

Why do I criticize MSY theory in ecosystem approach?

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Ecosystems, including those that contain fisheries resources, are characterized by uncertainty, dynamic properties, complexity and evolutionary responses of the component species. However, the classical maximum sustainable yield (MSY) theory does not include any of these (Matsuda & Abrams 2004). Thus, it is perhaps not surprising that the MSY theory and its derivatives have not worked for ecosystem fisheries management. Therefore, we said goodbye to traditional MSY theory (Matsuda & Abrams in press). The MSY theory does not guarantee coexistence of all species in the food web (Matsuda & Abrams 2006). In addition, some may expect feedback control in fishing pressure as a robust strategy for management with uncertain, dynamic and complex ecosystems. However, feedback fisheries management does not always work for complex ecosystems. We investigate the effects of species interactions on sustainable yield from an exploited multispecies communities. We consider the consequences of feedback control in fishing effort. If the prey species is exploited, increasing fishing effort decreases the predator abundance more than the prey abundance. Feedback control of fishing effort may cause extinction of the predator, even if the fishing effort is well controlled. We recommend monitoring not only the target stock level but also any other indicator of the \square gentire \square h ecosystem. I propose the following principles: (1) do not catch fishes that are at low stock levels; (2) do not catch immature fishes but catch adult fishes; (3) catch fishes that are temporally dominant; (4) in order to achieve these three principles, improve the technology for selective fishing; (5) monitor not only a target species, but its prey and predator and the ecosystem (Matsuda & Abrams in press).

[References]

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