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A methodological framework to assist decision-making on prioritising conflicting uses ion multi-functional environments

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A strong and evidence-based environmental legislation contributes to reduce the generalised degradation of natural and semi-natural environments. However, the wide range of coastal settings and the complexity of interactions between physical, biological and socio-economic factors prevent the development of very specific guidelines at national and regional levels. Often coastal management decisions are taken locally as local governments are better placed to engage with local community. However, they can also be more influenced by stronger local sectors and suffer from lack of expertise, experience and funding. Significant conflicts might arise between sectoral interests, especially in multi-functional coastal areas. Reaching a consensus on which function is more important is a difficult task. Here a methodological framework is suggested to support decision-making in (1) the identification of priority objectives (e.g. which function should be preserved; how much loss is acceptable etc.); (2) the selection of measurable indicators to assess environmental damage (e.g. loss of habitats, services etc.) and (3) assessment of habitat/service compensation. Amongst the initial decisions, it is necessary to (a) determine at which scales (temporal and spatial) the objectives will be defined and (b) the sensitivity of each step to conflicts between experts' opinion (what is scientifically more adequate) and local needs (what the local community expects). The framework is applied to address conflicts identified in the management of Farlington Marshes (Langstone Harbour, Portsmouth, southern England) between habitat conservation, management of flood risk and provision of recreational grounds/green areas. Langstone Harbour is a designated conservation area of national, European and international importance. The North Solent Shoreline Management Plan (2011) indicates that 'hold-the-line' is the most adequate approach to be implemented along most of Langstone Harbour's shoreline in the next 100 years, except along Farlington Marshes. Farlington Marshes are designated grazing marshes of recreational important in a highly urban environment with scarce green areas. Seawalls built in the 18th century protect the freshwater habitats from tidal flooding but aggravate loss of intertidal habitats due to coastal squeeze and erosion. Existing coastal defences protecting Farlington Marshes are reaching the end of their life-time and upgrading of existing defences might be required in the future if flood risk is to be kept at current levels. Constraints arise not only due to the high costs to upgrade the defences but also from the detrimental environmental impact this might cause on designated conservation zones. For these reasons, managed retreat has been suggested as a preferable alternative for Farlignton Marshes in the long-term (in 50 to 100 years). However, the multi-functional character of Fartlington Marshes implicates that some of the functions will be lost or considerably affected whatever management alternative is to be implemented. This study assesses the potential benefits and drawbacks resulting from the adoption of three alternative management scenarios for Farlington Marhses by following a methodological framework incorporating the principles of integrated coastal zone management and considering the most common methods used worldwide to assess environmental damage and compensatory measures.