Diet of invasive pikeperch

Impact assessments of invasive piscivorous fishes usually rely on dietary analyses to quantify their predation pressure on prey communities. Stomach contents analysis (SCA), typically a destructive sampling method, is frequently used for this. However, many invasive piscivores are exploited by catch-and-release sport angling, with destructive sampling often not feasible. Stable isotope analysis (SIA) provides an alternative dietary analysis tool to SCA, with use of fin tissue, scales and/or epidermal mucus potentially enabling its non-destructive application. Here, the diet of a population of pikeperch Sander lucioperca, an invasive sport fish to Great Britain, was investigated by applying SIA to a range of tissues. Testing SI data of dorsal muscle (destructive sampling) versus fin, scale and mucus (non-destructive sampling) revealed highly significant relationships, indicating that the tissues collected non-destructively can be reliably applied to pikeperch diet assessments. Application of these SI data to Bayesian mixing models predicted that as S. lucioperca length increased, their diet shifted from macro-invertebrates to fish. Although similar ontogenetic patterns were evident in SCA, this was inhibited by 54% of fish having empty stomachs. Nevertheless, SCA revealed that as S. lucioperca length increased, their prey size significantly increased. However, the prey:predator length ratios ranged between 0.08 and 0.38, indicating most prey were relatively small. These results suggest that when non-destructive sampling is required for dietary analyses of sport fishes, SIA can be applied using fin, scales and/ or mucus. However, where destructive sampling has been completed, SCA provides complementary dietary insights, especially in relation to prey size.

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