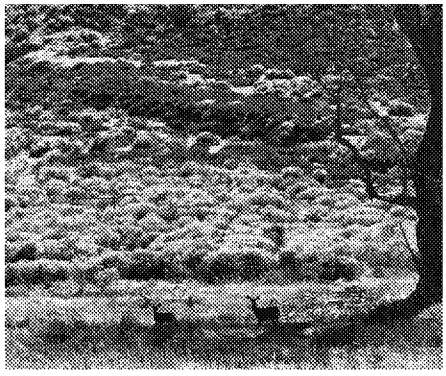
FLASH GRAZING GUIDANCE MANUAL

PETERSEN RANCH MITIGATION BANK

LEONA VALLEY, LOS ANGELES COUNTY, CALIFORNIA



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Disclaimer: This flash grazing plan has been written for immediate implementation in Spring 2021. Applicability of this plan to future years is subject to IRT authorization.

1.0 Introduction

In 2020, an abundance of non-native, invasive annual grasses (collectively "invasive annual grasses"), including rip gut brome (*Bromus diandrus*; CAL-IPC Moderate), red brome (*Bromus rubens*; CAL-IPC High), and hare barley (*Hordeum murinum* ssp. *leporinum*; CAL-IPC Moderate), was documented in the Rift Valley during annual vegetation monitoring in Area A of the Petersen Ranch Mitigation Bank (Bank). As such, this document has been prepared to provide guidance in regards to flash grazing seasonal wetland meadows and immediately surrounding areas.

The Bank is an active cattle ranch governed by a sustainable grazing plan to control non-native species populations (Bank Enabling Instrument [BEI], Exhibit D-5 Long-Term Management Plan, Appendix B Grazing Plan). The Rift Valley seasonal wetland meadows are located within a cattle exclusion zone as outlined in the BEI, Exhibit C-1 Development Plan, Section 5.1. These areas have not been grazed since the Bank was established in 2016. However, as detailed in the BEI Exhibit D-5 Long-Term Management Plan, Appendix B Grazing Plan:

> *Occasionally, grazing within the exclusion areas may be desirable to control invasive species or a build-up of thatch or fuels. If deemed necessary for management objectives, and subject to IRT approval, grazing in these areas would be conducted after the end of season rains, but while grasses are still green. Careful timing of grazing after rains have stopped and the ground has hardened will protect soil stability around wetlands and will prevent excess nutrient inputs into the downstream waters. Grazing while grasses are still green will prevent cattle from overutilizing riparian vegetation as cattle preferentially forage on protein rich grasses when available and will be less inclined to loaf in riparian habitats when temperatures are cool* (BEI Exhibit D-5, Appendix B, page 6).

Consistent with the approved use outlined above, the Bank Sponsor seeks Interagency Review Team (IRT) approval of a targeted plan that focuses on efficient control of non-native species while protecting native wetland communities and structure within the Rift Valley cattle exclusion zone. This document provides recommendations that can be implemented over time as-needed in the Rift Valley cattle exclusion zone.

The goals for the flash grazing adaptive management effort outlined in this guidance document are to:

1. Reduce stress on native plant species in Rift Valley wetland communities; and
2. Increase habitat quality for native plants and animals.

The goals will be achieved via the following objectives:

1. Control early rapid growth of invasive annual plants by timing flash grazing to begin before the start of the period when annual grasses are growing rapidly; and
2. Reduce the evapotranspiration of soil water during native perennial grass dormancy by reducing biomass of annual grasses.

The objectives will be achieved by grazing the Rift Valley pastures in the Spring at the recommended stocking rate. The guidance and recommendations below are provided to achieve the stated goals.

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2.0 Area of Focus

Flash grazing will be implemented within the Rift Valley's cattle exclusion zone. Existing infrastructure will be utilized to divide the valley into four sections (Figure 1). Cows may be moved between sections sequentially or deployed in multiple sections simultaneously depending on total number of cows available and site-specific conditions, such as timing of grass emergence.

