

Practical Application of Natural Capital Assessments to Inform Policy and Business Decisions - Case Studies



AUTHORS

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NATURAL CAPITAL VALUATION AND ACCOUNTING

Natural Capital assessments can enhance the transparency and robustness of decision making across a range of activities including natural capital accounting, investment option appraisal, biodiversity offsetting, product stewardship, site clean-up and remedial options appraisal, valuing environmental damage and compensation, strategic planning and corporate social responsibility. Business and policy makers each benefit from decisions that recognise and act upon risks and opportunities for increased resilience, risk reduction, resource efficiency, long-term value creation, reputation-building and cost savings. Ramboll Environ has been evaluating natural capital (NC) and ecosystem services (ESS) for more than 20 years using a range of tools and methods. Benefits of the approach and lessons learned from the practical application of these assessments are presented herein using two differing case studies that showcase the versatility of the natural capital assessment framework and methodologies and the diverse range of business and policy decisions they can inform.

Natural capital can be defined as “the stock of renewable and non-renewable natural resources (eg plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people” Natural Capital Coalition¹, adapted from Atkinson and Pearce 1995²; Jansson et al. 1994³

Ecosystem services refers to “the benefits people obtain from ecosystems”, (Millennium Ecosystem Assessment 2005⁴), and are generally categorised into provisioning, regulating, cultural and habitat or supporting services. Biodiversity and habitat services underpin other ecosystem services.

INSECTICIDE USE IN CITRUS ORCHARDS IN SPAIN

Pesticides are applied to crops for protection with the aim of maximising the harvest, providing food for consumers and an income for the farmer. Traditional pesticide risk assessment includes a thorough evaluation of the risks to the environment and fully considers the safety to human health. It is designed to be protective, although generally corresponding to worst cases. Policy decisions that rely on technical risk assessments alone do not consider:

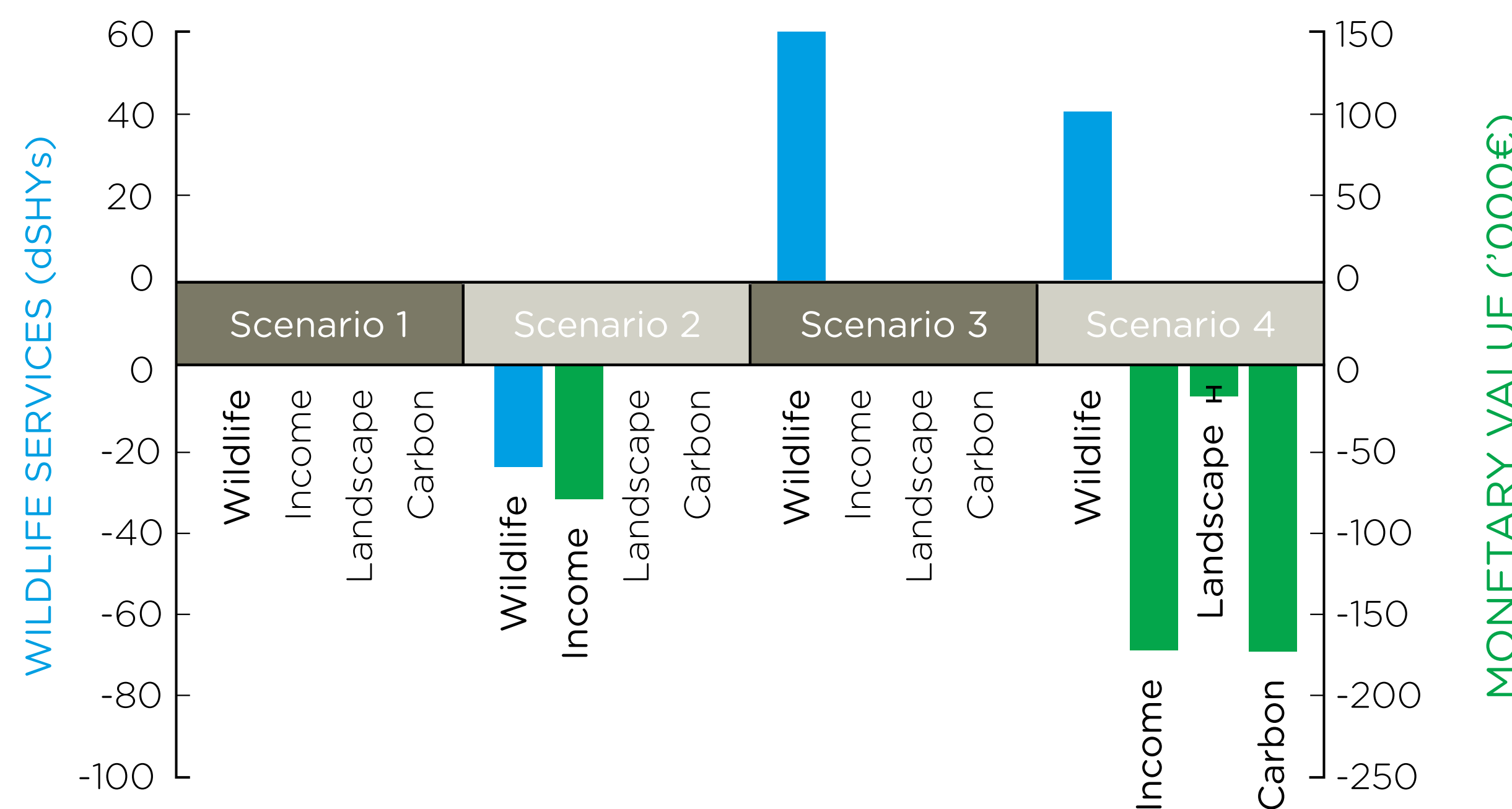
- The consequences to the crop production system relative to the risks and benefits that the product would bring.
- The consequences of possible alternatives including land use changes.

