Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Interaction between a rough boundary layer and multiple cylinders wakes: application to ecological restoration[1] ALINE COTEL, University of Michigan, OLIVIER EIFF, FREDERIC MOULIN, Institut de Mécanique des Fluides de Toulouse — Among many ecologically important aspects of fish locomotion, turbulence is thought to create large stability challenges for fishes. Turbulence is a ubiquitous, highly variable feature of aquatic habitats (Denny, 1988). Species that are more prevalent in "energetic water" have more effective control systems and greater ability to generate propulsive power to maneuver. Understanding fish responses and interactions with turbulence is an important biological issue pertinent to evolution of swimming mechanisms and capabilities, and ecological roles and distributions of fishes. There is a current lack of quantitative evaluation of such systems. In most natural systems, sediments and various factors in streambed topography create a rough turbulent boundary layer along the bottom. This work used complimentary laboratory experimental studies and previous field observations (Cotel et al. 2005) to determine how a rough turbulent boundary layer interacts with flow structures created by obstacles in a channel using PIV. Preliminary analysis shows a strong interaction between the turbulent boundary layer created by roughness elements and the wakes behind cylinder arrays.

[1]Supported by NSF IREE.

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Date submitted: 03 Aug 2009 Electronic form version 1.4