Sodium dynamics of tamarisk in the lower Virgin River, Nevada

Shogo Imada[*1], Kumud Acharya[2], Takeshi Taniguchi[2], Fumiko Iwanaga[2], Fukuju[3], and Norikazu Yamanaka[1]

[*]s-imada@alrc.tottori-u.ac.jp
[1]Arid Land Research Center, Tottori University,1390 Hamasaka, Tottori 680-0001, Japan
[2]Desert Research Institute, 755 East Flamingo Road, Las Vegas, NV 89119
[3]Tottori University, 4-101 Koyama-Minami, Tottori 680-8550, Japan

Tamarisk, a highly invasive riparian plant in the US for many years, is known to cause an increase in soil salinity through secretion from their salt glands. Increase in soil salinity in the vicinity of these plants affects other native riparian plants. To increase our understanding of the extent of effects of Tamarisk (*T. ramosissima*) on soil salinity, we conducted a yearlong field experiment to investigate sodium (Na) dynamics of a tamarisk stand in the lower Virgin River, Nevada from September 2009 to September 2010. Three quadrant plots (5 × 5 m) were set up in the stand and diameter and height of all living and dead sprouts were measured. Similarly, litters, throughfall and stem-flow were collected every one or two months during the experiment. Seven individual trees were also selected outside of the plots and harvested. Harvested trees were then separated by living and dead sprouts and measured for their size and biomass. Roots were dug up and weighed. The data from outside of the plot was used to estimate biomass in the plot using regression equations and vegetation survey data (height and diameter). Soil samples were also collected from 0 to 50 cm depths near the plots and analyzed for soluble Na concentration. Preliminary data suggest that the total Na accumulation in the trees (leaves, branches and roots) was approximately 24% of that in the soil. The Na was mainly accumulated in the roots and leaves, which accounted for nearly 50% and 35% of the total Na accumulation, respectively. The amount of Na returned to the soil through rainfall (throughfall and stem-flow) and leaf litter was more than half of the total Na accumulation. Thus, our data suggest that *T. ramosissima* in the Virgin River returns high amount of Na to soil as a result of leaching and litter production.