3.0 Grazing Recommendations

3.1 Stocking Rate

Stocking rates are a function of available forage within a unit area. Available forage production and stocking rates for the Rift Valley were estimated using the USDA Antelope Valley Soil Survey forage production values and professional history with the Site.

3.1.1 Forage Production Estimates

Forage production estimates for the Rift Valley from the USDA Antelope Valley Soil Survey for favorable, normal, and unfavorable production years are summarized below in Table 1.

Table 1. Forage Production Values for Soil Map Units in the Rift Valley

Soil Map Unit	Forage Production (Lbs. per Acre)		
	Favorable Year	*Normal Year*	*Unfavorable Year*
Co – Chino Loam	425	170	43
HbC – Hanford coarse sandy loam, 2 to 9 percent slopes HcC – Hanford sandy loam, 2 to 9 percent slopes	935	595	425
Average	**680**	**383**	**234**

The Rift Valley pastures contains several wetland restoration sites, for which some areas were in-filled with on-site soil material. Based on professional observations made by WRA staff soil scientists over the years, much of this material likely consisted of soil from the Hanford series, and many of the areas being invaded by the invasive annual grasses are underlain by Hanford soils. Additionally, residual dry matter (RDM) monitoring in surrounding pastures and personal observations support the theory that the Rift Valley is generally capable of higher forage production than what the soil survey estimates.

For the reasons outlined above, the initial stocking rates will be calculated using an estimated total forage production of 383 pounds per acre, which is the average of the estimated total forage production for the Chino loam and the Hanford sandy loam soils in a normal year.

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Figure 1: Location of Flash Grazing Pastures and Associated Infrastructure

LAND VERITAS

Legend

- Flash Grazing Area
- Gate
- Cattle Water Trough
- Petersen Ranch Mitigation Bank Boundary (By Area)
- Excluded From Bank
- Lahontan RWQCB Jurisdictional Boundary

0 500 1,000 2,000 Feet

N

3.1.2 Stocking Rate Recommendations

Based on the "Take Half, Leave Half" principle, an estimated forage production value of 383 pounds per acre will yield a total available forage of 192 pounds per acre. With an available forage production of 192 pounds per acre and an Animal Unit (AU) daily consumption rate of 30 pounds per day (NRCS 1997), the Rift Valley pastures, totaling 162.24 acres, can support 1,038 Animal Unit Days (AUD). In order to achieve the adaptive management goals and avoid compaction, it is recommended that the Rift Valley pastures be grazed with the fewest number of head of the smallest cattle livestock class available. Given this consideration, the recommended stocking rate is calculated by dividing the total AUDs that the Rift Valley pastures can support by the number of grazing days in the grazing season. As an example, the 2021 grazing season, pending IRT approval of the Flash Grazing Adaptive Management Proposal, is anticipated to begin on April 19, allowing for 43 total grazing days. The resulting stocking rate in this example is 24 AUs. It is important to note that the stocking rate will change based on the number of grazing days and the anticipated total available forage. The stocking rate should be calculated each year based on the anticipated grazing season and residual dry matter (RDM) monitoring results from the previous year (Section 4.3). Additionally, stocking rates may be adjusted based on the results of the monitoring efforts recommended in Section 4.0. Table 2 summarizes the daily forage consumption in pounds and Animal Unit Equivalents (AUE) for recommended livestock classes. The AUE can be used to convert the prescribed AU into the required number of head for the particular livestock class being grazed. Table 3 summarizes the total AUDs for the Rift Valley Pastures and for each individual pasture. Finally, an example is provided in Table 3 that outlines the required number of grazing days in each pasture for the 2021 grazing season. This was calculated by dividing the total AUDs for the individual pasture by the prescribed 20 AU stocking rate. In future years, these targets should be recalculated based on the length of the grazing season that year and the prescribed stocking rate.

