

The Collaborative Research Programme's (CRP) strategic approach to benefits consists of seven projects covering both the work we can reasonably expect to complete by March 2008 to inform the first River Basin Management Plan in 2009, and work beyond 2008, which will inform later cycles of River Basin Management Plans. This long-term outlook recognises that a number of technical challenges and missing information (e.g. the precise scientific links between pressures and impacts in some instances) inhibit widespread commissioning of new studies to generate monetary estimates in the short-term. This is due to the lead times necessary to get the pre-valuation 'building blocks' rights.

1.1 CRP proposed work plan on Benefits

The following principal projects comprised the CRP *proposed* workplan on benefits²:

Project 4 – Analysis to specify benefits – combination of short and long-term work to provide rigorous benefits information needed for the long-term assessment of disproportionate costs, while enabling a proportionate and well prioritised programme of measures for the first plan. Sub-projects as below.

- Project 4a Expert workshop - precursor to any further work. The objective of the workshop will be to peer review and develop the workplan for benefits. This document is the report of this workshop.
- Project 4b Context study - what factors influence peoples' enjoyment of the environment and therefore WTP for improvements, i.e. is access to a river a deciding factor, facilities at a beach affecting beach use, physical limitations on water sports enjoyment compared to the quality of the water as a limiting factor. This is a precursor to any further benefits work. It will help obtain stakeholder preferences and buy-in and help develop survey questionnaire (4c).
- Project 4c Overall benefits survey - benefits survey to look at values of improvement and no deterioration scenarios – applied to whole POMs. Survey with additional questions. Done at a national level but take account of differences in each RBD. Used as a check on the overall scale of the first POM. Would include all categories of benefit and not attempt to disaggregate.
- Project 4d Survey of preferences/attitudes to risk - obtain preferences for different levels of risk of the outcomes of the improvements/no deterioration happening/not happening. Used for prioritisation within

² These project details are taken from version 1.2 (Draft) of the CRP Strategic Approach to Benefits – Pre workshop report (Project 4a). Dated 19 June 2006 (Author: Kevin Andrews).

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the first POM and help identify poor and good value for money projects.

- Project 4e - Direct benefits study - study of the financial cost savings and other direct benefits arising from improvements in WQ (for example for drinking water protected areas).
- Project 4f - Waterbody use and access - study of water body use (and access) data to deal with substitutability, marginal impacts, distance decay etc. distributional issues etc. Should be done using GIS. Looks at factors affecting use of waterbody. Link to benefits realisation plan.
- Project 4g - Basic science support - ensure that any further work on cause and effect of measures takes into account the human welfare end-points which would need to be valued. This will need to take an ecosystem services approach and account for the incremental changes of measures given expected status. It will identify good qualitative descriptions of benefits arising in different circumstances and definition of the indicators needed to describe these benefits quantitatively.
- 4h - Non-use benefit work - Focused work to derive non-use estimates for RBMP building on the scoping study undertaken by the EA (2005). The short-term work would include developing a better understanding of what non-use values are and why people are concerned about them, defining areas where non-use values are required for the WFD and defining new studies that can address current challenges to non-use valuation in the medium to long-term.

Projects 4a-e and h were considered to be short-term work packages. They would deliver in mid 2007 in time for the operational cost-effectiveness analysis and disproportionate cost analysis. Projects 4f and 4g are considered to be longer-term and will need around 4 years to complete

Project 5 – Guidance on assessment - guidance development to supplement the outputs of Project 3³ to aid in the analysis of disproportionate cost. Interim output needed for first RBP, followed by a revision on the completion of the new empirical work. To include the development of integrated CEA – DC guidance for end users.

Project 6 – New benefits valuation studies - new valuation work for specific categories of benefit (following use and access and basic science).

³ Title: Guidance on the evidence required to justify disproportionate cost decisions under the Water Framework Directive.

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Projects 5 and 6 have short and long-term components related to an interim output that is useful for the first plan and a longer-term output that is useful for the second plan. Given the likelihood that benefits values developed through empirical work will go out of date, aspects of this workplan will need to be repeated for subsequent river basin plans.

Detailed scopes for these projects, together with other relevant background information were provided to the workshop participants and peer reviewers prior to the workshop.

1.2 Purpose of workshop

The proposed workplan above aimed to address the major gaps and uncertainties regarding the assessment of benefits. The Benefits Workshop (Project 4a) aimed to further refine and modify these principal projects and define the short-term and long-term plans for benefit analysis, to ensure the plans are coherent and robust and make the best use of available resources from CRP partners and elsewhere.

Specifically the workshop posed key questions such as:

- Is the overall approach coherent?
- Are the project outlines methodologically sound, and are the projects achievable in the timeframe and with the budget proposed?
- Have we got the areas of work and priorities right (short term vs long term, direct/ecological services/ non-use balance, overall vs detailed assessments)?
- Have we got the timing of the various components correct (i.e. short and medium-term divide) & how best can we inform the first round of RBMP within the work plan set out?
- Have we got the linkages between the seven projects correct enough to avoid duplication and facilitate good programming of the work?
- What current research is going on in these areas that we should be complementing and building on?
- What are the key risks and uncertainties?
- Does the work meet the needs of the Water Framework Directive?

1.3 Format of the workshop

The one day workshop comprised the CRP PSG, key environmental economic and RBMP practitioners, policy makers, consultants and leading environmental economic academics (a list of attendees is provided in the annex). The objective was to refine and agree a work plan on benefits assessment for the WFD with stakeholders. A panel of four peer reviewers was set up that comprised two academics (Prof. Ian Bateman and Prof. Kerry Turner), one RBMP practitioner (Tony Heaney), and one environmental economic consultant (Dr. Rob Tinch).

The pre-workshop report, project scope documents, overall logic diagram and background material were issued to all invited guests and speakers and these were used as a basis for discussion and debate. Presentations were followed by discussions in the morning. In the afternoon break-out groups further discussed, refined, identified linkages and dependencies and modified, where justified, the principal projects.

1.4 Outline of report

Section 2 of this report introduces the Workshop and provides context. Section 3 of the report records key points, referencing written submissions of peer reviewers to support these key points. Section 4 reports on the key discussions of each of the break-out groups and on plenary discussion following feedback from groups. Section 5 concludes the Workshop report and highlights next steps.

2. Workshop Presentations

2.1 Welcome and Introductions

Following Kevin Andrew's (Defra and CRP Chair/Programme Executive) introduction of the key individuals (peer reviewers, workshop organisers, project manager etc), he detailed the objectives of the day and gave the audience a brief history of Mary Ward.

2.2 Keynote Address

Richard Price (Chief Economist, Defra) delivered the keynote address.

Richard's address emphasised the importance of the CRP's work, in particular the collaborative aspect of its efforts in developing tools and techniques. He emphasised the essential requirement for systematic evidence based benefits analysis for strong economic analysis and policy decisions, minimising the administrative burden, ensuring that compliance costs are justified and that transparency is achieved.

He acknowledged the challenging circumstances surrounding the implementation of the Directive and the change in approach of the WFD from previous water related Directives where the latter set prescriptive sets of outputs, with no discretion as to how to arrive at the outputs. Now, under the WFD, Member States are given flexibility in their methods to achieve the Directive's default objectives or alternatives.

He highlighted the UK's pivotal role in a number of key WFD building blocks at European level, including economics guidance, and intercalibration. Finally, he extended his appreciation to the peer review group.

2.3 The CRP and Benefits Assessment for the WFD

Camille Bann of the Environment Agency gave a general introduction to the CRP and its planned work on benefits. The CRP is developing the tools and

techniques to put general river basin planning principles into practice. These principles are set out in the Defra/WAG consultation document on River Basin Planning⁴. A key principle is the full use of exemptions where these are justified in order to set alternative environmental objectives. A key justification for an alternative environmental objective is that the benefits of the improvement in the status of a waterbody are not sufficient to outweigh the costs. As such, it is necessary to be able to estimate and use information on benefits within the objective setting process.

Following a strategic steer by the Economics Steering Group⁵, the CRP members made a decision to take a long-term approach to benefits analysis for the WFD – relying on qualitative and quantitative information where possible for the first plan, while working towards having robust monetary estimates of benefits for the second plan. A full justification of this approach, its implications and an issues log were part of the pre-workshop report.

2.4 Guidance on Disproportionate Costs and Benefits database (Project 3)

Project 3 provides guidance on the evidence required to justify disproportionate cost decisions under the WFD. This project has produced practical guidance and a benefits database on the evidence needed to justify why taking further measures to improve the status of a water body would be disproportionately expensive. The benefits database provides sources of additional information to assign values to water related benefits.

The benefits are divided into welfare impact benefits (23 in total) and economic impact benefits (4), with welfare impacts assessed qualitatively, semi-quantitatively, quantitatively and monetarily. In addition and importantly, the report highlights existing gaps in welfare impacts and values for undertaking water related benefit analysis.

The outputs from Project 4 can be used to test the usefulness and applicability of the benefits values in the Project 3 benefits database.

3. Peer Review comments and Plenary Discussions

The following sections record the main peer reviewer comments with references where relevant. Written comments were received prior to the workshop and summarised by the peer reviewers during the workshop.

All the peer reviewers agreed that the pre-workshop report was a major advance on a very important area of work and were clear that the workshop represented a tremendous opportunity to develop a rational and effective plan for benefits work under the WFD.

⁴ <http://www.defra.gov.uk/corporate/consult/wfd/consultation.pdf>

⁵ The group of government economists and others set up to discuss implementation of the economic aspects of the Directive

3.1 Introduction

It was suggested that Project 4 should start off with the best estimate of the likely ecological (with notion of spatial and temporal distribution) consequences of implementing the WFD, and what elements of the impacts of implementation the general public might perceive. This pre-cursor science work should run in parallel with Projects 4b and 4c (ref: Bateman, Turner).

Project 4 requires clarification regarding the appraisal method, as the method will influence the technical analysis at a more detailed level and in particular the work in project 4g. Prof. Kerry Turner put forward the following appraisal method options:

- CBA as standard environmental economics – rule based decision, or
- CBA as a component of a wider integrated multi-criteria assessment, or
- CBA and other decision-making aids/methods as separate but complementary assessments brought together more loosely in the decision support system (such as practiced in transport economics) (this type of method is supported by Dr. Rob Tinch), or
- CBA plays a minor role in a process dominated largely by qualitative analysis, informed by social surveys.

Changing the CBA format to accommodate transfer flows between gainers and losers (and possibly distributional weighting of costs and benefits) is the right way forward (ref: Turner).

