

Validation of Vegetation Cover Map of the ISU O'Neal Reserve

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INTRODUCTION

The purpose of this analysis was to develop and validate a comprehensive land cover map prior to the commencement of various research activities on the O'Neal Ecological Reserve (Figure 1).

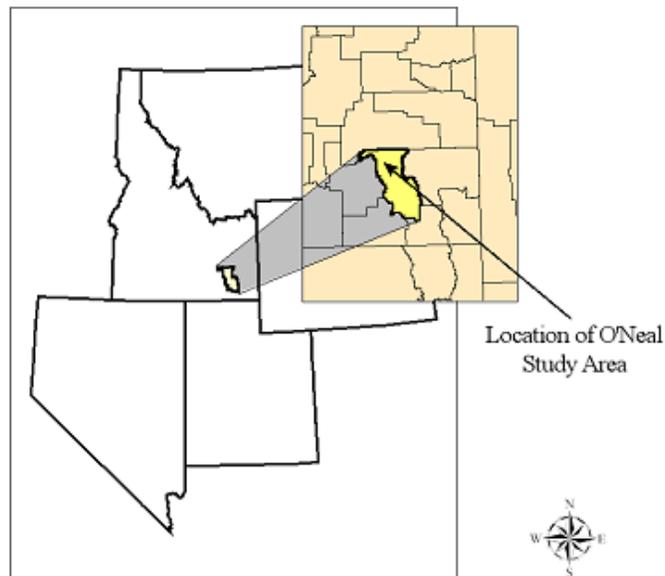


Figure 1. Location of O'Neal Reserve

METHODS

-Field data was collected at numerous points by Jed Gregory during summer 2005.

“Visual estimates were made of percent cover for the following; bare ground, litter and duff, grass, shrub, and dominant weed. Cover was classified into one of 9 classes (1. None, 2. 1-5%, 3. 6-15%, 4. 16-25%, 5. 26-35%, 6. 36-50%, 7. 51-75%, 8. 76-95%, and 9. >95%).” (Gregory et al 2005)

-The percent cover classes were given the following values: (<1%) = 0, (1-5%) = 1, (6-15%) = 2, (16-25%) = 3, (26-35%) = 4, (36-50%) = 5, (51-75%) = 6, (76-95%) = 7, (>95%) = 8.

-2-inch resolution aerial photograph was acquired by 3DI West (Figure 2).

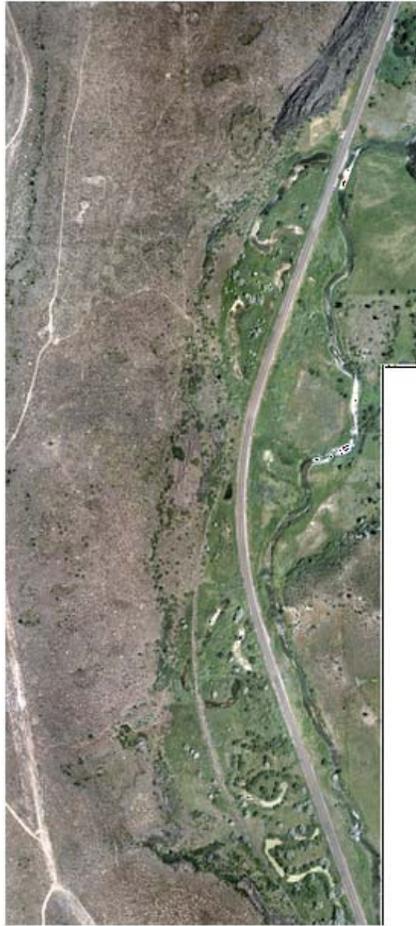


Figure 2. Aerial photograph of O'Neal Reserve

- A layer of 30m x 30m “wire frame cells” (polygons) was created.
- The aerial photograph was overlaid by the 30x30 cells layer.
- The O’Neal study area was broken into two sections, north and south as delivered by 3Di West.
- Each individual cell was classified by cover type using the same classes mentioned above (only bare ground, shrub, and grass were considered).
- The classified cells were compared to the visual estimates for bare ground, shrub, and grass collected by Jed Gregory (i.e., the classification of the point(s) within a given grid were compared to the classification of that grid).

RESULTS

- Table 1 shows the comparison of the north section sample points with cell-based classifications (n=51).
- “Difference” was determined by subtracting the cell classification from the field classification.
- Table 2 shows the comparison of the south section sample points with the cell-based classification (n=24).
- Most cover types had an average classification difference of +/- 1 cover category (approximately 10% difference in cover estimation).

Table 1: Comparison of north pasture points with 30x30m cell analysis

Cover type	Average difference	Average absolute difference	+/-1 cover category(%)
Bare	-0.1	1.0	0.73
Grass	0.9	0.9	0.75
Shrub	1.0	1.1	0.76

Table 2: Comparison of south pasture points with 30x30m cell analysis

Cover type	Average difference	Average absolute difference	+/-1 cover category(%)
Bare	0.5	1.1	0.71
Grass	0.1	0.3	0.96
Shrub	0.7	1.1	0.71

CONCLUSIONS

Analysis of the aerial photograph does not appear to be as accurate as the field data, however a much larger area was classified in much less time than was required to classify land cover in the field. Field data was classified by observing a 2 m radius around each point, while the aerial photograph was classified using 30x30 meter cell. The difference between the field classification and the orthophotograph classification may be caused in part by differences in the size of the area being classified. While the absolute resolution of the aerial photo was extremely fine (0.15m), the functional or practical resolution of the photograph (approximately 1:150) made it difficult to distinguish between some cover categories due to shadows and digital dithering. Litter probably had the biggest effect in this respect. It was impossible to classify litter on the photograph. Weeds also could not be classified. Cheatgrass in particular could not be differentiated from other grasses. Perhaps the only way to get a more accurate vegetation map would be to obtain even higher quality orthophotography.

LITERATURE CITED

Gregory, J., L. Sander, and K. T. Weber. 2005. Range vegetation assessment in the Big Desert, Upper Snake River Plane, Idaho 2005, ISU GIS Training and Research Center. URL: http://giscenter.isu.edu/research/techpg/nasa_tlcc/template.htm visited 9-March-2006.