Revegetating the banks of snowmaking reservoirs: Benefits for freshwater alpine biodiversity

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Résumé

Snowmaking reservoirs are unique hydraulic structures constructed at high altitudes within ski resorts for artificial snow production. Their number increased in response to uncertain water resources attributed to global warming and escalating demands from winter tourism, and are now integral components of the aquatic landscape in the Alps. Despite their utility, these reservoirs have drawn criticism for their environmental impact. More recently, the lack of aquatic vegetation on the banks have been identified as a source of ecological trap. In this study, we have conducted experiments to revegetate their banks with aquatic plants and assess the benefits for biodiversity. The first experiment of revegetating snowmaking reservoir banks is currently underway at Les Arcs ski resort. Soil bioengineering techniques (reed rolls) were adapted to the specificities of such structures. Plant traits are measured to evaluate the effectiveness of revegetation efforts. Biodiversity inventories are made in plants and rip-rap within the reservoir, and compared with closed natural water bodies of the watershed, to quantify the benefits of aquatic plants for alpine freshwater species. The results suggest that revegetation efforts can be successful in such habitats and that the addition of aquatic plant could play a role in dispersal process for alpine biodiversity.

Mots-Clés: Snowmaking reservoirs, Freshwater biodiversity, Nature based solutions, Bioengineering, Ecological continuity, Artificial ecosystem, Ski resort, Ecological trap

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