Table 2: Daily Forage Consumption and Animal Unit Equivalents for Recommended Livestock Classes

Livestock Class	Daily Forage Consumption (lbs.)	Animal Unit Equivalent (AUE)[1]
Cow, 1000 lbs., with Calf	30	1.00
Dry Cow, 1000 lbs.	25.5	0.85
Heifers,18-24 months-old	26	0.86
Yearling Cattle, 12-17 months-old	22.5	0.75
Yearling Cattle, 7-12 months-old	17 – 19.5	0.56 – 0.65

[1] Animal Unit Equivalent values from the USDA NRCS National Range and Pasture Handbook.

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Table 3: Total Animal Unit Days (AUDs) for the Rift Valley Pastures

Pasture	Acres	Total Available Forage (lbs.)	Total Animal Unit Days (AUDs)[1]	Example: Total Grazing Days[2] (4/19/2021 - 5/31/2021)
A	53.55	10,282	343	14
B	22.01	4,226	141	6
C	30.42	5,841	195	8
D	56.26	10,802	360	15
Total	**162.24**	**31,150**	**1,038**	**43**

[1] AUDs are calculated by dividing the Total Available Forage by the Daily Forage Consumption of a 1,000 lbs. cow with Calf (see Table 2)

[2] The Total Grazing Days for each individual pasture was calculated by dividing the total AUDs for the individual pasture by the prescribed 24 AU stocking rate. This should be updated each year as the Total Grazing Days per season and the prescribed stocking rate change.

3.2 Timing

Spring grazing is recommended for the Rift Valley. Grazing during this period will promote grazing of annual invasive grasses, due to their earlier phenology when compared to the native grasses present in Rift Valley. By targeting the invasive annual grasses in this manner, the competitive consumption of ground water by the invasive annual grasses will be reduced, thereby reducing late season water stress in native perennial plants.

Grazing should begin after soils in the wetland areas have dried, but before the invasive annual grasses begin their rapid spring growth. If grazing does not begin before this rapid growth period, the recommended stocking rate may be inadequate, and the effects of competition with invasive annual grasses will not be significantly reduced. Grazing should end when the invasive annual grasses have dried out or when the majority of the native grasses have produced flowers, whichever occurs sooner. Additionally, grazing should end, be suspended, or be influenced (i.e. through the use of attractant) if the average stubble height of the invasive annual grasses is four inches or lower (Bush *et al.* 2006), or if the cattle are observed preferentially grazing native species. This may only be a temporary measure if this effect is observed early in the season.

It is recommended that the Rift Valley Pastures be grazed in two evenly timed passes, ensuring each pasture is grazed more evenly throughout the season. Pasture A is at a higher elevation than the other pastures, so it is recommended that it be grazed first in each pass as it will be the earliest to dry out each season.

An example grazing schedule for 2021 is presented in Table 4.

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Table 4: Example of Potential Grazing Schedule for 2021 Grazing Season

Grazing Pass	Pasture	2021 Grazing Start Date	2021 Grazing End Date
1	A	19-Apr	25-Apr
	B	26-Apr	28-Apr
	C	29-Apr	2-May
	D	3-May	9-May
2	A	10-May	16-May
	B	17-May	19-May
	C	20-May	23-May
	D	24-May	31-May

3.3 Livestock Class

According to the Antelope Valley Soil Survey, susceptibility to compaction ranges from medium to low within the Rift Valley. Despite the absence of soils with high susceptibility to compaction, livestock classes with the least weight will be preferentially selected. This will minimize any chance of habitat degradation due to compaction.

3.4 Animal Distribution

3.4.1 Water

Water troughs should be placed in upland areas and areas dominated by non-native plants when possible. Water should be kept in constant supply in order to avoid herd panic caused by water scarcity. The planned locations of water troughs in Pastures A-D are shown in Figure 1.

3.4.2 Livestock Attractants

Salt licks and other supplements can be placed and moved to encourage preferential grazing of areas dominated by invasive annual grasses.