On the basis of a recent Defra report (NR0103: 'Valuing our Natural Environment'), it was suggested that more work is required in developing decision support tools for combining alternatively methodologies and different types of value evidence with a view to present as much information (monetary and non-monetary) as possible rather than aiming to come up with a single number at the end of the analysis (ref. Tinch and Turner).

3.2 Project Specific Comments

3.2.1 Project 4b (Context Study)

- A context study is essential to understand how individuals understand risk and what individuals' value about the water environment. It will set the ground rules for subsequent projects, while itself having been informed by project 4g's (Science Support) preliminary findings. It is a vital precursor to preference and valuation exercises (ref: Bateman, Turner, Tinch). Also, the issues of benefits to private individuals versus general public (with reference to the Sugden approach), property rights (e.g. access and compensation frameworks), ex-ante versus ex-post, invisible aspects of quality, information sources (misinformation and uncertainty) and trust, conflict between different types of use, congestion, size of sites, private versus social discount rates, and equity considerations (ref: Tinch).
- The literature review for this project should not restrict itself to UK studies, nor even the water environment (e.g. lessons from studies of other forms of outdoor open access resource use).

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- The literature review and stated preference as part of project 4c (Overall Benefits) should be supplemented with ongoing results from project 4f (Use and Access) (ref: Bateman).
- This project should be integrated as part of 4b and 4c (Overall Benefits) (ref: Bateman, Turner).
- This project should consider both use and non-use values, within the same coherent framework. For example, how do stakeholders view the distinction between use and non-use, and its treatment in decision making? (ref: Tinch)

3.2.2 Project 4c (Overall Benefits Survey)

As set out in the pre workshop report, the objective of Project 4c is to use a top-down approach to obtain a national value and RBD values for WFD improvements, using a stated preference approach.

An alternative would be to obtain values via a bottom-up approach where values are obtained for specific measures or group of measures, but it was suggested that combining the values obtained via bottom up would over-estimate the aggregate value obtained for the largest good, due principally to the impact of substitution effects.

Bateman et al. (2004) showed that a top-down approach yields, if anything, a higher value for the larger good than a bottom-up valuation sequence, which controls for substitution effects. A complication of trying to use a bottom-up approach is that it may not be technically feasible to offer any smaller goods within the context of the study (ref: Bateman).

The proposed survey approach, stated preference, allows the inclusion of an element of non-use/non-user values in the first round (which revealed preference methods are not suited). The options within stated preference are: contingent valuation (CV) or choice experiment (CE). Technically, a key advantage of CV is that it can have better incentive compatibility properties. However, whichever approach is selected, there are a number of technical concerns that need to be addressed in the design (ref: Bateman):

- Unfamiliarity with the good being valued
- Latency (e.g. timing of benefits)
- Payment vehicle (e.g. water rates, taxes)
- Hypothetical bias (e.g. overstating WTP by non tax payers)
- Focussing illusion and the visible choice set effect (nothing is as important as when you are thinking about it)
- The incorporation of substitution effects and distance decay (taking account of the availability of substitutes)

Beyond the technical concerns it was suggested that risk, as a strength of preference issue, could be incorporated into this project. Also, serious consideration should be given to integrating 'disaggregation' work into the top-down stated preference work. Concern emerged here about using weighted average strength of preference from project 4d (preference and attitudes to risk) to split an aggregate WTP estimate, when this could be achieved within 4c without the need for 4d to do it (ref: Tinch).

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Regarding statistics and indicators, there is a question whether existing indicators are sufficient for the statistical demands of modelling, and specifically, what is the risk that the configurations of statistics needed for comparative purposes will involve combinations of indicators that are physically/ecologically inconsistent or implausible (and what happens if respondents realise this?).

3.2.3 Project 4d (Survey of preferences and attitudes to risk)

The approach to capture preference and attitudes to risk set out in the pre-workshop report is pairwise comparison, with the expectation that the weighted results based on overall strength of preference could be used to split an aggregate WTP estimate. The main aim of this element of the work programme was to enable prioritisation where there are options for improvements within the first programme of measures.

Comments about the project as it is set out in the pre-workshop report include:

- Cognitive load (the very large and diverse set of issues being assessed here invites overload) (ref: Bateman).
- Simplistic attribute descriptions (generalisation of attributes is not conducive to clear understanding of the goods under investigation, which, in turn, undermines the validity of responses) (ref: Bateman, Tinch).
- Pairwise comparison problems (there is an established literature on the variety of problems which pairwise comparisons can engender leading to a stark and negative assessment of the potential for using pairwise comparison to generalise to any wider context) (ref: Bateman).
- Risk assessments (as a number of the comparisons involve risky decisions, there is ample evidence showing that individuals have great difficulty with any sort of uncertainty) (ref: Bateman).
- Suitability (pairwise approach needs to be suitable for the WFD context before committing major resources into a full study) (ref: Bateman).
- The proposed method needs further elaboration and clarification, in particular its linkage to Projects 4b (context study) and 4c (benefits study) (ref: Turner).
- A standalone project may not be necessary and could be integrated with 4b (ref: Tinch).
- More discursive methods might provide more useful information (ref: Tinch).

3.2.4 Project 4e (Direct Benefits)

This project aims to deliver monetary estimates of the direct (market) benefits of improvements (and prevention of deterioration) in ecological quality of waterbodies as a result of WFD implementation, following recommendations from project 3.

Comments about the project as it is set out in the pre-workshop report include:

- Will researchers have access to sensitive business cost information necessary to conduct the research? (ref: Bateman).

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- Data holders, particularly water companies, have an incentive to misrepresent their costs (ref: Bateman).
- Direct benefits are based on complex functions with the potential for high uncertainty and natural variability, compounded by inefficient management (ref: Tinch).
- Project to proceed but at a reduced budget (ref: Bateman, Tinch).

3.2.5 Project 4f (Water Body Use and Access)

The aim of this project is to deliver a database of quantitative estimates of the use of waterbodies for use in benefits valuation together with a tool for predicting use and changes in use as a result of the changes in status from meeting WFD objectives.

Comments about the project as it is set out in the pre-workshop report include:

- Excellent and long overdue project that will answer the key question of who uses what sites, how much and for what purposes. Support for the proposed use of GIS – this will allow the collected data to be related to existing information on road networks, population distribution and the socio-economic characteristics of that population through relation to the UK Census (ref: Bateman).
- Advised to consider extending this study such that it also yields revealed preference estimates of the value of water environment improvements (ref: Bateman, Tinch).
- Such a revealed preference extension might very well show concerns about non-use value and that site characteristics are overstated. It is simple accessibility that determines the vast bulk of value, thereby begging the question as to whether the improvement provided by the WFD will have any substantial impact upon users' utility (ref: Bateman).
- A similar GIS based travel-cost survey underpins one of the largest water quality valuation studies. Egan et al, (2005) uses a panel database (i.e. the same respondents are asked to provide records of water-based recreation at a number of points throughout a study lasting several years). Extending the revealed preference study to recruit such a panel would provide a further interesting approach to consider (ref: Bateman).
- Critically, careful thought needs to be given to "how are sites to be determined for this exercise?" as the "definition of sites" for recreation studies seems a problem, especially for river and canal sites (ref: Bateman).
- Behaviour surveys could also be integrated here (ref: Tinch).

3.2.6 Project 4g (Science Support)

The aim of the project is to provide a bridge between the development of economic analytical methods and the basic science underpinning the management of waterbody ecology. It will deliver a more joined-up, interdisciplinary approach, maximising the value to be gained from ongoing basic science in terms of benefits valuation.

Comments about the project as set out in the pre-workshop report include:

- Essential and needed to undertake valuation and preference survey work (ref: Bateman).
- Cannot wait until March 2008 end date and needs to start immediately (ref: Bateman).
- This project should run in parallel with 4b and 4c in order to set the environmental change impacts on a sound scientific footing and empirically tied to WFD-related changes. Preliminary findings of 4g should inform 4b and 4c (ref: Turner).

3.2.7 Project 4h (Non-Use benefits)

The aim of this project is to provide an agreed methodology for tackling the current challenges facing valuation of non-use benefits for the WFD, and new non-use estimates for priority areas generated by new studies.

Comments about the project as it is set out in the pre-workshop report include:

- The project is essential to answer the basic question of what it actually is that constitutes a non-use benefit. This can then be compared with factors that drive non-use value estimates. This should be one test of coherence (ref: Bateman).
- Given the challenging nature of this project, it proposes starting at a fundamental level (ref: Bateman).
- Concern was expressed regarding the usefulness and applicability of using terms such as 'citizens values' and 'intrinsic non-anthropocentric values', as these lie outside standard theory and CBA (ref: Bateman). Challenging the dichotomy of citizen versus consumer is the idea that the same person might have more than one 'set' of preferences, the expression of which is context dependent. Our valuation methods can trigger different preferences, which poses a problem. But it may not be possible to say that one set is valid and others are not (ref: Tinch).
- Overstatement of non-use values is a concern, in particular: hypothetical bias; focussing illusion and the visible choice set effect; the incorporation of substitution effects. It was suggested that choice experiment design might be appropriate for tackling the latter two concerns.

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Table 1.1 summarises the peer reviewer comments.

| Table 1.1 Summary Peer Reviewers Comments | | | | | |
|--|--|---|--|--|--|
| Reviewer | Ian Bateman | Tony Heany | Kerry Turner | Rob Tinch | Summary: Agreement and Uncertainties |
| b - context | Yes, but timing (can do now) | Can it be done in 6 months? | Can't do without f and g | Primary importance. Need to do before 4c. Pragmatically could go ahead without f and g. Inc risk (4c) and non use (4h). Broaden to decision-making. Detailed. Focus groups enough? | Agreement that this project should be undertaken. Uncertainty regarding timing, format and realisation without input from Projects f and g. |
| c - overall benefits | Yes, but why this approach, why needed? | Key to setting affordability for first plan. | Can't do without f and g. Potential for duplication. | Need to include risk (strength of preference). Why not disaggregate? | Agreement that this project should be undertaken. Uncertainty regarding approach, potential for duplication and realisation without input from Projects f and g. |
| d – prefs /risk | Reservations; can't support. Too cognitively demanding | Important -gives us attitudes and priorities. But difficult. No time for slippage | Potential for duplication | Very problematic. Context element in 4b. Strength of preference in 4b. | Reservations about the project, scope, timing and potential for duplication. |
| e - direct benefits | Very valid, but data? | Least support, these are always low benefits. How often affected? | Potential for duplication | Looks good. Not sure it's easy. | Agreement that this project should be undertaken. Uncertainty regarding data, usefulness, potential for duplication and complexity. |
| f - use and access | Brilliant, but not far enough, make into RP study | Very important, esp. given marginal changes | No comment | Needs extending to revealed preference | Agreement that this project should be undertaken but recommended extending to a Revealed Preference |
| g - science | Excellent, timing is wrong - start now. | Vitally important, link ecological change to economic benefits. Start now. | Fundamental start up front | No comment | Agreement that this project should go ahead but should start immediately. |
| h - non-use | Can support. Fundamental look OK | Output will be key to overall affordability | Collective or individual approach | Not just monetary methods | Agreement that this project should go ahead. Uncertainty regarding approach. |
| Overall | Timing wrong, most projects OK. Need help with distribution. | What about wider economic benefits? | Need to sort out appraisal context | Most very good and necessary. | Overall agreement of the workplan, nevertheless, further consideration to appraisal and sequencing. |

4. Breakout Groups

4.1 Breakout Group A discussed Projects 4b (Context), 4c (Overall Benefits), and 4d Preference and Attitudes to Risk).

Ian Bateman proposed to replace the suggested Contingent Valuation Study with a Choice Experiment incorporating monetary values for different types of improvement, conducted ideally at RBD level. General agreement that the approach might be an improvement on a national CV study as set out in 4c due to the benefits of overcoming many of the problems usually associated with CV studies (including use and non use value distinction, latency, hypothetical bias etc).

