Microhabitat use by 0+ brown trout (Salmo trutta L.) in a mountain stream affected by hydropoeaking operations (Pyrénées, Southeast France)

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With 4 figures and 3 tables in the text

Abstract: Numerous streams are known to experience sudden flow variations due to water releases from hydroelectric power plant managed in hydro-peaking mode. These short-term recurring disturbances acted significantly on the physical habitat. In the River Oriège (Pyrénées, France), these disturbances were responsible for the reduction of the density of 0+ brown trout (Salmo trutta L.). Microhabitat use by 0+ trout was studied in early summer and autumn. Fish samples and environmental variables were collected simultaneously using the Point Abundance Sampling approach by Electro-fishing (P.A.S.E.). 397 point samples were undertaken at low flow (the natural flow was preserved when the plant was inoperative) within three comparable study sites located 300 m upstream, 700 m and 3000 m downstream of the power-plant. 0+ brown trout show a general stability of their habitat preferenda. Slight temporal fluctuations in substratum and refuges use were observed to coincide with shifts in habitat preference, according to the summer growth of the fish. However, under strong hydropoeaking conditions, 0+ tend to use sheltered locations, depending on the presence of intraspecific competitors. These results highlight the necessity to consider local parameters in the habitat availability determination, which could be considered as limiting factors for the young-of-the-year (YOY) fish, and promote the use of P.A.S.E. to assess man-made disturbance on such populations.

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