Midpeninsula Regional
Open Space District

R-17-51
Meeting 17-10
April 26, 2017

AGENDA ITEM 6

AGENDA ITEM

Approval of Rangeland Management Plan for October Farm

GENERAL MANAGER'S RECOMMENDATIONS

1. Determine that the recommended actions are categorically exempt from the California Environmental Quality Act (CEQA) as set out in the staff report.

2. Approve the Rangeland Management Plan for the October Farm portion of the Purisima Creek Redwoods Open Space Preserve.

3. Adopt an Amendment to the Preliminary Use and Management Plan for the October Farm portion of the Purisima Creek Redwoods Open Space Preserve to incorporate the Rangeland Management Plan.

SUMMARY

On March 14, 2012 (R-12-30), the Board approved the purchase of the October Farm portion of the Purisima Creek Redwoods Open Space Preserve ("October Farm") and associated Preliminary Use and Management Plan ("PUMP"). Per the PUMP, the District has continued grazing under a year-to-year interim grazing lease with a tenant while a comprehensive Rangeland Management Plan ("Plan") was being developed. In 2016 Sage and Associates, Inc., a California Certified Rangeland Manager (CRM), completed a comprehensive plan for October Farm and, if the Plan is approved by the Board, the District will develop a long-term conservation grazing lease for October Farm and continue the use of livestock grazing for natural resource and vegetation management.

DISCUSSION

The District acquired the 270-acre October Farm in 2012 as an addition to the Purisima Creek Redwoods Open Space Preserve (Attachment 1). The property, located within the Coastal Annexation Area, included livestock grazing at the time of acquisition. Per the Coastside Service Plan, continuation of livestock grazing was required and the District entered into an interim grazing lease with an existing grazing tenant, Doug Edwards, under the General Manager's authority. At the time of acquisition, the Board also adopted the PUMP for October Farm, which required:

> "*Preparation of a Rangeland Management Plan in accordance with the District's Coastside Service Plan and the District's Grazing Management Policy. Present the*

Rangeland Management Plan for review and approval by the District Board of Directors. Rent the grassland areas for cattle grazing on a short-term interim basis until Rangeland Management Plan and lease is developed for the property."

In accordance with the PUMP, the District hired Sage and Associates, Inc. in 2016 to develop a comprehensive Rangeland Management Plan (Plan) for October Farm (Attachment 2). Sage and Associates was selected through a competitive bid process in which they were the lowest priced responsive, responsible bidder. Staff presented the Plan to the San Mateo County Farm Bureau on April 3, 2016 at their regular meeting. The main recommendations from the Plan are summarized below:

Stocking Rate:
The Plan recommends seasonal rotational grazing on October Farm during the spring and early summer months with an estimated 186 Animal Unit Months (AUMs) equivalent to 36 cows for six months. Additionally, the Plan identifies that year-round rotational grazing is also acceptable, provided adequate stock water is available. Applying the same annual stocking rate of 186 AUMs, this would be equivalent to 18 cows year-round.

Rangeland Infrastructure:
October Farm was historically grazed with well-developed infrastructure in place and the Plan requires no immediate need for improvements. Perimeter fencing is in good repair and requires no replacement or additional sections to be installed. Interior fencing is a combination of natural barriers and wire fencing in good repair. Additional fencing may be constructed to protect natural resources if unacceptable damage is observed per the District's Natura Resource Policies.

Stock water is provided by a groundwater well powered by a windmill and stored in a 5,000-gallon tank. Water is distributed to three (3) troughs throughout the upland grassland areas.

Corrals are located adjacent to Lobitos Road and are in good condition.

Natural Resource Management:
Grassland resources on the October Farm property are typical of the San Mateo coast, with the grasslands dominated primarily by non-native European grasses. The presence of invasive vegetation is a concern, including thistles and moderate to severe impacts from brush encroachment into the grasslands. Control of invasive vegetation is recommended, including coyote brush, to protect and enhance grassland habitat. The District and the current grazing tenant are working to control noxious vegetation on October Farm through the District's Integrated Pest Management (IPM) program.

October Farm contains two (2) stock ponds, one seasonal pond in the grazing area and one perennial pond located on the other side of Lobitos Road in a portion of the preserve that is not accessible to livestock grazing. Both stock ponds have the potential to support rare aquatic wildlife species. Some rare wildlife species that have been identified within the grassland areas of the Preserve include burrowing owl and American badger, both of which use California ground squirrel burrows throughout the grassland areas. The grasslands provide quality forage for migratory birds.

FISCAL IMPACT

Using the District's current AUM rate of $16.05 per AUM and an estimated annual stocking rate of 186 AUMs, annual revenue generated by the grazing lease will be approximately $2,985.00.

BOARD COMMITTEE REVIEW

Board committee review was not required for this item.

PUBLIC NOTICE

Public notice was provided as required by the Brown Act.

CEQA COMPLIANCE

Project Description

The project consists of amending the District's Preliminary Use and Management Plan for the October Farm portion of the Purisima Creek Redwoods Open Space Preserve to allow the continuation of cattle grazing under specific prescriptions and rangeland management practices set forth in the Rangeland Management Plan (Plan) and the District's future award of a long-term lease with a grazing tenant. Due to its location within the Coastside Protection Area, the project incorporates all of the San Mateo County Coastal Annexation Final Environmental Impact (FEIR) mitigation measures that apply to agricultural land management within the Coastside Protection Area and is subject to the FEIR mitigation monitoring program.

The Plan provides the District and the District's grazing lessee(s) with guidance for management practices for soil and water conservation, pest, and erosion control for the 168-acre grassland and shrubland portions of the October Farm property that are used for conservation grazing land operations. Conservation management practices components include specific recommendations for: livestock grazing and rangeland management; livestock and wildlife water development; livestock and wildlife fencing maintenance; land management; roads and infrastructure maintenance; and wildlife, water quality and habitat management.

No change of use would occur as a result of implementing this Plan since the current grazing practices on the property would continue. The Plan would facilitate the approval of a long-term lease for the grazing operations and would be included as an amendment to the District's 2012 Preliminary Use and Management Plan, associated with the property acquisition.

CEQA Determination

The District concludes that this project will not have a significant effect on the environment. It is categorically exempt from CEQA (California Environmental Quality Act) under Article 19, Sections 15301, 15302, 15304 of the CEQA Guidelines as follows:

Section 15301 exempts operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The proposed plan recommends maintenance of the existing roads for erosion control including placement of water bars, rip rap, and straw bales, when needed. The road and road infrastructure maintenance are covered activities under an

existing Routine Maintenance Agreement with the California Department of Fish and Wildlife and San Francisco Bay Regional Water Quality Control Board. The project incorporates the District's approved Integrated Pest Management (IPM) Program and Environmental Impact Report mitigation measures for invasive pest species management. The proposed plan also calls for maintenance of existing native plants by mowing. Under the proposed plan, there will be no expansion of use, and the property will be operated under a long-term lease.

Section 15302 exempts construction and location of limited numbers of new, small facilities or structures. The proposed plan recommends installation of one new 5,000-gallon water tank, one new water trough, and a connecting line within the upland grasslands of an existing pasture.

Section 15304 exempts minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. Section 15304(a) exempts grading on land with a slope of less than 10 percent, except that grading shall not be exempt in a waterway, in any wetland, in an officially designated scenic area, or in officially mapped areas of severe geologic hazard as delineated by the State Geologist. Section 15304(b) exempts new landscaping, and 15304(f) exempts minor trenching and backfilling where the surface is restored. The proposed plan recommendation to install the new 5,000-gallon water tank, one new water trough, a connecting line, and minor fencing will involve minor grading, trenching, and backfilling. The proposed plan also calls for the reseeding of disturbed areas to prevent erosion. This work will not involve removal of healthy, mature, scenic trees, and will not occur in a waterway, any wetland, an officially designated scenic area, or in an officially mapped area of severe geologic hazard.

NEXT STEPS

Pending Board approval of the General Manager's recommendations, staff will implement the Rangeland Management Plan and develop a long-term grazing lease for management of October Farm.

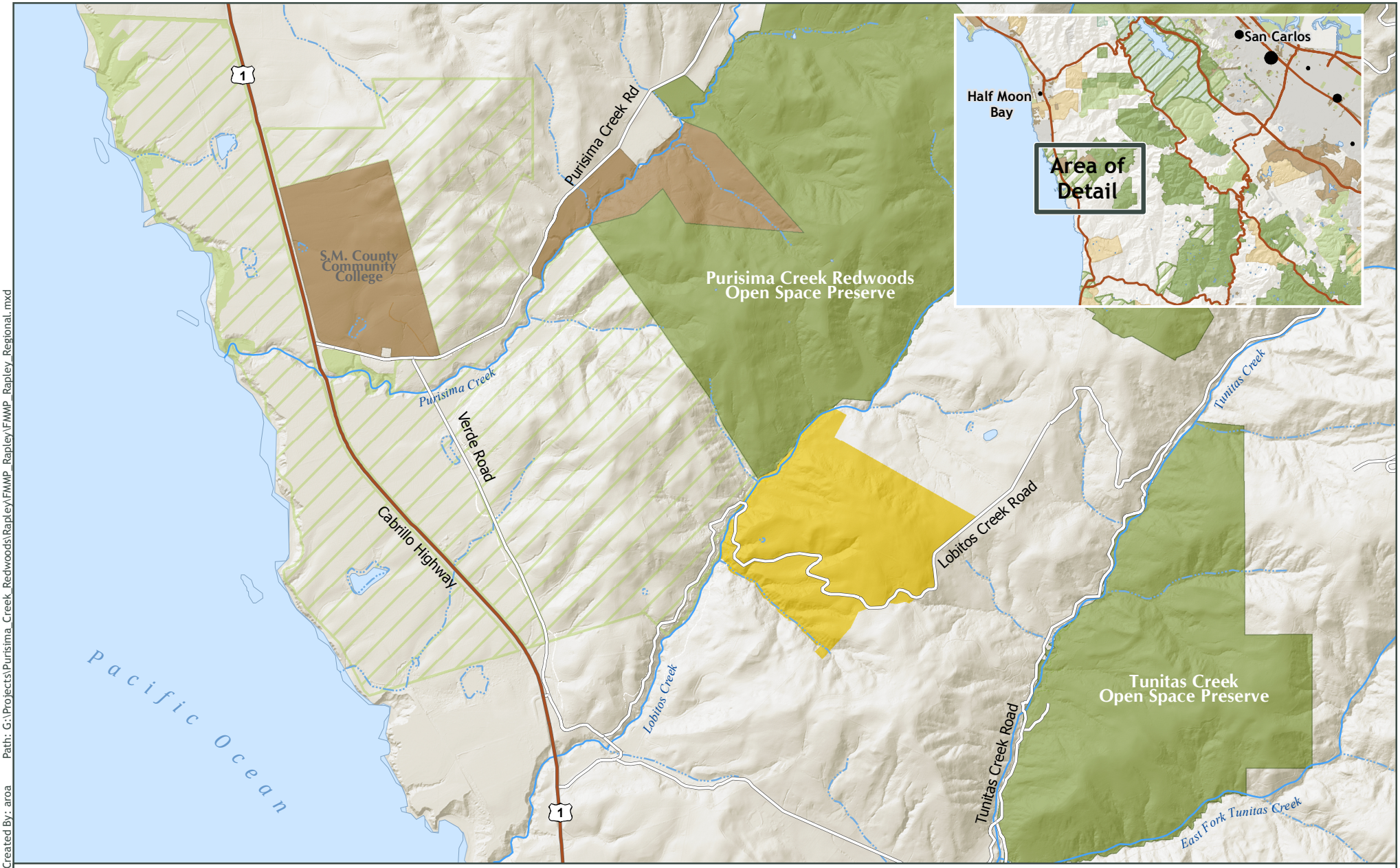
Attachments

1. Map
2. October Farm Grazing Management Plan

Responsible Department Head:
Kirk Lenington, Manager, Natural Resources Department

Prepared by:
Clayton Koopmann, Resource Management Specialist II

Attachment 1



Created By: aroa Path: G:\Projects\Purisima_Creek_Redwoods\Rapley\FMMP_Rapley\FMMP_Rapley_Regional.mxd

Location Map, POST (October Farm) Property

- POST (October Farm) Property
- MROSD Preserves
- Other Protected Open Space or Park Lands
- Watershed Land
- Other Public Agency
- Non MROSD Conservation or Agricultural Easement
- Private Property

Midpeninsula Regional Open Space District *(MROSD)*

August, 2011

Miles 0 0.5 1

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

SAGE
Associates
AGRICULTURAL AND ENVIRONMENTAL CONSULTANTS

Offices in
Santa Barbara
Mammoth Lakes

OCTOBER FARM

GRAZING MANAGEMENT PLAN

PREPARED FOR:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022-1404
Attention: Mr. Clayton Koopmann, Rangeland Ecologist

PREPARED BY:
SAGE Associates, April 2016

1396 Danielson Road, Santa Barbara, California 93108 • P.O. Box 50806, Santa Barbara, California 93150
805 969-0557 FAX 805 969-5003 sage@silcom.com

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

EXECUTIVE SUMMARY

October Farm Grazing Management Plan

Sage Associates prepared the October Farm Grazing Management Plan in April of 2016 at the request of Mr. Clayton Koopmann-Rangeland Ecologist for the Midpeninsula Regional Open Space District (MROSD).

