

A welfare economic assessment of biodiversity offsetting applying a cost-benefit methodology

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Abstract

This study examines biodiversity offsetting, which is an instrument used by developers and planning authorities, where new habitats are created to compensate for environmental and ecological damage caused by economic development activities elsewhere. Biodiversity offsetting has gained strong political support worldwide and offsets are rapidly being implemented. The policy seeks to achieve no net loss of biodiversity and nature values. This requires gains from biodiversity offsets implemented as compensation for the damage and loss of biodiversity caused by human activity such as new roads and cities. The aim of this analysis is to present a welfare economic assessment of biodiversity offsetting applying a cost-benefit methodology. The model is based on the principle of no net loss and a criterion of net present value (NPV) being equal between the offset and lost areas. Various values of discount rates and offset multipliers – factors by which the offset area is larger than the lost area – are analyzed and the criteria of no loss in NPV is explored involving the effect of different time horizons and discount rates.

Our findings suggest that using standard parameters offset multipliers should be equal to approximately 7,2 to achieve no net loss over a time period of 50 years using the recommended discount rate of 3,5%. This result is strongly influenced by the time horizons. Using time horizons of 100 and 200 years result in optimal offset multipliers of 3,8 and 3,5, respectively. The general practice in Denmark uses offset multipliers equal to 2. Our study imply that this will always result in a net loss of socioeconomic biodiversity value. This is illustrated by the finding that for the general offsetting factor of 2 the

discount rate used in the analysis for 50, 100 and 200 years should be respectively 0,1%, 1,9% and 2,3%, to secure no net loss of biodiversity values. This seems highly unrealistic compared to general recommendations for cost-benefit analysis.