

Grazing Management

The Deer Creek Hills Preserve Grassland and associated blue oak woodlands are largely dominated by non-native annual grasses and forbs although native species are also a common component. Accumulation of non-native annual grass thatch (phytomass) has been shown to reduce native species abundance, reduce native species composition and cover (Marty 2005). Reduction of thatch and competition from non-native annual grasses is required to maintain and foster the establishment of native grasses and forbs (Dyer *et al.* 1996).

In order to achieve the goals and objectives of this management plan, vegetation management will be required. The primary goal of vegetation management is to remove phytomass accumulation in order to foster native plant and animal species. A secondary goal is to reduce fuel loads in the grasslands in order to help prevent high intensity wildfires. Livestock grazing is the primary tool available for phytomass management on the Deer Creek Hills. (Prescribed burns may also be used in addition to livestock grazing, but not as a substitute for grazing.)

Grazing, if properly managed, can be an effective means of managing the annual grassland and encouraging native species abundance and diversity. Robins and Vollmar (2002) compiled a thorough review of current literature, plus expert opinion and anecdotal information on the potential positive and negative impacts of livestock grazing on the grassland ecosystem of the Central Valley. Assessment of the primary impacts include phytomass removal, trampling, and nutrient dynamics. Depending on the seasonality, duration and intensity of grazing, each of these impacts can be viewed as either beneficial or detrimental to the ecosystem and its associated species.

1 Animal Selection

Grazing of cattle, horses, sheep and goats can be an effective means of managing the annual grassland and encouraging native species abundance and diversity. Cattle will graze invasive grasses, can trample inedible weed species, and can incorporate native seeds into the soil. Cattle also tend to move across the landscape and graze areas uniformly. Horses also prefer grasses, but are more selective than cattle and prefer the more palatable species. Sheep and goats prefer broadleaf forbs and are less effective at removing phytomass resulting from annual non-native grasses. Sheep and goats also tend to be relatively selective and do not graze areas uniformly (Tu *et al.* 2001).

Grazing animal selection should consider land use history as well. All grazing animals tend to be at least slightly selective and consume preferred forage, especially perennials, before eating other plants. While lands traditionally grazed by one type of animal will eventually lose certain plant species or even suites of species due to overutilization, whether or not these species will return under a different grazing regime is uncertain. No empirical studies have been conducted on the impacts of changing grazing animals in the vernal pool grassland ecosystem. However, because most rangeland in the Sacramento County region has been under the same livestock management for decades, it is highly doubtful that sufficient seed bank remains to foster recolonization of the species lost through grazing overutilization. Additionally, overall species diversity could be negatively impacted if a site which has already lost species to one grazing animal is subject to the selective pressures of another grazing animal.

Many environmentalists have expressed a desire to see wildlife (native grazers) replace cattle and sheep grazing in the grassland landscape and other ecosystems. Native grazers such as pronghorn and tule elk are wide ranging species, occupying an area for only short periods of time, then moving on to other areas. These species are highly selective foragers and, having evolved with the native flora, prefer to graze native plants. While this option has aesthetic value, it is highly impracticable for vegetation management in small-scale preserves and may not yield the desired vegetation management results. For example, the native grazers might not be effective in reducing the non-native phytomass and could reduce overall native species composition due to selective foraging.

2 Grazing Operator Interviews

In order to better understand the historical and current grazing practices within the Sacramento area and vicinity, taped interviews were conducted with the current leasees and several nearby livestock operators (Witham 2004). The purpose of these interviews was to gain insight into the specific management strategies used by experienced ranchers with emphasis on timing, stocking rates, weed encroachment, and adaptive management.

One fundamental conclusion can be drawn from the oral history project: experienced ranchers use adaptive management to develop and implement effective planning for their livestock operation. Rainfall and water availability play key roles in this decision making process. If the fall rains are late, then the animals go into the pasture at a later date. If it is a dryer than normal year, fewer head of livestock can be supported on a given acreage of pasture. If there is abundant late rain, then the animals can remain on the pasture until early summer. While the livestock operator is primarily concerned with the health and welfare of the grazing animals, these same “rule of thumb” management strategies are also beneficial to the vernal pool grassland ecosystem.

3 Stocking Rates

Because Deer Creek Hills has been grazed by cattle for nearly the past half century, it is appropriate that it remain under a cattle grazing regime. In this region of Sacramento County, the winter grazing season is typically November 1 through June 30, though some operators may put cattle out in October (Marty pers. comm.). This varies with rainfall patterns and on most sites the actual grazing period is typically from November 15 to May 15 (Jonas pers. comm.).

In order to provide a nursery for new grass and native forbs in the fall, it is desirable to leave a certain amount of standing material (residual dry matter) at the end of the grazing season. Most management plans for grassland ecosystems suggest a residual dry matter (RDM) level of 500 to 1000 pounds per acre, or an average of ~750 RDM per acre in areas with <20% (less than twenty percent) slope (TNC 1998). Areas with >20% (greater than twenty percent slope) should have an average RDM of ~1200 pounds per acre in order to help prevent erosion. Accumulations of >1500 RDM in the flatter areas (<20% slope), and >2000 RDM in the steeper areas (>20% slopes) is highly discouraged because it chokes out next year’s seedlings of both annual grasses and native forbs.

The relatively shallow soils on the Deer Creek Hills Reserve yield an average of 1500 pounds per acre of dry vegetation during a normal rainfall year. To obtain a desired RDM of ~950 (average of 750-1200, considering terrain of DCH) pounds per acre, that leaves approximately 550 pounds per acre available for cattle forage.

Grazing capacity is based upon the amount of available forage material on a given site. The unit of measurement of available forage is animal unit months (AUM), which is defined as the amount of forage needed to support either one adult cow, one horse, one mule, five sheep, or five goats for 30 days (USDA 1993). This is equivalent to about 800 pounds of forage. For the Deer Creek Hills Reserve, annual grazing capacity is approximately 0.675 AUM per acre. This calculates to one cow for every 8-9 acres over a six month grazing season or one cow for every 11-12 acres over an eight month grazing season.

The approximate stocking rate used on the Deer Creek Hills Reserve for the past several decades is one cow for every 8.5 acres for a five-six month grazing period (Harry pers. comm.). Continued grazing at that approximate stocking rate is appropriate, except in years of higher than average rainfall in the spring. Then the cattle should remain on pasture for an additional two-to-four weeks to prevent an accumulation of phytomass in the grasslands.

4 Grazing Exclosures

Because much of the public has misconceptions about the value of controlled grazing under specific circumstances, it is desirable and beneficial to create visual examples of the impacts of grazing exclusion in the vernal pool grassland ecosystem. To that end, SVC should install several small, permanent grazing exclosures on the DCH parcel. Visitors can then witness, first hand, the differences in vegetation composition and wildflower abundance between grazed and ungrazed areas.