

A decision-making framework for area-based biodiversity conservation and sustainable use under climate change

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Conservation and sustainable use of biodiversity are a primary issue to establish a society in harmony with nature. Because biodiversity is changing extensively due to climate change, there is an urgent need to make adaptation actions for the conservation and sustainable use. There is, however, currently limited guidance to help decision makers choose the set of adaptation actions and their order for species conservation and sustainable use under climate change. We review several frameworks presented so far, and propose an updated area-based decision-making framework for full complement of actions in response to changes in species distribution, based on a co-production process with various stakeholders (researchers, managers, etc.). It consists of following steps: collating basic information on the area of interest, defining the species of interest in discussion with the stakeholders and collating distribution/trait/management data for the species, future projections on the distribution based on species distribution modeling and/or mechanistic modeling based on the trait and future climate scenarios, examination of adaptation options based on the projections, discussion with the stakeholders to set implementation actions for adaptation considering current management plans, and adaptive management based on the monitoring after the implementation. Adaptation actions based on this framework were successfully identified for two Japanese national parks that includes alpine and coral reef ecosystems vulnerable to climate change.

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