

## COMMENTS

### Comment: Trout Mortality from Baited Barbed and Barbless Hooks

In a meta-analysis of the literature on hooking mortality of trout in streams, Taylor and White (1992) quantitatively summarized mortality rates associated with different gear types. In general, their analysis was well founded and made a very useful contribution to the sport fisheries literature. However, we believe the study contains a flaw that has important management implications.

Taylor and White reported that average mortality rates for trout caught on baited hooks and then released were 33.5% for barbed hooks and 8.4% for barbless hooks. This result implies that managers should require bait fishers to use barbless hooks as a means of reducing hooking mortality. In addition, the analysis suggested that barbless baited hooks cause only about twice the mortality induced by artificial flies or lures (i.e., 4.8%).

We believe these results have influenced sport-fishing regulations in California. After a 1991 chemical spill killed nearly 300,000 wild rainbow trout *Oncorhynchus mykiss* in a 36-mi stretch of the upper Sacramento River, the river was closed to angling for 2.5 years, then reopened in 1994 under largely catch-and-release regulations. Members of fishing organizations and the public brought the 8.4% mortality rate for trout caught on baited barbless hooks to the attention of the California Fish and Game Commission. The Commission then required bait with barbless hooks for a 6-mi reach where trout harvest was allowed so as to promote better survival of fish that were released. The results of Taylor and White (1992) clearly influenced this decision. In addition, an article in the March 1995 magazine *Fly Fisherman* cited Taylor and White's study and suggested that use of barbless hooks with bait could substantially reduce hooking mortality. Therefore, these results may have wide-ranging effects on fishery management decisions.

We do not think the original studies substantiate the reported difference in mortality between baited barbed and barbless hooks. Taylor and White's

conclusion was based on seven studies involving barbed hooks and one study involving barbless hooks; of these, only Westerman (1932) dealt with both hook types (contributing a "study" to both groups). Westerman provided the 8.4% mortality for barbless hooking noted above, but his figures for mortality after barbed hooking also were low: 7–10.5%. Westerman conducted his study on immature brook trout *Salvelinus fontinalis* 3.5–7 in long, which could have accounted for the low mortality. Taylor and White's (1992) analysis indicated that brook trout had an intermediate hooking mortality rate among those of three other trout species and that small fish survived better than large trout.

The large difference in trout mortality between barbed and barbless hooking shown by Taylor and White's meta-analysis thus obscures the small difference in mortality shown by the only study in which these hook types were directly compared. The most logical conclusion that can be drawn from these data is that mortality from bait fishing will not be markedly reduced by the use of barbless hooks. This important result should be clarified for managers of sport fisheries.

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