

**AN ASSESSMENT OF REPRODUCTIVE ISOLATION BETWEEN
YELLOWSTONE CUTTHROAT TROUT AND RAINBOW TROUT IN THE
YELLOWSTONE RIVER, MONTANA^{AFS}**

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The genomic extinction of Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) has occurred throughout many parts of its historic range because of introgression with introduced rainbow trout (*O. mykiss*). However, relatively low levels of introgression have been detected in cutthroat trout within the Yellowstone River, implying they may be reproductively isolated from rainbow trout. If reproductive isolation exists, then determining its spatial and temporal components could assist managers in better conserving genetically pure cutthroat trout. Reproductive isolation was assessed by radio-tagging and tracking 164 trout (98 cutthroat, 37 rainbow, and 29 cutthroat x rainbow trout hybrids) captured in four areas of a 133-km segment of the mainstem Yellowstone River during three spawning seasons (2001-2003). A total of 72 spawning fish (42 cutthroat trout, 17 rainbow trout, and 13 hybrids) were documented moving into potential spawning sites in tributaries ($n = 55$) or within the mainstem river ($n = 17$) during the April through early July spawning season. Spatial overlap of spawning sites was documented between cutthroat trout and rainbow trout or hybrids in both tributaries and the river. However, both rainbow trout and hybrids spawned earlier than cutthroat trout. Therefore, differential timing of spawning is more likely the predominant mechanism for maintaining reproductive isolation. Maintaining temporal reproductive isolation may be facilitated by leasing water in tributary streams to allow for later spawning by cutthroat trout. In addition, entrainment of post-spawn cutthroat trout into irrigation diversions on tributary streams indicates that screening of diversions would be beneficial.