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## RESOURCE USE BY BLACK BASS IN RIVERINE AND IMPOUNDED HABITATS

Successful management of sport fish species depends on understanding their resource requirements, how those requirements vary under different conditions, and the role that biological interactions such as competition may have on their use of available resources. We investigated resource use by two closely related species, smallmouth bass (*Micropterus dolomieu*) and spotted bass (*Micropterus punctulatus*), to determine patterns of resource partitioning in riverine and impounded sections of New River, Virginia, where the two species co-occur. We found that the fish were spatially but not trophically segregated and, as judged from individual growth and body condition, did not differ in relative fitness.

### BASS DISTRIBUTION, DIET, AND INDIVIDUAL FITNESS WERE INVESTIGATED

Spatial segregation was investigated by determining distribution of the two species among habitat types in a small impoundment and in riverine sections upstream and downstream of the impoundment. Transects were established in representative habitats and were traversed monthly from May to October 1991 using boat-mounted electrofishing gear. Bass were collected, identified, counted, weighed, and measured. We removed the stomach contents for analysis in the laboratory. Food items were identified, categorized, and weighed wet. Trophic overlap between three size classes of the two species (40–80 mm, 81–150 mm, >150 mm TL) was

calculated by using Schoener's alpha. Scales were collected in the field and used to back-calculate length-at-age as a measure of individual growth. Length-weight relations were examined by using relative weight ( $W_t$ ). To discern differences in population fitness between lotic and lentic conditions, mean values for growth and condition were compared intraspecifically between riverine and impounded locations.

### SPECIES WERE SEGREGATED SPATIALLY, NOT TROPHICALLY

Chi-square analyses indicated that abundance of the two bass species varied by habitat. Spotted bass were more abundant in areas of standing water, such as the impoundment and along river margins, whereas smallmouth bass were more abundant in the river. Smallmouth bass also were abundant in reservoir habitats having rocky ridges or dropoffs. Both species ate insects, crayfish, and fish in similar proportions, with similar shifts during development. Trophic overlap values ranged from 0.57 to 0.71.

### INDIVIDUAL FITNESS SEEMED NORMAL

Growth and relative weight did not differ between species in either river or impoundment habitats. Both species showed better growth and condition downstream of the dam than in the river upstream of the reservoir. The

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difference could have been due to enhanced productivity in the tailwaters of the dam. The comparison of our results with data from other Virginia waters suggests populations in our study area were near average or better in physiological condition.

#### NO EVIDENCE OF COMPETITION WAS FOUND

Our results suggested that bass species in New River segregate spatially but consume similar foods. Average or better growth and body condition suggested that food resources in the study area were adequate, and that competitive pressures were not acute. Additional research is needed to assess the significance of competition for spawning habitat and interactions among young-of-the-year. Managers are urged to be familiar with differences in habitat use by the two species, as well as their similarities in diet, when assessing plans to

manipulate populations or modify habitats where these species co-occur.

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