The 270-acre October Farm property is located in the San Mateo County Coastside Protection Area, along Lobitos Creek Road, about two miles northeast of the intersection of State Highway 1. Approximately 168 acres of the property is designated Grazing Land and about 115 acres are designated as Other Land comprised of more dense vegetation of which some areas can be grazed. Most of the Grazing Land is utilized for a seasonal cow/calve grazing operation. A residential enclave in the southeast portion of the property is not part of the grazing operation.

The grazing land includes grassland and interspersed shrubland areas available for cattle grazing along ridges, terraces, swales and foothill sideslopes. Ridgetop elevations top out at about 850 feet.

MROSD Goals are to Manage District land with livestock grazing that is compatible with public access; to maintain and enhance the diversity of native plant and animal communities, manage vegetation fuel for fire protection, sustain the local agricultural economy, and preserve and foster appreciation for the region's rural agricultural heritage. In order to implement this goal, the purpose of this plan is to provide a framework around which resource managers can make rangeland management decisions on the properties with adaptive management feedback.

As stipulated in this plan, conservation management practices components are to be implemented by the MROSD and grazing lessee(s), for all grazing areas, and are included specifically to apply to Livestock Grazing and Rangeland Management; Livestock and Wildlife Water Development; Livestock and Wildlife Fencing Maintenance; Land Management; Roads and Infrastructure Maintenance; and Wildlife, Water Quality, and Habitat Management on the approximately 168-acre portion of the properties that are used for grazing land operations.

The remaining approximately 115 acres include brushland and woodland that are not suitable for livestock grazing but provide valuable wildlife habitat and cover.

Operation and Infrastructure Requirements: The grazing land should be operated with one lessee with a multi-year grazing lease. Cattle can be off-loaded at the corrals along Lobitos Creek Road and fed certified weed-free hay for 24 hours in the corral (for weed control from manure) and then rotated into the first three pastures Pasture management grazing can follow a pattern whereby pasture rotation can occur as follows across the three pastures:

1st Year :	East	Middle	West

2nd Year :	Middle	West	East
3rd Year:	West	East	Middle
4th Year :	East	Middle	West
Etc.			

Depending upon water availability, the grazing season shall from mid to late spring into summer because the pastures contain a preponderance of annual grasses and coyote bush, however, the residual dry matter (RDM) must exceed minimum performance standards in the first utilized pasture or four inches of green grass growth must be present in that pasture prior to turn out of cattle. As of March 17, 2016 cattle had not been turned out by the current lessee. The lessee felt that the ground was too wet after recent rains and would wait a couple of weeks. Green grass height exceeded four inches. Cattle are planned to be grazed by the lessee into August depending on forage availability. Below normal rainfall has persisted the last four years, with closer to normal rainfall thus far this year. Lessee stewardship has responded to lower rainfall by reducing stock rates to 24 animal units (144 animal unit months) for a six month period.

The above rotation schedule will vary on the three pastures since pastures are not equal in size, water availability, or forage productivity. Therefore, a rotation schedule is to move more frequently from mid to late spring into June and less frequently in the summer. The estimated carrying capacities based on soil survey forage production estimates and RDM requirements for an average rainfall year are 32 animal units for six months or 186 Animal Unit Months (AUMs), which is slightly above the current conservative stocking rate.

Stocking intensity may require a downward or upward adjustment depending on rainfall amounts and distribution and temperatures. The lessee(shall be able to make necessary stocking adjustment during the grazing season in order to achieve the performance standards as closely as possible. Performance standards are included below per average slope:

0 to 30% slopes: an average minimum of two inches to three inches of residual dry matter – approximately an average of 600 – 1,000 pounds per acre as slopes become steeper.

Greater than 30% slopes: an average minimum of three to four inches of residual dry matter – approximately an average of 1,000 to 1,200 pounds per acre as slopes become steeper.

To improve RDM distribution and resource management, salt blocks and liquid feed supplements shall be placed by the lessee at least 1/8 mile away from accessible water sources and any future public access roads and trails. Salt locations should be moved periodically to further improved forage utilization and so as not to over utilize any given area.

Livestock water is the limiting factor to grazing on the upper parts of the Middle and West pastures. A water trough and tank is planned for the upper part of these pastures from an existing well and windmill. Water development would cost about $4,500.

MROSD roads and road infrastructure maintenance should be coordinated with the cattle lessee. Roads are well maintained and are in good condition at this time. and should not be graded except for repair.

During the grazing season, fencing and water infrastructure maintenance and repairs shall be the responsibility of the lessee with materials supplied by MROSD.

The monitoring program for grazed MROSD lands must ensure that the specified rangeland uses are in compliance with the applicable land use regulations and the land stewardship goals, objectives, and implementing guidelines. Rangeland/habitat health checklists and photo point monitoring forms are to be utilized for the rangeland-monitoring program on an annual basis in the fall prior to rainfall. The monitoring program implementation shall be the responsibility of the MROSD staff.

1.0 INTRODUCTION

1.1 Background and Location

Sage Associates prepared the October Farm Grazing Management Plan in April of 2016 at the request of Mr. Clayton Koopmann-Rangeland Ecologist for the Midpeninsula Regional Open Space District (MROSD).

This plan incorporates materials supplied by Mr. Koopmann including base topographic/ortho photomaps, a vegetation habitat map, soils map and acreages, and property descriptions. A field assessment was conducted in March of 2016 by Sage Associates to update grazing and resource information and to determine water and fence locations and potential monitoring photo points. Maps are located by figure number in Appendix A and photos are located by photo number in Appendix B.

The 270-acre October Farm property is located in the San Mateo County Coastside Protection Area, about nine miles southeast of Half Moon Bay, on both sides of Lobitos Creek Road, about two miles east of the intersection of State Highway 1 (Figure 1). Approximately 168 acres of the property is designated Grazing Land and about 115 acres are designated as Other Land comprised of dense vegetation some of which can be grazed and some of which have been mowed. (Figure 2). Most of the Grazing Land north of Lobitos Creek Road is utilized for a seasonal cow/calve grazing operation. A residential enclave in the southeast portion of the property is not part of the grazing operation. The property includes grassland and interspersed shrubland areas available for cattle grazing along ridges, terraces, swales and foothill sideslopes. Ridgetop elevations approach 850 feet. Lobitos Creek forms the northwest property boundary and is not grazed.

1.2 Purpose, Goals, and Policies of the Grazing Management Plan

The purpose of this plan is to provide a framework around which resource managers can make rangeland management decisions on the properties with adaptive management feedback. The plan addresses appropriate management practices for soil and water conservation, erosion control, pest management, nutrient management, water quality, and habitat protection on the approximately 168-acre grassland and shrubland portions of the property that is mostly used for grazing land operations. The remaining 115 acres include brushland and woodland that are not suitable for livestock grazing but provide valuable wildlife habitat and cover.

The Mission Statement of the MROSD is:

"To acquire and preserve a regional greenbelt of open space land in perpetuity; protect and restore the natural environment; and provide opportunities for ecologically sensitive public enjoyment and education."

In the spirit of the Mission Statement, in September 2006 the MROSD staff formulated

Goals, Policies, and Implementation Measures for potential areas of grazing land within the District.

Goal: Manage District land with livestock grazing that is compatible with public access; to maintain and enhance the diversity of native plant and animal communities, manage vegetation fuel for fire protection, sustain the local agricultural economy, and preserve and foster appreciation for the region's rural agricultural heritage.

Policies and Implementation Measures:

10.1 Ensure that grazing is compatible with and supports wildlife and wildlife habitats.

- *Inventory and assess sensitive habitats to identify areas requiring special protection. The conservation of these areas will take precedence over other uses and management practices that are determined to have an adverse effect on these resources.* Section 4 of plan.

- *Prepare site-specific management plans by a certified rangeland manager for preserves where grazing will be utilized as a resource management tool.* Section 7.1 of plan.

- *Manage agricultural leases and easements to protect and enhance riparian areas and to maximize the protection or enhancement of water quality.* Sections 5.2.3.3 and of plan.

10.2 Provide necessary infrastructure to support and improve grazing management where appropriate.

- *Utilize fencing that allows wildlife movement and fosters habitat connectivity.* Section 5.2.1.2 of plan.

- *Encourage and assist grazing tenants on District land to provide range improvements to restore or conserve wildland resources and to enhance range condition.* Section 5.2.1.2 of plan.

- *Inventory and assess roads and trails on District lands to identify significant erosion and sediment sources abandon and where feasible restore to a natural condition poorly designed or sited roads.* Sections 3.4 and 5.2.2 of plan.

- *Provide water sources and protect water quality from degradation resulting from grazing animals.* Sections 5.2.1.2 and5.2.3.5 of plan.

10.3 Monitor vegetation response to grazing on District lands.

- *Monitor forage utilization and distribution by grazing animals to assure appropriate amounts of residual dry matter remain on the ground to achieve desired resource management objectives.* Section 6 of plan.

- *Monitor livestock use levels and infrastructure condition to insure conformity with lease provisions to contribute to improved management.* Section 6 of plan.

• *Monitor wildland conditions with an emphasis on documenting the location, distribution and abundance of native grasses, wildflowers, and other native flora and*

fauna. Section 6 of plan.

• *Monitor non-native vegetation response to grazing with an emphasis on documenting the location, distribution and abundance of target invasive species.* Sections 4.2, 5.2.3.4 and 6 of plan.

10.4 *Utilize different livestock species to accomplish vegetation management objectives.*

• *Research the effective use of cattle, goats, sheep, and horses to manage vegetation on District lands.* Section 5.2.1.1 of plan.

10.5 *Provide public access in a manner that does not fragment the grazing operation unless no feasible alternative is available.*

• *Grazing operators on District lands or lands under easement to the District shall be consulted when public access is being planned and considered for the property to minimize conflicts between the public and the grazing operation.* On-going with operators.

Additional validation of the MROSD purposes, goals, and policies for working landscapes comes from The California Rangeland Resolution that recognizes the critical importance of California's rangelands along with practices that benefit sensitive species that are fully compatible with normal ranching practices, maintaining and enhancing working landscapes, and public education about the benefits of rangeland grazing. The resolution has been signed by over 150 ranches, federal and state agencies, and conservation organizations (through June 2015) and is included at the end of this section. University research has also shown that social benefits of working landscapes help to safeguard ecosystems, protect open space, and maintain traditional ranching culture (Brunson and Huntsinger (2008). Further support for managed cattle grazing for sensitive habitats and species, includes ongoing university research that seeks to explain why some threatened aquatic invertebrates such as the California tiger salamander and the California red-legged frog appear to be more abundant in grazed than in ungrazed stockponds (DiDonato, 2007).

