

MAPPING ASPEN IN THE INTERIOR WEST

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Abstract.—Quaking aspen (*Populus tremuloides* Michx.) is a critical species that supports wildlife and livestock, watershed function, the forest products industry, landscape diversity, and recreation opportunities in the Interior West (Bartos and Campbell 1998). Studies have indicated that changes in fire regimes, an increase in herbivore presence in young aspen stands, and recent drought episodes have been the main factors for increased mortality rates in aspen stands (DeBlander et al. 2010). Forest Inventory and Analysis (FIA) plot data are a consistent source of ground-based information that if used appropriately, can be extremely valuable for mapping and modeling forest attributes such as forest type and canopy cover. GEO-object based image analysis, or GEOBIA, is a relatively new subdiscipline of geographic information systems (GIS) focused on developing automated techniques for partitioning remotely sensed imagery into image objects and accessing them for use in a variety of mapping applications (Hay and Castilla 2008). Spatial data mining is an automatic or semi-automatic exploration to identify patterns in data that have a geographic component (Shekhar et. al. 2005). Random Forests™ is an ensemble classifier that uses multiple decision trees to predict target variables from input variables (Breiman and Cutler 2003). To help understand the current status and extent of quaking aspen across the Interior West, efficient and repeatable mapping and modeling techniques need to be further established. This investigation aims at exploring viable methods for creating canopy cover maps of quaking aspen for several different locations across Utah. FIA plot data for inventory years 2000-2009 that correspond to image objects derived from Landsat TM imagery will be analyzed along with other ancillary geospatial data using spatial data mining and Random Forests™. Information gained from this investigation may provide further insight into object based segmentation and classification techniques using FIA plot data, satellite imagery, and ancillary geospatial data.

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