Novel riparian systems of the West: the composition of an irrigation system

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Abstract. Larimer and Weld Counties in Colorado typify the semi-arid agricultural areas of the western United States. Numerous irrigation canals used to convey water across the landscape often maintain diverse riparian communities of woody and herbaceous vegetation. The canals support macro-invertebrate communities of varying similarity to natural channels. Canal riparian areas were sampled for vegetation biodiversity, litter, cover, and vertical complexity as well as biodiversity and abundance of aquatic macro-invertebrates. Canals were mapped according to their dominant canopy vegetation (i.e. herbaceous, dense shrub, or sparse tree) and points randomly selected from these segments, stratified by the proportion of the system in each canopy class. 27 canal sites were sampled in Larimer County and 22 in Weld County. Natural channels were sampled at sites with minimal human disturbance at 3 locations in Larimer and 4 locations in Weld County. 251 plant species were identified with 147 native and 104 introduced. Macro-invertebrates were equally diverse with 72 genera identified as well as several taxa of snails, leaches, worms and crayfish. Preliminary analysis suggests canals further from the point of diversion have lower macro-invertebrate diversity and abundance. Vegetation analysis revealed canals sampled in Larimer County were dominated by woody vegetation while those in Weld Country were primarily herbaceous. Species richness in the most diverse 10 sites was above 50 species but included only two natural sites. Lower species richness values were observed for plants and macro-invertebrates in Weld County, including the minimally disturbed natural channels and riparia.