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Influence of sediment control dam on fish community in the backwater reaches

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Influence of sediment control dam on fish communities in the backwater reaches was studied in Kamo River, Kyoto Prefecture, Japan. Reaches of the study area were classified into three types: i.e., backwater reaches of a sediment control dam characterized by depositional features with low hydraulic gradient, transitional reaches with intermediate amount of sedimentation along the channel, and control reaches without dam effects on stream geomorphology. Four sets of riffle/pool were selected in each reach type for fish sampling in 21-30 Oct 2003. Characteristics of the fish community parameters were investigated in relation to geomorphological and hydraulic parameters of each riffle/pool, water quality, amount of vegetation cover along the shoreline and light intensity indicated by sky clearance rate.

Species richness, total fish density (per unit length of streams of study reaches) and diversity index were not different among the three reaches. Density of fresh water goby, *Rhinogobius flumineus*, however, was lower in control reaches than backwater reaches and transitional reaches. The density of Japanese chub, *Zacco termmincki* was not different in reaches. Correlation analysis of the goby fish to the environmental factors showed a higher density in a lower gradient reach. Contrastingly, the density of chub showed no correlation. On the other hand, pike gudgeon, *Pseudogobio (Pseudogobio) esocinus esocinus* inhabited more in backwater reaches, although the density showed less significant multiple correlations with the gradient and depth factors. Reasons for the difference in specific distribution patterns were discussed in relation to sedimentation process in the dammed reaches.

Keywords: sediment control dam; backwater reach; riffle; pool; fish community; spatial scale; stream geomorphology; hydraulic gradient.

Table 1. Environmental and fish community parameters of the study reaches.

	backwater reach				transitional reach				control reach			
	st1	st2	st3	st4	st5	st6	st7	st8	st9	st10	st11	st12
gradient	0.003	0.003	0.008	0.020	0.010	0.018	0.009	0.014	0.010	0.014	0.024	0.006
depth (cm)	42.98	22.87	27.42	28.13	8.54	25.27	22.86	15.68	23.33	17.73	26.31	40.76
species richness	5	5	6	4	4	5	4	3	6	4	3	4
fish density (/m)	9.17	10.96	23.17	8.29	10.97	16.32	4.20	2.95	17.10	3.67	1.19	8.71
diversity index	1.065	0.893	0.798	0.738	0.837	0.619	0.785	0.789	0.457	0.878	0.874	0.409