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RESEARCH ARTICLE

# Application of biological and fisheries attributes to assess the vulnerability and resilience of tropical marine fish species

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Abstract

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## Abstract

Taking advantage of published data on life-history traits and short-term information on fishery parameters from 3132 records for 644 fish stocks along the coast of India, we calculated resilience (R) and vulnerability (V). Further, we developed an Index of Resilience and Vulnerability (IRV) for 133 species of tropical finfishes, crustaceans, and molluscs. Using 7 resilience and 6 vulnerability attributes, two-dimensional scatter plots of the resilience and vulnerability scores were generated and the Euclidean distance and angle from the origin to each point were calculated to determine IRV and the effect of fishing on fish species. By ranking the species, the top 10 highly resilient, highly vulnerable, and high-risk species (low IRV) were identified. While small-sized species with fast growth rate and low trophic level were among the highly resilient species, large predatory species such as sharks and barracudas

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