

APPENDIX G

RMV GRAZING MANAGEMENT PLAN

CHAPTER 1

1.1 Background

This Grazing Management Plan (GMP) has been prepared to guide the management of grazing on Rancho Mission Viejo (RMV), located in southern Orange County, California during the long-term implementation of the NCCP/MSAA/HCP. RMV has grazed cattle on its lands since 1882 and intends to continue to do so in the long term, in a manner consistent with its recent low/moderate grazing regimes, on lands which may, as part of approval of the NCCP/MSAA/HCP, become part of a Habitat Reserve. As described in *Part I, Chapter 11* grazing is considered a Covered Activity when implemented in accordance with this GMP. As discussed later, this GMP is, in a manner analogous to the Water Quality Management Plan (*Appendix K*), a long-term management program to be conducted by RMV or its successors “in coordination with” the Adaptive Management Program (AMP) component of the overall Habitat Reserve Management Program (HRMP) for the Southern Subregion, as described in *Part I, Chapter 7*.

1.2 Relationship to Southern Subregion NCCP/MSAA/HCP

The Southern NCCP/MSAA/HCP is being prepared by the County of Orange in cooperation with the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) in accordance with the provisions of the state Natural Community Conservation Planning Act of 1991 (NCCP Act), California Endangered Species Act (CESA), and Federal Endangered Species Act (FESA) and Section 1600 *et seq.* of the Fish and Game Code. The purpose of the Southern NCCP/MSAA/HCP is to provide for the conservation of identified listed and unlisted species (termed “Covered Species”) and associated habitats that are currently found within the 132,000-acre Southern Subregion NCCP/MSAA/HCP study area while allowing reasonable economic development. Species and associated habitats are to be conserved through creation of a permanent Habitat Reserve and implementation of the HRMP.

As shown in *Part IV, Figure 3*, the Southern NCCP/MSAA/HCP includes the southern portion of Orange County from the coast inland to the boundary with the counties of Riverside and San Diego. Along the coast, the Subregion extends from the mouth of the San Juan Creek in the City of Dana Point to the County of San Diego boundary, in the City of San Clemente. The Subregion comprises about 26 percent of the County of Orange. Thirty (30) percent of the entire Subregion (about 40,000 acres) is located within the Cleveland National Forest (CNF). The CNF

is subject to a separate ongoing planning process and will not be addressed in the Southern NCCP/MSAA/HCP. The remaining 92,000 acres are outside of the CNF and constitute the planning area for the Southern NCCP/MSAA/HCP.

Landowners within the Subregion, including both private and public agency owners, are affected by the NCCP/MSAA/HCP. In recognition of the potential impact of the NCCP/MSAA/HCP process on their properties, several major landowners contributed funding and services to support completion of the NCCP/MSAA/HCP (*Part I*), Joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (*Part II*), and Implementation Agreement (IA) (*Part III*). RMV is the largest private landowner within the Southern Subregion and is a participant in the Southern NCCP/MSAA/HCP.

Draft planning guidelines have been prepared for the Southern NCCP/MSAA/HCP (“Draft Southern Planning Guidelines”) (refer to *Part I, Chapter 4* for the full text of the guidelines). Using the broader NCCP and SAMP Tenets as a framework and starting point, the Draft Southern Planning Guidelines provide guidance for decision-makers that is keyed to biologic, hydrologic, and geomorphic conditions within the planning area. These guidelines address resources at both the landscape (watershed) and more detailed hydrologic/geomorphic sub-basin levels. For each sub-basin planning unit, the guidelines identify the important biological resources and key hydrologic/geomorphic processes. Protection, restoration and management recommendations for each sub-basin also are included.

The Draft Southern Planning Guidelines are comprised of four primary components:

1. NCCP Tenets outlined in the 1993 NCCP Conservation Guidelines;
2. Reserve Design Principles prepared by the panel of NCCP Science Advisors convened by The Nature Conservancy;
3. SAMP Tenets; and
4. A set of draft Baseline Conditions Watershed Planning Principles and sub-basin specific planning recommendations prepared by the NCCP/ SAMP working group.

In addition to these components, the Draft Southern Planning Guidelines also set forth general policies for resource protection, management and restoration that apply at the planning (landscape) area scale. The following policies include provisions from General Policy 6 of *Part I, Chapter 4* setting forth the Draft Guidelines and additional policy guidance developed through the NCCP/MSAA/HCP planning process:

- Cattle grazing shall continue to be permitted within the RMV portion of the Habitat Reserve provided that grazing activities are consistent with a “grazing management plan” approved as part of the NCCP/MSAA/HCP.
- The Grazing Management Plan (GMP) approved as part of the NCCP/MSAA/HCP shall identify suitable grazing areas and allowable grazing practices that are: (a) consistent with light to moderate grazing levels comparable to past grazing practices, and (b) that are consistent with the avoidance of specified sensitive habitat areas under specified time duration or other conditions (*e.g.*, exclusion of cattle from arroyo toad breeding habitat during the breeding season, exclusion of cattle from vernal pools, limitations on grazing in recently burned coastal sage scrub habitat areas until vegetation has re-generated) consistent with NCCP/MSAA/HCP policies. The GMP will address current grazing practices and grazing practices following transfer of lands to the Habitat Reserve.
- Additionally, the GMP will identify grazing management techniques that would be implemented on a voluntary basis by RMV following a request from the RMV Land Conservancy (RMVLC) that are designed to promote perennial grasses, further other restoration measures identified pursuant to the AMP over time and, where appropriate, reduce fuel loads for fire.

1.2 Purposes of the Grazing Management Plan

Non-native plant invasions associated with European settlement in the 1700 and 1800’s led to vegetation type conversions on RMV lands (Froke 1993), and only active management approaches will allow managers to restore and maintain lands in a condition that approximates those historical circumstances that are most beneficial to native plant and animal species of concern (Allen *et al.* 2000; Bartolome and Gemmill 1981; Heady 1977; Stylinski and Allen 1999; Whelan 1989; White 1967). The causes of this type conversion are many and complex (Allen *et al.* 2000; Klopatek *et al.* 1979; Minnich and Dezzani 1998; Pavlik *et al.* 1993; Zedler *et al.* 1983), and include past grazing practices; but regardless of the mechanism of the conversion, strategies must be developed to maintain diverse, interdigitated grasslands and open stands of coastal sage scrub.

An often-cited review article by Fleischner (1994) concluded that livestock grazing, especially in the arid west, is virtually exclusively deleterious to environmental health, and therefore should be terminated in nearly all circumstances. Brussard *et al.* (1994) took issue with that conclusion, warned that the premise was faulty, and, importantly, that Fleischner’s treatment of the issue was biased in its presentation of both the standing literature and then current knowledge. Certainly,

ample examples exist showing that grassland ecosystems that are overgrazed, especially during periods of stress from drought, can be negatively impacted and that overgrazed grasslands frequently manifest reduced biomass and native plant species diversity. However, at lowest levels, grazing can have inconsequential effects on native plant and animal species diversity, some of which could not even be measured. At low but consequential levels, grazing can be selective and beneficial to biodiversity, serving to reduce biomass and the likelihood of devastating wildfire, reduce thatch with benefits to native grasslands and reduce populations of undesired non-native plants that may compete with desired native species. And, it has become clear that grazing is a necessary component of conservation strategies that target native plant and animal species where atmospheric nitrogen deposition is creating a fertilizer load on coastal California grasslands (Cione *et al.* 2002; Padgett and Allen 1999; Padgett *et al.* 1999; Weiss 1999). Many conservation-planning efforts have incorporated livestock grazing as a tool to assist managers in meeting explicit species diversity goals or other productivity-related targets (Wallis Devries and Raemakers 2001; Kimball and Schiffman 2003; Hayes and Holl 2003; Soderstrom 1999; Harrison *et al.* 2003). According to Menke (1996), herbivory and fire are natural and necessary processes, which remove litter, recycle nutrients, stimulate tillering and reduce seedbanks of competitive annual plants.

In light of the foregoing discussion, the GMP has three purposes:

1. To identify those aspects of the recent RMV grazing regime that are supportive of existing conditions so that they may be continued throughout the implementation of the NCCP/MSAA/HCP (*i.e.*, given examples of severe over-grazing in other areas involved in NCCP planning in Southern California as contrasted with conditions on RMV lands manifesting high levels of bio-diversity and high populations of sensitive species, it is important to identify the specifics of the RMV grazing regime).
2. To identify those aspects of grazing on RMV lands (after the lands are dedicated to the Habitat Reserve) to be adjusted on a seasonal basis for purposes of protecting Covered Species; and
3. To review and identify grazing actions that are supportive of vegetation community enhancement and restoration actions identified in *Part I, Chapters 7 and 13* for possible future action by RMV in conjunction with requests from the RMVLC.

This GMP is directed toward three complementary objectives in support of the above purposes. These objectives are reviewed in the following subsection and include identifying: **(1)** grazing practices that have been shown to be consistent with high levels of biodiversity and species populations so that these essential grazing management practices can be carried forward both prior to and following the dedication of conservation easements on RMV lands to the Habitat

Reserve; (2) seasonal grazing practices that are important for protecting specific Covered Species following dedication of conservation easements; and (3) grazing practices that would, on a voluntary basis on the part of RMV, be supportive of habitat enhancement and restoration programs carried out pursuant to the AMP component of the HRMP, including fuel load management. The GMP will address both grazing practices to be continued on RMV lands prior to dedication of lands to the Habitat Reserve and grazing practices following the dedication of lands to the Habitat Reserve.

1.3 Objectives of Grazing Management Plan

To achieve the above overall purposes and general objectives, the following specific objectives have been developed:

a. Management of grazing consistent with the recent low/moderate grazing regime through implementation of the NCCP/MSAA/HCP

The existing grazing management program has management features that benefit natural communities and related species and that need to be identified to assure that these beneficial measures continue during implementation of the NCCP/MSAA/HCP. These beneficial management features result in natural conditions that compare favorably to conditions on lands with a history of tenant ranching (as contrasted with family ranching on RMV). The identified grazing management measures need to be assessed in the context of high levels of biodiversity (e.g., natural regeneration of woodlands) and species populations (seven listed species) on RMV lands. In order to identify the important grazing management practices that need to be continued, the GMP will:

- Establish a minimum residual dry matter (RDM) per acre for active and proposed pastures and stocking levels consistent with recent low/moderate grazing regimes;
- Identify interim and long-term changes to existing and proposed pasture configurations that will result from land use changes consistent with the NCCP/MSAA/HCP;
- Identify a timed rotational grazing scheme to maximize use of available forage consistent with the recent low/moderate grazing regime;
- Outline procedures for monitoring grazing management practices to ensure consistency with GMP objectives, including methods for monitoring forage levels in order to assess range conditions; and

- Identify pastures that may be subject to prescribed fire. Identify appropriate pasture rest periods following burns, whether planned or unplanned, to promote habitat recovery. Pre-determined rest periods cannot be determined as the duration of a rest period will depend on multiple factors including but not limited to vegetation communities burned, geographic extent of burn area, time of year of burn, and intensity of burn.

b. Identification of exclusion areas required to protect sensitive species

Although existing species biodiversity and populations are high on lands that historically have been used for grazing, some types of seasonal exclusion of cattle grazing during breeding seasons of some aquatic species may still be needed. Accordingly, the GMP will identify sensitive habitat areas where cattle grazing shall be excluded seasonally to protect specific aquatic species during their respective breeding seasons.

c. Management of grazing, where considered appropriate by the RMVLC and where considered feasible by RMV, to further AMP enhancement and restoration measures

As described in *Part I, Chapter 7*, the Science Advisory Panel (Science Panel) will make annual recommendations to the RMVLC Board of Directors regarding the priority management actions for the Habitat Reserve, including whether or not to undertake active restoration and/or enhancement of upland habitats. Where such a recommendation is made, approved by the RMVLC and subsequently determined to be feasible by RMV, the following specific objectives would apply where feasible and appropriate:

- coordinate grazing with AMP measures to enhance and restore native grasslands (VGL – valley grasslands) as described in the Habitat Restoration Plan (*Appendix H*).
- coordinate grazing with Wildland Fire Management Plan (WFMP; *Appendix N*) adaptive management measures intended to reduce fuel loads and protect habitat areas from wildfires.
- coordinate grazing with AMP measures directed toward the enhancement, restoration and management of thread-leaved brodiaea populations.

