Enabling genetic monitoring of upstream steelhead movement through FishPass

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ABSTRACT:

Multiple strains of adfluvial rainbow trout (steelhead; *Oncorhynchus mykiss*) are stocked into Great Lakes tributaries to generate sportfishing opportunities. The construction of FishPass to replace the Boardman River's Union Street Dam in Traverse City, Michigan is intended to provide up- and down-stream passage of desirable fishes while simultaneously blocking and/or removing undesirable fishes. Presently, passage is targeted for only fishes native to the upper Great Lakes. We evaluated the capacity of a recently developed microhaplotype genotyping tool to differentiate Great Lakes steelhead strains from the rainbow trout present above the Union Street Dam which would permit genetic monitoring of unintended steelhead passage. Our microhaplotype genetic data provided confident discernment among the steelhead strains stocked into the Great Lakes; however, we determined the rainbow trout present above the Union Street Dam likely recently originated from those strains, precluding confident genetic detection of unintended passage at this time. Continued genetic divergence of rainbow trout above the Union Street Dam is possible which may allow for future genetic monitoring.