California Rangeland Resolution

The undersigned recognize the critical importance of California's privately owned rangelands, particularly that significant portion that encircles the Central Valley and includes the adjacent grasslands and oak woodlands, including the Sierra foothills and the interior coast ranges. These lands support important ecosystems and are the foundation for the ranching industry that owns them.

WHEREAS, these rangelands include a rich and varied landscape of grasslands, oak woodlands, vernal pools, riparian areas and wetlands, which support numerous imperiled species, many native plants once common in the Central Valley, and are home to the highest diversity and density of wintering raptors anywhere in North America;

WHEREAS, these rangelands are often located in California's fastest-growing counties and are at significant risk of conversion to development and other uses;

WHEREAS, these rangelands, and the species that rely on these habitats, largely persist today due to the positive and experienced grazing and other land stewardship practices of the ranchers that have owned and managed these lands and are committed to a healthy future for their working landscapes;

WHEREAS, these rangelands are a critical foundation of the economic and social fabric of California's ranching industry and rural communities, and will only continue to provide this important working landscape for California's plants, fish and wildlife if private rangelands remain in ranching;

THEREFORE, we declare that it is our goal to collaboratively work together to protect and enhance the rangeland landscape that encircles California's Central Valley and includes adjacent grasslands and oak woodlands by:

- ☐ Keeping common species common on private working landscapes;
- ☐ Working to recover imperiled species and enhancing habitat on rangelands while seeking to minimize regulations on private lands and streamline processes;
- ☐ Supporting the long-term viability of the ranching industry and its culture by providing economic, social and other incentives and by reducing burdens to proactive stewardship on private ranchlands;
- ☐ Increasing private, state and federal funding, technical expertise and other assistance to continue and expand the ranching community's beneficial land stewardship practices that benefit sensitive species and are fully compatible with normal ranching practices;
- ☐ Encouraging voluntary, collaborative and locally-led conservation that has proven to be very effective in maintaining and enhancing working landscapes;
- ☐ Educating the public about the benefits of grazing and ranching in these rangelands.

California Rangeland Resolution Signatories *(June 2015)*

Agricultural - Natural Resources Trust of Contra Costa County
Alameda County Board of Supervisors
Alameda County Resource Conservation District (RCD)
Amador RCD
American Farmland Trust
Audubon California
Bay Area Open Space Council
Bear Yuba Land Trust
Blue Ridge Berryessa Natural Area Partnership
Bureau of Land Management
Burrowing Owl Preservation Society
Butte County RCD
Butte Environmental Council
Cachuma RCD
Calaveras Co. RCD
Califlora
California Association of Resource ConservationDistricts
California Cattlemen's Association
California CattleWomen's Association
California Chapter of the International Soil and Water Conservation Society
California Climate and Agriculture Network
California Council of Land Trusts
California Deer Association
California Department of Conservation
California Dept of Fish and Wildlife
California Dept of Food and Agriculture
California Dept of Forestry and Fire Protection
California Farm Bureau Federation
California Grazing Lands Coalition
California Hawking Club
California Invasive Plant Council
California Native Grasslands Association
California Native Plant Society
California Open Lands
California Rangeland Trust
California Resources Agency
California Wildlife Foundation/California Oaks
California Wolf Center
California Wool Growers Association
Cal-Pac Section Society For Range Management
Carter Ecosystem Services
Center for Re-connecting with Nature
Central Coast Rangeland Coalition
Central Sierra Region of Resource Conservation Districts
Central Valley Bird Club
Central Valley Land Trust Council
Chimineas Ranch Foundation
City of Livermore
Coursegold RCD
Committee for Green Foothills
Community Alliance with Family Farmers
Contra Costa RCD
Contra Costa County Board of Supervisors
Defenders of Wildlife
Ducks Unlimited
East Bay Regional Park District
El Dorado RCD
Endangered Species Coalition
Environmental Defense
Felidae Conservation Fund
Foothill Conservancy
Friends of Swainson's Hawk
Glenn County RCD
Hollister Ranch
Humboldt State University Rangeland Resources
Institute for Ecological Health
Land Conservancy of San Luis Obispo
Land Trust for Santa Barbara County
Lassen Land & Trails Trust
Marin Agricultural Land Trust
Marin County RCD
Mariposa County RCD
Mendocino County RCD
Middle Mountain Foundation
Napa County Board of Supervisors
National Wild Turkey Federation
National Cattlemen's Beef Association
National Marine Fisheries Service Southwest Region Protected Resource Division
Natural Resources Conservation Service
Nevada County Board of Supervisors
Nevada County RCD
Northern California Regional Land Trust
Northern Foothills Partnership
Pepperwood Preserve
Placer County RCD
Placer Land Trust
Planning and Conservation League
Point Blue Conservation Science
Rocky Mountain Elk Foundation
Sacramento River Watershed Program
Sacramento Valley Conservancy
Santa Barbara County Farm Bureau
San Joaquin Raptor/Wildlife Rescue Center
San Joaquin Valley Conservancy
San Luis Obispo County Board of Supervisors
Sequoia Riverlands Trust
Sierra Business Council
Sierra Foothills Audubon Society
Sierra Nevada Conservancy
Solano Land Trust
Sonoma County Board of Supervisors
Sonoma Ecology Center
State Water Resources Control Board
SunOne Solutions
Sustainable Conservation
Sutter County RCD
Tehama County RCD
Tejon Ranch Conservancy
The Center for Conservation Biology at Stanford
The Nature Conservancy
Tomkat Ranch Educational Foundation
Tri-Valley Conservancy
Trust for Public Land
Tuleyome
Tuolumne County RCD
University of California
UC California Rangeland Research and Information Center
Upper Salinas-Las Tablas RCD
US Fish and Wildlife Service
US Forest Service
VernalPools.org
Western Shasta RCD
Wildlife Conservation Board
Wildlife Heritage Foundation
WildPlaces
Xerces Society for Invertebrate Conservation
Yolo County Board of Supervisors
Yolo County RCD
Yolo Land Trust

2.0 REGIONAL AGRICULTURAL USES IN SAN MATEO COUNTY

As stated in the MROSD Grazing Management goals statement:

"Livestock ranching is a small but vital part of the Bay Area's agricultural economy. As with any business that depends on local infrastructure and services, livestock ranching is increasingly threatened with each ranch that goes out of business. Every livestock rancher depends on services and supplies including veterinary care, feed sales and delivery, farm and ranch infrastructure supplies, and livestock transportation services. As land is taken out of ranching, all of these services and supplies are incrementally affected and may cease to operate, increasing the burden for families and businesses who choose to keep ranching".

In a regional context, for San Mateo County, agricultural production continued to provide a significant total gross value of $152,153,000 for 2014-a 5.9 percent increase over 2013. The 2015 crop report was not yet completed at the time that this plan was prepared.

Specific 2014 production values for San Mateo County included the following:

COMMODITY	GROSS VALUE
Vegetable Crops	**$22,107,000**
Livestock	**$2,205,000**
Fruit and Nut Crops	**$2,794,000**
Livestock and Apiary Products (cheese, eggs, wool)	**$1,658,000**
Field Crops	**$725,000**

In 2014, Cattle and calves comprised 1,562 head with a total gross value of $1,691,000. Sheep and lambs, goats, poultry, swine, etc. had a total gross value of $514,000. Livestock are grazed on about 22,000 acres of rangeland in San Mateo County with a gross value of about $306,000.

According to the San Mateo County Crop Report, livestock ranchers struggling with drought conditions resulted in a decline of 22 percent in the number of cattle and calves as stocking rates were reduced.

Future agricultural activities on MROSD lands will contribute to the overall San Mateo County, and to the adjacent counties of Santa Clara and Santa Cruz agricultural productivity. Approximately 12,000 acres of MROSD land is grazed (Koopmann, pers. comm. 2016), which is a significant portion of the San Mateo County rangeland. Land uses surrounding the property include cattle grazing, farming, and open space with scattered residential houses.

3.0 RANGELAND MANAGEMENT

3.1 Historical Agricultural Uses

Historical agricultural uses of the property included grazing and dryland grain and hay farming (Edwards, pers. comms. 2016). The dryland farming occurred on some of the property south of Lobitos Creek Road. These areas are fallow and unfenced with no established livestock water and are shown as four lighter colored cleared "lobes" on Figure 3. The property area north of Lobitos Creek Road was grazed year around by about 30 cow/calve pairs.

3.2 Existing Rangeland Soil Agricultural Characteristics

To assess existing grazing land conditions eight representative photos were taken of the properties on March 17, 2016 during sunny conditions and are included below. The photo locations are shown on the Photo Location Map (Figure 3). These photos serve a dual purpose by showing existing grazing land areas and habitat conditions and can also be utilized for photo monitoring of grazing land and habitat conditions in the future as discussed in Section 6.0.

For convenience, a "quick glance" list of photo location numbers and titles are summarized below. The photo numbers may be referred to in subsequent text discussions and tables.

Photos of the October Farm Property

Photo 1	**Corrals and rangeland.**
Photo 2	**East pasture rangeland.**
Photo 3	**East pasture pond.**
Photo 4	**East pasture trough.**
Photo 5	**Middle pasture solar pump and windmill and rangeland.**
Photo 6	**West and Middle pastures rangeland.**
Photo 7	**West pasture pond and rangeland.**
Photo 8	**West pasture rangeland.**

The property encompasses 10 Soil Series (U. S. Department of Agriculture - USDA, 1961, and 1969). These soils are shown on the USDA Soils Map (Figure 4). Soil acreages were calculated by MROSD for the entire property. Based on field observations, approximately 206 acres north of Lobitos Creek Road have grazing potential and are shown in parentheses in Column 1 of Table 1

For brevity, the soil agricultural characteristics of the 10 Soil Series are included in Table 1. This Table summarizes the available USDA Soil Survey data along with up to date field observations and carrying capacities per Soil Series for the property.

TABLE 1: OCTOBER FARM RANGELAND AND SOIL CHARACTERISTICS-Page 1

SOIL SERIES-TEXTURE and SOIL SURVEY SYMBOL/ACRES (USDA)(MROSD)	RANGE SITE (USDA)	PHOTO NUMBER per SOIL and PRIMARY HABITATS (MROSD/Field)	AVERAGE SLOPE % and EROSION HAZARD (USDA)	AVERAGE CANOPY COVER % (Field)	AVERAGY YEAR RANGELAND DRY MATTER PRODUCTIVITY per Range Site (USDA) (AUMs/Acre)	REQUIRED RESIDUAL DRY MATTER Per AVERAGE SLOPE (USDA)(UCCE) (pounds/acre)	LIVESTOCK FORAGE USE LIMITATIONS (USDA/Field)	RANGELAND/ HABITAT HEALTH (Field)*	DOMINATE GRAZING SUITABILITY (Field)	ESTIMATED CARRYING CAPACITY AVERAGE YEAR (USDA/Field) Animal Unit Months (AUMs)
Cayucos-clay loam CcD2/12 acres (12)	Clayey	1/grass/shrubs	16 to 30% Moderate	0 to 25%	2	800	shrubs/thistles	Near Normal*	Higher	24
Gazos-loam GbF2/60 acres (55)	Loamy Very Steep	1 right, 4/grass/shrubs/ trees	>40% Very High	0 to 100%	0.01	1,200	shrubs/thistles, slope, trees	Near Normal*	Lower-Unsuitable	1 (shrubs)
Gazos/Lobitos-loams GoF3/7 acres (2)	Loamy Very Steep	grass/shrubs	>21% Very High	0 to 100%	0.01	1,200	shrubs, slope	Near Normal*	Lower-Unsuitable	<1
Gullied Land Gw/<1 acre	Not Assigned	shrubs	>100% Very High	100%	0	1,200	shrubs, slope	Not Normal prior erosion	Unsuitable	0
Lobitos-loam LID2-LIE2/136 acres (130)	Loamy-Loamy Steep	5, 6, 7, 8/grass/shrubs	16 to 41% Moderate-High	0 to 50%	1.5	700-1,000	shrubs	Near Normal*	Higher-Lower	150 (shrubs) (-1/4 due to shrubs)
Mixed Alluvial Land-sand-Ma/13 acres	Not Assigned	2 mid-ground/shrubs/ dense trees	0 to 100% Very High	100%	0	not grazed	dense shrubs/trees	Normal	Unsuitable	0
Pomponio-loam PpD2/4 acres (4)	Claypan	7 mid-ground/grass/ shrubs	11 to 20% High	0 to 100%	2	600	shrubs	Near Normal*	Higher-Unsuitable	4 (shrubs) (-1/2due to shrubs)
Rough Broken Land-rocky Rb/49 acres	Not Assigned	7 back of pond/dense shrubs-trees	>41% Very High	100%	0	not grazed	slope, brush, rocks, trees	Normal	Unsuitable	0
Tunitas-loam TxB/3 acres (3)	Loamy	2 mid-ground/grass/ shrubs	2 to 5% Slight	0 to 25%	2.5	600	thistles	Near Normal*	Higher	7
Totals: 206 acres of grazing land shown in ( ) north of Lobitos Creek Road.										Estimated Current Stocking 186 AUMs (16 AU/Year) (32 AU/6 mos.) Current Stocking 144 AUMs (12 AU/Year) (24 AU/6 mos.)
END * diminished due to invasive plants.										

