Nevada Plant Community Survey
CENTENNIAL PARK DISC GOLF COURSE

Prepared for

AAD 257 * Plant Materials
Truckee Meadows Community College

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By

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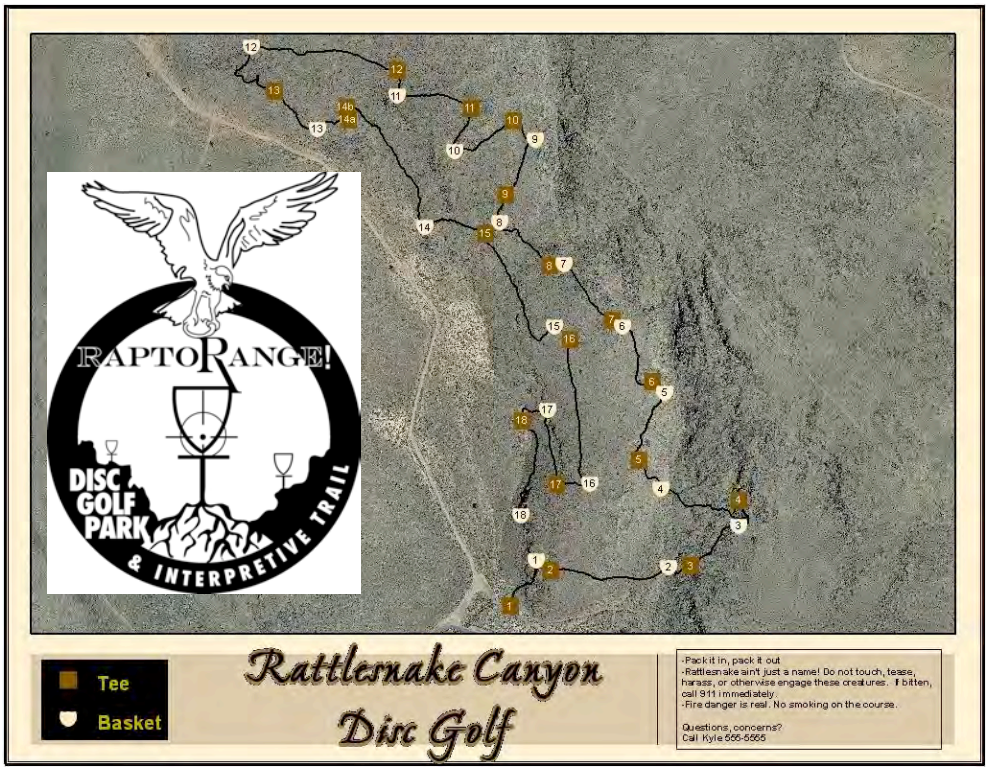
BACKGROUND

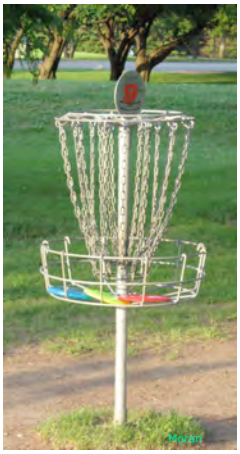
For my native plant community I chose an area of approximately 50 acres that is targeted to be developed as a disc golf course and interpretive trail. The site is located just north of John D. Winters Centennial Park on the northeast outskirts of Carson City, Nevada. Centennial park's existing 59 acres contains multiple softball fields, a soccer field and a tennis court complex with amenities. Centennial Park is bisected by Eagle Valley East golf course. Trails leading east and west from the north end of Centennial Park Drive provide access to linear recreation like hiking, mountain-biking, off-road vehicles and an archery course. The addition of an 18-hole disc golf course at this juncture would improve continuity of the multi-use outdoor recreational offerings by infusing activity into a dead-space, and putting more eyes on the open-space (safety).