Project background

Ramboll Environ analysed the effects on ESS (including socio-economics) of using an organophosphate (OP) insecticide in citrus orchards to identify risk management actions and understand the consequences of the discontinued use of the insecticide in a hypothetical situation.

A quantitative approach was advanced to evaluate changes in ESS associated with the use of the OP insecticide in citrus production. Initially a proof of concept framework net ecosystem services analysis (NESA), was developed to conceptualise the range of potential ESS uses, management actions and habitat types typically found in Valencian commercial citrus orchards.

Based on a field ecology study of birds and a field visit, three orchards with varying topography, a range of surrounding land uses and a wide variety of species including 53 bird species were chosen as a representative sample for the region. The NESA framework was applied to the representative orchards (total combined area of 26ha) to evaluate the potential effects on ESS with (scenario 1) and without the insecticide.



- Scenario 1: current practice including insecticide
- Scenario 2: hypothetical registration for insecticide cancelled
- Scenario 3: illustrative with insecticide and vegetation buffer
- Scenario 4: hypothetical, longer term with 30% loss of orchards

Relative change in the value of ecosystem services when compared to the current use of the insecticide (Scenario 1)

Under the scenarios above, where the use of the insecticide becomes restricted, there is:

- No improvement in wildlife.
- A major negative impact on the livelihoods of growers, the Spanish agro-economy and citrus production in the EU.
- A large decrease in carbon sequestration.
- Erosion of cultural values related to recreation and tourism in citrus dominated landscapes. For example, citrus growing is a way of life in the Valencia region of Spain. Local people use citrus groves for walking and cycling and they enhance the aesthetic qualities of the agricultural landscape of the region.

KEY LESSONS

- ESS analysis brings a holistic approach to environmental decision-making by valuing the benefits people obtain from ecosystems.
- The assessment may avoid decisions with unintended consequences that may be costly, increase risk or be detrimental to ecosystems and human wellbeing.
- It puts potential short-term environmental risks into context with longer-term gains in farm economics and food provisioning services.
- Socio-economic aspects are scalable from field to regional and national levels.
- ESS analysis emphasises trade-offs between services.
- The analysis can be used to support decision-making on risk management and integrated pest management.