1.3 Participants in the Grazing Management Plan

The GMP was prepared by RMV with input provided by the County, USFWS and CDFG.

CHAPTER 2: EXISTING CONDITIONS

The section is focused on the descriptions of the RMV pastures. For a full description of the resources present on RMV, including vegetation communities, terrains and geomorphology, listed and unlisted species the reader is referred to *Part I, Chapter 3*.

2.1 Pastures

Figure G-1 to this GMP shows the general location of the historic RMV pastures within the RMV property boundary. Trabuco Pasture, Oil Well, Horno, McFadden, Lower Chiquita, Middle Trabuco, Cecil's Pasture, Horseshoe Pasture, Upper Chiquita, the Vineyard, Bull Pasture, Lower Gobernadora, Horse Pasture and Nick's Pasture are located north of San Juan Creek in the San Juan Creek Watershed. River Pasture straddles San Juan Creek. South 40 is located adjacent to Ortega Highway in the San Juan Creek Watershed. South of San Juan Creek located partially within the San Juan Creek Watershed and partially within the San Mateo Creek Watershed are Sierra, Rinconada, Cristianitos Pasture, Gabino, Talega and TRW Pasture.

2.1.1 Pasture Description

The following is an overview of the location by sub-basin, soils, vegetation community, sensitive species, fencing and water resources for each of the historic pastures listed above (see *Figures G-2* through *G-4* in this GMP). The current status of the pasture is also discussed; *i.e.*, whether it is actively grazed or not.

a. Trabuco Pasture

Trabuco Pasture is located in the Trabuco sub-basin. Terrains in this sub-basin are low to high slope less erodable clays. Vegetation in this pasture is dominated by grassland and coastal sage scrub. Other vegetation types occurring in the pasture to a lesser degree include riparian and chaparral. Agriculture, disturbed land covers and developed also occur in this pasture. Thread-leaved brodiaea occurs in this pasture. No other sensitive plant species occur. Eleven California gnatcatcher locations occur in this pasture. Other species of note include American badger (historical den), Bell's sage sparrow, coastal cactus wren, grasshopper sparrow, red-tailed hawk and white-tailed kite.

Trabuco Pasture has been set aside for conservation purposes in accordance with the terms and conditions of the USACE, USFWS and CDFG permits for Ladera Ranch and the Arroyo Trabuco Golf Course. No active grazing occurs on this pasture. In accordance with the terms and conditions of the Ladera Open Space Conservation Easement grazing is a reserved use subject to the preparation and approval of a grazing management plan by the County of Orange.

A subsequent amendment to the Ladera Open Space Easement associated with approval of the Arroyo Trabuco Golf Course revised this provision of the easement to state “No grazing shall be permitted within the Conservation Easement Area without the written consent of CDFG and the Service.” Because, it is not the intent of RMV to resume grazing in the Trabuco Pasture, this pasture will not be further addressed by this GMP.

b. Narrow Canyon

Narrow Canyon Pasture is located in the Narrow Canyon sub-basin which is a subset of the Chiquita sub-basin. This pasture is characterized by high to low slope and less erodible clays. Vegetation types in Narrow Canyon Pasture include agriculture, annual and native grasslands, coastal sage scrub and minor amounts of chaparral and riparian. No sensitive plant species occur within this pasture. Recorded locations of listed species include 11 locations for California gnatcatcher. Other species of note recorded within this pasture include coastal cactus wren, grasshopper sparrow, loggerhead shrike, northern red-diamond rattlesnake, orange-throated whiptail, rufous crowned sparrow, San Diego horned lizard, western spadefoot toad and western whiptail.

Because grazing is excluded from Narrow Canyon in accordance with the terms and conditions of the 404 permit issued by the Corps for Ladera Ranch and is also partially within the Ladera Open Space Conservation Easement (discussed above), this pasture will not be further discussed in this GMP.

c. Horno

Horno Pasture straddles the Horno and Narrow/Chiquita sub-basins. This pasture is characterized by high to low slope and less erodible clays. Vegetation types in Horno Pasture include agriculture, annual grasslands, coastal sage scrub and very minor amounts of native grasslands, chaparral, open water and riparian. No sensitive plant species occur within this pasture. Recorded locations of listed species include one location for California gnatcatcher. Other species of note recorded within this pasture include barn owl, great horned owl and western spadefoot toad.

Horno Pasture is also part of the Ladera Open Space and is subject to the Ladera Open Space Conservation Easement and its subsequent amendment. Because, as noted above for the Trabuco Pasture, RMV does not intend to resume grazing in the Ladera Open Space Conservation Easement, this pasture will not be discussed further in this GMP.

d. McFadden

McFadden Pasture straddles the Horno and Narrow/Chiquita sub-basins. This pasture is characterized by high to low slope and less erodible clays. Vegetation types in Horno Pasture include agriculture and annual grasslands. No sensitive species occur within this pasture. Water is provided by a cattle trough. McFadden pasture is actively grazed.

e. Oil Well Pasture

Oil Well Pasture straddles the Horno and Narrow/Chiquita sub-basins. This pasture is characterized by high to low slope and less erodible clays. Vegetation types in Oil Well Pasture include agriculture, annual grasslands, coastal sage scrub and minor amounts of native grassland, riparian and developed. No sensitive plant species occur within this pasture. Recorded locations of listed species include three locations for California gnatcatcher. Other species of note recorded within this pasture include coastal cactus wren and western spadefoot toad.

Oil Well Pasture is also part of the Ladera Open Space and is subject to the Ladera Open Space Conservation Easement and its subsequent amendment. As noted above for the Trabuco, Narrow Canyon and Horno pastures, RMV does not intend to resume grazing in the Ladera Open Space Conservation Easement; consequently, this pasture will not be discussed further in this GMP.

f. Lower Chiquita, Middle Trabuco, Upper Chiquita and Cecil's Pasture – "Chiquita Pastures"

Lower Chiquita, Middle Trabuco, Upper Chiquita and Cecil's pastures are all located within the Chiquita sub-basin and include the majority of Chiquadora Ridge located in the western portion of the Gobernadora sub-basin. Portions of Middle Trabuco, Cecil's, Upper and Lower Chiquita pastures have been removed from active grazing for development purposes (Cecil's pasture below Oso Parkway) or set aside for conservation purposes (Cecil's pasture and Upper Chiquita above Oso Parkway, Horseshoe pasture, Narrow Canyon and portions of Horno). The remaining portions of these pastures are grazed as one pasture today. For purposes of this overview this group of pastures will be called the "Chiquita pastures." These pastures are characterized by sandy or silty terrains in the main and side canyons. Ridges on the east side of the valley are characterized by rock outcroppings and areas of hardpan (eroded remnants of claypans formed in the geologic past that have eroded to form mesas) and locally steep slopes.

Vegetation in the Chiquita pastures includes coastal sage scrub, agriculture (in the form of citrus and avocado orchards and barley fields), patches of annual and native grasslands and patches of chaparral. Chiquita Creek supports herbaceous riparian, southern willow scrub, arroyo willow riparian forest and coast live oak riparian forest. Slope wetlands also occur in this pasture.

Several listed and other plant species of note occur in the Chiquita pastures including the federally-listed California gnatcatcher, the state/federally-listed thread-leaved brodiaea, the state/federally-listed least Bell's vireo, California Native Plant Society (CNPS) List 1B plants many-stemmed dudleya, intermediate mariposa lily, southern tarplant, Coulter's saltbush and Salt Spring checkerbloom. Other wildlife of note using this pasture include coastal cactus wren, ferruginous hawk, prairie falcon, merlin, northern harrier, wintering burrowing owls, loggerhead shrike, grasshopper sparrow, rufous-crowned sparrow, California horned lark, tricolored blackbird, (nomadic colonies), orange-throated whiptail, coastal western whiptail, San Diego horned lizard, northern red-diamond rattlesnake, mule deer and mountain lion.

The actively grazed portion of the Chiquita pastures is enclosed by a four-strand barbed wire fence located below Tesoro High School for the northern boundary, along Chiquita Ridge for the western boundary and the west side of Gobernadora Creek for the eastern boundary. Internal fencing to separate cattle from other uses, such as the orchards, the Chiquita wetland mitigation sites and the wastewater treatment plant also divides the pasture. Fencing along San Juan Creek for the River Pasture forms the southern boundary of the actively grazed portion of Chiquita pastures. Water is provided by a cattle trough in the lower part of the pasture and via Chiquita Creek.

The portion of Upper Chiquita pasture between Oso Parkway and the Tesoro High School fence was actively grazed as part of the Lower Chiquita Pasture until construction of Tesoro High School was initiated in 2000.

The portion of Cecil's Pasture and Upper Chiquita north of Oso Parkway and Horseshoe Pasture have not been actively grazed since 1996 when RMV sold a conservation easement to the Transportation Corridor Agencies (TCA) as mitigation for the Oso Segment of the Foothill Transportation Corridor-North. In accordance with Term and Condition No. 3 of the Section 7 biological opinion issued for that project by USFWS (Biological Opinion 1-6-96-F-06) "All agricultural activities, including grazing and farming activities, shall cease within the easement area north of Oso Parkway unless approved by the Service"(p.20). This GMP will address grazing practices within the Upper Chiquita Canyon Conservation Easement Area.

g. Gobernadora Pastures

Three separate fenced pastures collectively called the Gobernadora pastures occur in the Gobernadora sub-basin: Vineyard, Bull Pasture and Lower Gobernadora. Each pasture is described separately below.

(1) *The Vineyard*

The Vineyard Pasture is located within the valley floor of the Gobernadora sub-basin. The valley floor is characterized by deep alluvial deposits within interbedded clay lenses. Vegetation in this pasture is primarily composed of agriculture (barley), annual grasslands and the riparian habitats associated with Gobernadora Creek. The more rugged uplands west of Gobernadora Creek are dominated by coastal sage scrub and grasslands. Recorded locations for listed species include two for the California gnatcatcher. Southern willow scrub in the revegetated wetland mitigation area (GERA) provides nesting habitat for least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat, yellow warbler, white-tailed kite and red-shouldered hawk. Other species of note within this pasture include California horned lark, grasshopper sparrow, orange-throated whiptail, rufous-crowned sparrow and western whiptail. Tricolored blackbirds periodically forage in the grasslands of the Vineyard Pasture. Two CNPS List 1B plants occur in the Vineyard pasture: many-stemmed dudleya and southern tarplant.