The area outlined in the map below consists of a broad rocky plateau that gains elevation to the north, flanked by two steep drainages to either side. The disc golf course will be a loop that skirts the bottom of the plateau, heads east, then follows the steep eastern canyon up the flanks of its drainage, meets the plateau as it narrows and loops back down into the western drainage after cresting a high saddle at about 5200 ft. (a gain of over 300 ft.) Disc golf is played like ball golf except golfers throw compact, long range plastic discs initially from a tee-pad, then from the point where the last throw landed and aim at 'pole holes' or baskets elevated above the ground. (holes are either par 3 or par 4)

This course will offer exciting elevation changes and dramatic vistas over a landscape that was burned by wildfire in 2007. It will rise from a low point at hole #1, a short walk from the parking loop, of 4860 ft. to a high point of 5200 ft. at the high saddle of hole #12.



Whats in a name: Raptor Range or Rattlesnake Canyon? What do you think?



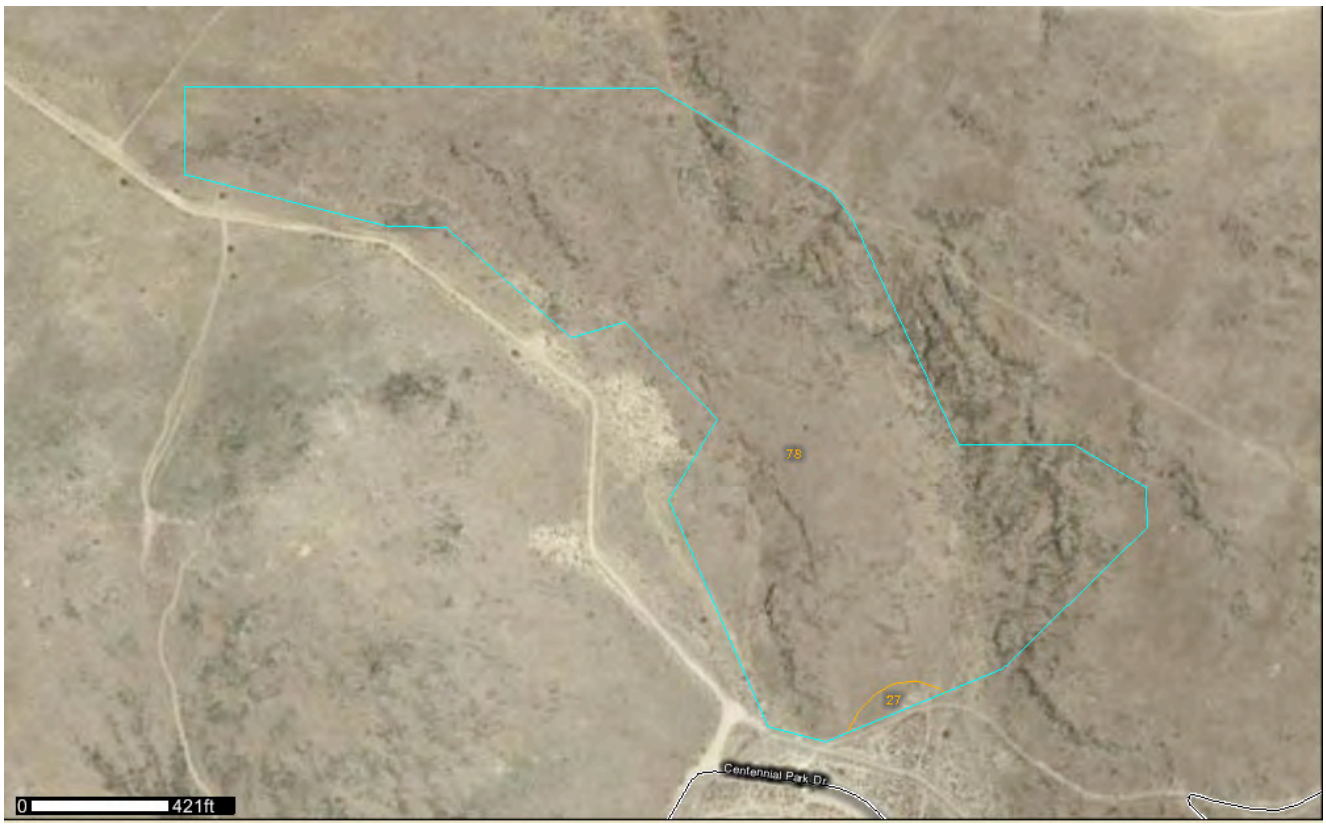
ROOTS DISC GOLF

A 501(c)3 (pending)

The course will be designed, constructed and Master Planned under the guidance of a newly formed 501(c)3 non-profit organization (pending) called Roots Disc golf, composed of myself (aspiring landscape architect) and founder Kyle Horvath. Kyle secured a $5000 in kind matching grant from Nevada Division of Forestry to revegetate the burned site adjacent to Centennial Park with native and adapted species. As Roots Disc Golf we will work closely with Carson City Parks and Recreation Department to sustainably develop this underutilized land for recreation and education. Along with a world-class level disc golf course that will attract high-tier events and disc golfers from all over the region/nation, we will incorporate an interpretive trail into the loop that will educate golfers and hikers alike. Signage will highlight geology, history, views, animal life and of course vegetation. We are looking at a planting plan within our budget that will restore lost trees from the fire, provide shade over the harsh terrain throughout the course, strategically shield prevailing winds, define fairways and highlight existing and introduced plant communities.

