

SPATIAL AND TEMPORAL PATTERNS OF RAINBOW TROUT INTROGRESSION IN THE FLATHEAD RIVER SYSTEM, MONTANA ^{AFS}

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Although the Flathead River system is considered a regional stronghold for native westslope cutthroat trout, the dynamics of non-native rainbow trout introgression in the Flathead system are poorly understood. Genetic patterns of introgression were assessed with samples from 43 sites in the Flathead River system. Admixed populations were detected in 58 percent (25/43) of the sample sites and the percentage of rainbow trout genetic contribution decreased as the distance upstream from Flathead Lake increased. Positive spatial autocorrelation was detected in North Fork tributary sites within 19 km from sampling locations (Mantel test, $r = 0.188$, $P = 0.0013$), indicating a clustering pattern among admixed sites. Temporal comparisons against 1980s surveys showed new rainbow trout introgression (7/14 sites), continued absence of hybridization (5/14 sites), and continued presence of hybridization (2/14 sites). Twelve percent of the admixed sites (3/25) showed statistically significant patterns of linkage disequilibrium, suggesting that rainbow trout introgression is spread primarily by post-F1 hybrids or several generations have passed since the non-native invasions. These data are consistent with the hypothesis that downstream sources have promulgated upstream expansion of rainbow trout introgression.