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DEVELOPING A CONSERVATION STRATEGY USING GENETIC DIVERSITY BETWEEN HATCHERY STOCKS AND NATURAL POPULATIONS OF TURBOT (*Scophthalmus maximus* L.)

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ABSTRACT

Population genetic analyses have been highly successful in predicting inter- and intra- specific evolutionary relationships, levels of gene flow, genetic divergence and effective population sizes. Parameters estimated by such analyses are evolutionary averages and thus relevant for contemporary ecological or conservation issues.

Changes in genetic variation within a species range may indicate patterns of population structure resulting from past ecological and demographic events that are otherwise difficult to infer and thus provide insight into evolutionary development. Genetic data was used, drawn from 24 enzyme loci amplified from turbot (*Scophthalmus maximus* L.) sampled in the Irish Sea and a hatchery-reared batch, to explore population structure using genetic diversity measures. The main issues to be tackled were whether artificial propagation poses a genetic threat to conservation of naturally spawning populations, and that the fitness for natural spawning and rearing can be rapidly and substantially reduced or increased by artificial propagation.

Turbot populations in this region represent less than 20% of their reported abundance and survive in very small populations found in fragmented habitats. Genetic data derived from allozymes have shown that a relatively low level of genetic diversity characterizes populations. An hypothetical model supporting genetic population substructure such as range expansion with founder-flush effects and subsequent population decline with small effective population sizes was considered. These observations support conservation measures based on genetic diversity be developed to ensure the survival of this diverse gene pool.