The Vineyard Pasture is enclosed by four-strand barbed wire fence. Internal fencing excludes cattle from GERA. Water is provided by cattle troughs and via Gobernadora Creek (outside of GERA).

(2) *Bull Pasture*

Bull Pasture is located within the Gobernadora sub-basin west of Gobernadora Creek. The flat to rolling terrain of this pasture exhibits areas of exhumed hardpan overlying sandy and silty substrates and exposed rock outcrops. Vegetation types in this pasture include agriculture (barley), coastal sage scrub, chaparral, oak woodlands, grassland, riparian and a small amount of disturbed area. Wildlife of note occurring in Bull Pasture include barn owl, coastal cactus wren, grasshopper sparrow, great horned owl, orange-throated whiptail, red-tailed hawk, rufous-crowned sparrow, San Diego horned lizard and western skink. Sensitive plants occurring in the pasture include many-stemmed dudleya, Catalina mariposa lily, intermediate mariposa lily and Palmer's grapplinghook.

Bull Pasture is enclosed by four-strand barbed wire fence. The RMV property perimeter fence is its northern boundary, its eastern boundary is fenced along Gobernadora ridge, its southern boundary shares a fence with the Lower Gobernadora pasture and its western fence is shared with the Chiquita Pasture. Water is provided by a cattle trough.

Lower Gobernadora

The Lower Gobernadora Pasture extends from Chiquadora Ridge to Gobernadora Ridge in an east-west direction, and from Bull Pasture and the Vineyard to the River Pasture in a north-south direction. This pasture includes the terrains of the valley floor (deep alluvial deposits with interbedded clays) and the ridges (exhumed hardpan overlying sandy and silty substrates).

Vegetation types on the east side of Lower Gobernadora Pasture include agriculture, coastal sage scrub, chaparral and oak woodlands. The more rugged uplands west of Gobernadora Creek are dominated by coastal sage scrub and grasslands. The valley floor is characterized by agriculture, annual grasses and the riparian communities associated with Gobernadora Creek and GERA. Disturbed and developed land use covers also occur in this pasture. Listed species occurring in this pasture include least Bell's vireo, California gnatcatcher, and southwestern willow flycatcher. Sensitive plant species that occur within this pasture include many-stemmed dudleya, intermediate mariposa lily, Catalina mariposa lily, Palmer's grapplinghook, southern tarplant and paniculate tarplant. Other species of note include barn owl, coastal cactus wren, desert woodrat, grasshopper sparrow, orange-throated whiptail, red-shouldered hawk, red-tailed hawk, rufous crowned-sparrow, western whiptail, white-tailed kite, yellow warbler and yellow-breasted chat.

Lower Gobernadora Pasture shares fences with Vineyard and Bull Pasture to the north, Horse Pasture and Nick's Pasture to the east along Gobernadora Ridge, River Pasture to the south and Lower Chiquita pasture to the west along Chiquadora Ridge. The wetland revegetation area, GERA, is fenced to exclude cattle. Water is provided by a cattle trough.

h. Horse Pasture

Horse Pasture is located within the Central San Juan subunit of the Central San Juan and Trampas Canyon sub-basin. Terrains in this pasture generally include erodible silts and clays. Upland vegetation types include coastal sage scrub, chaparral, oak woodlands, grassland, open water, riparian, agriculture, developed and disturbed areas (Colorspot Nursery). Listed species present in this pasture include California gnatcatcher locations north of Colorspot Nursery. Sensitive plant species include many-stemmed dudleya, intermediate mariposa lily, Catalina mariposa lily and Palmer's grapplinghook. Also present in this pasture are barn owl, coastal cactus wren, desert woodrat, grasshopper sparrow, orange-throated whiptail, red-tailed hawk, rufous crowned-sparrow, southwestern pond turtle and western whiptail.

Horse Pasture shares fences with Lower Gobernadora to the north-west, Nick's Pasture to the north-east and River pasture to the south. No active grazing occurs in this pasture due to the extent of the Colorspot Nursery operation.

i. Nick's Pasture

Nick's Pasture is also located within the Central San Juan subunit of the Central San Juan and Trampas Canyon sub-basin. Terrains in this pasture generally include erodible silts and clays. Upland vegetation types include coastal sage scrub, chaparral, oak woodlands, grassland, riparian and agriculture (citrus orchards). A small portion of this pasture is classified as developed. Listed species locations recorded in this pasture include arroyo toad, California gnatcatcher and least Bell's vireo. Sensitive plant species in this pasture include many-stemmed dudleya, intermediate mariposa lily, Catalina mariposa lily and Palmer's grapplinghook. Other species of note with locations in this pasture include barn owl, coastal cactus wren, grasshopper sparrow, orange throated whiptail, red-tailed hawk, rufous-crowned sparrow, western spadefoot toad and western whip tail.

Fencing of Nick's Pasture includes the RMV perimeter fence along the eastern edge and Bull Pasture and Lower Gobernadora to the west and fencing to separate the cattle from adjacent citrus. No permanent source of water is available for this pasture; therefore water is trucked to temporary troughs.

j. River Pasture

River Pasture straddles San Juan Creek and is within the Central San Juan subunit of the Central San Juan and Trampas Canyon sub-basin. Terrains in this subunit generally include erodable silts and clays in the uplands north of San Juan Creek and alluvial terrace deposits in San Juan Creek itself. Vegetation types within the River Pasture include agriculture, chaparral, developed, disturbed, forest, grassland, open water, marsh, riparian, coastal sage scrub, stream and oak woodlands. Listed species locations in this pasture include arroyo toad and least Bell's vireo. Other species of note include ash-throated flycatcher, barn owl, coastal cactus wren, desert woodrat, yellow-breasted chat, yellow warbler, rufous-crowned sparrow, sharp-shinned hawk, ferruginous hawk, merlin, northern red-diamond rattlesnake, orange-throated whiptail, white-tailed kite, Cooper's hawk, red-shouldered hawk, great horned owl, red-tailed hawk, great blue heron, southwestern pond turtle, two-striped garter snake, western skink, western spadefoot toad, arroyo chub and threespine stickleback.

River Pasture shares fences with Horno, Lower Chiquita, Lower Gobernadora and Horse Pasture to the north; and Sierra, Rinconada, Cristianitos and Gabino to the south in the San Mateo Watershed. Water is provided via San Juan Creek and a water trough when the creek is dry. River pasture west of Cow Camp Crossing is actively grazed. River pasture east of Cow Camp Crossing was grazed until approximately 1981. Resumption of grazing east of Cow Camp Crossing is proposed as part of this GMP.

k. South 40

South 40 Pasture is located within the Central San Juan sub-basin, adjacent to Ortega Highway. Terrains in this pasture are erodable clays and some silts. Vegetation types in this sub-basin are disturbed/agriculture (barley), annual grasses and chaparral on the steeper slopes. No sensitive plant locations occur in this pasture. Locations for barn owl, Cooper's hawk, ferruginous hawk (foraging habitat), grasshopper sparrow, loggerhead shrike, night snake, northern red-diamond rattlesnake, orange-throated whiptail, racer, red-tailed hawk, rufous-crowned sparrow, tricolored blackbird, western skink and western spadefoot toad occur in this pasture.

South 40 Pasture is fenced along Ortega highway. Water is provided via a water trough.

l. Sierra Pasture

Sierra Pasture is located partially within the Chiquita sub-basin and partially within an un-named sub-basin that is located south of Prima Deschecha. Terrains in this pasture are erodable clays and less erodable clays of low to high slope. Vegetation types in this pasture are predominately grassland and coastal sage scrub, with some riparian and minor amounts of oak woodland and forest. Agriculture and developed land uses also occur in very small amounts. No sensitive plant locations occur in this pasture. However, several California gnatcatcher locations occur, as do locations for barn owl, Cooper's hawk, ferruginous hawk, grasshopper sparrow, loggerhead shrike, night snake, northern red-diamond rattlesnake, orange-throated whiptail, racer, red-tailed hawk, rufous-crowned sparrow, tricolored blackbird, western skink and western spadefoot toad. Both the federally-listed San Diego and Riverside fairy shrimp occur within vernal pools located along Radio Tower Road within this pasture.

Sierra Pasture is fenced along Prima Deschecha Landfill, La Pata Avenue, Ortega Highway and shares fencing at the ridgeline with Rinconada Pasture. Cattle are also excluded from the Ranch House by fencing. Water is provided via a water trough.

m. Rinconada Pasture

Rinconada Pasture is located within the Trampas and Cristianitos sub-basins. Terrains in this pasture are erodable silts and clays of low to high slope. Vegetation types in this pasture are predominately coastal sage scrub, grassland, chaparral and riparian, with oak forest and smaller amounts of oak woodland. Disturbed and developed land uses also occur in this pasture, namely the Oglebay Norton Industrial Sands (ONIS) mining operation. Trampas Canyon Dam is associated with this use. The Donna O'Neill Land Conservancy also lies within the historic boundary of this pasture, although grazing no longer occurs within the Conservancy. The state- and federally-listed thread-leaved brodiaea occurs within this pasture, as do several other sensitive plants including many-stemmed dudleya, intermediate mariposa lily, Palmer's

grappling hook and Catalina mariposa lily. Of the other listed species, one California gnatcatcher location, and one Riverside and one San Diego fairy shrimp pool occur in this pasture. Both fairy shrimp occur within vernal pools located along Radio Tower Road within this pasture. Locations for barn owl, coastal cactus wren, great horned owl, Cooper's hawk, osprey (using open water), grasshopper sparrow, loggerhead shrike, night snake, northern red-diamond rattlesnake, orange-throated whiptail, racer, red-shouldered hawk, red-tailed hawk, rufous-crowned sparrow, San Diego horned lizard, turkey vulture, western spadefoot toad and white-tailed kite also occur in this pasture.

Rinconada Pasture is fenced along Ortega Highway, Cristianitos Road, the boundary with Prima Deshecha Landfill and Sierra Pasture. The Donna O'Neill Conservancy boundary is fenced to exclude cattle. Water is provided via water troughs and the mining pond associated with the ONIS operation. Although cattle are not specifically excluded from the ONIS operation, the lack of available forage in the active mine area acts as a deterrent to wandering cattle.

n. Cristianitos Pasture

Cristianitos Pasture is located partially within the Cristianitos sub-basin and partially within the Gabino sub-basin. Terrains in these portions of the sub-basins are erodable to less erodable clays and are subject to erosion under intensive grazing pressure.

Grassland, including native grasslands and coastal sage scrub are the dominant vegetation types in this pasture. Chaparral, forest and riparian also occur in lesser amounts, as do open water, stream, woodland and rock. Developed, disturbed and agriculture (citrus and avocado) also occur in this pasture. The listed thread-leaved brodiaea occurs within this pasture, as do several other sensitive plants including many-stemmed dudleya, intermediate mariposa lily, Palmer's grapplinghook, Coulter's saltbush, mesa brodiaea, small-flowered microseris, upright burhead and western dichondra.

