

Integrating Site History Into EBIPM: The Legacy of Dry Farming



Location: Box Elder County, Utah - Approx 150 miles NW of Salt Lake City (similar sites are found throughout the Great Basin)

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Brief Area History:

Across the arid West, dry farming (agriculture without irrigation) helped fuel a land rush of new homesteads after 1909.

Homesteaders cleared sagebrush, plowed and harrowed the soils, and planted grains in hopes of making a living. Although successful in some areas, most of the dry farms failed and many people lost everything.

The impacts of this historic land use can still be seen in aerial photos nearly 100 years after cultivation.

(Photos courtesy of the Utah State Historical Society and the USGS)

Park Valley, Utah Locator Map

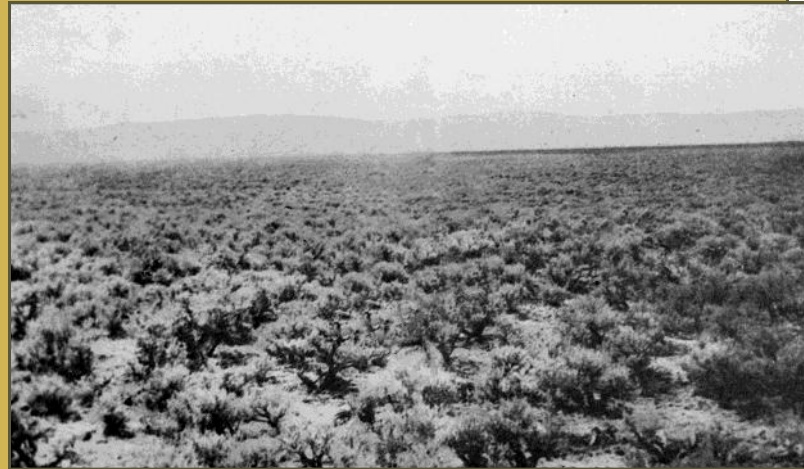
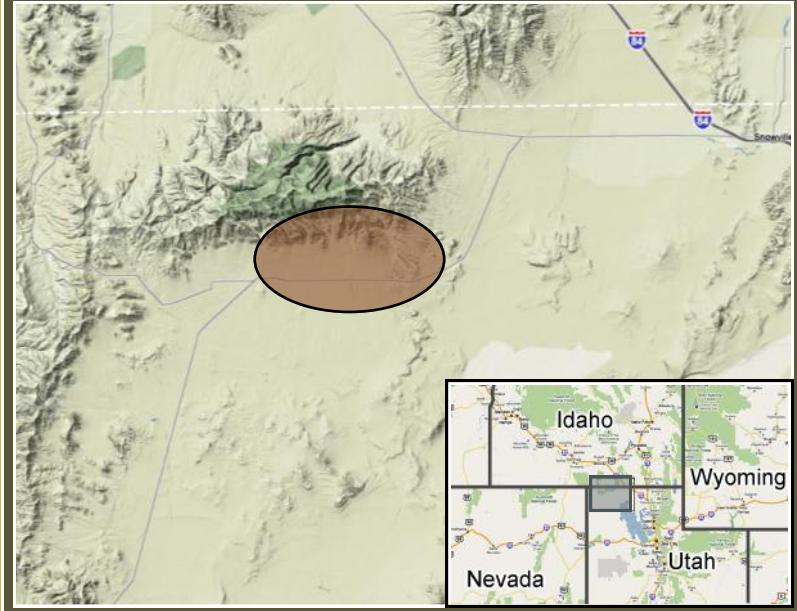


Figure 1: Park Valley, Utah in 1911

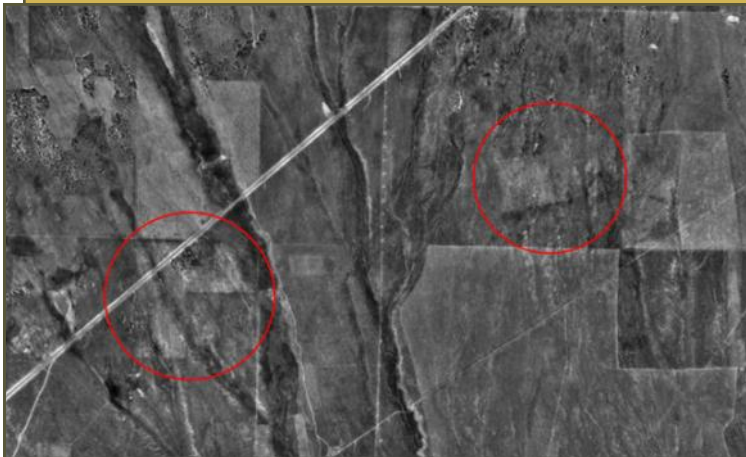


Figure 3: Aerial photo in 1999 showing old dry farms in the Park Valley



Figure 2: Dry Farm in Park Valley, 1911



Figure 4: Shrub species dominance changed at the edge of the field at this paired site from mixed shrubs to all big sagebrush. Note the edge of the field marked by the red arrow and increased quantity of sagebrush.

Objective: Our objective is to evaluate how site history (dry farming) has influenced rangeland vegetation and soil nearly a century after being cultivated. If this site history influences present conditions, it is likely to have similar influences on future management outcomes.

Progress: We compared vegetation and ground cover in historically dry-farmed areas to adjacent land outside of the historically cultivated fields at 6 paired sites across 3 ecological sites. We found:

- Total shrub cover was lower across all ecological sites in historically dry-farmed fields;
- Total forb cover was lower across all ecological sites in historically dry-farmed fields;
- Total grass cover (mostly *Elymus elymoides*) was higher in historically dry-farmed fields at two ecological sites;
- Biological crust cover was lower across all ecological sites in historically dry farmed fields while rock cover was higher in historically dry-farmed fields;
- One paired site had changed shrub species composition from a mix to *Artemisia tridentata* dominance in the historically dry-farmed field.

Our results indicate that historic dry farming has had long-lasting impacts on vegetation and ground cover across different ecological sites that could influence key ecosystem properties. Dry farming was widespread across the West during the early 1910s. Understanding the legacies of this land use has important applications for invasive species management, ecological site classification, livestock producers and land management.

What's Next: We are testing soils from in/out of historic cultivation for differences in Total N, Total C, pH, EC and texture. In addition, we are initiating several studies (from greenhouse to field) to examine species performance of native and introduced plants growing in/out of historically cultivated soils.

Our greenhouse study will look at differences in performance of four species: cheatgrass (*Bromus tectorum*), bottlebrush squirreltail (*E. elymoides*), Indian ricegrass (*Achnatherum hymenoides*) and globemallow (*Sphaeralcea grossulariifolia*); grown in soils collected from in and out of historic cultivation from two ecological sites.

In addition, two of the ecological sites have been broadcast seeded with the native species listed above to evaluate differences in establishment. Finally, in the spring of 2010, we will plant young seedlings (i.e. phytometers) of three native species in and out of historically cultivated sites to examine their performance in the field over the next two years.



Figure 5: Justin Williams conducting broadcast seeding on paired sites in Park Valley.



Figure 6: Cheatgrass plants grown in a greenhouse setting give further information about the growth of invasive annual grasses in previously-cultivated soils.