ABSTRACT

TITLE:	Changes in Vegetation Over Time Below the McPhee Dam, Dolores River, Colorado
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ABSTRACT: The aim of the study was to evaluate changes that occurred over time in the composition of the riparian community at the Lone Dome Recreational Area, below McPhee Dam on the Dolores River, Colorado. This site has been sampled by the Fort Lewis College Field Ecology class starting in 1988 to 2007. Percent cover of woody riparian vegetation (14 species) was measured along a 540 m line-transect. The effects of the dam (built in 1984) were hypothesized: (1) to see a trend in diversity with an initial increase in woody vegetation, but as the switch from moisture dependent species to drier/upland species takes effect, there will be a decrease in species diversity; (2) to see invasive species present; (3) to see changes in the composition of the community. A Bray-Curtis ordination using Pcord5 was used to analyze changes and correlations in vegetation composition relative to time, average percent cover, and peak flow. The two most important variables explaining variation in vegetation are time and the relationships between vegetation cover and peak river flow data. The greatest amount of variation was 2007 and 1989 for Time and 1998 and 1988 for Peak river flow. Populus angustifolia (Narrow-leaf cottonwood), a facultative wetland species, showed an initial increase followed by a decrease in abundance over time, correlating with a decrease in river peak flow over time. Salix exigua (Coyote willow), an obligate wetland species, showed an initial increase and then a decrease in cover over time, correlating with peak river flow data. Acer negundo (Box elder), a facultative wetland species, showed an increase in cover over time. No increase or establishment of invasive species (Russian olive or tamarisk) occurred at the site. Species diversity did slightly increase over time, then peaked, and decreased. Acer negundo, a late successional species, increased over time potentially due to the location of the species growing near the base of a steep canyon wall obtaining moisture form snow melt or drainage. There was no increase in invasive species potentially because the elevation is due too high for the establishment of tamarisk and dispersal issues for Russian olive. A decrease in some riparian species abundance may be attributed to a lowered ground water table. Interactions between dam management and precipitation may explain the water table dynamics. During drought little water is let out of the reservoir; this causes a decline in river peak flow and ground water level. In order to supply adequate amounts of water long term management needs to implemented including flow releases corresponding to seasonal flooding (for cottonwood establishment and clearing of the point bar) and an increase in the magnitude of water flow for longer periods of time (imitating natural flow).