Arroyo toad and California gnatcatcher are the two listed wildlife species with locations in this pasture. Other species of note include arboreal salamander, barn owl, California horned lark, California whipsnake, coastal cactus wren, Cooper's hawk, desert woodrat, grasshopper sparrow, great horned owl, merlin, northern red-diamond rattlesnake, orange-throated whiptail, prairie falcon, red-shouldered hawk, red-tailed hawk, rufous-crowned sparrow, San Diego horned lizard, southwestern pond turtle, coast patch-nosed snake, western spadefoot toad, western whiptail, white-tailed kite and yellow-breasted chat.

Cristianitos Pasture is fenced along Ortega Highway, Cristianitos Road, Talega Pasture and the Cristianitos/Gabino ridgeline. Citrus areas in Cristianitos are also fenced to keep cattle out. Water is provided via three defunct mining ponds and water troughs.

o. Gabino

Gabino Pasture is located within the Gabino and Verdugo sub-basins. Terrains in the Gabino sub-basin are divided into silty clays in the upper Gabino subunit and cobbly sands in the middle subunit. Upper Gabino is subject to erosion under intensive grazing pressure. Middle Gabino is a source of coarse sediments for Cristianitos Creek. Verdugo sub-basin terrains are cobbly sands with some silts. Verdugo Canyon is a source of coarse sediment for San Juan Creek.

Coastal sage scrub and chaparral are the dominant vegetation types in this pasture. Grassland, including native grasslands, and riparian also occur in lesser amounts, as do marsh, woodland and rock. Developed and agriculture also occur in this pasture in small amounts, namely Portola Camp and citrus production. Many-stemmed dudleya, intermediate mariposa lily, Coulter's saltbush and Fish's milkwort occur in this pasture.

Arroyo toad and California gnatcatcher are the two listed wildlife species with one location each, in this pasture. Other species of note include: arboreal salamander, barn owl, coastal cactus wren, Cooper's hawk, grasshopper sparrow, great horned owl, long-eared owl, orange-throated whiptail, prairie falcon, red-shouldered hawk, red-tailed hawk, rufous-crowned sparrow, San Diego horned lizard, southwestern pond turtle, two-striped garter snake, white-tailed kite and yellow-breasted chat.

Gabino Pasture is fenced along Ortega Highway, south of Gabino Creek where it shares a common fence with the Talega Pasture and at the RMV boundary with Riverside County (perimeter fence). Water is provided via Jerome's Lake, water troughs and Gabino Creek (when water is available).

p. Talega

Talega Pasture is located within the Talega and Blind Canyon sub-basins. Terrains in both sub-basins are cobbly sands and are a source of coarse sediments for Cristianitos Creek.

Coastal sage scrub, chaparral and grassland including native grasslands are the dominant vegetation types in this pasture. Riparian also occurs in lesser amounts, as do oak forest and woodland. Developed land cover also occurs in this pasture in small amounts. Thread-leaved brodiaea, many-stemmed dudleya and chaparral beargrass occur in this pasture.

Arroyo toad and California gnatcatcher are the two listed species with locations in this pasture. Other species of note include arboreal salamander, barn owl, coastal cactus wren, Cooper's hawk, grasshopper sparrow, northern red-diamond rattlesnake, orange-throated whiptail, prairie

falcon, red-tailed hawk, rufous-crowned sparrow, San Diego horned lizard, western whiptail, white-tailed kite and yellow-breasted chat.

Talega Pasture is fenced along the boundary with MCB Camp Pendleton, the RMV boundary, the TRW (Northrop Grumman) lease area and shares a common fence with Gabino and Cristianitos pastures. Water is provided via Talega Creek and water troughs.

q. TRW (Northrop Grumman) Pasture

TRW Pasture is located within the Talega and Cristianitos sub-basins. Terrains in the Talega sub-basin are cobbly sands. Talega Canyon is a source of coarse sediments for Cristianitos Creek. Cristianitos sub-basin is generally silty clays.

Coastal sage scrub and grassland including native grasslands are the dominant vegetation types in this pasture. Riparian, chaparral and forest also occurs in lesser amounts, as do open water and woodland. Developed and disturbed also occur in this pasture, namely the Northrop Grumman facility and associated ancillary uses. Many-stemmed dudleya, Palmer's grapplinghook, small-flowered microseris, Coulter's saltbush and western dichondra occur in this pasture.

Arroyo toad, California gnatcatcher and least Bell's vireo are the three listed wildlife species with locations in this pasture. Other species of note include barn owl, coastal cactus wren, Cooper's hawk, grasshopper sparrow, great horned owl, long-eared owl, northern red-diamond rattlesnake, orange-throated whiptail, red-shouldered hawk, red-tailed hawk, rufous-crowned sparrow, sharp shinned-hawk, western whiptail, yellow warbler and yellow-breasted chat.

Although listed as a pasture, no active grazing occurs within the TRW Pasture due to the ongoing lease operations of the Northrop Grumman Capistrano Test Facility.

2.1.2 Summary of Pastures Currently Actively Grazed or Proposed for Future Grazing

In summary, the following pastures are currently actively grazed: McFadden, Lower Chiquita, Vineyard, Bull Pasture, Nick's Pasture, Lower Gobernadora, River Pasture (to the Cow Camp crossing), South 40, Sierra, Rinconada, Cristianitos, Gabino and Talega. Resumption of grazing is proposed for Lower Chiquita between the Tesoro High School fence and Oso Parkway, Chiquita Canyon above Oso Parkway (including Horseshoe Pasture, but excluding Cecil's Pasture) and River Pasture east of the Cow Camp crossing. In the event that Northrop Grumman terminates their lease early, the TRW pasture would also be grazed prior to development of Planning Area 8. *Figure G-5* shows both actively grazed pastures and pastures proposed for future grazing.

CHAPTER 3: CURRENT AND FUTURE GRAZING MANAGEMENT

This Chapter addresses the objectives of the GMP set forth in Chapter 1 by: (a) reviewing the current RMV grazing practices, including residual dry matter (RDM) goals, grazing patterns and stocking rates; and (b) recommending future grazing practices that would be implemented prior to and following transfer of lands to the Habitat Reserve.

a. Current Grazing Practices

This section describes the basic practice of grazing management on RMV, both in terms of general concepts and specific applications.

The production of grassland, whether annual or native, for forage purposes is dependent on four factors: (a) precipitation, (b) temperature, (c) soil characteristics and (d) plant material residue. These four factors largely control forage productivity and seasonal species composition. These factors also change the timing and characteristics of the four distinct growth phases: (a) break of season, (b) winter growth, (c) rapid spring growth and (d) peak forage production. *Break of season* follows the first fall rains that cumulatively exceed 1 inch during a 1-week period. Timing of the break dramatically affects forage production. *Winter growth* period occurs as the fall break season ends and is the result of cooling temperatures, shorter days, and lower light levels. *Rapid spring growth* begins with the onset of warming spring temperatures, longer days and higher light intensities. Peak forage production occurs at the end of rapid spring growth (UC Extension, Leaflet 21378).

While the precise dates of the four distinct growth phases are subject to the factors noted above, generally on RMV the annual grasses break of season occurs late October – early November, winter growth occurs mid-December through early February, rapid spring growth occurs between early February and mid-March and peak forage production occurs by late March. Although influenced by the same factors noted above, native grasses generally lag slightly behind annual grasses by about eight weeks on RMV (T. Bomkamp, pers. comm.).

RMV has grazed cattle on its property since 1882. Since that time, RMV has practiced a rotational grazing pattern that takes into account available water, forage productivity and a desire to maintain an average of 25% RDM for “natural” or “unimproved” pastures. The 25% RDM has proved over time to sustain cattle grazing while at the same time contributing to high biodiversity on RMV lands. Natural pastures are those not artificially improved through the planting of a forage crop such as barley. Availability of water, forage productivity and the desired level of RDM in turn dictate the stocking levels of RMV pastures.

The following sections describe the existing pasture configurations, forage residue, stocking levels and grazing patterns on RMV lands.

1. Existing Pasture Configurations & Resources

The current configuration of active grazing pastures or future configuration of a proposed grazing area is shown on *Figure G-5*.

- ***Active Grazing Pastures***

The following pastures are actively grazed and will be continue to be grazed prior to transfer of lands to the Habitat Reserve: McFadden, Lower Chiquita, Vineyard, Nick's, Bull, Lower Gobernadora, River (west of the Cow Camp crossing), South 40, Sierra, Rinconada, Cristianitos, Gabino and Talega.

- ***Proposed Grazing Pastures***

Resumption of grazing is proposed for: Lower Chiquita between the Tesoro High School fence and Oso Parkway and River Pasture east of the Cow Camp crossing (permanently, following transfer of lands to the Habitat Reserve). In the event that Northrop Grumman terminates their lease early, the TRW pasture would also be grazed prior to development of Planning Area 8. Grazing in Upper Chiquita and Horseshoe Pasture may occur subject to recommendations from the Science Panel and approval by the Wildlife Agencies. Grazing practices in these areas are further discussed below.

2. Forage Residue Criteria

Residue or dry residual matter (RDM) is the dry organic matter remaining at the end of grazing. RMD, acting as mulch, influences germinating plants and soil organic matter. RMD is therefore a major manageable factor governing productivity and composition (UC Extension, Leaflet 21378). Amounts of RDM per acre vary according to geography, soil conditions and livestock use. Areas with heavy rainfall, erosive soils or steep hills need more residual dry matter than do flat, stable soils in drier climates. To maintain desired forage production, therefore, it is useful to set *minimum* RDM standards. RMV has historically used an average minimum RDM of 25%. If produced forage was 1,000 lbs per acre for a pasture, the RDM would be 250 lbs per acre as the minimum standard for pastures with natural forage; *i.e.*, annual/native grassland. RMV also plants forage (barley) in the alluvial valleys of Lower Chiquita, Vineyard, Bull Pasture, Lower Gobernadora and South 40. RDM standards are not established for planted forage areas because these areas are replanted annually and thus their recovery is not dependent on RDM. This GMP

will review the 25% RDM standard for natural forage and make recommendations for revisions as necessary.

As an example of a post-peak productivity assessment of the RDM conditions on the property, existing RDM was estimated in July 2003 using the visual determination method described in UC Extension Leaflet 21327. RMV staff estimated existing RDM using the following levels:

- *Light* grazing leaves little or no patchy appearance. Unused plant matter averages 3 or more inches in height and small objects are masked. The RDM is more than an average of 800 pounds per acre.
- *Moderate* grazing leaves an average of 2 inches of unused plant matter, a patchy appearance and little bare soil. Small objects will not show at a distance of 20 feet or more. The RDM ranges from 400 to 700 pounds per acre.
- *Heavy* grazing leaves less than 2 inches of unused plant matter. Small objects and areas of bare soil are visible at 20 feet or more. RDM is less than 400 pounds per acre.

To verify the visual assessment, actual RDM weights were taken in three pastures in accordance with the method described in Leaflet 21327. Results of this verification were as follows:

- Rinconada: 1,890 lbs per acre
- Sierra: 1,038 lbs per acre
- Gabino: 1,946 lbs per acre

The assessment results (*Table 1*) and the subsequent dry weight verification show that RDM on RMV typically reflects light to moderate grazing.