Sources: U. S. Department of Agriculture Soil Survey San Mateo Area California 1961; Supplement to Soil Survey of San Mateo Area California, 1969; Soil Survey Santa Cruz County, 1980; MROSD soils acres; University of California Guidelines for Residue Management on Annual Range, 1982 and 2003; and SAGE Associates field assessments 2016.

Salient soil agricultural characteristics are summarized below by table column. The introduction and placement of these tables in this section facilitates reference and discussion of the content in later sections of this plan. The terms rangeland/grazing land, and the terms soil types/soil series have the same meaning in this plan.

Column 1: Soil Series-Texture and Soil Survey Map Symbol/Acres (USDA): includes the Soil Series name and soil texture, the Soil Survey map symbol per the United States Department of Agriculture (USDA) mapping and the planimetered acreage of the soil.

The first soil listed on the top of Page 1 of Table 1 will be used as an example whereby the Soil Series (or soil type) is named Cayucos, the texture is clay loam, and the Soils Survey Map symbol is CcD2 of which there are 12 acres of grazing land distributed across the northeastern portion of the property (Figure 4).

Column 2: Includes the USDA Range Sites that are comprised of Soil Series that have similar textures and produce similar types and amounts of forage. These sites are used as the basis for forage production estimated by the USDA and the University of California Cooperative Extension (UCCE). Range Sites within the rangeland areas include Clayey, Loamy, Loamy Steep, Loamy Very Steep and Claypan. Three Soil Series are not assigned Range Sites due to their marginal forage production, dense canopy cover, gullying, and timbered or brushland areas. The most productive forage producing Range Sites are the Clayey, Claypan, and Loamy on less steep slopes.

The CcD2 soil is in the Clayey Range Site.

Column 3: Photo Number per Soil and Primary Habitats from MROSD data base and photo point field observations. Primary vegetation locations and acreages for forests, grassland, shrubland, and land use/unvegetated areas are shown on Figure 5. Grassland and shrublands will intermix therefore, grasses may be found in shrubland and shrubs will be found in grasslands. Forests and dense shrublands will usually contain no grasses.

The CcC2 soil is shown in Photo 1 and contains primarily grassland with smaller concentrations of shrubs (primarily coyote bush).

Column 4: Includes the average slope percentage and erosion hazard for each Soil Series per USDA mapping. Terraces are generally flat-lying. Swales and ridgetops generally slope from five to 16 percent, side hills range from about 15 to 45 percent, and steeper slope and canyon areas are greater than 45 percent. Slopes greater than 45 percent are less well utilized by livestock and may also have a dense canopy cover and require more ground cover to reduce erosion. Slope is factored into estimated carrying capacity determinations. Erosion hazards range from slight to very high and are predicated upon soil texture, and slope. Sandy textured soils on steeper slopes would be more erosion prone.

The CcD2 soil has average slopes from 16 to 30 percent and a Moderate erosion hazard. However, field observation of some of the soil areas show a slope of nearly level in the corral location (Photo 1).

Column 5: Shows the average percent canopy cover for the vegetation on each Soil Series as observed in the field. The higher percentages of canopy cover greater than about 25 percent, such as in coyote bush and in chaparral and timber, results in a lesser amount of palatable grazing forage and usable grazing areas. For example, 50 percent canopy cover could reduce forage production up to about 50 percent. Total canopy cover of 100 percent brush or timber would reduce forage production to essentially zero. Canopy cover is factored into estimated carrying capacity determinations.

The CcD2 soil has a canopy cover that averages 0 to 25 percent with coyote bush encroachment into the grassland areas creating the canopy cover that can reduce grassland productivity by shading and physically occupying the grassland areas if allowed to increase. Some areas are open grassland (Photo 1 foreground) while other areas are higher percent coyote brush shrub within the Lobitos loam soil on the hillside (Photo 1 background). Other Soil Series also contain varying percentages of coyote brush shrub up to 100 percent coverage.

Column 6: Shows the average year rangeland dry matter productivity per Range Site in animal unit months (AUMs) per acre as determined by the USDA in the Soil Surveys, UCCE in published research, and by assessing the amount of forage and canopy cover observed in the field. Favorable years will produce more forage and unfavorable years will produce less forage, hence the variation in productivity. Rainfall amounts and distribution, and temperatures can greatly influence rangeland productivity in any given year. By convention, rangeland productivity is measured as dry matter in pounds per acre. For example, a 1,000-pound cow will consume about three percent of its body weight in the equivalent of dry forage per day. Approximately 11,000 pounds of dry forage will be consumed (some will be lost to trampling) by a 1,000-pound cow (an animal unit) per year or about 30 pounds per day or slightly more than 900 pounds per month.

The CcD2 soil can support about 2 animal unit months per acre since it mostly grassland. It would take about 6 acres of productive grassland forage to support one animal unit grazing for one year.

Column 7: Lists by Range Site the required residual dry matter (RDM) per average slope per USDA NRCS and University of California Cooperative Extension (UCCE) guidelines. A moderate level of rotational grazing is recommended by both the USDA and UCCE so that all forage types are more evenly utilized, reseeding of annual and perennial grasses is encouraged, and erosion is controlled. A minimum of approximately 400 to 1,200 pounds per acre of residual dry matter (RDM) is required per UCCE guidelines by this plan on slopes from zero to 30 percent, and 1,000-1,200 pounds per acre on slopes greater than 30 percent depending on soil texture and shrub cover.

The CcD2 soil RDM should be about 800 pounds per acre per average slope prior to green feed in the fall or winter on the steeper side slopes and may be lower on the flatter slope areas.

Column 8: Lists Livestock Forage Use Limitations by Soil Series per USDA and field observations that may include tree cover, steep slopes, brush cover, cattle access, weeds,

rocks, and poor forage production. The property may have chronic livestock water limitations with prolonged drought.

The CcD2 soil is limited by shrub encroachment and concentrations of thistles.

Column 9: Rangeland health indicators have been developed by the USDA Natural Resource Conservation Service (NRCS formerly the Soil Conservation Service) in order to assess departures from normal rangeland characteristics. These indicators were updated for California in 2007 and 2015. Overall normal rangeland health maintains or improves soil fertility, reduces erosion and sedimentation, improves water quality, allows for plant community biodiversity and management, and provides suitable habitat for wildlife. Observations are made in the field that rely on rangeland health checklists. Most areas are near normal but do contain areas of invasive plants such as coyote bush, and thistle that can be managed.

The CcD2 soil has a near normal rangeland health designation because of coyote bush encroachment and thistles as invasive plants.

Column 10: Portrays the dominant grazing suitability as observed in the field for each Soil Series area. A summary of grazing suitability limitations is also included and discussed further in later sections. Basically, invasive weeds, brush, slope, livestock water availability, forage productivity, access, and soil quality determine whether an area has a higher, moderate, lower, or unsuitable suitability.

The CcD2 soil has a higher grazing suitability. Higher suitability areas would include grassland while areas of dense brush cover would be unsuitable as examples.

Column 11: Includes estimated carrying capacity determinations in an average production year in animal unit months. An animal unit month is how much forage dry matter a 1,000-pound grazing animal will utilize in one month (typically 900 pounds). An animal unit is 1,000 pounds of grazing animal such as a cow/calve pair, two-500 pound steers, or five-200 pound sheep, etc. One animal unit per year equates to one animal unit grazing for 12 months or 12 animal unit months.

The CcD2 soil has an estimated carrying capacity of 24 AUMs for the property. Variations in AUMs per acre can occur due to variations in canopy cover densities.

Total carrying capacity estimates are included at the end of the column for the property. Approximately 186 AUMs or 32 AU/6 months is estimated at this time. Future stocking rates may increase with shrub and thistle reduction treatment practices. Current stocking rate is 24 AU/6 months, which shows a conservative stocking rate.

Summaries of the above columns will be utilized in many of the following plan sections.

3.3 Existing Rangeland Operations and Management

The property is currently grazed by one lessee on a yearly basis with MROSD. Approximately 24 AUMs are grazed from late spring into mid-summer (about six months).

The cow/calve grazing operation utilizes three pastures-an East pasture, a Middle pasture, and a West pasture (Figure 6 divided by fencing and livestock vegetative barriers). Cattle are moved between the three pastures during the grazing season. Clearing and mowing of coyote brush and thistles is currently undertaken by the lessee with follow-up reseeding with rye grass or a rangeland seed mix of annual grasses, as needed. Some clearing has been accomplished with a small dozer with a brush rake attached to the blade and a trailing drag to minimize ground disturbance and smooth out cleared areas. Mowing has also been used. The brush rake is effective in areas of more dense shrubland and mowing (with follow up) works adequately in areas with less shrub concentrations. Herbicides are not used but would be okay with the lessee if applied by MROSD.

Rangeland stewardship by the lessee was excellent with a reduction in stocking rate due to four years of drought conditions and through the utilization of rangeland management practices. Green feed, comprised primarily of annual grasses with some Harding grass perennials was abundant on the property with heights up to about 12 inches. Soils were saturated from recent rains and the lessee was waiting for the soils to dry out before turnout of cattle.

Rainfall conditions have been below normal for four years with 58 percent of normal in 2014 as measured at the Montara Water and Sanitary District station north of Half Moon Bay but at 475 feet elevation, which more closely approximates the property elevation than at sea level. Current rainfall year precipitation is 27 inches, which is below the yearly average of 32 inches.

3.3.1 Rangeland Uses and Livestock Grazing Suitability

Rangeland uses are limited to cattle grazing of grassland and shrubland, which vary in suitability for livestock grazing due primarily and coyote bush and thistle density that diminish suitability at this time. Livestock water availability is limited at the top of the Middle and West pastures. The property does allow for management practices to occur that will be favorable for enhancing grassland bio-diversity with livestock water development and invasive plant management.

The following general observations were made of the Property during the field assessments and mapping for the plan on March 17, 2016 that will influence the implementation of future rangeland and habitat management practices as discussed in Section 5.

- Topography and slopes vary from nearly level ridge tops and swales to steeply sloping side hills and canyons. The steeper side slopes are more difficult to graze.

- Rangeland areas vary from 100 percent annual grassland to ungrazed habitats containing dense areas of coyote bush, riparian woodland, and forest woodland (Photos 2 foreground and midground, and Photos 5-8).

- Range conditions for palatable annual grassland livestock forage are excellent where concentrations of wild oats, various brome and fescue grasses, vetch, clovers, trefoil, rye grass, plantain, filaree, and bur clover predominate outside of the scattered higher density thistle areas.

• Cattle grazing distribution can be improved with an additional upland water trough, and adequate livestock water is a limiting factor in the Middle and West pastures (Photo 6).

• Access roads are well maintained with minimal grading and provide sufficient pasture access.

• Perimeter and pasture cross fencing is adequate along with natural vegetation barriers.

• Adequate corrals with water trough exist adjacent to Lobitos Creek Road (Photo 1).

• Site erosion is negligible as related to cattle grazing and access roads.

