



The interrelationship of riparian vegetation and water temperature demonstrated with field data measurements and analysis of the rivers Pinka and Lafnitz

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Riparian vegetation is an important part of riverine system and plays a key role in terms of eco-sustainable streams, which consequently also affect the water driven erosion processes and flooding from an engineering point of view. Furthermore it is a crucial prerequisite for intact and balanced terrestrial and aquatic ecosystems. Due to intensive anthropogenic impacts, especially in lowlands, streams in Central Europe were strongly influenced and set to a moderate ecological status. Riverine forests changed to settlements or agricultural areas and so important functions of the riparian vegetation, such as shading decreased. Consequently, stream warming occurs and has an impact on the water quality of small and moderate sized streams. The objective of this study is to correlate different vegetation parameters and the river water temperature.

The study was carried out in the Pinka and Lafnitz river catchments, located in the Austrian provinces Styria and Burgenland. Both rivers are medium sized lowland rivers of the "Hungarian Plains". Digital aerial photograph analysis and field measurements are the basement of the vegetation analysis. Water temperature was measured at several points along both rivers. Data were sampled every hour from July 2012 until September 2013. For the water temperature measurements HOBO Pendant Temperature/Light Data Logger 8K * UA-002-08 were used.

The results show that there is a correlation between water temperature and riparian vegetation parameter depending on the temporal and spatial scale. There is a verifiable difference in daily water temperature range (6.7° to 3.5°) of different vegetation stands in contrast to unshaded areas. Also the peak time of the daily water temperature is different comparing high shaded areas with unshaded areas. The results confirm that the riparian vegetation has a significantly impact on the water temperature specifically at low water conditions and demonstrate the need for more in depth studies of this topic related to climate change mitigation measures. Furthermore the results are the basement for an integral river mission development and sustainable riparian vegetation management.