TABLE 1
ESTIMATED DRY RESIDUAL MATTER FOR
RANCHO MISSION VIEJO PASTURES IN JULY 2003

Pasture	Grazing Level	Estimated Dry Residue Based on Visual Estimates
McFadden	Light	>750 lbs/ac
Chiquita pastures ¹	None	>800+ lbs/ac
Nick's Pasture	None	>800+ lbs/ac
River Pasture	Light – Moderate	>650-750 lbs/ac
Sierra	Light	>750 lbs/ac
Rinconada	Light	>750 lbs/ac
Cristianitos Pasture	Light	>700-800 lbs/ac
Gabino	Light - Moderate	>600 lbs/ac
Talega	Light	>800 lbs/ac

3. Existing Grazing Patterns

Generally cattle are grazed in the natural southern pastures (South 40, Sierra, Rinconada, Cristianitos, Gabino and Talega) from October to May to take advantage of the break of season through peak production of annual grasses. In late May or early June cattle are moved from the southern pastures to the northern pastures in the Chiquita and Gobernadora sub-basins (*i.e.*, Lower Chiquita, Lower Gobernadora, Vineyard, Nick's and Bull Pasture) and McFadden pasture and remain there until late September to take advantage of the barley stubble. From May through most of September, the southern pastures “rest.” From October through most of May the natural areas of the northern pastures rest, while the alluvial valleys of Lower Chiquita, Bull Pasture, Lower Gobernadora and the Vineyard are re-planted with barley. Allowing a rest or fallow period is a well known agricultural concept, the benefits of which are documented in the literature. On RMV, these periods of rest are essential for the production of the next grazing seasons forage, particularly in the natural southern pastures. During the transition from the southern pastures to the northern pastures in May or June, cattle are held temporarily in River Pasture, while adjustments to the herd size are made. On average the herd size is reduced by 20% during this transition time. In late September, cattle are returned to the southern pastures.

4. Existing Stocking Rates

Stocking rates on RMV vary according to the availability of water, the productivity of forage and the RMV 25% RDM standard. Generally speaking, in an average rainfall year, the RMV cattle

¹ Residues were estimated for Upper Chiquita. Lower Chiquita is planted with barley therefore residues are not applicable.

herd averages approximately 500 head during the southern pasture grazing season (October – May), distributed as follows: Talega 60 head, Gabino 130 head, Cristianitos 130 head, Rinconada 70 head and Sierra 110 head. As discussed above the herd is reduced by 20% during the transition from the southern pastures to the northern pastures, resulting in approximately 400 head being distributed in the northern pastures between June and September as follows: McFadden 30, Chiquita pastures 270 head, and Vineyard, Bull Pasture, Lower Gobernadora 100 head (combined).

a) Residual Dry Matter

As noted above, the RDM for RMV pastures should account for rainfall, slope and soil type. Rainfall averages 12 to 16 inches per year, generally falling between the months of November and March. Sixteen (16) inches is considered “normal” for RMV. Wet and dry cycles, typically lasting 15 to 20 years, are characteristic of southern California. The region presently appears to be emerging from a wetter-than-normal cycle of years beginning in 1993. Previously, five consecutive years of sub-normal rainfall and runoff occurred in 1987 through 1991 (PCR 2002). 2001 and 2002 were both below normal rainfall years (averaging 4 inches), while 2003 and 2004 were above normal at 18 and 16 inches respectively. Years with less than average rainfall result in lower productivity and can affect species composition. *Table 2* sets forth the 25% recommended RDM levels for existing and proposed RMV pastures.

**TABLE 2
RECOMMENDED RESIDUAL DRY MATTER
FOR RANCHO MISSION VIEJO PASTURES**

Pasture	Slope	Soil Type	Recommended Dry Residue
McFadden	Low-moderate	Clays & Silts	750 lbs/ac
Chiquita pastures	Low – Moderate	Mixed sands/silts and hardpan	750 lbs/ac
Bull Pasture	Moderate	Clays & silts	750 lbs/ac
Nick's Pasture	Low – Moderate	Clays & silts	750 lbs/ac
River Pasture	Low	Mixed silts/ clay and alluvium	725 lbs/ac
South 40	Low-Moderate	Clays	750 lbs/ac
Sierra	Moderate	Clays	750 lbs/ac
Rinconada	Low – Moderate	Silts	750 lbs/ac
Cristianitos Pasture	Low- Moderate	Clays	750 lbs/ac
Gabino	Moderate	Mixed silts/ clay and sands/silts	750 lbs/ac
Talega	Moderate	Sands	750 lbs/ac

b) Stocking Rate

To determine stocking rates for RMV pastures, two factors must be known: (a) the total monthly forage requirement and; (b) the total annual forage per pasture. The following methodologies are taken from UC Extension Leaflet 21456. The Animal Unit (AU) is the standard measurement of livestock forage requirements. One Animal Unit Month (AUM) is the amount of feed required to support one AU for one month. This value depends on the type of feed used (*i.e.*, 1 AUM = 1,000 lb of air dry forage [*e.g.*, stand of annual grasses], 800 lb of hay, or 533 lb of concentrate, etc.). *Table 3* shows representative AU values of air dry forage for cattle at different production stages using a mature cow with calf as the Standard Unit of 1.0.

i. Total Forage Requirement

**TABLE 3
ANIMAL UNIT VALUES FOR AIR DRY FORAGE**

Animal Type	AU	Monthly Forage requirement/head (lb air dry forage) ²
Mature cow with calf	1.00	1,000
Mature bull	1.25	1,250
Weaned calf	0.60	600
Yearling 12-17 mos	0.70	700
Yearling 17-22 mos	0.75	750

To determine the total monthly forage requirement, multiply the monthly forage requirement per head by the number of animals to be grazed:

$$\begin{array}{r} \text{Monthly} \\ \text{Forage} \\ \text{Requirement/} \\ \text{Head} \end{array} \times \begin{array}{r} \text{Number} \\ \text{of} \\ \text{Animals} \end{array} = \begin{array}{r} \text{Total} \\ \text{Forage} \\ \text{Required/} \\ \text{Month} \end{array}$$

Using the average RMV herd of 500 head, divided into Animal Units as follows, 300 mature cows with calf, 20 mature bulls, 75 yearlings 12-17 mo and 75 yearlings 17-22 months, and 30 weaned calves the total forage required per month is as set forth in *Table 4*:

² Monthly forage = AU x 1,000 air dry forage

**TABLE 4
TOTAL FORAGE REQUIRED PER MONTH**

Animal Type	Number of Animals	Monthly Forage requirement/head (lb air dry forage)	Total Forage Required/Month (lbs/month)
Mature cow with calf	300	1,000	300,000
Mature bull	20	1,250	25,000
Weaned calf	30	600	18,000
Yearling 12-17 mos	75	700	52,500
Yearling 17-22 mos	75	750	56,250
Total	500		451,750

To calculate the total forage required, multiply the total forage required per month by the grazing season:

$$\begin{array}{l} \text{Total} \\ \text{Forage} \\ \text{Required/} \\ \text{Month} \end{array} \times \begin{array}{l} \text{Grazing} \\ \text{Season} \end{array} = \begin{array}{l} \text{Total} \\ \text{Forage} \\ \text{Required} \end{array}$$

For the 500 head of cattle (300 mature cows with calf, 20 mature bulls, 75 yearlings 12-17 mo and 75 yearlings 17-22 months, and 30 weaned calves in Animal Units) RMV grazes for 8 months in the southern pastures, 3,614,000 lbs of forage would be required. For the 400 head that graze in the northern pastures for 4 months, assuming the same number of bulls and a 20% reduction in cows, yearling and weaned calves, (for a total of 240 mature cows with calf, 20 mature bulls, 60 yearlings 12-17 mo and 60 yearlings 17-22 months, and 20 weaned calves in Animal Units) total forage required would be 1,486,000 lbs of forage.

ii. Total Available Forage

Total available forage is calculated by subtracting the desired RDM from the estimated production value and multiplying the difference by the number of grazable acres, as follows:

$$(\text{Production per Acre} - \text{RDM per Acre}) \text{ Acres} = \text{Available Forage}$$

For example, available forage on a 10-acre pasture with a recommended RDM of 750 lbs per acre with a production value of 3,000 lbs per acre would be $(3,000 - 750) \times 10 = 22,500$ lbs available forage. In this example the 10-acre pasture would be capable of supporting 22-23 mature cows with calves for one month. Because the quantity and quality of available forage changes throughout the year, it is necessary to make seasonal adjustments. For example, late

season or summer natural forage has limited nutrient value (a more common sense way to think of this is “green grass is better than brown grass). *Table 5* sets forth adjustment factors.

TABLE 5
SEASONAL FORAGE AVAILABILITY ADJUSTMENT

Season of Use	Seasonal Availability Adjustment
Year long	1.0
Winter	0.7
Spring	1.3
Summer	0.8
Fall	0.6

Total available forage is calculated by multiplying the available forage by the seasonal adjustment factor, as follows:

$$\text{Available Forage} \times \text{Seasonal Adjustment} = \text{Total Available Forage}$$

For example, using the available forage of 3,000 lbs from the previous example and adjusting for the highest production value (*i.e.*, Spring), the total available forage would be 3,000 lbs x 1.3 x 10 = 39,000 lbs for the 10-acre pasture, thus increasing the number of mature cows with calves capable of being supported by this pasture for one month to 39.

Tables 6 and *7* estimate the total available forage for each of the RMV pastures subject to this GMP. As noted above precipitation, temperature, soil characteristics and residue influence production and as such total available forage varies from year to year. For this GMP, an average production value of 3,000 lbs was used (Leaflet 21456) based on the observed post-peak productivity assessment taken in July 2003 (after grazing in the southern pastures) and rainfall on RMV. Available forage is only calculated for those pastures with RDM goals; *i.e.*, natural or unimproved pastures. As noted above, southern pastures are grazed in the winter and spring, while northern pastures are grazed in the summer and fall. *Tables 6* and *7* reflect this rotational grazing pattern. Note that McFadden is not included in the table due to its small size and limited ability to support many cattle.

TABLE 6
TOTAL AVAILABLE FORAGE IN POUNDS FOR NORTHERN PASTURES

Pasture	Summer	Fall
Chiquita pastures	493,200	369,900
Bull Pasture	9,000	6,750
Nick's Pasture	135,000	101,250
River Pasture	313,040	234,780
Total	950,240	712,680

TABLE 7
TOTAL AVAILABLE FORAGE IN POUNDS FOR SOUTHERN PASTURES

Pasture	Winter	Spring
Sierra	916,650	1,702,350
Rinconada	582,750	1,082,250
Cristianitos	1,847,475	3,431,025
Gabino	1,343,475	2,495,025
Talega	735,525	1,365,975
Total	5,425,875	10,076,625

Based on the Total Available Forage set forth in *Tables 6 and 7*, and the required forage discussed above (3,614,000 lbs of forage in southern pastures for 500 head [per the Animal Units noted above] and 1,486,000 lbs of forage for northern pastures for 400 head) natural RMV pastures produce more than sufficient forage to support the average RMV herd. It should be noted that in addition to the natural northern pastures, Vineyard, Bull, and the alluvial valleys of Lower Gobernadora and Lower Chiquita are improved via barley plantings which contribute significant additional forage value. According to Leaflet 21424 the forage quality of improved grasslands (*i.e.*, planted barley) is excellent and produces an increase in quality value of 0.3 over un-improved pastures. Therefore if production value of an acre of un-improved pasture is 3,000 pounds per acre, then barley pastures would have an additional production value of 450 lbs per acre, or 3,900 lbs per acre total. For the approximately 1,000 acres of barley that RMV plants its production value would equate to 3,900,000 lbs of production value. This would be in addition to the available forage listed in *Table 6*. Using a mature cow with calf as a the typical AUM, 1,000 acres of barley is capable of supporting an additional 975 cows for the 4 month period that cattle are grazing in the northern pastures.