• Water troughs (Photo 4), water tank (Photo 1), two stockponds (Photos 3 and 7), a solar pump and water well (Photos 5 and 6) and a windmill (Photos 1, 5, and 6) supply water Figure 6).

From the field assessments, the dominate livestock grazing suitability was determined for the properties which reflects the Higher, Moderate, Lower, or Unsuitable livestock grazing suitability areas as summarized in Table 1. These areas may transition rapidly from one designation to the other depending on slope, and the amount of coyote brush and thistle encroachment into the grasslands.

Higher suitability areas have no constraints to grazing. Slopes average zero to about 30 percent. Livestock and lessee road access are good. Non-forage canopy cover ranges from about 0 to 25 percent and is comprised primarily of areas of coyote brush, and/or thistle. Typical areas include grassland-dominated swales, ridge tops, and flats (Photos 1 foreground-midground). Photo 5, and Photo 6-swale area will have higher suitability with the proposed livestock water trough and water tank. Coyote bush and thistle may occur in these areas but are considered manageable (Photo 5 right of shed).

Moderate suitability areas are well utilized; however, slopes average 30 to 45 percent with average non-forage canopy cover to about 75 percent consisting mainly of areas of coyote brush. Livestock water development is needed to draw cattle to water from side slope areas of Photos 6 and 7. Typical areas include steeper ridge side-slopes (Photos 6 and 7). Livestock will readily use these areas but it requires more energy to graze the slope areas or to walk further to water. More residual dry matter must be left on side slopes to help prevent erosion. Coyote brush, and thistle may also occur (Photo 8).

Lower suitability areas are utilized less, or are more difficult for livestock access and water availability. Slopes average usually greater than 45 percent and/or average non-forage canopy cover varies from 25 to 100 percent (Photo 1 upper left and Photo 7 background). Typical areas include partial brushy and woodland steep side-slopes, and difficult to access grassland in upland areas. Abundant edge areas exist. In grassland areas, more residual dry matter is required on the steeper side slopes to help prevent erosion. Livestock water development may be needed. Cattle can utilize many of these areas but with greater energy expenditure due to more difficult access.

Unsuitable areas are primarily utilized for livestock shelter and shade with minor areas of interior livestock forage (Photos 1 right background, and Photo 7 right midground). Average slopes may vary from nearly level to greater than 45 percent with non-forage canopy cover up to 100 percent. Typical areas include dense brushy uplands, rock outcrops, timbered canyons, woodlands, riparian corridors (Photo 2 midground along Lobitos Creek) and steep slopes that cannot be traversed by livestock. Areas are commonly used for nesting, denning, and browse by wildlife and as wildlife trails, corridors and shelter. Wildlife water is abundant in most larger drainage areas that are inaccessible to livestock due to steepness, or dense vegetation.

3.3.2 Livestock Stocking and Distribution

Rangeland assessments typically equate stocking rates to a particular "level" or intensity of cattle grazing as is summarized below from UCCE research.

Stocking Intensity	Visual Characteristics of Rangeland
Light	**Little or no patchy appearance; unused plant matter greater than five inches and small objects on ground are not visible. Plant decadence and invasive plant infestations may occur.**
Moderate	**Two to five inches of unused plant material remains; little bare soil; patchy vegetation appearance (UCCE recommended).**
Heavy	**Less than two inches plant material remains; small objects and bare soil are highly visible.**

A moderate level of grazing is recommended by NRCS and UCCE so that all forage types are more evenly utilized, reseeding of annual and perennial grasses is encouraged, and erosion is controlled. Heavy grazing does not leave adequate RDM for reseeding and erosion control. Light grazing, even with rigorous planned pasture rotation, often allows animals to pick and choose the more palatable plants while leaving less desirable plants such as mustard, fennel, and thistles to more readily reproduce even though overall RDM levels may be higher. Coyote brush encroachment into grassland is also encouraged by light grazing or non-grazing of grassland areas.

At the time of the site assessment in March 2016 the property was being moderately grazed even with drought conditions.

Cattle distribution is predicated by management practices, available water, cross fencing, temperatures, slope, and access. Placement of livestock watering locations and salt locations can improve distribution and manipulate grazing patterns away from sensitive riparian resources (George, 2007).

Cattle distribution is excellent to poor depending primarily on water availability and shrubland density (See Section 3.3.6). Access roads and trails are good and grassland slopes are not too steep for grazing.

With the proposed management practices discussed in Section 5, cattle distribution should improve.

3.3.3 Rangeland/Habitat Health and Residual Dry Matter

Rangeland evaluations in previous years relied on a description of range conditions that compared the present forage production capacity of an area to a desirable standard that was a product of long-term grazing management. Numerically, range condition and production standards were formulated whereby the following percentages of desirable range grasses and forbs included (USDA, 1961):

Range Condition	Production*
Excellent	65 to 100%
Good	40 to 65%
Fair	25 to 40%
Poor-Very Poor	less than 25%

*Percent of potential forage capacity.

Excellent condition occurs when 65 percent or more of the cover is made up of desirable vigorous forage plants. There are no undesirable forage plants such as coyote brush, thistle, and blackberry. Litter from plants is adequate for erosion control and regrowth. Good condition occurs when 40 to 65 percent of the forage is made up of desirable plants. Fair condition occurs when 25 to 40 percent of the forage is made up of desirable plants. Poor condition occurs when most of the forage plants are undesirable including foxtail fescue, Mediterranean barley, blackberry, plantain, thistles, and coyote brush with poor forage cover (USDA, 1961).

Overall existing range conditions on the properties range from excellent to poor depending on the type of forage or invasive vegetation present in the grassland areas. Areas of invasive thistle (Photo 8 foreground), and coyote bush (Photo 7 midground) reduce range conditions by out competing both native perennial and introduced palatable annual grassland forage species. Fortunately, the areas of invasive plants can be controlled with proper management in the future. The property does contain a majority of highly productive annual grassland.

In recent years, descriptions of rangeland conditions have focused on evaluating rangeland/habitat health, and residual dry matter observations. These factors are dependent on long-term stewardship management and climatic conditions and take into account the health of all plant communities and not just grasslands.

Rangeland and habitat health indicators have been developed by the Natural Resource Conservation Service for California in 2007, and revised in 2015, in order to assess departures from normal rangeland and habitat characteristics. Overall normal rangeland and habitat health maintains or improves soil fertility, reduces erosion and sedimentation, improves water quality, allows for plant community biodiversity and management, and provides suitable habitat for wildlife. Rangeland and habitat health evaluations include the following

soil, water, and vegetation indicators as classified from normal to extreme conditions:

INDICATORS	NORMAL	TO	EXTREME
Rills	No recent formation	to	Severe and well defined.
Water Flow Patterns	Minimal soil erosion	to	Active flow erosion
Soil Pedestalling	Minimal pedestalling	to	Rocks and plants pedestalled
Bare Ground	Small bare areas	to	Large bare areas that are connected
Gullying	Natural stable channels	to	Active head cuts/down cutting
Wind Erosion/ Deposition	None to infrequent	to	Extensive wind scouring/deposits
Litter Movement	Uniform Distribution	to	Concentrated Movement
Soil Surface Stability	Organic Matter	to	Loose powder
Soil Surface Loss	Normal top soil per soil type	to	No top soil present
Plant Types/Runoff	Controlled by vegetation	to	Vegetation increases runoff
Soil Compaction	Trails/water troughs	to	Most of site
Plant Community Changes	Closely matches historic climax community mix of annual and native perennial plants	to	Climax community decreasing with invasive plants dominant
Plant Mortality/ Decadence	Uncommon	to	Common over site/severe stress
Litter Amount	Common for climate	to	Absent
Plant Growth Annual Production	Growth exceeds 80% of potential production	to	Growth less than 20% of potential production
Invasive Plants	Not present or expected	to	Dominate the site
Perennial Plant Reproduction (if plants present)	Seed and tiller reproduction are common	to	Severe reduction in seed and tiller production

During rangeland/habitat health studies the above Indicators are evaluated in categories that range from normal with none to slight deviations from normal, to not normal with extreme deviations from normal.

Other than some invasive plants, the vast majority of the property has normal or near normal rangeland and habitat health based on the assessment of the rangeland/habitat health Indicators. Many areas of the most common invasive plants such as thistle, and coyote bush can be managed. Maintenance of some of the invasive plants will be difficult, especially if the plants originate from off-site of the grazing area or are due to climatic changes.

Residual dry matter (RDM) is a measure of the amount of dry vegetation left on the ground, typically measured in the end of the summer or fall, prior to rainfall. Appropriate levels of RDM strive to minimize thatch, which can inhibit new plant growth, while maintaining adequate levels of vegetation to prohibit soil erosion. UCCE (2003), and USDA NRCS (2000) recommended minimum residual dry matter of about 600 to 1,000 pounds per acre for slopes up to 30 percent and about 1,000 to 1,200 pounds per acre is recommended for slopes greater than 30 percent. These RDM levels correspond to an average minimum of two to six inches of stubble height. USDA NRCS residual dry matter material includes palatable forage and ground litter and stalks that may not be palatable so pounds per acre weights may be slightly higher in grasslands than for the UCCE recommended minimum heights. UCCE recommended minimums include the amount of palatable residual dry matter required to maintain a sustainable moderate level of grazing (i.e. where residual forage can average about two to five inches in height with higher growth patchy areas and is sufficient to prevent erosion, and to provide a seed crop), per average Soil Survey slope categories as recommended by the University of California Cooperative Extension (1982 and 2003) for annual grasses in coastal rainfall areas.

Estimates of pounds per acre of RDM are obtained by fall clippings of one square foot of palatable dry forage, weighing in grams, and multiplying by 100 to achieve the pounds per acre of RDM. Visual estimates of RDM can also be made whereby a mosaic of two to five inches of RDM equates to about 1,000 pounds per acre.

At the time of the site assessment in March 2016, the range grasses were still green and growing due to winter and spring rains, thus, RDM could not be evaluated. The rainfall year is still slightly below the normal for the area, but soils were very wet and green grass was several inches to a foot in height.

3.3.4 Livestock Facilities

Well-maintained corrals are located on the north side of Lobitos Creek Road (Photo 1).

3.3.5 Livestock Fencing

Livestock-tight perimeter and cross fencing is adequate. Maintenance is an on-going situation since the fences are old and in many instances vegetation barriers that serve as fences could be penetrated by cattle.

Since natural slope, rock, and brush barriers have been historically utilized to contain cattle on the properties. The brush barriers would be ineffective if wildfire should burn the boundaries of the grassland areas.

3.3.6 Livestock Water Sources

Livestock water sources are utilized from two ponds (Photos 3 and 7), a solar-pump/water well and a windmill pumped water well (Photo 5), water troughs and water tank (Photos 1 and 4).

Livestock water is inadequate on the upper portion of the property along the Middle and West pastures fenceline.. Pond maintenance may be needed in the future for repair and desilting, and invasive vegetation reduction per MROSD and agency approvals.

3.4 Existing Rangeland Road Access and Maintenance

Rangeland access roads are well-maintained gravel or dirt, are minimally graded, or have good vegetative cover to reduce road-related runoff and erosion.

4.0 EXISTING NATURAL RESOURCE CONDITIONS

4.1 Natural Resources

Natural resources of the property are shown on the vegetation types map prepared by MROSD (Figure 5). This section of the Grazing Management Plan focuses on the natural resources that are adjacent to, or may be directly affected by grazing operations. Vegetation types were observed during the green feed season, thus, making it more difficult to adequately list all grassland plant species. Lobitos Creek riparian forest forms the northwestern boundary of the property. A Fact Sheet provided by MROSD and field observations provide an existing conditions description of the natural resources.

4.1.1 Vegetation Communities

Vegetation communities that can be affected by grazing as shown on the Figure 5 Vegetation Types Map include California Annual Grassland (85 acres), Shrubland (140 acres) and Forest (35 acres).

