



## **Summary of the RUBICODE Review on: “Preferences and Economic Values for Ecosystem Goods and Services”**

*A. Kontogianni, M. Skourtos and P.A. Harrison*

There is growing emphasis on ecosystem functions, services and values at all governance levels, especially within state agencies and international organisations. This is a testimony to the importance attached to human benefits from ecosystems in modern nature conservation thinking. The increasing demand for evidence of “good value for money” from public funds used for conservation projects makes reliable monetisation of conservation costs and benefits essential. Although traditionally the costs of environmental externalities (such as climate change, water purity and health impacts) have not been included in national or corporate accounts, monetary reporting on ecosystem health will become more familiar and widespread as ambitious research leads to improved techniques, and as society increasingly demands full accounting.

This review addresses the dynamics of economic values and preferences for ecosystem goods and services. The key questions are “How do human preference and values for ecosystem services change through time?” and “Do we have the methods and data necessary to assess these changes accurately?”

The review highlights empirical evidence of both demand-driven and supply-driven changes in values. Demand-driven changes arise when human preferences change in the short to medium term and thereby alter the value people put on ecosystem services. Review of the evidence reveals considerable differences in the time span examined (2 weeks to 20 years). It is shown that values are stable for time periods of less than a year and certainly change for time periods of twenty years. For periods of four to five years the evidence is mixed.

Over longer periods, changes in cultural parameters can play a key role. This makes the task of modelling the dynamics of preferences very complex. We examine integrated ecology-economy models, and dynamic bioeconomic models, as representative approaches to modelling supply-driven dynamics. The reviewed models are normative, describing in an optimum control fashion how the complex socio-ecological systems should evolve over time in order to fulfill the requirements of efficiency and sustainability. The evolution of values (or ‘shadow prices’) in such an optimum control frame is described as the time path of state variables indicating how much social welfare is increased if the corresponding variables or restrictions are relaxed by a marginal unit. These approaches have advanced our understanding of complex systems, while also alerting both researchers and policy makers to the dangers of oversimplification. Further improvements in understanding will require mixing of methods and pooling of data. In this respect, the potential of systematic and formalised interdisciplinary research lies in the integration of insights, methods and data drawn from evolutionary and behavioral economics as well as from integrated ecology-economy models in order to portray in a mixed qualitative/quantitative fashion the dynamics of ecosystem values. It remains a task for future research to develop detailed strategies for taking these steps.

*Full report: Review of the dynamics of economic values and preferences for ecosystem goods and services.*