The land is on a 99 lease from the Bureau of Land Management to Carson City and the Parks and Rec department has discretion as to how it is used. They see a disc golf course as a favorable land use because it provides healthy recreation to a potentially diverse set of users for a fraction of the cost of other conventional facilities like tennis or softball. It makes use of otherwise unusable terrain while introducing its users to the existence of a dynamic ecosystem at the Wild Urban Interface (WUI).

SOILS ANALYSIS



(websoilsurvey.nrcs.usda.gov)

The majority of the site is covered in **Xerta-Rock outcrop complex (78)**, with 4 to 30 percent slopes. This soil type is normally located at elevations of 5,000 to 6,800 ft. The composition breaks down further to 65 percent Xerta and similar soils and 20 percent rock outcrop. The parent material is residuum derived from basalt. The area is well drained and 24 percent of the surface area is covered with loose cobbles, stones and boulders. Hilly landforms are linear down-slope and convex across-slope. Depth to duripan and lithic bedrock are 20 to 40 inches, with a depth to water table of more than 80 inches. Maximum calcium carbonate content is 5 percent and available water capacity is very low at about 2.8inches. The site never floods or pools with water.

Typical profile

0 to 10 inches:	Very stony loam
10 to 23 inches:	Clay
23 to 24 inches:	Indurated
24 to 28 inches:	Unweathered bedrock

overall soil makeup: 66.6% sand - 23.4% silt - 10.0% clay

A small but important portion of the site is made up of **Haybourne gravelly sandy loam (27)** with 2 to 4 percent slopes, at the alluvial base of the east canyon drainage, at the course boundary line of hole #2. This composition is generally found between 4600 to 4900 ft. The parent material is mixed alluvium. Depth to a restrictive feature is more than 80 inches, frequency of flooding is rare and there is no ponding. Available water capacity is double the Xerta at 5.8 inches, but still considered low. Maximum calcium carbonate content is 1 percent.

Typical profile

0 to 6 inches:	Gravelly sandy loam
6 to 25 inches:	Gravelly sandy loam
25 to 60 inches:	Stratified gravelly coarse sand to fine sandy loam

overall soil makeup: 41.6% sand – 37.4% silt – 21.0% clay

This soil can be moist in the winter and spring but can border on xeric in the summer and fall.

