

Effects of Debris Flows on In-channel Sediment Deposits and Habitat Structures in Steep Headwater Streams

Sohei KOBAYASHI* and Yasuhiro TAKEMON

*COE researcher, DPRI, Kyoto University

Synopsis

Disturbance plays key roles maintaining species diversity and ecosystem function in wide range of ecosystems. We examined relationships between debris flow history and stream habitat structure (in-channel sediment deposits, abundance of streambed elements, occurrence of different types of microhabitats) using 42 headwater streams with different histories of debris flows in a managed forest watershed, Totsukawa, Nara. In-channel sediment deposit was highly correlated with channel slope and valley width, and related little to debris flow history. Number of large woody pieces and woody debris dams were more in streams with older occurrence of debris flow. Erosive microhabitats such as bedrock, splash zone, moss mat were common in all streams, while depositional microhabitats such as mud and leaf pack occurred only in streams with old (>30 yrs) debris flow, and sand was absent in streams with very old (>50 yrs) debris flow. These results indicate that stream habitat diversity is dynamically maintained in a repeated manner through debris flow history.

Keywords: headwater streams, debris flow, sediment deposit, habitat structures, microhabitats, aquatic invertebrates

源頭溪流において土石流が河道内土砂と生息場構造に及ぼす影響

小林草平*・竹門康弘

*京都大学防災研究所COE研究員

要 旨

奈良県十津川村の人工林施業域において、土石流発生履歴の異なる42の源頭溪流を対象に、河道内土砂量、ハビタット要素の多さ、マイクロハビタット構造を調査した。土石流発生履歴と河道内土砂の関係は見られなかったが、土石流によって倒木、落葉枝ダムや堆積卓越型マイクロハビタットが減少することを明らかにした。底生動物群集を規定するマイクロハビタットの多様性は土石流発生の履歴とともに変動することを示した。

キーワード: 源頭溪流、土石流、河道内土砂、生息場構造、マイクロハビタット、底生動物