Assessing the ecological base flow in an experimental watershed of Central Taiwan

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The ecological base flow is crucial for the assessment and design for habitat rehabilitation and recovery. The amount of discharge affects the aquatic creatures and may damage the existence and balance of the community under extreme low conditions. Aquatic insect is selected as the target species in this study to evaluate the influence of the discharge and to estimate the ecological base flow. The distribution of the number of species and abundance (density) versus discharge is assessed to define the critical discharge. A stream located at the alpine area in central Taiwan is selected as the study area to evaluate the base flow. From the preliminary data (Aug 2008 to May 2009) collected from Creek C of Sitou watershed (area: 1.3 km^2) shows that the abundance of several species varies with the discharge. The dominate family and genus of aquatic insects is Baetidae (Order Ephemeroptera) and Baetis spp. that accounts for 26.3 and 17.2 %, respectively. The Hilsenhoff family biotic index (FBI) shows that the water quality is classified to "Excellent" and "Good" level while the EPT Index (Index of three orders: Ephemeroptera, Plecoptera, and Trichoptera) indicates that the stream is non-polluted. The discharge of base flow interpreted from the 90%, 95% and 96% curve of duration for the daily discharge is 0.1582, 0.0476 and 0.0378 cms; the threshold value evaluated by curve of abundance vs. discharge is 0.0154 cms. Consistent observations are yet to be collected to yield more accurate results.