ASSESSING ENVIRONMENTAL DAMAGE AND ECOLOGICAL RESTORATION

Project background

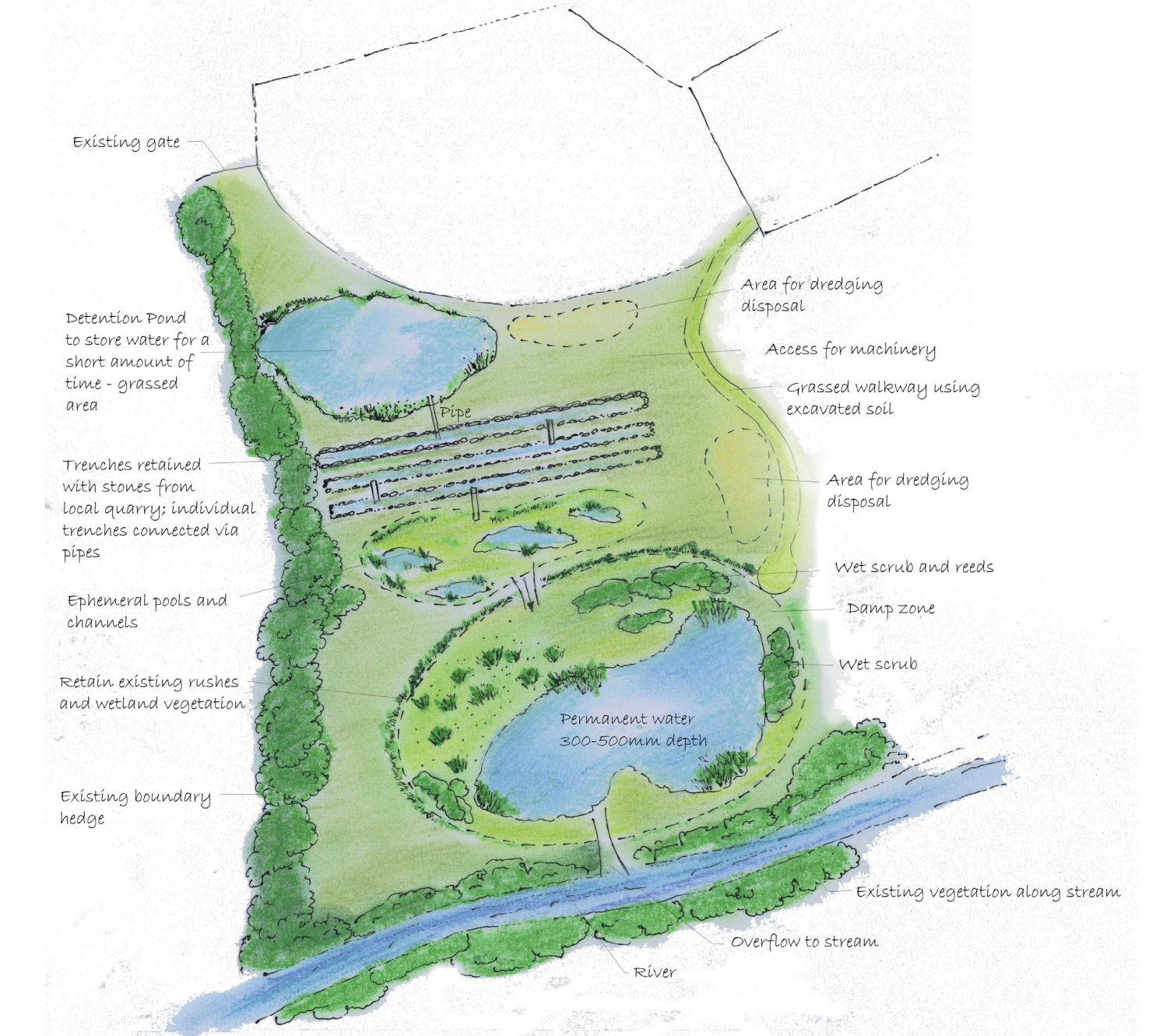
During a road construction project, failure to dam a river prior to a permitted construction activity caused a chemical release to kill a number of fish. Ramboll Environ and its legal partners valued the resulting environmental damage and identified beneficial compensatory actions that were acceptable to the client, local conservation authorities and the regulator.

Enforcement action required:

- Action to secure that the offence does not continue or recur.
- Action to secure that the position is, so far as possible, restored to what it would have been if the offence had not been committed.
- Any other action that would secure benefits or improvements to the environment (including the payment of a sum of money to a third party).

