BEAVERS AS WATER BIOENGINEERS: EFFECTS ON THE BANK ROUGHNESS IN THE EARLY YEARS OF NEW SETTLEMENT IN TUSCANY

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ABSTRACT

The Eurasian beaver (Castor fiber) can be classified as an important 'ecosystem engineer'. This is due to its ability to modify riparian habitats through felling trees to feed and the construction of dams and lodges. This study examines the effects of beaver activities on riparian vegetation and bank hydraulic roughness during the initial years after their settlement along rivers in Tuscany (central Italy). Field surveys were carried out between 2022 and 2024 on the riparian buffers of three Tuscan watercourses, i.e. Ombrone, Merse and Tevere (Tiber) rivers, to assess the changes in tree stand characteristics induced by rodent activity. To date, results show that the early settled rodents have decreased the density of trees and selectively affected the diameter distribution of riparian trees, with a preference for diameters between 3 and 7 cm. Riverbanks roughness has slightly decreased, as well as the composite roughness of the entire cross-section. Hence, the presence of beavers does not raise the hydraulic risk in the investigated areas. This research contributes to a better understanding of the hydraulic effects of beavers on riparian buffers, thereby supporting their role in more natural river management and risk mitigation.

KEYWORDS

Beaver; bank roughness; soil and water bioengineering; riparian vegetation; hydraulic risk; natural flood management