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4.0 Monitoring and Reporting

Flash grazing measures will be implemented in the Spring each year it is utilized as an adaptive management approach. The following metrics will be documented and compiled in a short memo update to the IRT to inform agency members of the effectiveness of the approach. The memo will be submitted as an appendix to the annual monitoring report, due to the IRT on November 15 of each year annual monitoring activities are completed at the Bank.

4.1 Grazing Season and Stocking Rate

Document the beginning and end of all grazing activities, including any suspensions of grazing activity or uses of attractant. Whenever grazing begins in any of the Rift Valley pastures, document the number of cattle and their livestock class. Additionally, any augmentations to the stocking rates recommended in Section 3.1 should be documented. All dates, counts, and notes should be recorded using the Grazing Calendar provided in Attachment A.

4.2 Stubble Height and Native Grasses

Actively grazed Rift Valley pastures should be monitored daily to ensure that the average stubble height is four inches or taller. If portions of the pasture are below the minimum allowable stubble height, attractants can be used to focus grazing away from these areas. If the average stubble height across an entire pasture is less than four inches, grazing in that pasture should be suspended or ended if it is clear that the invasive annual grasses will not regrow. Daily average stubble height estimates should be recorded using the Flash Grazing Monitoring Data Sheet provided in Attachment A.

4.3 RDM and Indicators of Rangeland Health

RDM monitoring should be conducted annually in October. In concurrence with RDM monitoring, indicators of degrading rangeland health, such as erosional features, compaction, and plant mortality and decadence, should be documented.

4.4 Water Quality Protection

To protect water quality, grazing will be limited to periods when there is no standing water or saturated soils present. The weather should be monitored daily for rain events, and the pastures checked after every rain event. If cattle are grazing a Rift Valley pasture and precipitation forecast calls for more than 0.25" of rain, the cattle will be moved from the pasture until the rain event has passed and the soil is dry.

4.5 Soil Compaction

As referenced in Section 3.3, despite the absence of soils with high susceptibility to compaction, livestock classes with the least weight will be preferentially selected for flash grazing activities within the exclusion areas. Soil compaction will be qualitatively evaluated daily by Ranch staff in concert with stubble height monitoring (Section 4.2), with observations recorded in the Flash Grazing Monitoring Data Sheet provided in Attachment A. Compaction monitoring will rely on visual observations of indicators of soil compaction such as deep hoof prints, or areas of smooth bare soil surface. If excessive soil compaction is observed, adaptive management measures such as placement of supplemental salt or hay in upland or transition

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areas away from wetlands within the exclusion zone will be considered. Per Section 4.4, grazing will not occur when soils are saturated.

4.6 Photographs

Photo monitoring of the Rift Valley Pastures should be conducted weekly during the grazing season and monthly outside of the grazing season. Photo numbers for weekly photo monitoring should be tracked using the Flash Grazing Monitoring Data Sheet provided in Attachment A.

5.0 Assumptions and Limitations

The purpose of this document is to provide implementing guidance only. The Bank Sponsor will be responsible for parties implementing the guidance outlined in the plan, and using best professional judgement in deciding when to move livestock.

6.0 References

Woodruff, G.A., 1970. *Soil Survey, Antelope Valley Area, California*. US Soil Conservation Service.

Bush, L. and Ptak, E., 2006. Grazing handbook: a guide for resource managers in coastal California. *Santa Rosa, California: Sotoyome Resource Conservation District*.

NRCS, USDA, 1997. National range and pasture handbook. *US Department of Agriculture, Grazing Lands Institute*.

ATTACHMENT A – FLASH GRAZING MONITORING DATA SHEET

Date	Pasture _____							
	Number of Cattle Grazing				Stubble Height (inches)	Soil Compaction Indicators	Weekly Photo Numbers	Notes
	Yearling	Heifer	Cow/Steer	Pair				