

1106-91-1063

Worku T Bitew* (biteww@farmingdale.edu), 2350 Broadhollow Rd, Farmingdale, NY 11735, and **Wisdom Akpalu**. *Optimum reserve size, fishing induced change in carrying capacity, and phenotypic diversity.*

Fish stocks around the world are heavily overexploited in spite of fishing policies in several parts of the world designed to limit overfishing. Recent studies have found that the complexity of ecological systems and the diversity of species, as well as negative impact of fishing activities on environmental carrying capacity of fish stocks—all contribute to the problem. A number of biologists, managers, and practitioners strongly support the use of marine reserves as a management strategy for marine conservation. This paper contributes to this line of research by seeking an optimum reserve size and fishing effort for situations where species diversity decrease at fishing grounds and fishing activities impact carrying capacity. We found that a reserve size which maximizes economic rents could ruin a fish stock if fishing impacts are not accounted for. On the other hand, the reserve serves as a bifurcation term which could improve the resilience of a marine ecosystem. Keywords: marine reserve; fishing impact on carrying capacity; fishing policy; phenotypic diversity; stock collapse (Received September 10, 2014)