



Comparison of Pinyon and Juniper Cover and Density Measurements Obtained Through Remotely Sensed Imagery and Field Based Rangeland Studies

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In response to pinyon (*Pinus*) and juniper (*Juniperus*) tree invasion into other ecosystem types, land managers have been actively involved in treating and monitoring woodland encroachment, in an effort to maintain functioning ecosystems. The integration of field based measurements with feature extracted data acquired from remotely sensed imagery can provide managers with the ability to assess a suite of rangeland conditions over large land areas. Therefore, the objectives of this study were i) to quantify the relationship between field-based measurements of tree canopy cover and tree density (using line intercept and point-quarter methods, respectively) with comparable values collected from high resolution, color (RGB) aerial photographs, and ii) to develop an effective and efficient method for quantifying tree canopy cover and density using high resolution photographs that were measured directly and without empirical calibration. Existing statewide field plot tree cover and density estimates collected by the Utah Division of Wildlife Resources Range Trend Project (UDWR RTP) were compared to results from feature extraction techniques of 25 cm resolution, RGB aerial-photography. Tree cover was extracted from the imagery through the use of Feature Analyst software extension for ArcGIS 9.3. Density was determined by summing the total number of polygons within the cover feature class produced above, after applying a negative buffer post processing technique. Results indicated a strong correlation between cover estimates derived from the UDWR RTP and classified imagery. Density results also indicated a strong relationship, but were less reliable for sites with high densities of juvenile trees.

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