Geophysical Research Abstracts
Vol. 13, EGU2011-9439, 2011
EGU General Assembly 2011
© Author(s) 2011

Responses of Mediterranean riparian guilds to hydrologic alteration

María Dolores Bejarano (1), Miguel Marchamalo (2), Marta González del Tánago (1), Diego García de Jalón (1), and Álvaro Sordo (3)

(1) Grupo de investigación en Hidrobiología, Departamento de Ingeniería Forestal, Universidad Politécnica de Madrid, ES-28040 Madrid, Spain (mariadolores.bejarano@upm.es), (2) Grupo de investigación en Hidrobiología, Departamento de Ingeniería y Morfología del Terreno, Universidad Politécnica de Madrid, ES-28040 Madrid, Spain, (3) Departamento de Ingeniería Civil: Hidráulica y Energética, Universidad Politécnica de Madrid, Spain

Few studies have focused on the impacts of flow changes on riparian forests in Mediterranean areas, and these studies have specifically addressed certain species, with no easily transferable results. Species tend to associate according to similar behavior in response to changing environments; in particular, parameters related to hydrologic regimes are the major causes of characteristic riparian plant associations within riparian zones and floodplains, indicating the need for riparian guild reconnaissance. In this study, we examined long-term flow alteration impacts on riparian guilds and evaluated whether their responses differed. We compared the changes in several vegetation attributes (i.e. composition, diversity and distribution) that occurred after the erection of a dam in a Mediterranean stream between its vegetation guilds. We used pre-dam and post-dam established vegetation based on air photographs and diameter at breast height (DBH) field measurements to evaluate changes resulting from flow alterations. Responses to flow alterations varied between vegetation guilds according to the ecological requirements of their dominant species. The ability to survive water stress and hydrogeomorphic disturbances allowed certain pioneer shrub-dominated guilds to spread on newly emerged surfaces downward to the main channel after flow alterations, although new shrubland was poorer in species diversity than pre-dam shrubland. Some transitional stages were also favored by regulation because hydrogeomorphic feedback related to shrubs created the appropriate habitat for the colonization of tolerant tree species. In contrast, new hydromorphological conditions limited the recruitment of native late-successional plant guilds. However, the coexistence of the remaining riparian species and the new arrival of upland species caused an increase in species diversity in this mature forest following damming. Understanding vegetation guild responses provides information about the general trends in plant populations and assemblage structures that are expected to occur during river development and flow regulation, increasing our capacity to detect and synthesize complex flow alteration–riparian ecosystem response relationships, and to anticipate irreversible impacts.