SALTCEDAR CONTROL and Riparian Restoration — *be careful with generalizations*

Ondrea C. Hummel *– U.S. Army Corps of Engineers and* ***Todd Caplan*** *– Parametrix Inc.*

Significant changes in plant communities have occurred along rivers in the Southwest since the early 1900s. This is due, in part, to the introduction of exotic plant species, particularly saltcedar (*Tamarix* spp.). The spread and abundance of saltcedar have been accelerated by management actions that have disturbed these river systems (Parker and others, 2005; Stromberg and others, 2005). These management actions, such as peak flow attenuation, channel narrowing, and channel incision, often influence the hydrology and geomorphology of the rivers. River regulation and geomorphic alterations, combined with seed source availability, have allowed saltcedar and other non-native vegetation to spread into many areas, and in some situations to compete with native vegetation.

Saltcedar is a deep-rooted deciduous shrub or tree that can grow up to 25 feet tall. Originally introduced from Eurasia for erosion control, it is widely distributed throughout the West, and surveys have estimated that over 1.5 million acres are populated with saltcedar in the Southwest. Saltcedar spreads through seed dispersal, but it can also propagate vegetatively. In arid and semiarid regions, dense stands are found in areas with adequate water availability such as river banks and reservoir margins.

Is Its Bad Rap Warranted?

Saltcedar has been targeted by management agencies for control or removal throughout the southwestern United States. Justifications for these large-scale control projects vary, but commonly include concerns that saltcedar increases groundwater consumption and soil salinity, decreases wildlife habitat quality, and proliferates following floodplain fires. Some of these concerns are substantiated by scientific research; others are less so.

> *It is naive to assume that simply removing saltcedar from a site will automatically translate to improved habitat.*

Fairly extensive research attributes high evapotranspirative water consumption to saltcedar, at least in quantities equal to native riparian overstory trees (see page 28). Others state that while supporting data are not conclusive, it is generally accepted that saltcedar transpires at least as much water as native overstory trees.

Conversely, claims that saltcedar increases soil salinity are less substantiated by research. Stromberg and others (2005) argue that such claims confuse the *correlation* between halophytic saltcedar and saline habitats with *causation*. They suggest that flow regulation and other human-induced river alterations are the probable causes of soil salinity, rather than saltcedar invasion itself. Thus saltcedar, a halophytic plant, is well-suited to these altered conditions whereas most native riparian vegetation (such as cottonwood-willow) is not. However, saltcedar commonly occurs in nonsaline floodplain environments including along dam-regulated rivers. Thus, blanket statements about cause-and-effect relationships between soil salinity and saltcedar appear unfounded.

Some Species Like It

Monoculture stands of saltcedar are commonly thought to have lower wildlife habitat value than native woody vegetation. Saltcedar often supports a lower population of arthropods—a main food source for birds—than native riparian vegetation such as cottonwood (*Populus* spp.) and willow (*Salix* spp.) (Shafroth and others, 2005). Yet this does not necessarily translate to poor-quality habitat for insectivorous animals. Sogge and others (2005) found no evidence that nesting in saltcedar-dominated habitat is detrimental to the federally endangered Southwestern willow flycatchers at breeding sites in central Arizona. Other research along the Rio Grande found rodent species richness to be greater in saltcedar (Ellis and others, 1997) and no differences in bird species richness between saltcedar and native-dominated habitats (Ellis, 1995). It seems that generalized statements about the wildlife value of

Color infrared 3-D visualization of a saltcedar-infested tributary to the Colorado River in western Colorado near Fruita, created from IKONOS satellite imagery. Saltcedar is the coarsely textured, darker red vegetation. Image from the U.S. Forest Service Remote Sensing Applications Center.

saltcedar should be used cautiously.

Increased fire frequency and severity in densely vegetated floodplains near the urban interface has become a serious concern along the Middle Rio Grande in New Mexico. Compared especially to native cottonwood, saltcedar responds favorably to fire and legitimate concerns exist that fires in mixed native and exotic vegetation have the potential to shift to exotic dominance. However, this is not always the case. Preliminary data from Merritt and Johnson (2006) found that native Goodding's willow was moderately tolerant of fire and had considerably lower post-fire mortality rates than Rio Grande cottonwood. Analysis of vegetation data along the Middle Rio Grande indicates that general plant species assemblages following fire are often similar to those occurring before the fire. Whether saltcedar dominates a previously mixed stand following a fire may depend upon a variety of issues, including fire temperature, fuel load characteristics, depth to groundwater, or other site characteristics.

Each Site is Unique

So what do we do with this information? The primary message is that blanket generalizations about saltcedar should not be used to justify a restoration project. Rather, projects involving the removal of saltcedar should be based upon site-specific information and carefully weighed management considerations. It is naive to assume that simply removing saltcedar from a site will automatically translate to improved habitat or site conditions. All projects, particularly those aimed at improving wildlife habitat, should have site-specific data before making assumptions about the benefits of saltcedar removal.

Although complete eradication of saltcedar may be attainable in small, secluded watersheds, this should not be a goal of the majority of restoration projects. In some situations, saltcedar may be the only woody riparian plant capable of growing at a site. Other sites may have considerable native riparian habitat restoration potential, but total saltcedar eradication may not be feasible. Saltcedar, if present, should be viewed as part of the riparian ecosystem. Successful wildlife habitat restoration through saltcedar removal and native riparian vegetation requires that managers prioritize restoration sites, collect site-specific information, and as importantly, avoid making assumptions based upon generalizations about saltcedar.

Contact Ondrea Hummel at ondrea.c.hummel@usace.army.mil.

References

Ellis, L.M., C.S. Crawford, and M.C. Molles, Jr., 1997. Rodent communicates in native and exotic riparian vegetation in the Middle Rio Grande Valley of Central New Mexico. The Southwestern Naturalist, 42(2): 13-19.

Ellis, L.M., 1995. Bird use of saltcedar and cottonwood vegetation in the Middle Rio Grande Valley of New Mexico, USA. J. Arid Envir. 30: 339-349.

Merritt, D.M. and B. Johnson. 2006. An evaluation of the effects of wildfires on the health, resilience and mortality of dominant riparian species, Middle Rio Grande RMRS, RWU-4351: 2005 Preliminary Findings. USDA Forest Service, Rocky Mtn Res. Station, Albuquerque, NM, 18 p.

Parker, D.L., M. Renz, A. Fletcher, F. Miller and J. Gosz, 2005. Strategy for long-term management of exotic trees in riparian areas for New Mexico's five river systems, 2005-2014. USDA Forest Service and New Mexico Energy, Minerals and Natural Resources Department.

Shafroth, P.B., J.R. Cleverly, T.L. Dudley, J.P. Taylor, C. Van Riper III, E.P. Weeks, and J.N Stuart, 2005. Control of Tamarix in the western United States: Implications for water salvage, wildlife use, and riparian restoration. J. Envir. Mgmt. 35: 231-246.

Sogge, M.K., E.H. Paxton, and A.Tudor, 2005. Saltcedar and southwestern willow flycatchers: Lessons from long-term studies in central Arizona. Presented at Monitoring Science and Technology Symposium: Unifying Knowledge for Sustainability in the Western Hemisphere. Sept. 20-24, 2004, Denver, CO.

Stromberg, J., S. Lite, and C. Paradzick, 2005. Tamarix and river restoration along the San Pedro and Gila Rivers. Presented at Connecting Mountain Islands and Desert Seas: Biodiversity and Management of the Madrean Archipelago II, May 11-15, 2004, Tucson, AZ.