Specific comments include:

- Caution was expressed regarding the description of site improvements (improved, not improved etc) that are relative to current state as many 'not improved' sites could easily be better than 'improved' (ref: Dickie).
- A suggested alternative would be to describe as fishable, bathable, walkable etc, but it was noted that many WFD improvements are very minor and indistinct so descriptions of this type might be problematic (ref: Bateman).
- Important to take account of alternatives that consumers may use their budget for, substitution is likely to take place between a wide range of alternatives and not just other sites (ref: Acutt), and not only financial but also time budget needs (ref: Mason).
- Agreement for the need to back-up a hypothetical study with a revealed preference study (as proposed for project 4f) (ref: Bateman).
- How to reliably estimate values that future populations are likely to place on improvements that are likely to occur in the future? Usual practice is to use current population's values for change in the future as an estimate of the values that future populations will have (ref: Bateman). The validity of this approach was questioned due to the absence of knowledge about the changes that have taken place in the last ten years in relation to values attached to environmental changes. In this case we need scientific information to support any estimates of the timeframe within which improvements are likely to take place (Defra study on Catchment Sensitive Farming may help to inform) (ref: Mason).
- The effectiveness of a choice experiment carried out at an RBD level in providing a national benefit envelope was questioned (ref: Heaney). Although a national study holds the disadvantage of consumers' unfamiliarity with the good and absolute values from a national study may not be accurate, the relative values and trade-offs would still be correct for a choice experiment carried out at a national level. Accepts need for choice experiment to be carried out at a national level (ref: Bateman).
- It is premature to discuss details of choice experiment and that project 4b exists to set out the context within which a choice experiment might take place and therefore the details of the survey (ref: Ozdemiroglu).
- Project 4b needs to pull together information about WFD improvements with which people associate value and how trade-offs are made between different uses of time and financial budgets in relation to

these goods. These outputs, along with scientific information, are vital to inform the 4c questionnaire. Compounding this, many of the WFD improvements will be subtle and much thought needs to go into the best ways to describe these.

- This group suggested that Project 4d is dropped from the work programme as a separate project, but components included within project 4c.

4.2 Breakout Group B discussed Projects 4e (Direct Benefits) and 4f (Use and Access)

The discussion surrounding project 4e (Direct benefits) regarded the challenge and usefulness of gathering this information. The key question was asked whether WFD will actually impact on many direct benefits. This led to the suggestion that 4e should be incorporated into project 4g (Science support). It was agreed that 4e should be a smaller study based on literature review and expert consultations, with a research agenda to follow from gaps.

The discussion surrounding project 4f regarded the challenge of structuring an effective project and methods to obtain relevant information. It was proposed that this project should comprise a staged approach based on existing data; construction of GIS maps of use and access; integration of travel cost into surveys; construction of a network of sites for visitor counts and the use of panel surveys to track changes in behaviour (actual and intended) over time.

4.3 Breakout Group C discussed Projects 4g (Science Support) and 4h (Non-Use Values)

It was suggested that project 4g must go beyond the current science, which defines Good Ecological Status, and to identify incremental changes arising from a diverse range of Programmes of Measures, representing these changes in a way that can be perceived by the layperson. It should also incorporate risk/uncertainty. This technical information should comprise identification, specification and qualitative descriptions of the outcomes and impacts with an AST framework, augmenting this information over the lifetime of the project.

Land management, ecosystem services; salt marshes and alternative flood risk management were identified as priorities for the development of the evidence base (e.g. through flagship demonstration cases). Also, climate change was identified as a key aspect to be considered, vis-à-vis its effects on the state of water bodies, habitats/ecosystems and the pressures. In this regard, economists must work continually with scientists to arrive at this outcome.

For project 4h, multidisciplinary research is required for economists and non-economists to understand what is meant by non-use values, how people perceive them and who the beneficiaries are. This definition and understanding must then be transferred consistently across all projects to ensure coverage of all impacts. Specifying clearly and fully all the impacts is critical. Furthermore, incorporating the impacts of substitution effects, income constraints, warm glow and contextual effects (including considering a measure within its overall programme) are also critical.

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A recommended first step was a substantive brainstorming with leading experts, practitioners and policy users to develop an agreed, appropriate, stated preference survey methodology that can adequately address all these challenges. The technical practitioners (especially at the Agencies) will be busy working on RBMP1 up to 2009 so they will not be able to input technical information until post-2009. Need to factor this into the timetable and critical path for delivering the survey findings in time for RBMP2. We may be able to do the ground clearing methodological work (e.g. on a SP methodology) before 2009.

5. Key Decision, Uncertainties and Next Steps

5.1 Key Decisions and remaining Uncertainties from Workshop (by Project)

Project 4b Context study - This project should be undertaken as it is seen as a vital precursor to valuation and preference exercises. This project is essential for understanding how individuals' understand risk and what individuals' value about the water environment. It will set out the context within which the revealed preference survey might take place and therefore the details of the survey. The literature review as part of this project should not restrict itself to UK studies, nor even the water environment, as important lessons can be transferred from studies of other forms of outdoor open access resources. Furthermore, the issues of benefits to private individuals versus general public (with reference to the Sugden approach), property rights (e.g. access and compensation frameworks), ex-ante versus ex-post, invisible aspects of quality, information sources (misinformation and uncertainty) and trust, conflict between different types of use, congestion, size of sites, private versus social discount rates, and equity considerations should be incorporated.

Input from projects 4f and 4g are considered important. This highlights the need to carefully monitor the interdependencies between these projects. Input from project 4g will be possible due to agreement to provide preliminary science information (see below under project 4g); nevertheless, a method to obtain input from 4f is still uncertain.

Project 4c Overall benefits survey - A stated preference survey approach should be used for this project. This approach will allow elements of use and non-use values (i.e. some disaggregating of total value) to be captured within the same coherent framework for use in the first round of River Basin Planning. The survey options within stated preference are contingent valuation (CV) and choice experiment (CE). While a key advantage of CV is the possibility of better incentive compatibility, there was general agreement that CE would be an improvement on a national CV study due to the benefits of overcoming many of the problems usually associated with CV studies (including use and non use value distinction, latency, hypothetical bias etc.).

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Importantly, the context within which the CE might take place will influence the details of the survey (e.g. RBD scale versus national scale).

The technical concerns that need to be addressed in the design of CE or CV are:

- Unfamiliarity with the good that is being valued
- Latency (e.g. timing of benefits)
- Payment vehicle (e.g. water rates, taxes); alternatives that consumers may use their budget for, with substitution likely to take place between a wide range of alternatives and not just other sites
- Hypothetical bias (e.g. overstating WTP by non tax payers)
- Focussing illusion and the visible choice set effect (nothing is as important as when you are thinking about it)
- The incorporation of substitution effects and distance decay (taking account of the availability of substitutes)
- Description of site improvements
- Reliability of estimate values that future populations are likely to place on improvements that are likely to occur in the future

Beyond the technical concerns it was suggested that risk, as a strength of preference issue, could be incorporated into this project. It was agreed that Project 4b (context study) and interim scientific information are vital to inform the questionnaire design for this project.

While the breakout group suggested that project 4d (preference and attitudes to risk) is dropped, there was general agreement that some combination of projects 4b, 4c and 4d should be undertaken, with care to avoid duplication.

Project 4d Survey of preferences/attitudes to risk – No agreement was made to go ahead with this project in the format detailed in the pre-workshop report (i.e. pairwise comparison). There were general concerns about the project, in particular regarding suitability in the context of WFD, cognitive load, simplicity of attribute descriptions, potential for duplication etc. Nevertheless, it was suggested that a stand-alone project might not be necessary, the idea required more elaboration and clarification, and that combining a suitable discursive method with projects 4b and 4c may be more beneficial.

Project 4e - Direct benefits study – there was agreement that this study should proceed on a smaller scale using a literature review and expert consultation, with a research agenda to follow from gaps. It was suggested that this might form part of project 4g (science support), but no agreement was made in this regard. Concerns were expressed regarding access to information and the complexity of production functions with the potential for high uncertainty and natural variability, compounded by inefficient management.

Project 4f - Waterbody use and access – there was agreement that this study should proceed but be expanded to comprise a staged approach based on existing data; construction of GIS maps of use and access; integration of travel cost into survey; construction of a network of sites for visitor counts and the use of panel survey to track changes in behaviour (actual and intended) over time. Critical uncertainty of this project is how to determine sites, as the definition of sites for recreation studies seems a problem, especially for river and canal sites.

Project 4g - Basic science support – there was agreement that this project should go ahead but an **interim version** of this project should take place immediately in order to set the environmental change impacts on a sound scientific footing and to inform 4b and 4c.

Project 4h - Non-use benefit work – there was agreement that this project should go ahead and, given the challenging nature of the project, to start at a fundamental level. The short-term work would include developing a better understanding of what non-use values are and why people are concerned about them, defining areas where non-use values are required for the WFD and defining new studies that can address current challenges to non-use valuation in the medium to long-term.

Finally, Prof. Kerry Turner was concerned about the appraisal methodology. In this context it has been suggested following workshop that the AST framework is the appraisal methodology most suitable for presenting qualitative, quantitative and monetary information.

