

Geometric rate of increase of saltcedar defoliation near Big Spring, TX during 7 years and effects on local plant communities

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The China/Kazakhstan *Diorhabda* beetles failed to establish below the 37th parallel after release in May 2001. Beetles then were collected from Crete, Greece, tested intensively in quarantine at Temple, TX and Albany, CA, received NEPA approval, and released in Colorado River watershed near Big Spring, TX. On 22 April 2004, we released 38 overwintered adults from field cages which defoliated 2 small trees by June, and another 2200 adults during the summer which defoliated 1 large and 3 small trees. No more beetles were released. These beetles increased rapidly and defoliated 2 acres in 2005, 20 acres in 2006, 2 miles along Beals Creek in 2007, 6 miles in 2008, 35 miles in 2009, and much more in 2010. The beetles produced 2 generations a year and defoliated saltcedar twice annually – in mid-July and in September. Completely dead trees were recorded after the third year. At some sites, the formerly bare soil under dense saltcedar thickets was 90% covered by good quality local pasture grasses 1 year after the saltcedar defoliation. At the original release sites, green saltcedar biomass has been reduced by about 90%, with up to 30% resprouting in the spring and usually to near 100% defoliation in the fall, which varies between years. Implementation releases reported here by Allen Knutson, using the Beals Creek beetles, are rapidly increasing at several outlying areas using new release methods he developed. Species diversity and populations of birds were moderately greater in native vegetation than in saltcedar plant communities while species diversity of the native was 4-5 fold greater than that of the saltcedar plant community. Water usage by saltcedar decreased directly with its decrease in green canopy cover.