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**nash: using Game Theory towards sustainable resource exploitation.**

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Sustainable harvesting of a common pool of interdependent living resources requires an appropriate formulation of a management objective.

The Maximum Sustainable Yield (MSY) objective ensures maximal long-term production without compromising the reproductive potential of the resource being exploited. It was first introduced into EU regulation in 2013 with the Common Fisheries Policy and in the UK in the more recent Fisheries Act 2020. Fisheries management advice has historically been provided on a stock-by-stock basis relative to MSY. However, in real natural systems species interact by feeding upon one another and/or through competition for resources. As a result, the yield of one species depends not only on its own harvesting level but that of other species. A promising translation of the MSY objective to cases with multispecies interactions has recently been suggested in terms of a Nash equilibrium.

Here we present “nash”, an R package that streamlines the computation of Nash equilibrium harvesting rates for abstract user-defined ecosystem models. It was successfully tested for a range of multispecies models varying in complexity, from which the case of the North Sea food web is here demonstrated.

Given the current plethora of ecosystem models being implemented in the R programming language, we believe nash has the potential to (i) extend the use of the Nash equilibrium MSY objective as the best candidate for practical (realistic) multispecies resource management; and (ii) facilitate its computation through a common function interface independent of the ecosystem model selected.

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