5.2 Next Steps

Next steps include revision of project specifications, development of specifications for those projects required in the short-term, evaluation of proposals, management and monitoring of projects and project interdependencies.

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6. ANNEXES

6.1 AGENDA

| Item | Agenda item | Person | Start Time |
|----------|---|---|--------------|
| | Registration & Coffee | | 09.45 |
| 1 | Welcome and Introduction to the day | Kevin Andrews – Defra | 10:15 |
| 2 | Keynote Address | Richard Price – Chief Economist Defra | 10.25 |
| 3 | Presentation on the Collaborative Research Programme and Benefits Assessment for the WFD | Camille Bann – Environment Agency | 10.45 |
| 4 | Guidance on Disproportionate Costs and Benefits Database | James Spurgeon (Jacobs) & Ece Ozdemiroglu (Eftec) | 11.15 |
| 5 | Peer Review Panel Comments on Work Plan & Discussion | Kerry Turner Ian Bateman Rob Tinch Tony Heaney | 11.30 |
| | Lunch | | 13:00 |
| 6 | Break out Groups to develop project outlines | | 13.45 |
| | Group A: Context Study (4b) & Survey of preferences/attitudes to risk (4d) Facilitator: Kerry Turner Scribe: Rebecca Badger | | |
| | Group B: Overall Benefits Survey (Project 4c) Facilitator: Ian Bateman Scribe: Gemma O'Reilly | | |
| | Group C: Direct Benefits Study (Project 4e), Water Body Use and Access (Project 4f) Facilitator: Rob Tinch Scribe: John Joyce | | |
| | Group D: Basic Science Support (Project 4g) Non-Use Benefit Work (Project 4h) Facilitator: Jonathan Fisher Scribe: Tom Griffiths | | |
| | Tea | | 15.15 |
| 7 | Feed back to Plenary (10 minutes per group) | | 15.30 |
| 8 | Summary of the day and close | Kevin Andrews | 16.15 |

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The day proceeded as planned in the agenda; however, the agenda was adjusted on the day to allow for a regrouping of the breakout sessions into three groups.

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6.2 LIST OF PARTICIPANTS

| Name | Surname | Organisation |
|-------------|----------------|--|
| Melinda | Acutt | Ofwat |
| Kevin | Andrews | DEFRA |
| Rebecca | Badger | SEPA |
| Bill | Baker | NERA |
| Camille | Bann | Environment Agency |
| Ian | Bateman | Centre for Social and Economic Research on the Environment - University of East Anglia |
| Alice | Baverstock | DEFRA |
| Zoe | Boorman | CRP Programme Support |
| Jonathan | Burney | English Nature |
| Rob | Curry | EA |
| Giordano | Collarullo | ICF |
| Yvette | DeGaris | UKWIR |
| Ian | Dickie | RSPB |
| Mike | Dobson | CRP Programme Manager |
| Preetum | Domah | DTI |
| Helen | Dunn | DEFRA |
| Neil | Edwards | Joint Environment Programme of the Association of Electricity Producers |
| Aniol | Esteban | RSPB |
| Robert | Falk | DTI |
| Jonathan | Fisher | Environment Agency |
| Keith | Forster | DOENI |
| Tom | Griffiths | Welsh Assembly Government |
| Gary | Grubb | ESRC |
| David | Hadley | Ofwat |
| Karl | Hardy | DEFRA |
| Tony | Heaney | Environment Agency |
| John | Joyce | Independent Consultant |
| Pam | Mason | DEFRA |
| Iain | McGuffog | UKWIR |
| Dominic | Moran | Scottish Agricultural College |
| Gemma | O'Reilly | DEFRA |
| Ece | Ozdemiroglu | Eftec |
| Anita | Payne | DEFRA |
| Elizabeth | Payne | National Farmer's Union (NFU) |
| Robin | Smale | Independent Consultant |
| James | Spurgeon | Jacobs |
| Rob | Tinch | Environmental Futures Ltd |
| Kerry | Turner | Centre for Social and Economic Research on the Environment - University of East Anglia |
| Rowena | Tye | Ofwat |
| John | Ward | DEFRA |
| Derrick | Wilkinson | Country Landowners and Business Association |
| Janet | Wright | Water UK |

6.3 PEER REVIEWERS' WRITTEN COMMENTS (REVISED POST- WORKSHOP)

Reviewer 1: Prof. Ian Bateman

- Project 4g (Science project) should start immediately to provide an initial guide to the physical impacts of WFD implementation. This should report within two months and emphasise measures of impact that are most likely to be perceived by the public.
- Project 4f (Waterbody use and access) should also commence collecting use data immediately within an interim report giving best estimates in time for the first decision round. The project remit should be expanded to collect data for a revealed preference study that will ultimately provide high quality estimates of the value of site characteristics and the value of improvements. This will necessitate an increase in budget but will be very well worth it given the need for robust decision-making regarding a multi-billion pound policy. Long-term this may give the most reliable estimates of WFD benefits.
- The stated preference valuation projects, 4b, 4c and elements of 4d should be conflated within a single coherent study along the lines suggested in comments on 4c within this document. This is designed to produce a rough estimate of overall benefits within an area in time for use within the next decision-making round.
- 4e to proceed.
- Consideration to be given to indirect impacts of WFD, in particular the potential major impacts upon the farming sector.

Introductory remarks: What would one need to assess benefits of WFD?

1. Define the good (supply side)

An ecological characterisation of catchments has already been completed and work on the definition of good ecological status is ongoing. However, prior to any meaningful benefits assessment information is required regarding the likely physical impact of the WFD. This can be a best estimate, focussing upon effects that are likely to have some perceivable benefits. Pam Mason (Defra) has commissioned work similar to this and this should report later summer 2006.

As part of this the assessment should provide some information on:

- Spatial aspect: There is likely to be substantial spatial variation in WFD effects e.g. in some groundwater areas there may be no impact. Indeed conflicting pressures of say CAP reform may even mean local deterioration (e.g. increased concentration of pig farms) or improvements in excess of what WFD will provide.
- Temporal aspect: May be very variable (in some places there is likely to be zero change to 2015).

Aside: there is a cost side issue – how given levels of provision can be attained through different routes at differing costs. This is not the same as cost-effectiveness, rather this is pure cost-benefit seeking to maximise net benefits.

2. Valuing benefits

An initial issue is to agree on the economic definition of a site. This is not trivial given the longitudinal, multi-access nature of water recreation sites. The economic definition of a waterbody may differ from hydrological or ecological definitions.

A related issue is to locate these sites. Therefore:

- What constitutes an 'economic' site from which utility is derived?
- Where are these sites?
- How many are there?

Further issues necessary to define and estimate benefits:

- What are the characteristics of a site? Which of these generate utility? How will WFD implementation change those characteristics?
- What is the population of users? Where are they? What are their personal characteristics?

Collection of the above information allows the following analyses:

- Inspection of the relation between site characteristics, change in those characteristics and resultant benefits.
- Inspection of substitution effects; there is potentially a very substantial diminishment in the value of improving an extra site in an area, once one site in that area has already been improved (this also means that one cannot simply add together the values of individual improvements; one has to allow for substitution effects or the total value will be massively over-estimated).
- This, in turn, leads to the phenomena of distance decay (values for improving a site reduce as we consider households located further and further away from that site). This factor is vital if we are to accurately assess aggregate values of improvements.
- Distributional analysis: We might be interested in how benefits are distributed between different groups and across different areas. In considering this we should look not only at the direct impact of the WFD, but also its second round (indirect) effects; for example, upon farmers who are likely to bear significant costs. We can, therefore, contrast the distributional implications of the WFD (beneficiaries = urban middle class; losers = rural farming communities).

Taken together these introduce a spatial dimension and a temporal dimension. Valuation methods have to allow for this at the project/RBD level.

Regarding Use Value (UV) and Non-Use Value (NUV); a few additional issues arise:

- UV can be estimated via both revealed preference (RP; i.e. looking at visitation behaviour) or stated preference (SP; i.e. asking questions) approaches. Neither are problem free.
- NUV can only be assessed via SP. This raises issues discussed elsewhere in my comments (e.g. the difficulty of accurately perceiving

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the scope of changes; the availability of substitutes, etc. within a SP question).

- Disentangling UV from NUV seems important. We know that UV varies across space (see distance decay above). However, if NUV is a function of the quantity of change generated by the WFD then it too may prove to be a declining function of distance.

The Present CRP (Project 4 – Analysis to specify benefits): Overall impression:

This report and the programme it outlines represent a very substantial advance over the position at the last EA Workshop in November 2005. In particular, the decision to embark on a considered programme of investigation into the complex issues surrounding WFD benefits and their measurement (rather than a short-term quick-fix of a few valuation studies) was the correct one and will have avoided many costly errors in the future.

There is no simple and obviously superior approach to the assessment of complex non-market benefits, such as those likely to be generated by the WFD. The proposed CRP addresses a number of fundamental questions that need to be tackled before any meaningful analysis can be undertaken. In particular, issues such as the definition of WFD benefits in projects 4b, 4g and 4h and the investigation of usage in 4f address crucial basic information needs, without which this enterprise is likely to fail.

That said, there is a certain lack of clarity regarding the policy role of the research undertaken within Project 4. This is intended to provide groundwork for Project 6, the bulk of which will be in January 2008. However, it seems likely that some direct use of Project 4 outputs may be made in the interim, e.g. within the work for PR09. Clarification regarding the use of work conducted within Project 4 would therefore be useful.

Overview comments on the sub-projects of Project 4

Project 4a Expert workshop

In principle this has to be a good idea and has the potential to identify major flaws and omissions and, hence, save a great deal of wasted resources.

Project 4b Context study

This is an essential element of the programme and I very strongly endorse it. Understanding what it is that individuals' value about the water environment is a vital precursor of any preference valuation exercise. However, I feel that this should be part of a united 4b/4c study.

However, to raise a point I will return to, it seems essential that the entire Project 4 should start off with the best estimate of the likely consequences of implementing the Water Framework Directive (WFD). An understanding of the ecological consequences of the Directive along with some notion of their spatial and temporal distribution seems to me the essential scientific requirements underpinning all of the social science research envisioned here. To some considerable extent this may already be known, although my contacts with both the Environment Agency and the Centre for Hydrology and

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Ecology suggest that there is quite considerable uncertainty regarding this issue. Without this information we lack a working definition of the goods that we are supposed to be valuing. Therefore, it seems that some elements of Project 4g (Basic science support) are required from the outset (failing that then 4g should start immediately, with its first output being a description of the consequences of WFD implementation and what elements of these impacts might be perceived by the general public and visitors to the water environment. Without this we really do not know what we are valuing.