The vegetation communities that may be affected by grazing operations include the following:

California Annual Grassland

Grazing areas of the property are primarily included in the California annual grassland plant community but may also include small concentrations of native bunchgrasses and other endemic plants. Non-native annual ryegrass, wild oats, bromes such as soft chess, ripgut, and red brome, fescues, filaree, plantain, rose clover, blackberry, purple false brome, Mediterranean barley, Harding grass, rushes, blue-eyed grass, and bur clover predominate in the grassland areas. Many of the grassland areas were extensively farmed in the past that may account for the lack of perennial grasses. See grassland photos.

Shrubland (Coyote Brush dominated)

Plants associated with this community would typically occur in various densities within many of the rangeland areas. Without wildland fire this community will eventually become the predominate plant community in an otherwise grassland assemblage. Coyote bush was observed to be especially invasive into areas of the grassland community. See grassland/shrub Photo 7.

Dominant plants typically may include the following:

- Coyote bush (*Baccharis pilularis*)
- Coastal golden-yarrow (*Eriophyllum* species)
- Figwort (*Scrophularia californica*)
- California sagebush (*Artemisia californica*)
- Poison oak (Toxicodendron *diversilobum)*

- Bush monkey-flower (*Mimilus aurantiacus*)
- Lupine (Lupinus *species)*

Forest

This plant community is found at the edges of the rangeland grasses and shrub areas and extend into the canyons and drainages of the property including about ¾ mile along the edges of Lobitos Creek. Lobitos Creek provides spawning and rearing habitat for steelhead trout and resident rainbow trout. The densely vegetated riparian corridors and seeps include thick groves of alders and willows. Edges of these dense areas may be used for "shading up" by cattle and may be browsed. Browsing was minimal at the time of the field assessment (Photo 2).

4.1.2 Wildlife

The vegetative communities provide foraging, nesting, breeding and protection for a variety of birds, mammals, amphibians, reptiles, fish and insects.

The well-vegetated drainages provide important wildlife migration corridors-if not too brushy-offering protective cover through otherwise adjacent open rangelands. The mature trees are particularly valuable to wildlife where there is both dense understory and canopy that provides cover and shelter for many species.

Wildlife of the Grasslands and Shrublands

Several species of birds rely on open expanses of grasslands for hunting and foraging, including the northern harrier, red-tailed hawk, turkey vulture, American kestrel, great horned owl, black-shouldered kite, Cooper's hawk, sharp-shinned hawk, burrowing owl, and common barn owl. Grasslands that are bordered by woodlands are particularly important for raptors, because the birds can use the large trees as "hawking" sites to observe the activities of prey within nearby grassland habitats. California toad and pacific newt may occur in the grasslands seasonally. Western skink, western fence lizard, California alligator lizard, common kingsnake, western rattlesnake and gopher snake are the most common species expected to frequent grasslands. Mammals expected to use the grasslands include California ground squirrel, Botta's pocket gopher, dusky-footed woodrat, western harvest house, and California vole. Mammalian predators, including coyote, long-tailed weasel, and bobcat depend on grasslands for foraging and denning sites. Grasslands are an important foraging habitat for mule deer and for mountain lions that prey on deer. Grasslands that are bordered by woodlands or dense brush are excellent foraging areas for small mammals such as cottontail and brush rabbits and mice.

Mule deer, California quail, chorus frogs, turkey vultures, red-tail hawks, western bluebirds, meadowlarks, and bobcat tracks were observed.

4.2 Invasive and or Noxious Species

Most of the invasive and or noxious species include both plants and animals that were

introduced from Europe or Africa and have since escaped into the rangeland, and wildland areas. They can disrupt grazing and agricultural activities and can crowd out native plants and animals, degrade wildlife habitat, and make areas more susceptible to flooding and erosion. The San Mateo County Agricultural Commissioner's Office has up to date information on these species and can be helpful in providing information on new species that may be encountered on the property in the future and are not included in this plan at this time.

The invasive plants are commonly concentrated in many of the historical farming areas. The most prolific invasive noxious plants that were found within the rangeland areas of the property today include the following: Poison hemlock *(Conium maculatum),* Bull thistle *(Cirsium vulgare),* and Italian thistle *(Carduus pycnocephalus).* The two thistles are listed as weeds of concern by the San Mateo County Agricultural Commissioner. Milk thistle was also observed.

Coyote bush (*Baccharis pilularis*) a native shrub, also was observed to be invading the annual grasslands of the property (see grassland/shrub photos) and will be discussed below. Coyote brush invades the coastal grasslands very rapidly. Eradication of coyote brush is necessary from time to time to keep invaders at a minimum (USDA, 1961).

The MROSD is currently involved in management of many of the invasive noxious species including the various thistles on many of their other properties. Spot herbicide applications are acceptable but only by certified applicators per San Mateo County Agricultural Commissioner's Office regulations. A brief description of the above plant species are included below with treatment practices discussed in Section 5 along with the MROSD Integrated Pest Management Plan practices.

Poison hemlock: Native to Europe, North Africa and Asia, poison hemlock has spread throughout the United States and other countries. It is a biennial, and spreads only by seed. Seeds are dispersed by water, mud, wind, animal fur, and by humans on clothing, boots, and machinery. Seeds have a very long dispersal period, ranging from June through February. The seeds can germinate in a wide range of soil, moisture and temperature conditions, and can remain viable in the soil for up to three years. Poison hemlock spreads quickly after the rainy season in areas cleared or disturbed. It is highly competitive and prevents the establishment of native plants by over-shading; it does not appear to be allelopathic. It is poisonous to vertebrates, causing death primarily by respiratory paralysis after ingestion (within 2-3 hours in livestock).

Poison hemlock occurs commonly adjacent to riparian woodlands, moist areas, roadsides, and encroaches into grassland areas and watering areas (Photos 3 and 4).

Bull thistle: A biennial thistle originally from the Europe, western Asia and North Africa, Bull thistle currently is most common in coastal grasslands, and disturbed pasture areas and along roadsides. Its basal rosettes blanket the ground, severely reducing the establishment of other plants.

Bull thistle reproduces from seed only after fall rains, with flowering peaking in July and early August. Seeds released are wind-dispersed, and may remain dormant in the soil for

several years. Soil and vegetation disturbance, and drought favor an increase in the thistle.

Found scattered along with milk thistle, and Italian thistle throughout many areas of the property (Photos 3, 4, and 8).

Italian thistle: A winter annual originally from the Mediterranean, Europe, Asia and Africa, Italian thistle currently is widespread in temperate zones. It is common in the Coast Ranges within oak savannas and disturbed areas, including grasslands, pastures, rangeland, and roadsides. Italian thistle dominates large areas and excludes native species, impacting both flora and fauna. Its basal rosettes blanket the ground, severely reducing the establishment of other plants. Italian thistle reproduces from seed only, flowering from September through December. Up to 20,000 seeds can be produced by a single plant in one season. Seeds are wind-dispersed, and may remain dormant in the soil up to 8-10 years. Soil and vegetation disturbance, and drought favor an increase in Italian thistle.

Coyote brush: A dominant component of the coastal sage scrub plant community. Coyote bush is a native bright green evergreen shrub with whitish or yellowish disk-shaped flowers that bloom in the fall. The plant has a low browse value for cattle but does provide forage variety and Vitamin A on dry grass rangeland where it is browsed in the summer and fall (Sampson, 1963).

Coyote brush was observed to be encroaching into the grassland areas (Photos 6, 7, and 8) and is being managed by the lessee by clearing, mowing, and reseeding (Photo 2).

A potential invasive animal species that may affect rangeland areas, spring, seeps, and stockponds, is the feral pig *(Sus scrofa)*.

Feral pig: The feral pigs were introduced into California by the Spanish in the 1500's. Pigs may inhabit oak and other woodlands, coastal sage scrub, chaparral, and grassland habitats, although they seem to prefer oak woodlands and riparian habitats. Pigs are highly adaptable, reproduce rapidly, and lack effective predators. Potential predators of feral pigs include mountain lion, bobcat, and coyote all species present within the properties

Feral pigs reach sexual maturity at age 6-8 months, and may breed year-round; most females have two litters per year. Litter sizes average 5 piglets, with a high mortality rate (70-90%). It should be noted that even with this mortality rate, an average of 5 piglets per litter and two litters per year would result in a 33% annual population increase. Average life span is about 10 months, with some individuals surviving 5-6 years.

Pigs are opportunistic omnivores that tend to exploit seasonally available food resources. They will eat berries, insects, roots, bulbs, soil grubs, and even small vertebrates, such as birds, snakes, mammals, lizards and bird eggs. They will eat carrion if available. Pigs feed heavily in oak woodlands on the mast crop, and cause extensive ground disturbance through there rooting foraging behavior. Feral pigs reduce the recruitment of oak trees by direct consumption of acorns and indirectly by uprooting oak seedlings. The pigs also disrupt the growth of other native plants. In-stream habitats, riparian woodlands, and oak woodlands can be heavily degraded by the trampling, rooting, foraging, and wallowing behaviors of

feral pigs. Pigs directly compete with mule deer, wild turkey and black bears for acorns, a critically important seasonal food source. Pigs cause extensive damage to native plants and wildlife, rangelands, agricultural crops, and landscaping. They degrade natural wetland habitats and increase erosion and sedimentation within riparian zones. Feral pigs may also transmit diseases to domestic livestock, including swine brucellosis, trichinosis, foot and mouth disease, African swine fever, pseudorabies, leptospirosis., and may serve as a reservoir for bovine tuberculosis. Feral pigs were not observed on the property.

5.0 GRAZING MANAGEMENT PLAN IMPLEMENTATION

5.1 Implementation of the Plan

The management of MROSD grasslands through the utilization of livestock grazing will promote grassland bio-diversity through the implementation of this Grazing Management Plan.

A crucial part of grazing management is adaptive management that must respond to regional markets, industry health, and production trends that in turn influence a lessee's fiscal responsibility. These management options can include decisions such as livestock markets, livestock trends, pests, climate changes, energy costs, resource constraints, and water resource uses. As livestock management and resource management science progresses, unforeseen future management changes can be made that consider such resources through applying the University of California Cooperative Extension and Natural Resource Conservation Service conservation current and future management recommendations.

5.2 Grazing Conservation Management Practice Components

The site-specific proposed conservation management practices often referred to as best management practices, in this plan are consistent with those local and regional resource and livestock management practices that are encouraged by various local, state and federal agencies including but not limited to the California Regional Water Quality Control Board, California EPA, California Department of Fish and Game, University of California Cooperative Extension, the Agricultural Commissioner's Office for San Mateo County, Natural Resource Conservation Service, Resource Conservation Districts, Bureau of Land Management, and the U.S. Fish and Wildlife Service.

Conservation management practices (also referred to as best management practices) components are to be implemented for all grazing areas, and are included specifically to apply to Livestock Grazing and Rangeland Management; Livestock and Wildlife Water Development; Livestock and Wildlife Fencing Development; Land Management; Roads and Infrastructure Maintenance; and Wildlife, Water Quality, and Habitat Management. Table 2 provides a summary of the selected conservation management practices that are discussed in the following sections. Proposed practice construction specifications for fencing and livestock water shall follow NRCS or MROSD guidelines and suggestions.

Many of the proposed conservation management practices have already been implemented by the MROSD and/or the lessee. These practices help to reduce erosion and sedimentation, improve water quality, and protect natural resources.

