# 1. Experimental setup and plant propagation

To acquire plants for our experiments, we collected live cottonwood and tamarisk seedlings (including *T. ramosissima* Ledebour*, T. chinensis* Loureiro, and *T. parviflora*) from the Bill Williams River (AZ), Virgin River (NV) and San Joaquin River basins in March 2013. Plants were greenhouse-healed for two months in vermiculite, and then shipped as bare-root plants to the RFS.

# 2. Plant morphological traits

We used a random subsample of 90 plants (47 cottonwood and 43 tamarisk) to quantify differences in morphological traits between species. At the end of the transplant and growth period, plants were carefully removed from their pots and rinsed of sand.

# 3. Flood experiment design

We conducted 10 flume runs that differed with respect to species, plant size, and density. Individual plants were tested in five of the trials, in which 4–5 plants were installed ca. 3 m apart within a 12-m long test section.

# References:

Bywater-Reyes S., Wilcox A.C., Stella J.C. & Lightbody A.F. (2015) Flow and scour constraints on uprooting of pioneer woody seedlings. *Water Resource Research,* 51, 9190-9206.

Edmaier K., Crouzy B. & Perona P. (2015) Experimental characterization of vegetation uprooting by flow. *Journal of Geophysical Research: Biogeosciences,* 120, 2169-8953.

Khuder H., Stokes A., Danjon F., Gouskou K. & Lagane F. (2007) Is it possible to manipulate root anchorage in young trees? *Plant and Soil,* 294, 87-102.

Kondolf G.M. (1997) Hungry water: Effects of dams and gravel mining on river channels. *Environmental Management,* 21, 533-551.

Kui L., Stella J.C., Lightbody A.F. & Wilcox A.C. (2014) Ecogeomorphic feedbacks and flood loss of riparian tree seedlings in meandering channel experiments. *Water Resource Research*.

Manners R., Wilcox A.C., Kui L., Lightbody A.F., Stella J. & Sklar L.S. (2015) When do plants modify fluvial processes? Plant-hydraulic interactions under variable flow and sediment supply rates. *Journal of Geophysical Research - Earth Surface,* 120, 325-345.

Rominger J.T., Lightbody A.F. & Nepf H.M. (2010) Effects of added vegetation on sand bar stability and stream hydrodynamics. *Journal of Hydraulic Engineering-Asce,* 136, 994-1002.

Scott M.L., Shafroth P.B. & Auble G.T. (1999) Responses of riparian cottonwoods to alluvial water table declines. *Environmental Management,* 23, 347-358.

Taylor J.P., Wester D.B. & Smith L.M. (1999) Soil disturbance, flood management, and riparian woody plant establishment in the Rio Grande floodplain. *Wetlands,* 19, 372-382.