Returning to Project 4b, I have a few comments regarding the proposed methodology:

- The literature review is important but should not restrict itself to UK studies (which are small in number, the US literature being far more extensive) nor even to just the water environment. There may be much to be learned from studies of other forms of outdoor open access resource use.
- The applied methodology proposed is exclusively based upon stated preferences (not necessarily valuation work) and focus groups. A concern here is that in such survey and qualitative studies individuals may well tend to give greater emphasis to what are, in relative terms, factors that are of lesser importance in explaining usage. One of the strongest factors is simple accessibility; distance to a site and how easy it is to use that site. Once stated, respondents may feel obliged to discuss lesser items (such as, perhaps, biodiversity) as motivators for trips. Such an approach ignores any observed behaviour information such as revealed preference work. It seems to me that integration with Project 4f (Waterbody use and access) might yield a very rich array of observations on behaviour. Linking this to characteristics of sites should tell us what it is that attracts visitors to a site. Admittedly Project 4f will take a considerable time to complete. However, the literature review and stated preference work can be supplemented with ongoing results from 4f. Furthermore, this topic could be revisited once project 4f is completed.

Regarding Appendix A: Without clear definitions of terms such as Overall net satisfaction (Os), Value for Money Satisfaction (VFM) and Quality, I felt unable to verify the approach proposed here. However, I did not follow some of the statements here (for example, why should we expect $b_{1i} = b_{1ii}$?). Furthermore, it was not clear to me what could be done with the sort of pure utility based measured proposed here. Reliance upon WTP seemed more straightforward (albeit with acknowledged measurement problems).

Project 4c Overall benefits survey

This is described as:

“a willingness to pay survey with additional questions. It would be done at a national (England and Wales) level but take account of differences in each (River Basin District) RBD. It is to be used primarily as a check on the overall scale of the first (Programme of Measures) POM.”

Therefore the objective is clearly defined; to obtain a national value for WFD improvements with some sensitivity between RBD.

Similarly, the methodology is more prescribed than elsewhere (stated preference; presumably either via contingent valuation (CV) or a choice experiment (CE) exercise). I would be interested to hear why this decision has been taken (is it that these national values must include an element of non-use value for which revealed preference methods are not suited?).

Furthermore, the form in which the good should be presented is defined subsequently as being via a ‘top-down’ presentation, i.e. starting with the largest good (WFD non-market benefits in England and Wales) and working down just one level to the RBD.

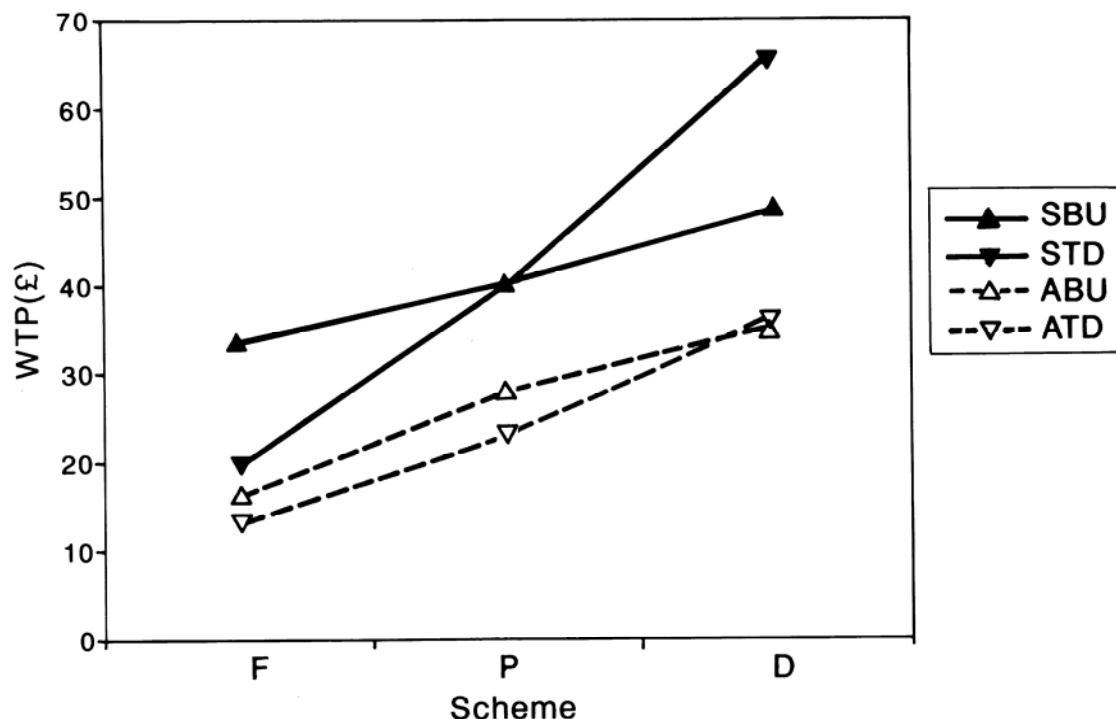
One claimed reason favouring top-down approaches is that they will not over-estimate the value of the inclusive (largest) good. The reasoning behind this argument seems to be somewhat erroneous and arises for an incorrect approach to aggregation. If a series of separate valuations of the exclusive (smallest) goods are taken, each obtained separately, and these are added together then a very high (often infeasible) value is found for the inclusive good. This is hardly surprising as separate valuations of ‘small’ goods will ignore the substitution effects which come into play when a larger set of goods is considered (Carson et al., 1998). Adding these separate valuations together over-estimates the value of the more inclusive good. Such a procedure is clearly incorrect.

The most famous example of a valid top-down, non-market valuation is that of Kahneman and Knetsch (1992). However, in subsequent work Bateman et al (2004) contrast this with a ‘bottom-up’ approach, where respondents first value an exclusive good, this is then ‘taken away’ from them to return them to the initial position. Respondents then value the larger, inclusive good. This value was contrasted with one valuing the same ‘large’ good via a top-down procedure. This showed that the top-down approach yields, if anything, a higher value for the larger good than a bottom-up valuation sequence which controls for substitution effects.

Note that in both of the above treatments respondents discover the full set of goods on offer in a ‘stepwise’ manner, these then being presented in either a ‘bottom-up’ or ‘top-down’ order (defining the treatments SBU and STD). The following figure illustrates mean WTP values for these two sequences as the two crossing lines in the upper part of the graph (note that an intermediate good was also valued). These values were contrasted with a situation in which respondents were told in ‘advance’ about all of the goods they were going to value (and then presented with those goods in either a bottom-up or top-down manner; defining the ABU and ATD treatments). This yields the two lower

valuation curves which demonstrate no significant effects from the order in which goods were valued. Note that the final responses of the first two groups are insignificantly different from the corresponding values of the groups who had advance knowledge of all the goods they would be valuing.

Figure: The visible choice set effect: Mean WTP for three goods (where $D > P > F$) presented in four treatments (see text for details)



Note that there is no theoretical superiority of any of these approaches. However, the empirical consistency of the advance disclosure treatments is clearly appealing. This might be considered within the design of Project 4c. However, a complication is that it may not be technically feasible to offer any smaller goods (i.e. restricting improvements to just a given area) within the context of the study. For example, can one area realistically be improved while another is not? Similarly there will be downstream impacts of an upstream improvement.

As noted, Project 4c asks for a stated preference approach and a contingent valuation (CV) exercise might be most appropriate there. An advantage of CV over choice experiments (CE) is that the former can have better incentive compatibility properties. However, whichever is followed there are a number of concerns that need to be addressed in the design. Key amongst these is the following:

Unfamiliarity with the good

Respondents are unlikely to have an accurate understanding of the number of sites and their quality even within their own RBD, let alone nationally. Similarly the improvements afforded by the WFD may not be well perceived. This needs considerable thought.

Latency

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The benefits of the WFD will not be immediate (indeed there are concerns that in some areas, particularly those which are groundwater fed, the delay may be extreme i.e. beyond the 2015 compliance point specified under the WFD). This will be complicated by the fact that related change may occur at a different (often much swifter) pace. For example, changes in landscape (mainly extensification – but in some areas heavy intensification, e.g. due to concentration of pig farms) due to alterations of farming practise forced by the WFD (and extensive reform of the CAP) may have by far the major impact upon the experience of waterside recreation. Great care needs to be taken to separate out these effects. One approach which may be useful here is recent applications of visualisation and virtual reality software to valuation studies (see Bateman et al., 2006).

Payment vehicle

There is a considerable literature on issues with respect to payment vehicles. Inclusive vehicles (water rates, taxes) are typically preferred although they raise concerns about one individual's responses dictating payments for another.

Hypothetical bias

Spending hypothetical future money lacks the full pain of spending actual present income. Furthermore, if, for whatever reason, the respondent feels they may not actually have to pay the amount specified (e.g. being a non-tax payer) then this may lead to overstatement of WTP. There is plenty of evidence to this effect, even within apparently incentive compatible Stated Preference (SP) studies. Ideally this would be approached by comparison of use value elements of this study with revealed preference derived values for water environment usage. An alternative is to use real payment 'provision point' approaches, where respondents sign up to commitments to pay say higher water rates in return for benefits (on the proviso that a threshold of other individuals have to sign up before the action takes place). This has worked well in the US electricity sector with respect to sign-ups for 'green power'.

Focussing illusion and the visible choice set effect.

Focussing illusion is the phenomena that 'nothing is as important as when you are thinking about it' (Schkade and Kahneman, 1998). This results in respondents according higher values to the single focal good than would be accorded if a wider set of goods were considered. Note that this occurs even when income constraint effects are controlled for (Bateman et al., 2004). The top-down approach (and possibly an advance disclosure format) may help address this. However, an approach that stresses the wider choice set and substitution opportunities is important as discussed below.

The incorporation of substitution effects

A further concern is that in stated preference studies respondents do not adequately take into account the availability of substitutes (neither to the extent that they do when determining behaviour nor, and this is the major problem, to the extent that analysts do when taking a literal, face value interpretation of survey responses). At the extreme survey respondents may only be considering a single site. Designs which

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explicitly address substitute availability are essential. As part of this, checks to examine whether both use and non-use values exhibit distance decay are required. Pure NUV should not have distance decay; however, site improvements may generate new use values giving the appearance of NUV distance decay in the responses of what were previously non-users.

