Dynamics of Russian Olive Invasion and Cottonwood Forests on the Lower Marias River[MAS]

Peter Lesica and Scott Miles
Conservation Biology Research
929 Locust, Missoula, MT 59802

Russian olive is an exotic tree used for wildlife and windbreak plantings in western North America. There is concern that Russian olive will replace native riparian forests resulting in a loss of biological diversity. We mapped the occurrence of Russian olive along the entire lower Marias River below Tiber Dam. We measured the size, density and age of Russian olive and cottonwood in sample plots in sandbar, low terrace and high terrace habitats at 19 randomly chosen sites along the lower river. Cottonwood establishment was restricted to lower terrace Sites, usually within 30 m of the river channel. Russian olive in all size classes occurs along the entire lower Marias River but is much more abundant in proximity to domesticated plantings. Russian olive establishes in moist, lower terrace habitat as well as under mature cottonwood on high terraces but was never observed in fresh sandbars with cottonwood seedlings. Seventy-seven percent of cottonwood trees in all size classes were damaged by beavers in low terrace habitat, while only 22% of Russian olives showed damage. Most beaver- damaged cottonwood were cut at the base, while damage to Russian olive was usually confined to one or two basal limbs. Beavers returned to harvest cottonwood in low terrace habitats at least every 2-3 years on average. Beaver use was lower in high terrace habitat with 41% and 2% of cottonwood and Russian olive respectively showing damage. The lower Marias River had large annual flow fluctuations and frequent flooding prior to construction of Tiber Dam in 1956. Since then flooding has been attenuated, and flows remain relatively constant throughout the year. Cottonwood recruitment that used to occur over large areas of the floodplain is now confined to a narrow zone along the channel. Beaver populations may have been enhanced by flow regulation that increases the number of potential den sites safe from flooding and severe drawdown. Beaver effectively prevent cottonwood from developing a mature canopy close to the river while having little effect on the continued invasion of Russian olive. Riparian cottonwood forests will eventually be replaced by Russian olive as old cottonwood die on upper terraces and young plants on low terraces are removed by beaver or shaded by the less palatable species. The decline of riparian cottonwood forests can be ameliorated by a return to more natural flow regimes, management of beaver populations, and not planting Russian olive near riparian areas.