Analysis of Relationship between Inundation Depth of Flow Duration and Plant Habitat

Jung Wook Kim[1]

Ph. D. Student, Dept. of Civil Engineering, Inha University, Korea

Dae Wung Lee[2]

Master's course Student, Dept. of Civil Engineering, Inha University, Korea

Yon Soo Kim[3]

Ph. D. Student, Dept. of Civil Engineering, Inha University, Korea

Seung Jin Hong[4]

Ph. D. Student, Dept. of Civil Engineering, Inha University, Korea

Hyung Soo Kwon[5]

Master's course Student, Dept. of Civil Engineering, Inha University, Korea

Hung Soo Kim[6]

Professor, Dept. of Civil Engineering, Inha University, Korea

Abstract. The wetland plant has a very high primary productivity and so it plays an important role in supplying energy to the upper food chain. It looks like a suitable place for plants because water and nutrients are abundant in the wetland. However, the wetland plant is suffered from its harsh environment physiologically due to severe variation of water level in the wetland. Therefore, in the case of plant which is greatly influenced by water level, the environment of plant habitat should be analyzed by considering inundation area and depth which can be simulated through inundation analysis of the wetland. In this study, we simulated the inundation area and depth of Binae wetland in NamHan river, Korea according to flow duration using HEC-RAS and RAS Mapper. And we analyzed the plant habitats affected by inundation depth. As a result, Willow inhabits in the area where the flooding didn't occur and in 0~0.8m below water level. Common reed inhabits in the area where the flooding didn't occur and in 0~0.4m below water level. Mugwort-Colt's-tail and Phragmites japonica steud inhabit in 0~0.4m below water level. And Humulus japonicus inhabits in 0~0.8m below water level. Here, plant habitats are analyzed by inundation depth and so we expect this study could be used as an idea for wetland design. For more accurate research, methodology for the analysis of relationship between water level and plants should be developed with accumulated data in long term.

[1] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail:rlawjddnr1023@gmail.com

[2] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail:civild@inha.edu

[3] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail: civil.engineer@hanmail.net

[4] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail:hongsst81@gmail.com

[5] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail: hsimsa@naver.com

[6] Center for Hydrology and Ecology, Civil Engineering Department, Inha University, Incheon, Korea ; Tel: 82-32-872-8729; e-mail: sookim@inha.ac.kr