I have not had much time to consider this problem, but a first response might be to use a choice experiment (CE) design. Here one might initially decide to address the issue that different sites experience differing baseline (present) quality levels, and will be changed to some different (typically better) quality endpoint by making some simplification. This can be explained as such to respondents who should be prepared to accept simplifications if they are not too extreme. That said, for the purposes of exposition, let us suppose that we can reclassify sites into three quality levels as follows:

Quality A (highest quality)
Quality B (intermediate quality)
Quality C (lowest quality)

One could provide more meaningful categorisations (such as those used in the EPA water ladder; e.g. boatable, fishable, swimmable, etc) but for the time being let's keep to the above. Readily comprehended information describing each quality level needs to be provided to respondents who are then asked to respond to a typical choice experiment series of questions. Each question asks respondents to choose between the status quo and one or more alternative states. The following figure provides an example of what one such question might look like. However, much of the information supplied here could be supplied visually (by describing the number and distances of sites via map form) – or with supplementary map information⁶.

⁶ Bateman et al (2006) show that the use of visual or combined visual and numeric information reduces the extent of anomalous results relative to sole reliance upon numeric information in CE studies.

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Figure: Suggested CE design to address quality change, substitution effects and distance decay in use and non-use values.

| | 'Status Quo' | 'Option A' | 'Option B' |
|---|--------------|------------|------------|
| Number of sites at quality A | X0 | X1 | X2 |
| Number of sites at quality B | Y0 | Y1 | Y2 |
| Number of sites at quality C | Z0 | Z1 | Z2 |
| Distance to nearest quality A site for which access IS allowed | DAX0 | DAX1 | DAX2 |
| Distance to nearest quality B site for which access IS allowed | DAY0 | DAY1 | DAY2 |
| Distance to nearest quality C site for which access IS allowed | DAZ0 | DAZ1 | DAZ2 |
| Distance to nearest quality A site for which access IS NOT allowed | DNX0 | DNX1 | DNX2 |
| Distance to nearest quality B site for which access IS NOT allowed | DNY0 | DNY1 | DNY2 |
| Distance to nearest quality C site for which access IS NOT allowed | DNZ0 | DNZ1 | DNZ2 |
| Addition to your annual water bill | £0 | £θ1 | £ θ2 |

Choose
'Status Quo'

Choose
'Option A'

Choose
'Option B'

Which would you choose?
(tick one box only)

The approach taken above is designed to examine a number of key issues:

- Number of sites at different quality levels (focussing on the substitute availability issue)
- Changes in the quality distribution of sites (examining the benefits of the WFD with other dimensions controlled)
- Accessibility and distance decay
- Use versus non-use
- Trade-off across all of these attributes and money.

Arguably, however, a CV method might be more appropriate for Project 4c given the claimed superior incentive properties of dichotomous choice methods (although these incentive properties are a subject of debate). A fall back position if these challenges cannot be met might be to use the SP exercise to recalibrate findings from an RP exercise proposed as an extension of Project 4f subsequently.

Project 4d Survey of preferences/attitudes to risk

The approach described here appears to be a pairwise rating respecification of a choice experiment study. As such it may be able to claim theoretical consistency via the random utility model (although I would need to see that verified; it seems to me that responses would need to be recoded as binary variables for this to hold). However, I have a number of concerns about this approach.

Cognitive load

The demands upon the respondent (if we are to subsequently be able to take responses at face value) are extreme. While the pairwise rating response mode appears straightforward, in reality the very large and diverse set of issues being assessed here invites overload.

Simplistic attribute descriptions

The respondent is faced with a host of attributes, and because of this the descriptions of each are extremely brief, indeed no more than titles, including the following:

- "environmental improvements"
- "higher risk to the environment"
- "customer service improvements"
- "pollution incidents"
- "better water environment"
- etc.

Such generalities are not conducive to clear understanding of the goods under investigation, which in turn undermines the validity of responses.

Pairwise comparisons

There is an established literature on the variety of problems which pairwise comparisons can engender. See, for example, preference reversals (Slovic and Lichtenstein, 1983), valuability problems, (Hsee, 1996), etc. Loomes (2006) provides a stark and negative assessment of the potential for using pairwise comparisons to generalise to any wider context.

Risk assessments

A number of the comparisons involve risky decisions. There is ample evidence showing that individuals have great difficulty with any sort of uncertainty (turning this into probability values: p values of 1 and 0 are understood, a value of 0.5 is fairly well understood, and anything else is poorly perceived). For example, Michael Jones Lee's review of the literature on the value of statistical life indicates that the biggest determinant of this value is the probability baseline picked by researchers in a given study).

Overall

I feel that this approach is worth investigating but that its suitability for the WFD context should be established before committing major resources into a full study.

Project 4e - Direct benefits study

This seems a useful piece of research. My concerns are:

- Will the researchers have access to the sometimes sensitive business cost information necessary to conduct this research?
- Data holders, particularly water companies, will have an incentive to misrepresent their costs. By manipulating these so as to make the direct benefits of the WFD appear smaller than they really are, they can gain a profit advantage by maintaining higher water prices than would otherwise be justified. The researchers DEFRA and OFWAT need to be aware of this and guard against it.

Project 4f Waterbody use and access

This is a marvellous project! It is very long overdue and is arguably the most vital of all the pieces of research being commissioned here. The essential question of who uses what sites, how much and for what purposes is fundamental to estimating WFD benefits – well done!

I would strongly advise that consideration is given to extending this study such that it also yields revealed preference estimates of the value of water environment benefits. This should not entail a substantial increase in data collection costs. The extra information required is to:

- (i) Find out where a sufficient subsample of visitors originate from; a simple question asking for full postcode is sufficient (this allows us to calculate travel costs and the accessibility of substitute and complementary sites)
- (ii) Ask what they are going to do at the site (to find a first link between facilities, activities and utility)
- (iii) Find out what alternative site they would have visited if the present site had been unavailable (this allows us to compare the characteristics of this second site with those of the chosen site so as to examine which of those characteristics induce visits and generate utility)

One could also ask about frequency of visitation which may assist in controlling for double counting. Not all respondents need to be treated in this manner, opening up the possibility of using automatic (electronic) counters at some points.

Such a revealed preference extension might very well show that concerns about non-use value and site characteristics are overstated and it is simple accessibility that determines the vast bulk of value. In a comparable study of visitation data for the Forestry Commission, Jones et al. (2002) analyse a database of thousands of visits made to over 100 sites across the UK. The best fitting transferable (all sites) model obtained from this research was as follows:

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Figure: Transferable model of the factors determining visits to Forestry Commission sites across the UK.

| Two Level Site Model (All Visitors) | | | | |
|---|-------------|-------|---------|-----|
| Variable | Coefficient | SE | t value | p |
| Constant | -11.730 | 1.775 | -6.608 | *** |
| Travel time to site | -2.563 | 0.026 | -98.615 | *** |
| Travel time to nearest inland water | 0.226 | 0.044 | 5.199 | *** |
| Travel time to nearest heathland | 0.170 | 0.023 | 7.274 | *** |
| Travel time to nearest coast | 0.153 | 0.022 | 6.888 | *** |
| Travel time to nearest National Trust site | 0.105 | 0.040 | 2.642 | ** |
| Travel time to nearest large urban area | 0.044 | 0.014 | 3.095 | ** |
| Percentage of outset district and surrounding districts classified as woodland | -0.048 | 0.012 | -4.105 | *** |
| Percentage of outset district and surrounding districts classified as BW canals | -0.018 | 0.002 | -9.588 | *** |
| Percentage of outset district classified as households with children | 1.157 | 0.293 | 3.952 | *** |
| Percentage of outset district classified with household head retired | 0.668 | 0.234 | 2.854 | ** |
| Percentage of outset district classified as Social Class 1 or 2 | 0.703 | 0.086 | 8.173 | *** |
| Percentage of outset district classified as ethnic | -0.109 | 0.029 | -3.710 | *** |
| Early site visitors (7am to 10am) | -0.093 | 0.030 | -3.082 | ** |
| Presence of Information Centre at site visited | 0.640 | 0.273 | 2.341 | * |
| Scottish site indicator | 1.485 | 0.299 | 4.967 | *** |
| σ^2_{u0} | 0.581 | 0.133 | 4.368 | *** |
| * 0.05 probability | | | | |
| ** 0.01 probability | | | | |
| *** 0.001 probability | | | | |

Inspection of the above model shows that the vast majority of visitor variation is explained by access variables, most particularly the accessibility of the site in question (with accessibility of substitutes and complements also being important). Socioeconomic factors also play a part (a result which may have policy implications if distributional issues are of concern; in the above example, families, the retired and the affluent all disproportionately benefit from forests whereas ethnic minorities use them less than average). In comparison only one site characteristic proved significant, and this was whether sites had a visitor centre rather than any aspect of their environmental quality. The fact is that such sites all offer a reasonable baseline of visitation experience quality and what really matters is where they were located rather than the specifics of the facilities offered. I suspect that a similar story may apply to the water environment – which in turns begs the question as to whether the improvements provided by the WFD will have any substantial impact upon users' utility.

The above analysis was only made feasible by relating visitor outsets and site locations spatially via a geographic information system (GIS) so I am delighted that this approach is being proposed. This will allow the collected data to be related to existing information on road networks, population distribution and the socioeconomic characteristics of that population through relation to the UK Census (the above example confirms the importance of such characteristics in determining visits).

A similar GIS-based travel cost survey underpins one of the largest water quality valuation studies carried out to date (Egan et al., 2005). This US EPA funded study of water recreation in Iowa uses a panel data base (i.e. the same respondents are asked to provide records of water based recreation at a number of points throughout a study lasting several years). Extending the approach to recruit such a panel would provide a further interesting approach to consider.

However, I do have one important unanswered question: How are sites to be determined for this exercise? The definition of sites for water recreation studies seems a problem, especially for river and canal sites. This needs careful thought.

Project 4g Basic science support

This is another very welcome proposal which should yield important findings. My main concern is that researchers' undertaking the valuation and preference survey work need scientific guidance now regarding the likely impact of the WFD. This needs to focus on those changes which are likely to be perceived by visitors of understood in non-use studies. This cannot wait until the March 2008 end date proposed and needs to be addressed as an immediate priority.

Project 4h Non-use benefit work

Perhaps not surprisingly, given the challenging nature of this project, it proposes starting at a fundamental level.

It seems essential to answer the basic question of what it actually is that constitutes a non-use benefit. This can then be compared with factors that drive non-use value estimates. This should be one test of coherence.

My main concerns here are:

Terms:

I am concerned about some of the terms used such as "citizens' values and intrinsic non-anthropocentric values". As the brief acknowledges, these lie outside standard theory and CBA and, therefore, I both am unsure what these really are and what they would be used for.

