

Aquatic Conservation: Marine and Freshwater Ecosystems

Incorporating free-flowing rivers into global biodiversity targets: Prioritization and targeted interventions to maintain ecological integrity

Petersen, CR; Van Deventer, Heidi; Smith-Adao, Lindie; Nel, JL

Abstract

Free-flowing rivers (FFRs) are important surrogates for freshwater biodiversity as there are increasingly fewer rivers that reflect intact habitat and species diversity from source to sea. The status and changes in the ecological condition or protection of FFRs is not explicitly reported on in global biodiversity targets. Indices are proposed for reporting such changes to the Sustainable Development Goals (SDGs) 6 and 15, Aichi Target 11, and the post-2020 global biodiversity framework. FFRs were identified at a countrywide scale in South Africa for protection, planning, monitoring, and assessing changes in their ecological condition and protection status. They were selected and prioritized using criteria co-produced with national, provincial, and local river managers and policy makers. Given the high competition for water resources and the unlikely possibility for strictly protecting all FFRs, a subset of FFRs, termed 'flagship FFRs', was identified. Methods for reporting changes in the protection levels of prioritized FFRs at a countrywide scale were developed, which included indices of FFRs related to global targets: the loss of the extent of FFRs in a natural and largely natural ecological condition for SDG 6; changes in the connectivity of FFRs included in the post-2020 global biodiversity framework targets; and changes in protection levels of FFRs for Aichi Target 11 and SDG 15.1.2. Flagship FFRs attracted targeted management initiatives and thus maintained their connectivity and ecological condition. This was not true when all FFRs were considered; in the broader set of FFRs, longitudinal fragmentation increased and ecological condition declined from 2011 to 2018. Considering the increasing pressures rivers are likely to experience from human and climate change impacts, particularly in semi-arid to temperate environments, urgent prioritization and monitoring of FFRs is called for so that a targeted set of protection and management strategies can be applied.