5.2.1 Grazing Management

The livestock grazing management and implementation of the conservation management components shall be the responsibility of the MROSD working in conjunction with the grazing lessee. Grazing leases should by multi-year with the

TABLE 2: SUMMARY OF SELECTED CONSERVATION MANAGEMENT PRACTICE OPTIONS
OCTOBER FARM
GRAZING MANAGEMENT PLAN

X	CMPs SELECTED	DESCRIPTION OF CMPs
LIVESTOCK GRAZING AND RANGELAND MANAGEMENT		
X	Prescribed grazing/salt placement.	Improves forage and use of grazing and salt areas.
X	Mowing invasive plant management.	Improves forage/access for grazing.
LIVESTOCK AND WILDLIFE WATER DEVELOPMENT		
X	Water line, tank, trough.	Provides additional reliable/well-distributed water
		that will be placed away from sensitive resources.
LIVESTOCK AND WILDLIFE FENCING DEVELOPMENT		
X	Future option for additional pastures	If needed, such as across road.
	or pasture cross fencing.	
LAND MANAGEMENT		
X	Invasive plant control other than	Provides for habitat protection and management of
	mowing.	invasive plants by spot herbicide treatment.
ROAD AND INFRASTRUCTURE MAINTENANCE		
X	Rip rap and straw bale placement.	Retards gully erosion for repairs, if needed.
X	Minimal road maintenance grading	Grade only where necessary for repairs.
X	Water bars	Install to drain water from steep road areas.
WILDLIFE, WATER QUALITY, AND HABITAT MANAGEMENT		
X	Rotational grazing.	Fuel management and may reduce invasive plants.
X	Mechanical clearing./mowing.	Small dozer and brush rake/mower/drag.
X	Reseeding.	Aids in revegatating disturbed ground.
X	Prescribed burning.	Improves wildlife habitat and reduces fuel load.
X	Rotational grazing.	Fuel management and reduces invasive plants.

option to renew as deemed appropriate by the MROSD. Multi-year leases allow for the lessee to become "vested" in the property and to be more willing to engage in long-term management practices, such as brush control practices.

5.2.1.1 Proposed Rangeland Conservation Management Practices

The application of conservation management practices are an integral part of the long-term implementation of the grazing management plan. These conservation management practices are applicable to any domestic grazing animal(s) on the property now and in the future including, but not limited to, horses, cattle, sheep, pigs, mules, and goats.

Livestock Considerations:

The ultimate choice of livestock type in part depends on the livestock that are being grazed in the area that would be available for MROSD grasslands. A local operator would seem to be favored because of transportation costs, grazing seasonality, and smaller disjunct grazing areas.

- Cattle – English/European breeds such as Angus, Charolais, Shorthorn, Hereford, Holstein, Belted Galloway, etc. or English/European breed cross breeds would be favorable over less complacent animals such as Mexican steers or Brahma that range more vigorously and are more apt to test fences and natural barriers. Public safety is another issue in considering bulls, or cows with newborn calves. Ideally, mid-weight heifers or steers, dry cows, or dairy replacement heifers would be favored. Distribution should not be a problem for these classes of animals with sufficient water, roads/trails, and salt placement.

  The current lessee grazes predominately cow/calf English/European-breeds such as Hereford and Angus and various crosses. The herds are usually more docile and well behaved and can be more easily approached.

- Sheep – are grazers that are still utilized in the county. Sheep, without herding, may graze grass closer than cattle. Sheep with herding would be ideal for distribution, however, sheep are more susceptible to predators and dogs and would need to be confined at night.

- Goats – are browsers, similar to deer, and are very effective at stripping vegetation from shrubs. Goats would require day herding to avoid heavy grazing, and would also need to be penned at night. Goats would be most effective at browsing on mustard, thistle, and coyote bush but would tend to leave branches and stalks. Goats should not be grazed in drainages that could impact riparian vegetation or drainage flows.

- Horses, mules, etc. – are more opportunistic grazers and will browse on shrubs. Horses are least favored for MROSD grasslands because of solid shod

hoof impacts that compact soil (versus an unshod cloven-hoofed animal, trailing tendencies, dentition that can uproot or damage plants, and safety since children are attracted to horses that can, kick, bite, or trample. Equestrian trail uses are fine with horses since grazing would not be substantial.

• Domestic Pigs – may be more prone to promote ground disturbance by rooting and should not be allowed in riparian areas that could create bare ground adjacent to drainages.

• Other – this may include future possibilities such as llamas that would be acceptable as long as performance standards are met if consistent with MROSD guidelines.

Livestock Grazing and Rangeland Management:

Livestock grazing and rangeland management shall be based on an approximation of carrying capacity whereby general rangeland dry matter productivity averages for the property has been determined from the NRCS Soil Surveys, and UCCE range clippings and research. Adherence to specified performance standards shall determine the actual operational carrying capacity that may vary from year to year based on climatic conditions and rotation.

The University of California grazing management courses emphasizes that overgrazing is a function of time and uniformity of utilization is a function of stock density. High stock density for short periods of time results in more uniform utilization-less picking and choosing-by cattle. Higher stock density for shorter periods of time increases competition for feed and causes cattle to be less selective about what they graze.

Overgrazing occurs when animals remain in a pasture too long so that regrowth gets regrazed or when cattle return to a pasture too soon before plants have recovered from the previous grazing. Light stocking combined with too much time in a pasture leads to a selection of more palatable plants where less palatable plants are left ungrazed. The longer plants remain ungrazed, the more decadent, coarser, and less digestible they become.

Grazing timing and rotation are based on management goals. For this plan, a major goal is to manage the grassland bio-diversity by properly grazing the annual grasses that may lead to enhancing any perennial grass composition in the future.

Currently the lessee grazes from mid to late spring into summer depending on livestock water availability. Livestock water sources may determine the ability to graze. In low rainfall years, adequate forage may exist but may not be grazed if the ponds do not fill with runoff water or well flow is inadequate. The lessee was cognizant of not grazing too early in the season to avoid trampling of wet ground. The annual grasses, with coyote brush, and thistle, can be grazed beginning in mid to late spring into summer as is currently done. Year around grazing would also be acceptable as long as RDM performance standards are met.

Cattle coming onto the property can be off-loaded into the corral at Lobitos Creek Road (Photo 1). The cattle shall be fed for 24 hours in the corral (for weed control from manure and to calm down after transport) and then rotated into the following pastures. Only certified

weed-free hay shall be fed. Exceptions can be made with MROSD approval.

For example, pasture management grazing can follow a pattern whereby pasture rotation can occur as follows:

1st Year:	East	Middle	West
2nd Year:	Middle	West	East
3rd Year:	West	East	Middle
Etc.			

Year-long rest of any pasture is not recommended, unless burned or cleared and reseeded, because of the already existing ample seed supply and because of the tendency of invasive plants such as thistle, and coyote bush to expand without grazing pressure. We would recommend as a guide, the above pasture rotation that should occur whereby in the fast growth phase, between mid to late spring through June livestock are moved frequently-every two weeks but also based on performance standards and do not revisit a pasture for four weeks. Beginning each spring, the RDM must at least meet minimum performance standards in the first utilized pasture or four inches of green grass growth must be present in that pasture and soils must be dry enough so that trampling does not occur during the first turnout. Herd density may need to be built up gradually if wet soil conditions exist to avoid trampling and forage spoilage.

The above rotation schedule may vary on the property since pastures are not equal in size, water availability, or forage productivity. Therefore, a more general realistic rotation schedule is to move more frequently from mid to late spring into June and less frequently in the summer.

Carrying capacities on the property may approach 186 AUMs (32 animal units for six months) or possibly more with livestock water improvement, and continued brush management that promotes grassland growth. Starting out numbers may be less (if wet ground), or for a shorter season if livestock water is limited by drought. Stocking intensity may require a downward or upward adjustment depending on rainfall amounts and distribution and temperatures. The lessee shall be able to make necessary stocking adjustment during the grazing season in order to achieve the performance standards as closely as possible. The Agricultural Lease should be worded to include this estimate.

Performance standards are included below per average slope:

0 to 30% slopes: an average minimum of two inches to four inches of residual dry matter – approximately an average of 600 – 1,000 pounds per acre per NRCS and UCCE definition. Description: In some areas rangeland will show evidence of extensive grazing. Residual vegetation is patchy with some areas grazed to less than one inch and other areas with greater vegetation remaining. Bare ground showing evidence of pocket gopher activity may exist. Golf ball objects are clearly visible at a distance of 10 feet and mostly visible at a distance of 20 feet.

Greater than 30% slopes: an average minimum of four to six inches of residual dry matter – approximately an average of 1,000 - 1,200 pounds per acre per NRCS and UCCE definition. Description: In some areas rangeland will typically show clear evidence of grazing. Seed stalks may be heavily utilized or trampled. Considerable ground cover and leaf litter may be present in some areas. Some bare soil will be apparent including pocket gopher activity, visible from a distance of 20 feet. Many golf ball sized objects are partially visible at a distance of 10 feet, and some may be barely visible at a distance of 20 feet.

The Agricultural Lease should include these standards.

Commonly observed key rangeland forage species within the pastures grassland areas include soft chess, annual rye, ripgut brome, filaree, rose clover, bur clover, and wild oats.

Areas that are to be considered exempt from the above performance standards include the following:

- Pastures that are burned, roads, tanks and unfenced pond sites, and rock outcrops.

- Areas within 100-yards of watering troughs, water tanks, salt and mineral licks, holding fields/traps, animal handling corrals, or where animals may naturally congregate due to topography or weather.

- Areas of low fertility due to insufficient soil depth or quality, sand, and steep slopes regardless of grazing pressure.

- Areas with extensive tree or shrub canopy cover.

- Areas subject to periodic insect infestations such as from grasshoppers and crickets.

- Areas subject to feral pig ground damage, or other wild animal use and disturbance.

Seasonal climatic data including rainfall and distribution, prolonged drought of two or more years, flooding, and high and low temperatures shall be included in evaluating the performance standards in the pasture areas. For example, during drought conditions 50% of unfavorable year grassland production within the NRCS Range Sites should be managed to remain as residual dry matter.

The above grazing management recommendations are consistent with UCCE, NRCS, RWQCB, and BLM grazing management objectives or standards. The above standards are at a recommended "moderate" level of grazing which has been recommended for sustainable livestock performance and range protection (Jensen, 2000). Studies by Holechek and Galt (2000) also corroborate that specific levels of residual vegetation levels needed for range protection are utilized for the California annual grassland type.

- Salt locations are based on the National Range Handbook standards that require salt locations to be no more than 1/2 mile apart on rough rangeland. Upland swales, ridgetops and livestock trail intersections away from water sources and away from public-used trails and roads shall be utilized for the placement of salt. Cattle will typically go from salt to

forage to water so to make the most of the forage utilization and to improve grazing distribution, salt and supplements shall be placed away from water sources. To improve RDM distribution and resource management, salt blocks shall be placed at least 1/8 mile away from accessible water sources and public access roads and trails. Salt locations should be moved periodically to further improved forage utilization and so as not to over utilize any given area.

No salt blocks were observed during the field assessment.

• Supplemental feeding should continue to be allowed at the corral location and in the rangeland areas. Liquid supplements shall be placed at least 1/8 mile from water and hay shall be scattered along the roads in the pasture areas. Both liquid feed supplements and certified weed free hay may be fed as supplements during late summer into early winter until annual grass feed strength returns. However, the rangeland RDM performance standards still must be met or cattle will be moved from the property.

No supplements were observed during the field assessment.

5.2.1.2 Rangeland Infrastructure Requirements

Determining the locations of livestock and wildlife water development and livestock and fencing modifications were based on the March 2016 field assessment. These proposed new locations are generally shown on Figure 6. Specific locations are to be determined in the field. The infrastructure improvements are proposed to aid in the operational management of livestock, and rangeland and natural resources. Existing livestock water supply requires re-thinking.

Livestock and Wildlife Water Development:

Livestock water facility development was generally designed based on the National Range Handbook standards that require the following:

- **A clean, dependable water supply;**
- **Adequate size to allow livestock to water within a two hour period;**
- **Spacing of watering areas 1/4 to 1/2 mile in rough terrain; and**
- **A 15-20 gallon per day requirement per a 1,000 pound animal.**

Studies by U.C. Cooperative Extension have shown that when higher quality trough water is available instead of ponds, calves often weigh an extra 50 pounds at weaning.

Yearling steers can gain an extra three-tenths to four-tenths of a pound per day (Western Livestock Journal, 2001). Historic research and experience has shown that stock water developments do divert livestock use, improving grazing distribution and forage management flexibility. For example, having clean trough water available away from streams diverted cattle use from those areas. As long as the grass was green on the uplands, the majority of the cattle stayed on the hillsides and came down only to water and loaf. After the upland grass dried, use of the riparian areas increased, however, cattle still used water troughs and loafed near the troughs away from the riparian areas (Chamberlain and

Doverspike, 2001). Water development combined with existing pasture cross fencing, benefits management, livestock, wildlife, and wetland habitats positively. The ponds currently provide lower quality livestock water and may not be reliable during drought (Photo 3).