Based on the Total Available Forage set forth in *Tables 6 and 7*, maximum stocking rates based on a mature cow (1,000 lbs AUM) for existing and proposed natural northern and southern pastures are set in *Tables 8 and 9*. These rates also reflect RMV's experience with managing

cattle, location of water and other factors not necessarily directly related to the production value of any given pasture. These stocking rates for northern pastures do not include cattle grazed on barley; therefore, overall herd size in summer and fall will be higher than noted here due to the availability of barley forage. It should be noted that these stocking rates are designed to be adapted to the conditions in any given year such that the recommended residue is maintained. Changes to the stocking rates should be made according to the methods reviewed above. Other factors which influence the decision of how many cattle to stock in general (*i.e.*, what size cattle herd to maintain) are those related to expenses. Expenses include insurance, interest, utilities (*e.g.*, cost of water), health costs (inoculations, etc), transportation, materials (*e.g.*, fencing costs) and labor. It is the combination of forage availability, expenses and market demand for beef that ultimately determine the herd size on RMV subject to the criteria set forth in the following subsection. Note that McFadden pasture supports an average of 30 head in the summer and less in the fall.

TABLE 8
MAXIMUM STOCKING RATES IN ANIMAL UNITS
FOR NATURAL NORTHERN PASTURES

Pasture	Summer	Fall
Chiquita pastures	116	102
Bull pasture	7	3
Nick's Pasture	45	29
River Pasture	69	44
Total	237	178

TABLE 9
MAXIMUM STOCKING RATES IN ANIMAL UNITS
FOR NATURAL SOUTHERN PASTURES

Pasture	Winter	Spring
Sierra	56	107
Rinconada	76	142
Cristianitos	187	345
Gabino	279	516
Talega	80	149
Total	678	1,259

b. Future Grazing Practices to Be Implemented Prior to and Following Transfer of Lands to the Habitat Reserve

The NCCP and SAMP policies call for the GMP to address the following goals contained within the GMP policy of *Part I, Chapter 4*, namely:

- allow for continued cattle grazing sufficient to support cattle operations consistent with the recent low/moderate grazing regime;
- address the needs of species and habitat requiring the seasonal exclusion of cattle grazing within defined areas and for specified time periods;
- promote perennial grasses including native grasses in the manner identified by the AMP; and
- where appropriate, reduce fuel loads for fire.

The first part of this Section focuses on: (a) those aspects of the policies dealing with sufficiency of forage consistent with the continuation of a low moderate grazing regime; and (b) species needs necessitating the exclusion of cattle grazing. The potential use of cattle grazing, where appropriate and feasible, in conjunction with AMP enhancement/restoration measures and fire management is discussed later in this Section.

1. Future Pasture Configurations and Resources

The configuration of the Habitat Reserve will influence the number of cattle grazed on RMV lands, as available pasture will be reduced with future development. Based on the Proposed Conservation Strategy under the NCCP/MSAA/HCP, the B-12 Alternative, the following pastures would be reduced by future development: Chiquita, Gobernadora, Bull, Nick's, Rinconada, Talega and TRW (in the event TRW pasture is grazed prior to development), see *Figure G-6*. McFadden pasture would be phased out entirely. While the exact timeframe for phase-out of pastures, or portions thereof is dependant on multiple factors including the real estate market conditions, infrastructure schedules, project phasing etc., the generally estimated timeframe for phase-out is set forth in *Table 10*. The reduction in available grazing acres and available forage will result in a smaller cattle herd being grazed on RMV over the long term, particularly in the northern pastures. Southern pastures are less affected by development therefore herd size will remain similar to the pre-development condition.

TABLE 10
ESTIMATED PASTURE PHASE OUT YEAR

Pasture (or portions thereof)	Estimated Phase Out Year ³
McFadden	2007
Lower Chiquita (east of Chiquita Creek & below CWTP)	2009
Gobernadora	2011
Nick's	2013
Bull	2013
South 40/Cristianitos/Gabino	2013
Rinconada	2018
TRW/Talega (lower elevation portions)	2032

2. Future Residue

As explained in the prior section dealing with existing residue, current RMV practice is to leave at least 25% RDM at the end of grazing. This practice has resulted in light to moderate grazing on RMV lands and has contributed to sustaining cattle grazing while protecting biodiversity. This operating principle will continue to be followed both prior to and subsequent to the transfer of lands to the Habitat Reserve.

3. Future Grazing Patterns

Due to the relatively greater amount of development in the San Juan Watershed under the B-12 Alternative, gradual adjustments to the historic north-south grazing pattern will be necessary to be consistent with the phasing of development. At the completion of all development activities, under the B-12 Alternative, grazing will occur in a modified north-south grazing pattern involving the following southern pastures; all of the Sierra Pasture, the majority of the Cristianitos, Gabino and TRW/Talega pastures, small portions of Rinconada pasture; and the following northern pastures; the portion of Lower Chiquita west of Chiquita Creek and east of Chiquita Creek above the Chiquita Wastewater Treatment Plant, Bull and Vineyard Pasture (refer to *Figure G-6*). During the transition from the southern pastures to the northern pastures, cattle will be temporarily grazed in River Pasture, while adjustments to the herd size are made. Due to the reduced northern pasture available under the B-12 Alternative as buildout occurs, the

³ The dates provided for Ranch Plan development are approximations only and based upon assumptions and estimates that are subject to change due to several factors including, but not limited to, market conditions, unit mix, infrastructure schedules, project phasing and timing of development. Thus, the information provided should be considered illustrative only and should not be construed as a guaranteed commitment of development.

herd size reduction following development and transfer of lands to the Habitat Reserve will be greater than under the existing grazing practices. Future reductions will range from 30 % for the average RMV herd to up to 70% of the pre-project condition for the northern pastures if the maximum herd size is grazed.

Subject to the recommendations of the Science Panel and approval of the Wildlife Agencies, grazing within Upper Chiquita and Horseshoe pastures north of Oso Parkway is permitted when used as a management tool to control invasive species for the benefit of Covered Species. In order to graze cattle within the Upper Chiquita and Horseshoe pasture north of Oso Parkway, improvement to the fencing adjacent to Oso Parkway and SR-241 will be necessary. A thorough evaluation and improvements as necessary of all fencing in the Chiquita pastures shall be conducted prior to the reintroduction of cattle into this area.

4. Future Stocking Rates

Based on the estimated phase out years noted above in *Table 10*, the available forage from the reduced pastures discussed above and shown in *Figure G-6*; the following are the maximum stocking rates in a post development scenario. As noted above, gradual reductions to this level will occur as development occurs and pastures are partially or totally phased out.

**TABLE 11
MAXIMUM STOCKING RATES IN ANIMAL UNITS
FOR NATURAL NORTHERN PASTURES AFTER DEVELOPMENT**

Pasture	Summer	Fall
Chiquita pastures	5	3
Bull pasture	90	44
River Pasture	69	44
Total	164	123

**TABLE 12
MAXIMUM STOCKING RATES IN ANIMAL UNITS
FOR NATURAL SOUTHERN PASTURES AFTER DEVELOPMENT**

Pasture	Winter	Spring
Sierra	56	107
Rinconada	31	58
Cristianitos	173	331
Gabino	160	298
Talega	76	142
TRW	38	70
Total	534	1006

5. Seasonal Sensitive Habitat Exclusions Following Dedications to the Habitat Reserve

Sensitive habitat exclusions (*i.e.*, those areas where cattle should be excluded) can be broken into two categories: (a) those areas from which cattle should be removed on a temporary basis (*e.g.*, seasonally); and (b) those areas where cattle should be removed permanently.

a. Seasonal Exclusions

i. Seasonal Species Exclusions

The purpose of seasonal exclusions is to remove cattle from a specific area for a specific time period for the benefit of a specific resource or species. This GMP recommends seasonal exclusions for the arroyo toad during its breeding season. The potential benefits and drawbacks of seasonal exclusions for Riverside fairy shrimp and San Diego fairy shrimp are also discussed.

The breeding season of the arroyo toad that runs approximately from March to mid-June. As noted above, RMV grazing practice is to graze cattle in the southern pastures from October to May. In late May or early June cattle are moved from the southern pastures to the northern pastures in the Chiquita and Gobernadora sub-basins and remain there until late September. During the transition from the southern pastures to the northern pastures, cattle are held temporarily in River Pasture, while adjustments to the herd size are made. Arroyo toads occur in discrete reaches of San Juan Creek, lower Gabino Creek, lower Cristianitos Creek and Talega Creek (see *Part I, Chapter 4*). The potential for cattle grazing and toad breeding to overlap, therefore, occurs in the following pastures: Cristianitos (Gabino Creek), TRW/Talega (Talega Creek) and River (San Juan Creek) pastures. Arroyo toads do not occur in upper Gabino Creek within Gabino pasture. Arroyo toads in lower Cristianitos Creek are addressed below under “Permanent Exclusions.” No recommendations are made for Talega Pasture because Talega Creek is largely located on MCB Camp Pendleton property, outside the RMV perimeter fence.

To reduce potential toad mortality resulting from trampling of either egg masses or metamorphs by cattle, following dedication of the applicable lands to the Habitat Reserve, the following seasonal exclusions are recommended for San Juan and Gabino creeks. Fencing will be installed when the location and timing of toad breeding overlaps with cattle grazing in River or Gabino pastures. In years when the two events do not overlap, exclusionary fencing will not be necessary. It is anticipated that the installation of exclusionary fencing will be possible in most instances of toad breeding; however, physical constraints (such as the presence of rock) may occasionally make the installation of fencing infeasible.

- Cattle shall be seasonally excluded from active breeding pools and adjacent sand bars and benches to the maximum extent practical within lower Gabino Creek during arroyo toad breeding season. To the extent feasible and/or necessary, temporary fencing around active breeding pools and adjacent sand bars and benches shall be erected to discourage cattle from entering these areas.
- Cattle shall be seasonally excluded from active breeding pools and adjacent sand bars and benches to the maximum extent practical within San Juan Creek during arroyo toad breeding season. To the extent feasible and/or necessary, temporary fencing around active breeding pools and adjacent sand bars and benches shall be erected to discourage cattle from entering these areas.

