

Habitat use and movement of spotted bass in Otter Creek, Kansas

by

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ABSTRACT

Understanding habitat use and movement patterns of fishes increases the success of habitat-restoration projects. Stream-habitat restoration and enhancement of stream-dwelling spotted bass *Micropterus punctulatus* populations is a long-term goal for the Kansas Department of Wildlife and Parks. Thus, the objectives of this study were to determine habitat use and movement patterns of spotted bass using radiotelemetry in Otter Creek, Kansas. Spotted bass were tracked biweekly from May 1998 through April 2000. Mean movement varied from 7.2 (m/h) to 18.1 (m/h) and differed significantly ($P = 0.002$, $F = 6.13$, $df = 37$) among seasons. Movement during spring and fall was significantly different ($P \leq 0.1$) compared to summer and winter movement. During all seasons, mean movement differed significantly ($P \leq 0.1$) among diel periods, and movement was typically lowest at night. A significant ($P = 0.0009$, $R^2 = 0.40$, $df = 29$) quadratic relationship existed between mean movement during daylight hours and water temperature, with peak movement at 16°C. The mean home range size used by spotted bass was 3,954 m² (SE = 537.7). Macrohabitat (i.e., pool, run, and riffle) use by spotted bass was non-random ($P = 0.0006$,

Wilk's lambda () = 0.51, $df = 2$), and pool ranked significantly different ($P \leq 0.1$) than the ranks of run and riffle. Cover-habitat (i.e., open water, overhanging vegetation, log complex, rootwad, and undercut bank) use by spotted bass was non-random ($P = 0.0001$,

= 0.06, $df = 4$), and woody debris (i.e., log complex and rootwad) and undercut bank ranked highest. Cover-habitat compositional analysis by season showed similar patterns. Woody debris use did not differ significantly ($P \geq 0.1$) among diel periods for summer and fall, but did differ significantly ($P \leq 0.1$) during winter and spring. Spotted bass use of clay and bedrock substrate was similar to availability, and spotted bass used large substrates less than available. Spotted bass used fine substrates more than available; however, use of fine substrates was positively linearly correlated ($P = 0.004$, $r = 0.57$, $df = 23$) with use of log complexes. Fine substrates were more common within 2 m of log complexes than other substrates. The use of depth by spotted bass in pools was similar to availability. Use of velocity by spotted bass in pools varied from 0 to 0.46 m/s (mean = 0.03 m/s, SE = 0.0014), was similar to availability, and represented the low-velocity environment of pools in Otter Creek. These results indicate that spotted bass have distinct movement patterns, small home ranges, and extensively use woody debris and undercut-bank habitats in pools. Thus, I suggest that subsequent habitat-restoration efforts focus on these habitats.