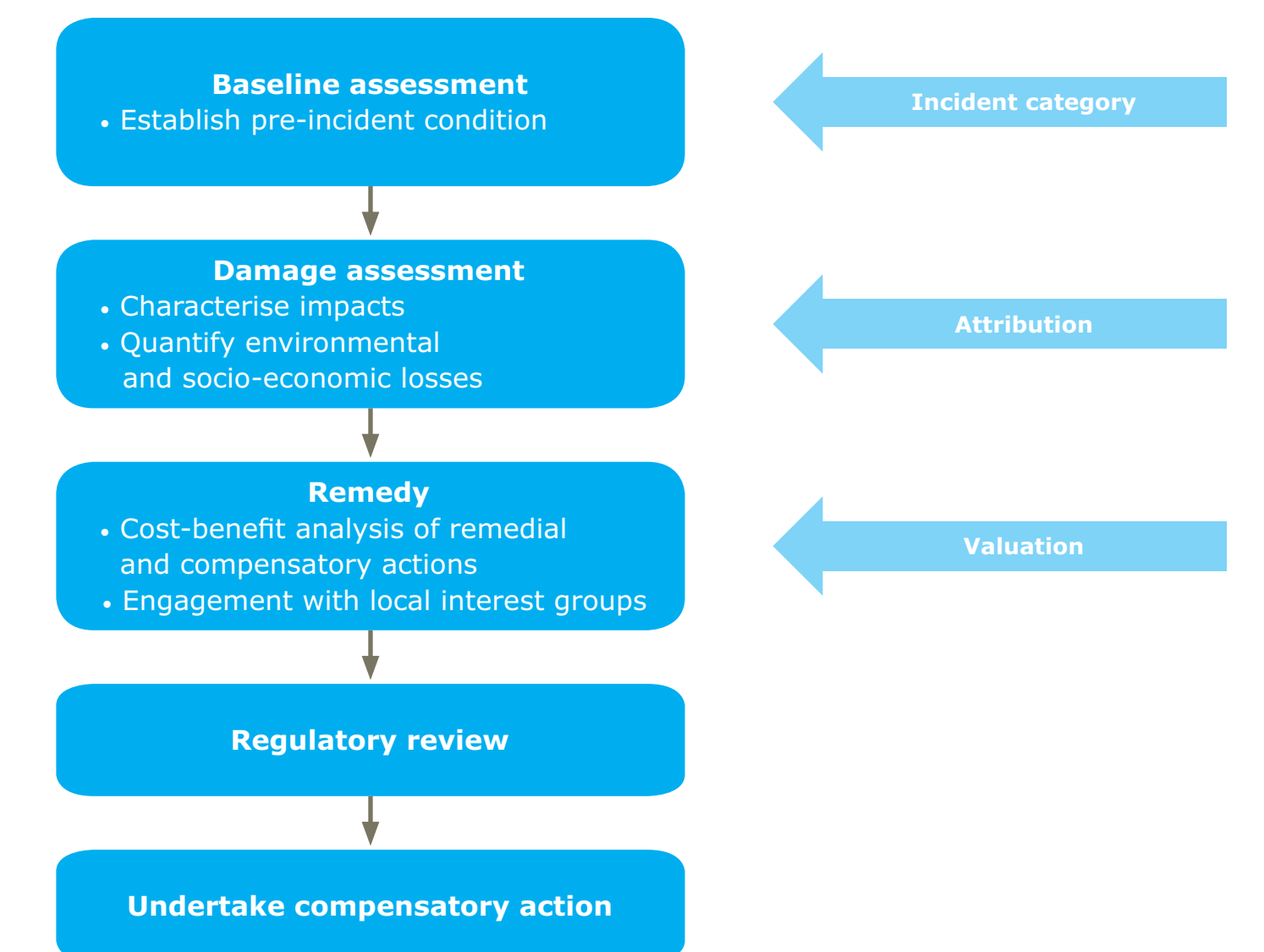
THE APPROACH

The valuation approach mirrored those applied under the European Environmental Liability Directive (2004/35/EC) by establishing a pre-incident baseline condition, evaluating the potential environmental impacts to the affected area and a cost-benefit analysis of compensatory actions including engagement with local interest groups.



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The system captures sediment, reduces nutrient inputs and minimises rainfall runoff from adjacent farmland, thereby improving the chemical and ecological status of the river. As a result of this action, the biodiversity of the wetland has been enhanced.



Step-wise approach to environmental damage valuation

KEY LESSONS

- Environmental liability (including civil sanctions) provides a compensatory option for the rectification of water pollution damage.
- Using a natural capital/ecosystem services approach to valuation, the cost of damage can be confidently quantified to assess the long-term harm, recovery and compensation to the water environment.
- Provides defensible propositions for compensation that are not necessarily the most costly option and provide a 'win-win' for the environment, operator, regulator and the local community.
- Allows for local compensatory action.
- Opportunity for good PR.
- Approaches are supported by government and regulators (eg European ELD).

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- ⁴ MA, 2005, *Millennium Ecosystem Assessment: Ecosystems and human wellbeing*, Biodiversity Synthesis, Island Press: Washington DC,