As described in *Part I, Chapter 7*, grazing can have both positive and negative impacts on vernal pools and associated species. Grazing can help control the proliferation of invasive exotics species such as annual grasses that choke out native plants and alter the natural hydrology of the pool and local contributing watershed (*e.g.*, Barry 1998), but poorly timed grazing can result in trampling of fairy shrimp cysts and hatchlings, as well as increase water turbidity. The management issue for the Radio Tower Road pools is therefore timing grazing in way that helps control non-native plants, but does not interfere with the functions and values of the vernal pools, most importantly, the reproductive cycle of vernal pool plant and animal species. Because studies in the Central Valley suggest that grazing exclusions can actually reduce the hydroperiod for vernal pools and may have the unintended consequence of reducing the ability of fairy shrimp to complete their life cycle prior to pond drying (Marty 2005), changes to the current grazing practices of rotational grazing are not recommended. However, subject to further studies and recommendations by the Science Panel, cattle may be excluded from the Radio Tower Road vernal pools as follows:

- If recommended by the Science Panel, cattle shall be seasonally excluded from the Radio Tower Road vernal pools once sufficient rainfall has occurred to result in the pools ponding (*i.e.*, holding water) to a depth of at least 1 inch lasting for at least 24 hours. To the extent necessary (*i.e.*, if cattle are being grazed in the Sierra Pasture), temporary fencing shall be erected around the pools to discourage cattle from entering the pools. If erected, fencing shall remain in place until the pools are sufficiently dry that cattle hooves do not result in soil disturbance and compaction.

ii. Short-Term Post-Fire Recovery Exclusions

Grazing can inhibit the recovery of burned areas. Burned areas, whether as a result of a prescribed burn or an “unplanned” wildfire, need time to recover. The re-introduction of cattle into a burned area too early can negatively affect the natural recovery process and may result in

state-transition from one vegetation type to another (e.g., coastal sage scrub to annual grassland). However, introduction of cattle at an appropriate time can benefit recovering areas by controlling invasive species as the vegetation recovers to its natural state. The WFMP contains management hypotheses to be tested for three of the major vegetation communities on RMV (coastal sage scrub, grassland and oak woodland). Results of the testing of these hypotheses will help identify the optimal time that grazing can be re-introduced into a burned area.

b. Permanent Exclusions

The purpose of permanent exclusions is to remove cattle from a specific area for the benefit of a specific resource or species. Cattle are permanently excluded from Lower Cristianitos Creek via fencing around the perimeter of the Donna O’Neill Conservancy as shown in *Figure G-7*. *Figure G-7* also shows fencing adjacent to Cristianitos Road that would separate cattle in a future TRW pasture from Cristianitos Creek. Cattle are currently excluded from the Gobernadora Ecological Restoration Area (GERA), the Donna O’Neill Conservancy and the Ladera Open Space. The GMP recommends continued exclusion of cattle from these areas, except for fuel modification treatment within GERA and the Donna O’Neill Conservancy as discussed in the next section. In addition to grazing for fuel load reduction purposes in these areas, at the recommendation of the Science Panel, grazing as a management tool for the benefit of Covered Species is allowed. Cattle are currently excluded from Upper Chiquita and Horseshoe pastures. As noted above, subject to the recommendations of the Science Panel and approval of the Wildlife Agencies, grazing as a management tool for the benefit of Covered Species may occur in Upper Chiquita and Horseshoe pastures.

6. Future Grazing Patterns in Relation to AMP Enhancement/ Restoration and Management Goals

The NCCP/MSAA/HCP describes grazing as a Covered Activity under the Proposed Conservation Strategy. Similar to the Water Quality Management Plan (WQMP; *Appendix K*), the GMP is not a formal element of the HRMP. However, as noted in previously in this GMP, where appropriate and feasible, grazing management can support AMP enhancement, restoration and management goals.

a. Potential Role of Grazing in Enhancement/Restoration of Native Grasses

Prior to discussing grazing practices and the AMP enhancement, restoration and management goals, it is useful to review the literature on grazing, particularly as it relates to native (valley and foothill) grasslands. As noted in the introduction to this GMP, a long history of intensive grazing in California following European settlement, combined with the innate competitive advantage of non-native grasses (which produce huge seedbanks compared with the root system expansion of

native grasses) has been cited as one of the primary reasons for the demise of native grasslands and dominance of non-native grasses throughout California (Burcham 1957; Keeley 1990; Bartolome and Gemmill 1981). However, as further noted in the introduction to this GMP most research has found that some intensity of grazing is beneficial to, or at least does not negatively affect, native grasses (Huntsinger *et al.* 1996). Several researchers have documented cases where native grasses have not increased in abundance on sites that have been excluded from grazing over 20- to 40-year periods (White 1967; Bartolome and Gemmill 1981; Goode 1981). Heady (1968, 1977) suggested that large native herbivores present prior to European colonization may have been an important factor in grassland formation and ecology. This assertion supports findings that some form of managed grazing may be useful as part of efforts to maintain or restore native grasses. Menke (1996) considers “Prescribed grazing to constitute the primary component of the first phase of a perennial grass restoration program.” (pg. 23). Edwards (1992) notes that “bunchgrasses can benefit from grazing in a number of ways.” (p.7) Grazing prevents the accumulation of dead residue within the grass bunch, increasing vigor and greater culm and seed production. Thatch reduction between bunches allows light and space for seedling recruitment. Edwards goes on to state “with proper levels of grazing at proper times, grazing can selectively reduce competition from plants lacking comparable recovery reserves such as annual grasses.” The concept of timed grazing (*i.e.*, proper levels of grazing at proper times) is central to the grazing systems described by Allan Savory in his Holistic Resource Management (HRM) (www.holisticmanagement.org). Thus, timed grazing, both to reduce competition from non-native grasses (which start spring growth about 8 weeks earlier on RMV lands than native grasses) and to remove thatch in native grasses, could serve as a technique for enhancing existing native grasses and restoring native grasslands pursuant to the AMP. Appropriately timed grazing can have several beneficial effects on the vigor of native grasslands:

1. Removal of litter and thatch
2. Recycling of nutrients
3. Stimulation of tillering (sprouting of new stalks)
4. Removal and control of alien species
5. Reduced transpiration (loss of water) by alien species making more water available for native grasses.

b. *Timed Grazing Recommendations for Specific Sub-Basins*

At the request of the RMVLC based on a recommendation by the Science Panel, RMV may, if feasible, agree to implement timed grazing as a management action to actively enhance existing native grasslands located in Upper Gabino, Upper Cristianitos or Blind Canyon.

UPPER GABINO CANYON CSS/VGL ENHANCEMENT AREA

Upper Gabino Canyon currently generates fine sediment due to extensive gully formation in the headwaters area. A combination of slope stabilization, grazing management and coastal sage scrub/valley needlegrass grassland (CSS/VGL) restoration will reduce sediment generation and promote infiltration of stormwater which will reduce downstream impacts. This area has been identified for CSS/VGL restoration because some areas mapped as grassland in 1990 have since naturally revegetated with sparse CSS. Allowing a mixed community to regenerate may thus represent a more natural climax situation. This area has at least one area of annual grassland adjacent to the creek suitable for revegetation and several patches of low quality VGL suitable for enhancement.

To support management actions to actively enhance native grasslands in Upper Gabino, grazing patterns could be managed to encourage proliferation of existing VGL. Two potential grazing adjustments are identified to support this management action: (1) reduced stocking rate and (2) timed grazing. Both of these potential adjustments would be experimental and subject to adaptation depending on the results.

The first grazing adjustment would involve temporarily decreasing stocking rates to a maximum of 50 head for one to three VGL growing seasons; *i.e.*, November through April. This reduced stocking rate is anticipated to provide sufficient time for establishment of VGL species in the enhancement areas.

The second potential adjustment would involve timed grazing. In order to encourage the proliferation of existing VGL, cattle would be grazed in the upper portion of Gabino Pasture identified for VGL enhancement during rapid spring growth and the peak production of annual grasses; *i.e.*, early February to late March. Grazing cattle during the rapid growth period and peak production of annual grasses will reduce annual grass seed production, reduce transpiration by the annual species, remove litter and thatch from native grasses and promote the recycling of nutrients. By grazing cattle during the rapid spring growth and peak production of annual grassland species and then moving the cattle off the VGL enhancement area, native species will start their rapid spring growth and peak production after the cattle have reduced the competition from annual species. The reduction of thatch in native-grasslands resulting from cattle grazing will also foster the growth of native-grasslands.

UPPER CRISTIANITOS VGL ENHANCEMENT AREA

Section 6 of the Draft Southern Planning Guidelines describes the Upper Cristianitos VGL enhancement area as follows:

Upper Cristianitos is recommended for VGL revegetation and enhancement to reduce the generation of fine sediments from clayey terrains, promote stormwater infiltration and to enhance the value of upland habitats adjacent to Cristianitos Creek. This area includes patches of annual grassland underlain by clay soils suitable for revegetation and low quality VGL suitable for enhancement. These recommended revegetation and enhancement areas also are contiguous with existing medium quality grassland, suggesting a high likelihood of successful restoration.

To support management actions to enhance VGL in Upper Cristianitos, a small adjustment to current grazing practices could be tested. As noted in the description of the RMV grazing patterns, the southern pastures, including Cristianitos, are grazed between October and May. In order to reduce competition from annual grasses in the VGL enhancement area, grazing in the VGL enhancement area could be concentrated in early February to late March during the rapid spring growth and peak production periods for annual species and ahead of the same periods for native species beginning by late March early April.

UPPER CHIQUITA CANYON CONSERVATION EASEMENT AREA

As discussed previously in this GMP, cattle have not been grazed in the Chiquita Pasture north of Oso Parkway since 1996. Consistent the requirements of the FTCN – Oso Section Biological Opinion and TCA’s management plan for this area, the following grazing practices are recommended for Chiquita Pasture north of Oso Parkway. RDM is set at 750 lbs per acre. Based on the productivity of the Chiquita grasslands, the recommended maximum stocking rate will be 146 head in a normal rainfall year. As noted previously stocking rates are subject to change (either up or down) to maintain the recommended RDM. Chiquita is a northern pasture and as such is recommended for grazing in the summer and fall, specifically from May/June through late September.

c. *Potential Role of Grazing in the Long-Term Management of the Coastal Sage Scrub Vegetation Community*

As previously described in this GMP, the RMV practices of a north-south rotational grazing pattern can be postulated as the “proper level of grazing at the proper time” for RMV pastures. As reviewed previously, the current diversity and quality of vegetation types and species on RMV would support this conclusion. As a whole, RMV lands can be characterized as high quality upland and riparian vegetation communities that support a variety of listed and unlisted species as described in Chapter 2 of this GMP and further described in *Part I, Chapter 3*. However, what, if any direct relationship occurs between historic rotational grazing patterns and the presence of high quality biota and sensitive species on RMV? A specific example of this question occurs in the Chiquita pastures. The highest densities of California gnatcatchers occur

in the Chiquita pastures (particularly between Oso Parkway and San Juan Creek) which have not burned since the 1950's but are actively grazed. Based on this set of factors, one could postulate that the timed grazing used by the Ranch benefits coastal sage scrub by controlling the proliferation of annual grasses and maintaining a habitat structure suitable for the California gnatcatcher. Alternatively, one could postulate that the prevalence of gnatcatchers in the Chiquita pastures is related to the production of barley as forage for cattle in the Chiquita pastures - the cattle concentrate in the planted areas and do not forage extensively in the coastal sage scrub (the barley has a higher nutrient value); as a consequence the light grazing in CSS may provide a thinning function that offsets or substitutes for the absence of a major wildfire in middle Chiquita Canyon in over 50 years. Or there may be no relationship as a third alternative. In any event, it does appear that, generally speaking, cattle and coastal sage scrub species have co-existed on RMV for several decades under the north-south grazing pattern and this practice is compatible with species persistence on the Ranch. Where feasible under the grazing program, the continued review of light grazing as an alternative to prescribed fire could be undertaken as part of the AMP.

d. Grazing Management in Relation to the AMP Fire Management Plan

As discussed in *Section 3.1*, one of the objectives of this GMP is to identify pastures that may be subject to prescribed fire, and identify appropriate pasture rest periods following burns to promote habitat recovery.