CONVERGENCE OF ZONES

Pinyon – Juniper Woodland

The chosen site for the future disc golf course and revegetation project begins at the base of the slope and parking area in Sagebrush Zone and rises into what could be considered Pinyon – Juniper Woodland (“Pygmy Woodlands”). There are three surviving mature Utah Junipers on the site as well as a few juvenile pinon pines. They appear to be located at high points that may have been missed by the brushfire in 2007. Concentrated down the west drainage and scattered along the plateau are multiple charred skeletons of what appear to be Junipers. The general appearance is of a shadeless, harsh, rocky landscape. The reddish volcanic rock outcrops, elevation changes, views and seasonal blooms do add

considerable interest to the discerning naturalist. As Roots Disc Golf it will be our job to identify the nature of these zones and plant accordingly to create a naturalistic plant community that enhances the comfort and enjoyment of disc golfers and hikers.

Our site is on the lower slopes of the north reaching section of Nevada's Pine Nut Range. Western Juniper (Juniperous occidentalis) and Single Leaf Pinyon Pine (Pinus Monophylla) can dominate at higher elevations, but it is the Utah Juniper that has grown naturally on our site at lower elevations. One mature specimen is doing well in the Haybourne gravelly sandy loam near the valley floor. Pinyon-Juniper Woodlands do not generally reach the valley floor, but with more plantings we could encourage a 'finger' of woodlands to bridge the Wild Urban Interface, making it inviting to explore the slopes above.

Utah Juniper

Pinyon Pine

The upper portion of our site is where the juvenile pinyons have established themselves. This is the beginning of the intermediate elevation bands where they start to dominate (5200 ft.). It would be appropriate to establish more single needle pinyons here. Utah Junipers endure more stressful environments at lower elevations and are better adapted to drought conditions, however these junipers usually reappear on rocky ridge tops where gnarled and ancient sentinels have wedged their roots into narrow rock crevices, where they can persist for centuries. Both the Pinyon and the Juniper typically reach no higher than 15 to 20 feet (hence the name “pygmy woodlands”).

Generally in the interspaces among these trees, various sagebrush community types appear much as they would if trees were absent. As woodlands become more dense, the understory plants decrease dramatically. This is the pervasive pattern over time in the Pine Nut Mountains, where areas of dense woodland comes and goes. It would not be a stretch to encourage bands of Pinyon- Juniper woodland to mature on our site with a coordinated planting strategy.

Pinyon-Juniper woodland supplies valuable cover and habitat for mule deer, species of birds, mammals, reptiles and invertebrates. Watch out for rattlesnakes! Juniper berries and pine nuts provide important food sources for a number of bird and mammal species. Woodland expansion into adjacent shrub-dominated vegetation may threaten species that require a sagebrush habitat, such as sage grouse and pygmy rabbit. Fire exclusion since the late 1800's has encouraged this expansion. For our purposes, small bands and islands of woodland should not compromise most of the sagebrush community, while providing shade and serenity in a harsh environment.

Sagebrush Zone

This is the shrubland zone dominated by sagebrush. The height of these shrubs range from 1 to 6.5 ft. tall and commonly cover about 25% of the ground while forbs and grasses cover another 25%. As with our site, Wyoming Big Sagebrush (Artemesia tridentata wyomingensis) is often associated with many other **shrub species** like Desert Peach (Prunus Andersonii), Mormon Tea (Ephedra Nevadensis), Rabbit Brush (Chrsothamnus nauseosus), and Spiny Hopsage (Grayia spinosa)

