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Impacts of Impatiens glandulifera (Himalayan balsam) on riverbank soil properties

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Himalayan balsam (Impatiens glandulifera) is a widespread invasive, non-native species in Europe and has colonised riparian zones in particular. It stands accused of causing increased riverbank erosion, by out-competing other plant species in summer, then uprooting completely in winter, leaving bare, easily-eroded substrate on the riverbank. This mechanism, however, remains to be robustly investigated and understood or refuted. Thus, this study set out to study the role of I. glandulifera in the hydro-geomorphology of the riparian zone of a typical UK river. The study site was on the River Wyre in NW England (53°56'50.6" N; 2°45'29.1" W).Soil samples were taken from six distinctive locations within the site, in order to determine how soil properties (moisture content, organic matter content, mean particle size and % fines) changed depending on the presence of I. glandulifera. In areas high up the bank profiles, which were rarely inundated, all soil properties showed no significant difference ($p > 0.10$) between sites vegetated by I. glandulifera and by other species. However, soil properties at sites vegetated by I. glandulifera became more different from those at sites vegetated by other species further down the bank profiles (i.e. in more commonly-inundated locations). At the lowest points in the profiles, differences in all measured soil properties were significant ($p< 0.05$). This suggests that I. glandulifera is less effective at retaining fine sediment fractions than other riparian plant species in the presence of frequent inundation. This study is being continued as an ongoing monitoring and analysis programme, with the aim of elucidating more fully the way in which I. glandulifera contributes to the eco-hydro-geomorpholoigcal functioning of fluvial channels.