Establishment and Survival of Prairie and Oak Savanna Plants in the Duwamish Hill Preserve

BACKGROUND
Duwamish Hill Preserve is a park in Tukwila, WA, which has undergone restoration since 2004. The most prominent feature of the site is a 40 million year old hill of unique rocky bald habitat. To the west and northwest of the hill are a series of constructed habitats, blending the science of restoration ecology and artistry of landscape architecture. Each of the four habitats (oak savanna, prairie, wet meadow, emergent wetland) has four cells. Native Pacific Northwest species were planted across cells in their appropriate habitats, with 6 species in particular occurring in both savanna and prairie habitats, allowing for comparisons between the two. Frugaria virginiana var. platypetala (Virginia strawberry), Dodecatheon hendersonii (broad leaved shooting star), Viola adunca (early blue violet), Carex inops (Long-stolon sedge), Camassia quamash (common camas) and C. leichtlinii subsp. Suksdorfii (great camas). These species were counted on several occasions to track survival since installation in November, 2015. Counts of Xerophyllum tenax (bear grass) and Quercus garryana (Garry oak) also occurred in the savannah habitat. Although many other species are common to both habitats, this sub-selection comprises what was established enough for a census to be performed in March-May, 2016, the time window for this study. Results of the census allow for the comparisons of survivorship shown below, and will be used in the future for stewardship of the park and as reference for a proposed TEK Lab (Traditional Ecological Knowledge).

RESULTS
- Small population sizes required a full census instead of sampling
- For easier and more consistent counting, quadrats were created by stretching string between opposing stakes, which were counted clockwise from each cell gate and labeled on custom maps
- Custom maps were created using outlines from SvR’s original planting schematics
- Four counts were performed, with mapping of relative plant positions:
  - March 16-18, April 14, April 17, and May 14-15.
- Recounts were performed by using printouts of the scanned original counts, marking casualties due to herbivory, volunteer weeding mistakes, or other damage
- At the final census, measurements were taken of QUAG and dominant CAMAS individuals, as well as counts of flowered FRVIP, DOHE, VIAD, and CAMAS.

SUMMARY
The most significant result was the drastic die-off of DOHE between the third and final census, but this is actually expected behavior for the species. Many DOHE successfully flowered, so it is hoped they will return next year.

KETE suffered high mortality from nearby rabbit populations between initial installation and erection of the fences. CAIN9 survived better overall in the Prairie, where it also seemed to have more robust individuals.

FRVIP and CAMAS were the most successful in survival, with some minor differences between habitats.

NASQ was not part of the census, or the planting schematic! It was apparently in the seed bank of the onsite urban fill used to create the mound forms, and suddenly appeared in May, taking over the site.

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Further study: The Savanna and Prairie habitats are both composed of mound forms that do not seem vastly different to the naked eye. It would be interesting to further study specific differences between them, however, such as moisture retention, sun exposure, or wind. As noted, CAIN9 seemed to have better survival and overall vigor in Prairie, which could use explanation.

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