Overstatement of Non-Use Value

Some of the concerns raised in respect of Project 4c apply here. In particular:

- Hypothetical bias
- Focussing illusion and the visible choice set effect
- The incorporation of substitution effects

CE designs such as that suggested for Project 4c might be appropriate for tackling the latter two problems here.

Project 5 – Guidance on assessment

This seems fine

Project 6 – New benefits valuation studies

My question about the short-term role of the present work still stands. Proposals for the second phase seem fine.

Scheduling of projects

Given my comments above I feel that some adjustment of the project scheduling timetable might be helpful. I would suggest the latter timetable:

| Schedule | Present timetable | Suggested alternative timetable |
|-----------------|---|--|
| Now | <ul style="list-style-type: none"> • Project 4a Expert workshop | <ul style="list-style-type: none"> • Project 4a Expert workshop |
| Earliest start | <ul style="list-style-type: none"> • Project 4b Context study • Project 4h Non-use benefit work | <ul style="list-style-type: none"> • Project 4f Waterbody use and access • Project 4g Basic science support (initial report)* • Project 4f Waterbody use and access • Project 4g Basic science support |
| Later start | <ul style="list-style-type: none"> • Project 4c Overall benefits survey • Project 4e - Direct benefits study | <ul style="list-style-type: none"> • Project 4b Context study • Project 4e - Direct benefits study |
| Latest start | <ul style="list-style-type: none"> • Project 4d Survey of preferences/attitudes to risk • Project 4f Waterbody use and access • Project 4g Basic science support | <ul style="list-style-type: none"> • Project 4c Overall benefits survey • Project 4d Survey of preferences/attitudes to risk • Project 4h Non-use benefit work • Project 4g Basic science support (full study) |

* Initial report on the impacts of the WFD (for valuation survey work)

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Reviewer 2: Prof. Kerry Turner

Coherence

As an aggregate programme of work the individual projects as set out in Annex 2 do seem to me to represent a coherent and programmatic strategy. The sequencing of the projects is also logical, with one exception project 4g. I share some of the commentators' concerns that this 'long term' approach while offering a practicable way forward in a complex area of work, should not be made into an excuse for delaying indefinitely empirical valuation studies. I also worry about possible duplication and overlap within the work programme. Some sort of monitoring group/arrangement is required to deal with this problem. More radically it may be helpful to think of projects 4b, 4c with inputs from 4g as one 'rolling' project and not separately contracted.

Project methodologies, timescales and budgets

Both the timescales and the proposed budgets seem reasonable as 'ball park' estimates, but this is a difficult issue to judge from this vantage point in time. As far as the suggested project methodologies are concerned I have some general comment to offer before dealing with a few more detailed queries.

As the diagram in Annex 2 sets out, the programme of work feeds off project 3 'disproportionate costs' and the ESG/CRP scoping report. Having played some role in project 3 and the Jacobs workshop on 'non-use' values, I still feel that some basic 'ground rules' need to be clarified and accepted by all the interested parties. These 'basics' include the form and method of the chosen overall appraisal methodology:

- CBA, as standard environmental economics – rule-based decision aid;
- CBA, as a component of a wider integrated multi-criteria assessment system;
- CBA and other decision-making aids/methods as separate but complementary assessments brought together more loosely in the decision-support system (such as that practised in transport appraisal);
- CBA plays a minor or non-existent role in a process dominated by largely qualitative analysis, informed by social surveys.

Until everyone is clear what the fundamental basis of the appraisal process is then I foresee continuing confusion over the details.

The choice between the forms of overall appraisal will then influence the technical analysis at a more detailed level and in particular the work in project 4g. There are a number of issues which need to be resolved: e.g.

It seems to me that project 4g should run in parallel with 4b and 4c in order to set the environmental change impacts on a sound scientific footing and empirically tied to WFD-related changes. The 'Ecosystem Services' methodology should also be applied in this project to provide the natural science – social science linkages.

How are we deciding on the scope for the economic rational choice model approach (i.e. stable, held and context independent preferences underpin

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valuation) versus an approach which allows endogenous preferences and preference formation within the value elicitation process?

This leads on to how we frame the context for the benefits valuation. Is it a consumer/market frame of reference, or a more collective process? If the latter what form of elicitation process will be involved and what sort of respondent groups? How do we fit data (monetary and non-monetary) from the different valuation processes into an overall appraisal system?

It seems clear to me that the WFD will lead to 'winners' and 'losers' in any given water basin area and therefore that 'distributional' issues must be focused on up front. Changing the CBA format to accommodate transfer flows between gainers and losers (and possibly distributional weighting of costs and benefits) is the right way forward. Links to the 'disproportionate costs' work on equity are important in this context.

Areas of work and priorities

I support the sequencing of the projects as outlined in the briefing document, with the one exception of project 4g which should run in parallel to 4b and 4c. Project 4b has a key role to fulfil. Given my comments on the overall approach to appraisal above, this project will then need to set the 'ground rules' for subsequent projects, while itself having been informed by 4g's preliminary findings. Issues, which need urgent attention, include:

Clarification of a spectrum of environmental changes/impacts, from small/marginal impacts causing marginal changes in use values (WTP) through larger impacts causing more profound changes in use values and therefore encompassing 'reference dependency' problems and issues of WTP vs WTAC; to 'significant' environmental impacts, involving loss of cultural, historical, symbolic values (non commensurability problems). Something like this typology needs to be set out for water quality/ecological impacts and others relevant to the WFD. There is a clear link to project 4g in this context and the further development of the 'ecosystem functions, goods and services' approach.

The typology work could help to clarify other more detailed questions about use and non-use values, elicitation methods, multi-criteria assessments (monetary and non-monetary data) etc. The Jacobs 'non use values' report findings need to be re-examined and this would fit well into project 4h.

Project 4d, on risk and uncertainty is clearly an important component of the programme and I think the pair-wise comparison approach has merit, but needs further elaboration and clarification. In particular how it links to 4b and 4c.

Linkages between projects

I think there is still a potential for duplication and overlap. Some degree of overlap is probably inevitable but I think we need to set up a mechanism for monitoring this potential problem. Setting the overall appraisal approach and agenda up front becomes critical; see my earlier comments and the idea of a monitoring group or set of arrangements.

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If we are going to include non-monetary and/or collective preferences elicitation approaches then we need to engage with those researchers who are investigating these more deliberative processes. Both sides would benefit from such collaboration in order to provide a robust evidence based case.

Reviewer 3: Dr. Rob Tinch

General overview:

I think the programme of work is along basically the right lines so far as monetary valuation goes (with the exception of Appendix A in project 4b, see below).

However, I think the POW is rather biased towards monetary valuation, and more consideration should be given to alternative methodologies, and how these might be integrated in decision support. See e.g. *Valuing our Natural Environment* (Defra project NR0103, March 2006).

I agree with the decision to adopt a long-term approach, and the "compromise" approach to conducting "high value added" studies for critical decisions. I wonder though if the approach is long-term enough; as currently set out, it will be difficult to avoid duplication of effort, inconsistencies and missed opportunities across the flush of projects to be completed on a short timescale (4b,c,d,e,h). I think some rejigging of the timing, and some rearrangement of the work across sub-projects, may help to avoid this.

Specifically, I suggest that the following ideas might be discussed:

- risk as a context issue should appear in 4b, while risk as a "strength of preference" issue could be incorporated within 4c.
- serious consideration should be given to integrating "disaggregation" work with the "top down" valuation of 4c – I'm not convinced about using weighted average strength of preference from 4d to disaggregate results from 4c.
- 4b and 4e should run concurrently. 4c needs results from 4b and should be delayed to take these in.
- A lot of the background work in 4h could be done now, and some should be built in to 4b which should consider both use and non-use values, within the same coherent framework. How do stakeholders view the distinction between use and non-use, and its treatment in decision making? Then the valuation aspects of 4h should be done either integrated with, or concurrently with, valuation in 4c.

"Collaboration" is noted throughout the text. What exactly is meant by this? It seems to go beyond attempts to coordinate research briefs across topics, and to include elements of stakeholder work, but it's not clear.

In places there seemed to be a feeling that the role of valuation data was to determine decisions, rather than to aid them. I think this lies behind the suggestion that decisions based on BCAs which turn on non-use values might be deferred. I think valuation should be seen as producing numbers which are an aid to decision makers, not numbers which take the decision for them. In particular valuation should not be used to circumvent later stakeholder consultations.

How does this programme of work build on existing work?

Defra and other – for example:

'Testing the Sugden approach' (FD2018) - exploring whether the transparency and equity of flood risk management economic appraisal can be improved through new approaches that more explicitly identify gainers and losers in the appraisal and decision making process. (Risk Solutions Ltd, completion September 2006).

'Developing an evidence base for improving appraisal guidance' (FD2019) - review existing guidance and examine potential improvements to reflect the findings of the 2004 Foresight study, 'Future Flooding' and the direction of travel for some of the other areas of project appraisal identified in the Government's first response to the Making Space for Water consultation. (RPA, completion September 2006).

'Valuing our Natural Environment' (NR0103) – (Eftec and Environmental Futures Ltd, completed 2006) "The overall role of valuation evidence is to support rather than to make decisions, and the choice is not a case of either economic or deliberative and participatory methods, but using a combination of these as the context of the decision requires" (from SID5)

"more work is required in developing decision support tools for combining different types of value evidence with a view to present as much information as possible rather than aiming to come up with a single number at the end of the analysis." (from SID5).

Jackson, T (2005) Motivating Sustainable Consumption – especially section 2 on models of consumer behaviour, which is relevant to questions about valuation methods and alternatives in environmental decision making.

Project 4b:

- Issue of benefits to private individuals versus general public: in BCA terms this is an irrelevant transfer issue, unless equity weights are used. Good to look at it here, but care might be needed to avoid "double counting" if any adjustments in valuations or methodologies resulting from this work on context are applied as well as any weighting scheme, or "Sugden approach" to identifying winners and losers.
- Attitudes to property rights issues more generally could be important (eg access issues, compensation framework in FCD).
- Role of Floods Directive – e.g. impact of move from permissive to statutory regime for FCD?
- Other aspects which might be focused on: impact (and appropriate treatment of) risk and uncertainty, including "invisible" aspects of quality; information sources and trust; conflicts between different types of use; congestion; size of sites.
- *ex ante* versus *ex post* – how does actual experience influence valuation? I suspect this may be more important than the "topical bias".
- Timing of payments: this probably does have an impact and it's worth noting in this context that private discount rates likely to be much higher than social (so care needed in working out NPVs)

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- Weighting of external costs in WTP – I'm not sure exactly what is meant here (last bullet, mid p12). I think a "getting the prices right" environmental tax should be counted as part of price in BCA, but is the issue to do with risks of double counting?
- Potential sources of information – market for bottled water? And how much of that is to do with misinformation / uncertainty?