The AMP includes a Wildland Fire Management Plan (WFMP; *Appendix N*) as an integral element of the overall AMP. The WFMP is composed of five parts: (1) Fire Management Program; (2) Long-Term Strategic Fire Protection Plan; (3) Short-Term Tactical Fire Suppression Plan; (4) Prescribed Fire Program; and (5) Research and Monitoring Criteria. Pertinent to this GMP is the relationship between grazing and fire. According to the WFMP, "because of the high numbers of wildfires that have burned through Rancho Mission Viejo since the late 1900's plus an active cattle grazing program, and the late 1980's and early 1990's Vegetative Management Program (prescribed burns) the wildland vegetation is fairly uniform throughout RMV" (page 3-9). The predominate vegetation over most of the Ranch is "scattered coastal sage scrub over cured grass" (Fuel Model 2). Should the fire frequency be disrupted (*i.e.*, longer intervals between fires occurs) or cattle grazing be eliminated from RMV, the result would be an evolution of the vegetation into fuel models that have the potential for catastrophic fires; *i.e.*, FM 6 (chaparral fuels 6 ft in height or less) and eventually FM 4 (chaparral fuels greater than 6 ft). Grazing management therefore plays a positive role in the management of fire (*i.e.*, suppression of catastrophic wild fires) on RMV.

The WFMP identifies prescribed burns as a management tool in the following areas:

- Sulphur Canyon (CSS restoration site)
- Talega/La Paz Canyon (Oak woodland site)
- Cristianitos/Gabino (Oak woodland site)
- Chiquita/Narrow Canyon (Native grassland site)
- Canada Gobernadora (Native grassland site)

The WFMP contains no management hypotheses for riparian systems because, according to the WFMP, “fire has no place in riparian area management.” According to the WFMP most fires in riparian zones are accidental and of high severity, causing relatively high rates of top kill. Riparian areas should be kept fire free if at all possible. According to the WFMP, the fuel load in GERA is increasing and there is an abundance of ladder fuels that will carry wildfire into the crowns of the planted oaks, willows and sycamores. The WFMP recommends maintenance of a fire break between GERA and the surrounding native or non-native fuels (along with the pruning of low hanging branches on the oaks and sycamore to reduce ground fire laddering). To facilitate the reduction of fuel loads within GERA, this GMP proposes the use of timed grazing within GERA. Once every three years, up to 30 head of bulls will be grazed in GERA between the months of June to October. Timed grazing within GERA will reduce the risk of a severe wildfire in GERA by reducing the presence of both the grass fuel load and the ladder fuel load. To reduce potential impacts to southwestern willow flycatcher and least Bell’s vireo that may breed in GERA, the following seasonal exclusion shall apply:

- Grazing within GERA for fuel modification purposes once every three years shall be conducted outside the breeding season for southwestern willow flycatcher and least Bell’s vireo (February 15 to July 15).

Similar to GERA, the Donna O’Neill Land Conservancy may require periodic fuel load reduction. Up to 20 head of cattle for a period of 60-90 days in late summer/early fall (August-October) once every three years is recommended as the method to reduce fuel loads. Due to the timing of the proposed grazing for fuel load reduction purposes, impacts to breeding birds or arroyo toads are not anticipated.

In order to manage fuel loads within Middle Gabino and La Paz canyons, RMV periodically grazes goats in these areas. Once every five years RMV will graze goats in these areas in the summer months (June through August) and once every three years RMV will graze goats in these areas in the fall/winter months (September through January). In order to maximize fuel load reduction, the goat grazing is highly managed through the use of temporary electric fencing or hog wire and a shepard and herding dogs to confine the goats to a specific area. The primary

target for fuel load reduction in Middle Gabino and La Paz canyons is the chaparral vegetation community. Given the location of known arroyo toads in the Gabino and La Paz sub-basins, the target vegetation community for fuel load reduction and the highly managed nature of the goat grazing, potential conflicts between goat grazing and arroyo toads are minimal and non-significant. No exclusions are proposed for goat grazing.

CHAPTER 4: MONITORING

4.1 Relationship of Grazing Management Plan to Stressor Based Adaptive Management Program

Part I, Chapter 7 describes the proposed Adaptive Management Program (AMP) element of the overall Habitat Reserve Management Program (HRMP) for the Habitat Reserve. The proposed AMP is stressor based. The underlying principle of this approach is that management and monitoring should be directed primarily towards environmental factors known or thought to be directly or indirectly responsible for ecosystem change. Cattle-related impacts are identified as one of six general environmental stressors known or likely to be relevant to the Habitat Reserve. *Part I, Chapter 7* presents conceptual models that depict known and potential relationships between cattle-related impacts and the vegetation community and individual species responses. Further *Chapter 7* presents adaptive management issues, goals and objectives and monitoring in relation to these conceptual models. Hypotheses between the role of grazing and vegetation communities and individual species responses are set forth, and monitoring is proposed to test these hypotheses.

Because the GMP is a “coordinated management plan” and thus is not a formal element of the AMP, it is not the function of this GMP to postulate and test adaptive management hypotheses. Rather, it is the role of the AMP to place the existing and future grazing program, as part of the proposed project and a potential stressor, in the context of adaptively managing vegetation communities and individual species as described in *Part I, Chapter 7*. As described in *Section 3.1*, the purposes of the GMP are to: (1) demonstrate consistency with NCCP/MSAA/HCP Habitat Reserve policies regarding grazing management; and (2) support, where appropriate, the long-term AMP goals of enhancement/restoration of native habitats. To achieve these purposes, the GMP has identified grazing practices which, consistent with the framework of the existing grazing management program, would: (1) maintain bio-diversity (*e.g.*, the continuing natural regeneration of oak woodlands); (2) provide specific post-dedication protections for certain Covered Species and other planning species; (3) promote perennial grasses, including native grasses; (4) provide sufficient forage to support a cattle operation and; (5) where appropriate, reduce fuel loads for fire. The monitoring portion of the GMP should therefore seek to answer whether these purposes are being achieved. In answering whether these objectives are being

achieved, monitoring for the GMP will provide valuable input into the iterative feedback loop of the AMP

4.2 Monitoring Objectives

To answer the question of whether the GMP is achieving its goals the monitoring objectives are established for each of the elements addressed by the GMP; namely, forage production, restoration of native habitats and sensitive habitat exclusions:

4.3 Forage Production and Residue

Objectives

The following objective is established for forage production and RDM:

- Monitor forage production such that stocking rates up to the maximum set forth in *Tables 8 and 9* can be grazed on RMV lands while maintaining a minimum RDM of 25%.

Monitoring

Accurate inventory and monitoring is essential to effective management of the grazed pastures. This information together with the existing conditions data described in the NCCP/MSAA/HCP will provide RMV managers with the data set necessary to set and adjust AUM's, determine current pasture conditions, predict future pasture conditions, and evaluate management practices.

a. Plot Location and Design

Forage production and RDM measurements should be taken in all natural or unimproved pastures. A minimum of ten permanent sample plots should be established on a stratified basis throughout the pasture in locations indicative of representative or typical conditions, such as slope, aspect, soil conditions, etc., in order to obtain a representative measurement of average forage production and RDM. All plot locations should be located using GPS and a permanent marker to provide a consistent record. Forage production measurements should be taken at peak forage production time to record the maximum available forage. RDM should be measured before the break of season.

b. Technique

According to Leaflet 21327, RDM weights can be estimated by direct clipping and weighing, double sampling (visual estimates with clipped herbage reference points) and, with experience,

visual estimates. The current RMV managers have over 40 years experience in running cattle on RMV lands and have traditionally used the visual estimate method. RMV managers intend to continue using this method. To provide a verification of the visual estimate, direct clipping and weighing will also be used periodically. The normal procedure for determining the weight of RDM is to use a square foot or frame and clip the herbage as close to the ground as possible (approximately 0.5-inch high). All litter or shattered plant material at the ground surface which can easily be picked up should be included in the sample. Grams scales are recommended for weighing samples in the field, and air-dry weights are satisfactory under most summer and early fall conditions. Wet or green forage samples should be oven dried for dry matter determination. Grams per square foot multiplied by 96 gives the pounds per acre. Example: 12 grams per square foot x 96 = 1,150 pounds per acre. All species within the square foot will be recorded, as will physical information including soils, soil moisture, slope and aspect. Weather conditions at the time of sampling will also be recorded.

c. Permanent Photo Points

In conjunction with the selection of plot locations and the location of same with GPS and permanent marker, a photo point will be established. Photos should be taken at the time of sampling using the same ASA film and approximately the same time of day. The photo point will provide a visual reference of the plot location, and further verify the visual estimate of the RMV managers.

d. Reporting

All forage production and RDM measurements will be recorded on data sheets and compiled for use in the annual report discussed in *Section 4.7*.

4.4 Restoration of Native Vegetation

Monitoring for the restoration of native vegetation and their response to the application of timed grazing as a restoration technique will be accomplished as part of the AMP, and not as part of this GMP. The monitoring obligation of the GMP relative to restoration of native vegetation is to ensure that the recommended grazing patterns are followed. In this regard brief monthly reports will be prepared by RMV managers documenting the location and number by pasture of cattle on RMV.

4.5 Sensitive Habitat Exclusions

Similar to restoration of native habitats, the monitoring of specific habitat or species responses to cattle exclusions is a function of the AMP. Monitoring through the AMP will determine whether

exclusions are a positive or negative influence through the iterative testing of hypotheses related to the conceptual models prepared for both habitat types and specific species.

The obligation of the GMP is to monitor and report on implementation of the recommended exclusions. For permanent exclusions, (*e.g.*, GERA), RMV managers will report quarterly on the status of the exclusion. Questions such as is the exclusionary mechanism (*e.g.*, fencing) in place and whether the mechanism is effective (*e.g.*, is it keeping cattle out) will be asked. If the mechanism is not effective, alternatives will be proposed and reviewed with the Habitat Reserve Manager.

For seasonal exclusions, (*e.g.*, arroyo toad breeding season, vernal pools), reporting will occur on a weekly basis for the duration of the exclusion. Similar questions will be asked for seasonal exclusions *e.g.*, Is the exclusionary mechanism (*e.g.*, fencing) in place and whether the mechanism is effective (*e.g.*, is it keeping cattle out?) will be asked. If the mechanism is not effective, alternatives will be proposed and reviewed with the Habitat Reserve Manager.

4.6 Fuel Load Reduction and Grazing for the Benefit of Covered Species

Grazing in GERA and the Donna O’Neill Conservancy for either fuel load reduction purposes or for the benefit of Covered Species shall be monitored for effects to Conserved Vegetation Communities and Covered Species. A report including before and after photographs of a set of fixed points in GERA and/or the Donna O’Neill Conservancy as applicable will be submitted to the Habitat Reserve Manager within 3 months of terminating the fuel modification or Covered Species benefit grazing. The Habitat Reserve Manager will include this report in the next applicable report submittal to the Wildlife Agencies.

4.7 Annual Reporting

RMV managers will provide the Habitat Reserve Manager with an annual report summarizing all monitoring efforts and the results thereof.