Mormon Tea

Rabbit Brush

Spiny Hopsage

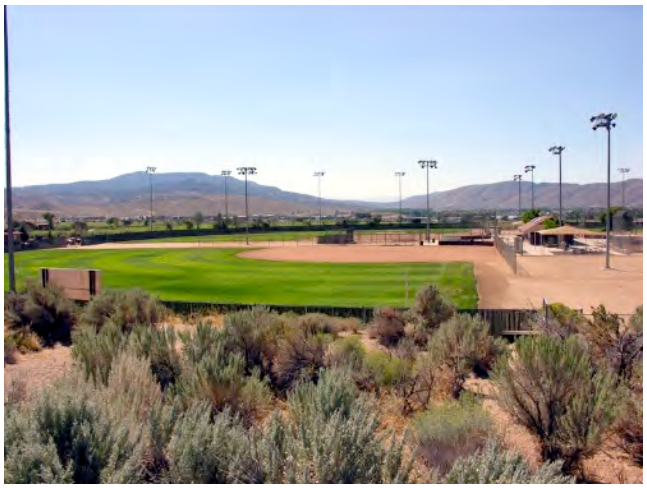
At our site **grasses** are abundant in these shrublands and steppe conditions including needleandthread grass (Stipa comata), Indian ricegrass (Oryzopsis hymenoides), Desert needlegrass (Achnatherum speciosum) and Thurber's needlegrass (Achnatherum thurberianum).

Needleandthread

Indian ricegrass

Desert Needlegrass

Thurber's Needlegrass



Wyoming Sage dominance

CONCLUSION

The Nevada Division of Forestry matching grant of $5000 for revegetation will allow us to make the play of our disc golf course more enjoyable and educational. We plan to rally volunteer work groups of local disc golfers and future disc golfers to implement our planting plan beginning this fall and into next spring using water bags and hand watering. In addition to strategic plantings of the native species mentioned above, we also plan to introduce some non-native adapted species selectively to the site for accent, interest, interpretation, sun and wind protection. Over time the vegetation should define the loop of the course itself, creating special spaces and defined fairways, paths and goals.

Black locust tree (Robinia pseudoacacia) – A legume that fixes nitrogen into the soil usable by other plants, plant 1 or 2 for shelter in Haybourne area, allow it do its spreading thing. Prefer sand or rocky soil. Grows very fast.

Cottonwood Robusta (Populus deltoides) – Fast growing large shade tree to 50' tall for the Haybourne soil.

Jefferey Pine (Pinus jeffreyi) – Native to the Carson range, but can pop up east of there at higher elevations (north of Dandini Boulevard). Can be very drought tolerant once established. Use multiple plantings to define fairway and rock ridge between holes 16 and 17. Suggested by NDF.

Bristlecone Pine (Pinus aristata) Nevada's state tree is extremely slow growing, drought tolerant and interesting to look at even when young. Plant in two locations as a specimen; kiosk at hole #1 and the high mound in the drainage of hole #2.

Curl-Leaf Mountain Mahogany (Cercocarpus ledifolius) – Small trees/shrubs of the rosaceae family that are native to most of the west, but haven't grown naturally on our site. Can add interesting texture, color and shelter to zones around tee-pads. Plant in clusters.

American Plum (Prunus americana) Also known as Wild Plum it is native to east and central US.Creates mass plantings in mounded appearance. Reaches 20ft tall producing sweet fruit and tolerates poor, rocky soils and thrives on neglect in full sun. Plant around tee-boxes where it is easy to water.

Cactus Zones – Plant hardy chollas and opuntias in rocky areas next to tee-pads and along paths between and through fairways for interest, to define zones and to discourage walking in precipitous or erodable areas.

The primary goal of the plantings will be to integrate the two types of plant communities mentioned above; Pinyon – Juniper Woodland and Sagebrush zones into a seamless mosaic of open steppes and sageland, canopied islands and bands that are conducive to interpretive signage between holes. It will be a challenge to site plantings that will take in the quick-draining, rocky, sandy Xerta soils that make up most of the terrain. We will try to gain clues from the skeletons of juniper trees and other large shrubs that were burned by the brushfire as to where there might be more reliable sources of water between rocks or along drainages. We will allow and observe the opportunistic spread of shrubs like rabbitbrush that love the conditions following a fire, to help guide our planting plan.

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