Appendix A:

- What is the difference between "overall satisfaction" and utility?
- Not convinced that "overall satisfaction" can be "interpreted from usage levels", at least not in any simple way.
- The proposed relationship of satisfaction with quality and charges essentially implies some maximum value for a given quality, with a linear decline from this with charges. This assumes that there is no possibility of varying the level of use. Then we have WTP "for a change in usage levels equivalent to a marginal change in quality" which implies that use can vary. What is the justification for thus mixing up quality and quantity?
- What does "100% satisfaction" imply / how does it fit with the functions proposed?
- Why should the "overall level of usage or satisfaction" tell us anything about whether WTP represents a potential gain or a deterioration?

Project 4c:

- Why not attempt to disaggregate? Seems to be a missed opportunity – it would help link with other parts of the POW. If disaggregation comes after the "top line" valuations (as it would pretty much have to) then should not interfere with the aggregate results, so nothing to lose?
- Could also help deal with (or keep tabs on) the problem that "it would include all categories of benefit". Could involve either deluging people with information, or keeping things so general that it's unsure what benefits respondents have in mind.
- Where do equity considerations (from "context" work in 4b) fit in to the "strength of preference" outputs here?
- "Benefits of meeting the WFD objectives" – consider also benefits of exceeding?
- "Choice experiments enable the value of different attributes of good status to be elicited in the context of other demands on hh income" – same could be said for CV.
- Are "current" and "good" indicators sufficient for the statistical demands of the model?
- When varying different indicators separately – what is the risk that the configurations of comparisons needed for the stats will involve combinations of indicators which are physically / ecologically inconsistent or implausible (and what happens if respondents realise this)?
- Small focus group / CV study – yes, and project will also need subsequent pre-testing of the "final" survey instrument
- Resources: FTF and telephone options noted. Consider internet?

Project 4d

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- Does some of this need to come before 4c? Seems to be important input, similar to 4b. I suggest that risk as a context issue should appear in 4b, while risk as a "strength of preference" issue could be incorporated within 4c
- What is the rationale for omitting monetary variables from most of this work?
- "You try to optimise" – does "you" refer to the WFD decision maker, or the survey respondent?
- Individuals' preferences among "visible environmental damage, heritage protection and sewer flooding" – OK provided the choices can be made plausible (i.e. realistic that we could do A without doing B, and v.v.)
- "Weighted results based on overall strength of preferences can be used to split an aggregate WTP estimate" (from 4c) – why not do this directly, within 4c?
- Example question pairs etc. – many of these seem to me to be far too vague for this sort of work. e.g. "fewer pollution incidents affecting local river" – how do we interpret that? Is this the best way to find out about risk attitudes? I think more discursive methods might give more useful information. I'm not sure if this needs a stand-alone project, or if it can be integrated with 4b.

Project 4e:

- Given project 3, £100k seems generous for the deliverables listed here. £50k?
- "Direct benefits are, however, easier to estimate" – I'm not sure this is true, at least not in all cases. For example, water quality contribution to fisheries: very complex functions, potential for high uncertainty / natural variability, realised and potential values may differ due to inefficient management (e.g. open access).

Project 4f:

- Some things to consider in modelling / tool development: substitutes, access costs, weather (and possible relationship between climate and WQ status), congestion.
- I think 4f should make explicit use of travel cost methods – allow comparison with SP results. Related questions could be built in to the SP work to help this.
- "Behaviour surveys" could also be integrated with other work.
- "Without access benefits cannot be realised" – this may vary by type of benefit.

Project 4h:

- We also need to look at non-monetary ways of taking non-use (and use, for that matter) values into account.
- Many of the "technical challenges" noted here also apply to use values – strategic, hypothetical, etc.
- "Citizens' values" are "outside the confines of CBA" – I don't think this is quite true. The point with "citizen" versus "consumer" is the idea that the same person might have more than one "set" of preferences, the expression of which is context dependent; and / or individuals

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might not have stable preferences at all, especially not for unfamiliar choices, but rather construct them on the fly, in a way which is context dependent. But there's nothing in economic theory to suggest that we can veto preferences which are not purely self-centred. Our valuation methods can trigger different preferences, which pose a problem, but I don't think we can say that one set is valid and others are not.

- I think that work along the lines set out on p35 should start off from a broader consideration of theories of choice and decision making (e.g. studies noted above): and rather than presupposing the monetary valuation objective, should look also at how stakeholders think these values should be taken into account. This should be integrated within 4b as part of the general context work – how do people benefit from the environment, how do they “value” this, how do they think decision-makers should take that into account? 4b should consider both use and non-use values, within the same coherent framework. How do stakeholders view the distinction between use and non-use, and its treatment in decision making?

Reviewer 4: Tony Heany

Introduction

Main interest is in producing & implementing a River Basin Management Plan. Not an economist, background is water quality planning therefore cannot comment on the economic methodologies but rather the practicalities re RBMPs.

CRP work vital in this re CEA & DCA.

Key EA Regional concerns re economics work for 1st RBMP round:

- guidance fit for purpose for a RBMP
- achievable given time & resource constraints
- proportionate
- role of economists & non-economists

Recognise the need for longer term thinking (2nd & 3rd RBMP rounds) re economics work but the current priority must be on delivering approaches to use in the 1st round. Need to be confident that the appropriate short term work is in hand before looking to the mid to longer term work.

Are we confident that Projects 2c & 3 have delivered/will deliver what their initial brief was **and** that they work in the context of practically producing a RBMP?

If the answer to this is no, then we need an urgent review of the work packages proposed in Projects 4,5 & 6 to see if more immediate effort in better spent on 2c and/or 3, i.e. Project 5a.

The proposed approach and the five main issues are a sensible way forward. However, the devil is always in the detail and this is especially so regarding issues (1) and (2) on page 3. Reading between the lines this seems to suggest that the 1st RBMP round will consist of national POMs assessed nationally on CEA & DCA grounds. These would then form a "baseline" in each RBMP with additional regional and local measures overlaying these. The inclusion of these additional measures would be assessed and justified regionally for CEA & DCA. If this is the intention then GREAT, as this is the way forward envisaged by the Ribble pilot after testing recent guidance. If it isn't, then again we need to review how 2c & 3 will enable RBMPs to be produced. Also if it is the way the 1st round is to be implemented then we need to say so to manage expectations especially given the recent formation of the River Basin Liaison Panels.

Projects 4, 5 & 6

Is the work to be done at an aggregated level (national) or a waterbody level? For 1st RBMP I suggest it is better to define this up-front rather than going into the studies hoping they will do both and because of the challenging timescales end up doing neither level well.

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Project 4b

Unclear as to the aim of this as I thought the context of the significance of benefit categories and WTP was already understood, but rather the economic debate was on the detail and application of these in specific circumstances?

If the aim is to have a fundamental review of benefit types then is a six month timescale finishing end of 2006 realistic?

Project 4c

This is the key to setting the overall affordability framework for PoMs.

Good to see an early delivery.

Unclear on regional surveys and what happens if regional opinion is significantly different to national opinion but the PoM is national.

Project 4d

Important study to frame public attitudes to water management and priorities - good for framing the debate.

Concern regarding the amount of information (number of questions) which can be extracted. Therefore effort needed on framing questionnaire to get the key issues addressed.

Again concern regarding relationship between national and regional work especially if key differences (see 4c comments).

Nine month timescale is ok. However, if there is slippage then this would impact on the inclusion of public preferences in SWMI reports.

Project 4e

Have we a rough figure for the general value of these markets? And how many instances there are likely to be?

In the NW, I can only see "abstraction" being a potential benefit and even that is reliable on dramatic changes in WQ not the more marginal changes.

It is a short project (three months) with an early completion (end 2006). Is it such a priority? If it includes recreational fisheries, not just commercial fisheries, then potentially yes.

Project 4f

Important in addressing current gaps especially regarding marginal changes in WQ and WFD objectives.

Concern that it is looking at the waterbody level. Therefore, not too sure how it fits into the planning framework of the 1st RBMP. Though it could be used in regional/local level PoMs/CEA work - is that the thinking?

UK Collaborative Research Programme on River Basin Management Planning Economics

Point of detail - ICREW project (NW EU Interreg-funded project; contact: me) could help on bather usage at bathing water sites. Findings of project were that less than 10% of beach users actually go in the water. Though recent DOENI work stated nearly 50% of Northern Ireland beach users went in the water!

Project 4g

IT IS VERY IMPORTANT TO LINK ECOLOGY AND ECONOMICS.

There is too much uncertainty in defining what the ecology is, where it is in relation to WFD 'good status' and how it will change under the various PoMs. Defining these "gaps" and changes is a vital pre-requisite for the economics work. This has been shown by the results of the testing of CRP Projects 2c and 3.

This project is due to start at the beginning of 2007. I think this project is so important to getting operational CEA/DCA working (i.e. Project 5) that it should be started as soon as possible as it will be needed sooner rather than later in RBMPs.

Project 4h

The number one economics benefit question. So it's unsurprising the prominence and importance attached to it as again these values will be a key debating-ground for setting the overall PoMs affordability framework.

Good to see an early start but completion of phase 2 is obviously the key for 1st RBMP decisions.

Project 5

THE KEY FOR OPERATIONAL IMPLEMENTATION OF THE 1ST RBMPs.

The timetable is ok for the planning of the 1st draft RBMP but if there is slippage then there is the potential for huge operational implementation problems.

I recommend that this project is the focus of effort.

I think it can only work if the overall decision-making framework is clear from the outset so that operational CEA/DCA guidance can be specific and tailored. If not, then huge concerns.

Other comments

DECISIONS ARE KEY

If there are issues which cannot be resolved in the short term then we need to recognise that, recognise to address them in the mid to long term, but come to short term working decisions to deliver the 1st RBMP. Whilst the work may not be 100%-economically robust we must make decisions to get the 1st RBMPs out-of-the-door.

REGENERATION BENEFITS

The regeneration benefits of WQ improvements have previously been recognised as important benefits particularly in areas such as the NW. However, quantification, especially monetary, has always been put on the too-difficult-must-do-more-research-on-this-later pile - again it does not figure in any these projects as a specific issue. Surely this is an important oversight for areas with a substantial industrial legacy? Will it be addressed?