Comparing herbaceous vegetation sampling methods on the Coconino National Forest, AZ, USA

Edward C. Rhodes[1], Doug Tolleson[2], William Shaw[1], Eric Twombly[3], John Kava[2], and Tim Brown[1]

In the summer of 2008, research was conducted to determine a suitable sampling method to meet the needs of the U.S. Forest Service Region 3's fire fuel landscape-level mapping project. An "enhanced" quadrat frequency (EFM) method (comprised of three basal hit pins, a 10x10cm and a 40x40cm frequency frame) was compared to a point-frequency frame (five basal hit pins, and five, 5x5cm frequency frames) developed by Texas A&M University. Data were gathered along 15 paired transects consisting of 100 lays of the EFM frame (300 basal hits), vs 50 lays of the point-frequency frame (250 basal hits). Comparisons were made between: time sampled, species richness, frequency of perennial/annual forbs, annual grasses, succulents, woody vegetation and cover of perennial grasses, bare ground, rock and litter. No differences were detected in cover measurements of perennial grass, rock, litter, or bare ground ($p > 0.05$). Perennial/annual forb and succulent frequency were greater in the 40x40cm EFM frame ($p < 0.001$), but no differences were detected between the 10x10cm or point-frequency frame. Perennial/annual forb ($p < 0.001$), succulent ($p = 0.0168$) and total richness ($p < 0.001$) were significantly higher in the 40x40 frame only. The point-frequency frame was significantly quicker ($p < 0.001$) than the EFM method, averaging 37.89 minutes faster. While the EFM method may collect more complete data, the point-frequency frame is much faster, and could possibly provide comparable data with more frame lays.

CNRIT
Center for Natural Resource Information Technology

[1]Center for Natural Resource Information Technology, Texas AgriLife Research, Dept of Ecosystem Science and Management, Texas A&M University, College Station, TX

[2]The University of Arizona, School of Natural Resources, Tuscan, AZ

[3]Natural Resource Information System, Natural Resources Research Center, Ft. Collins, CO.