Proposed water trough improvements are dispersed along the upper ridgelines and swales, and to the extent possible, away from public access roads and trails, that will aid in the distribution of cattle and will improve the existing water supply. Troughs are also located away from existing natural water sources so as to benefit wildlife, to reduce siltation, and to improve water quality and the potential for wetland habitat management. The MROSD shall install wildlife-friendly water troughs-both existing and proposed troughs-whereby a wooden, concrete, rock, or mesh "escape ramp" is installed inside the trough to allow trapped birds and mammals to not drown. Water quality is thereby also improved for livestock and wildlife. For flow-through water troughs, outlets should be rock or concrete lined to reduce erosion, improve water quality, and provide water for smaller animals and birds.

New roads should not have to be constructed for any of the proposed waterline, and trough installation. Waterbar diversions will be required as a conservation management practice on any bulldozer trails established for access of equipment and materials or on any water line trenching that may occur on slopes.

One water trough, a 5,000 gallon water tank, and connecting water line is proposed to be placed within the fenceline to provide a new water source for the top of the West and Middle pastures (Figure 6 and Photo 6). Water will be sourced from the existing solar pump/windmill water wells (Photo 5). Lessee cost estimate is about $4,500.

Any future spring or seep developments shall be fenced or covered to preclude livestock and possible feral pigs. All of the water supply improvements will provide an additional dependable year-around good water quality water source for livestock and wildlife.

Livestock and Wildlife Fencing Development:

No new pastures are proposed at this time in the plan.

Existing pasture rotation, coupled with coyote brush clearing/mowing/reseeding, and water development, should improve management options and ease of the moving of livestock, pasture management, natural resource management, and riparian management through livestock rotation and timing of grazing. RDM standards, water quality, and rangeland/habitat health will all benefit. Managing the rotation from one pasture to another, plus reducing turnout during wet soil conditions, will also reduce potential trampling, trailing, and soil compaction.

5.2.2 Access Road Maintenance Requirements

Roads and road infrastructure maintenance are well maintained and are in good condition. However, over the years, stretches of road will require periodic water bar diversions, and gully maintenance.

Secondary roads shall be minimally graded and mowed in order to maintain a natural ground cover to help prevent erosion. New culverts, will require riprap protection at inlets and outlets. These roads may be mowed to reduce fire hazard. Gully maintenance may extend to areas that receive access road runoff.

The following conservation management practices shall be followed on access roads and gullies.

Management Item	Access Roads Conservation Management Practices
Grading	**Minimize grading for repairs and maintenance. Allow cover crop to be established and mowed on most road surfaces. Cant road surface to sheet water.**
Erosion Control	**Install water bars across road slopes, install road drains, install V ditches, and rip rap outlets. Drainage diversions to reduce sheet washing and rilling of road surfaces shall be placed at least every 200 feet on roads with gradients greater than eight percent. Maintain cattle guard by removing sediment and provide clean out.**
Dust Control	**Maintain cover grass on road. Utilize minimal grading.**
Existing Gullies	**If renewed erosion occurs, place riprap in gully to control erosion. Straw bales may also be placed in gullies. Willow cuttings may be planted in wet gullies. Utilize certified weed-free straw bales.**
Drainages	**Do not side-cast material into drainages. Utilize existing drainage crossings or span new crossings with suitable bridging that does not disturb channel bank or channel bottom. If culverts are used at smaller drainage crossings, then, provide inlet and outlet protection with riprap material. Grade drainage crossing only after water flow has ceased.**
Reseeding	**Reseed and mulch cut and fill slopes. Install necessary sand bags, straw bales to retard erosion until slopes are revegetated. Use certified weed free straw.**

Road maintenance shall be the responsibility of the MROSD.

5.2.3 Natural Resources Management

Adoption of the rangeland management policies described herein will aid in the conservation of the natural resource habitat conditions throughout the grazing land.

Land, Wildlife, Water Quality, and Habitat Management

Plant communities and wildlife habitats will benefit from rangeland management practices, allowing the continued natural growth of native plant communities, and the concomitant improvement of wildlife habitat values. Benefits to the natural resources of the properties through grazing and rangeland management will result from measures that will improve water quality in the creek and ponds, increase slope stability, reduce sedimentation, and reduce soil compaction.

5.2.3.1 Vegetation

Annual grassland plant communities will benefit from suggested removal of invasive, native and non-native plants, which presently can out-compete native, plants and encroach into grassland areas. Livestock management practices will continue to result in managed rangeland habitat conditions, allowing native plants to expand their abundance and plant communities to expand their diversity and areal extent.

Grassland/Coastal Shrubland Habitats

Grasslands, and coastal shrubland communities occur on uplands and will be managed, where applicable, by the proposed prescribed grazing practices that have been previously discussed.

Grasslands will be grazed through improved pasture rotation and timing that results in achieving, at a minimum, the RDM performance standards, concomitant with maintaining overall rangeland health. Performance standards, rotation, and grazing seasonality will favor grassland bio-diversity.

Coastal shrubland will continue to flourish since livestock and wildlife frequent the edge areas and deer actively browse well into the interior of the coastal shrub. Deer and cattle browsing encourages new plant growth and sunlight within the community. Coyote bush despite livestock and wildlife browsing, are encroaching upon areas of annual and some perennial grasslands. These areas shall require mechanical management and/or herbicide treatment through mowing and spot spraying in order to maintain the grasslands and the grassland/shrubland edge areas and wildland mosaics.

Erosion Control Using Native Plants

Bio-remediation using the native plants may be used to restore any eroded gullies, and roadwork, as needed.

Prescribed Burn Management

The use of fire as a fuel management tool on gently to moderately sloping areas of coyote brush dominated coastal scrub, should increase upland water infiltration and help in fuel management. Prescribed burning appears to be less effective at controlling coyote brush because of its high moisture content in the green leaves. Where fire has been used in the coast ranges, a combination of a follow-up Roundup herbicide treatment for two consecutive years after the prescribed burning approximately 90 percent control is achieved with the combination burning and herbicide treatments (Hill-El Sur Ranch, pers. comm. 2006). Therefore, any prescribed burning of coyote bush must be in the fall when fires would burn hotter and should be over a pilot area to determine effectiveness. Burning of any residual brush piles is also allowable under this plan.

Brush management techniques for improving cattle and wildlife forage will be limited to mechanical raking, dragging, crushing, mowing, and/or burning of coyote brush dominated coastal scrub in areas on average slopes of less than 30 percent where deeper soil profiles

typically occur. Typical vegetation includes coastal sage, coyote bush, and poison oak. This will prevent increases in surface runoff, erosion and sedimentation during the improvement period. Additional requirements would include the following: provision of a 50 foot vegetated buffer strip between drainage courses; riparian vegetation will not be disturbed; high soil erosion areas will be avoided; all cultural resource areas shall be avoided; equipment will be excluded from drainage channels; burning will leave a mosaic pattern of burned and unburned vegetation; no spring burning will be allowed due to potential high runoff, and nesting bird impacts; and in heavy fuel load areas mechanical clearing around trees shall be completed prior to burning.

Cooperation will be required from MROSD fire units with possible assistance from the California Department of Forestry (CDF) and local air pollution agencies under their permitting requirements.

A minimum of fire lines should be established. Hand clearing of some firelines can occur and existing roads can be used as firelines. Dead brush can also be spot burned in the fall or winter to minimize the construction of firelines. Brush can be crushed a year in advance to improve the effect of the burn. Minimal ground disturbance shall occur. If fire lines have to be cut, then, site-specific conservation management practices for reseeding and for waterbar diversions shall be followed. This program can be repeated every five to seven years. Grazing of the burned areas shall be deferred until new grass growth has been established. Native grass broadcast reseeding is encouraged in the burn areas. Because of the preponderance of annual grasses, annual rye grass, or an annual grassland range mix would also be acceptable if approved by MROSD.

Prescribed burning is included as a possible future management tool but is not required at this time. Liability, costs, permitting, and logistics may make this option impractical at this time but the practice is still a possibility for future adaptive management.

5.2.3.2 Wildlife

Wildlife resources will continue to be managed in part through the continued implementation of rangeland management practices as previously described. Because grassland plants will also continue to benefit from livestock control and the removal of invasive plants, native plant communities such as perennial grasses may begin to flourish.

Wildlife Game Animals

Any necessary feral pig management through MROSD-approved trapping is most important to rangeland management in order to reduce damage to wetland, ponds, and spring sources – if needed since feral pigs were not observed on the property.

Wildlife Corridors

Wildlife and livestock movement corridors will be improved by the proposed rangeland management practices. Mowing of dense areas of coyote bush will provide more edge areas, grassland mosaics, improve wildlife movement, and provide additional browse of mowed coyote bush sprouts. Existing pasture fencing does permit wildlife movement where wires

are loosely strung, and natural barriers for cattle still allow for wildlife movement.

Wildlife Water

Wildlife water sources will be improved through placement of reliable year around wildlife-friendly water troughs. New and existing water troughs will contain wildlife escape ramps. If needed, protection of spring water sources will also continue to improve wildlife water quantity and quality adjacent to these areas.

Dead Trees

Dead trees shall be left in-place, unless they pose an immediate danger to the public. Such trees provide important habitat for cavity nesting bird species and for bats. Taller dead trees also provide important "hawking" sites for raptors to hunt from, providing an unobstructed view.

Dead trees should be considered an important part of integrated pest management because of the habitat they provide to beneficial wildlife. Raptors help to control ground squirrel and gophers.

Ponds

On-going natural siltation and aquatic vegetation growth in the ponds continues to occur. Pond maintenance (vegetation removal, spillway/berm) may also be necessary at some time in the future and will be the responsibility of the MROSD to obtain necessary permits.

Maintenance/repair suggestions for these ponds include the following, if needed in the future:

- Once dry, deepen the intermittent ponds to the extent legally and environmentally feasible within the currently established pond area.

- Provide for riprapped drainage swales for the intermittent ponds.

- Remove aquatic vegetation in order to retain water holding capacity of the pond.

Springs or Seeps

Any springs or seeps on the property that may be used in the future as livestock and wildlife water trough sources are to be fenced to preclude cattle and wildlife. Fencing or other structures shall also exclude feral pigs since wallowing can destroy spring boxes. clog pipes, disrupt or stop spring flow, and reduce water quality.

5.2.3.3 Riparian Corridors

The dense riparian corridors are primarily located in woodland drainages and along Lobitos Creek (Figure 5) that are inaccessible to livestock and contain little forage value (Table 1, Figure 4). In addition, browsing the accessible perimeter of these areas will not impact the

vegetation since studies corroborate that overall wetland species composition is not sensitive to periodic intense grazing use if coupled with moderate grazing levels on uplands (Allen-Diaz and Jackson, 2000). Riparian functionality will be maintained by precluding cattle from Lobitos Creek. Prescribed grazing and riparian management techniques such as rotational grazing, new upland water sources, and residual dry matter management will continue to benefit the riparian corridors.

5.2.3.4 Invasive and or Noxious Species

This plan recommends the implementation of management measures for invasive plant and animal species found within the property boundaries that could affect existing and future rangeland areas. This plan discusses management options for invasive noxious non-native species that compete with native plant species and are of little value to livestock and/or wildlife, resulting in an over-all reduction in habitat values to both flora and fauna and negatively affecting grassland areas. A balance must be struck regarding maintenance requirements since many of these invasive plants originated from outside the property and are regional problems that may be uncontrollable.

This plan may be amended by the MROSD to cover additional invasive plants or animals if their populations become problematic in the future as determined by annual monitoring visits. Collaborative efforts with other agencies aimed at target invasive noxious species shall be encouraged for long-term management options for existing and future invasive noxious species. Agencies may include California State Parks, California Conservation Corps, BLM, U.S. Forest Service, U.C. Cooperative Extension, Natural Resource Conservation Service, and the San Mateo County Agricultural Commissioner's Office. Control and removal may not necessarily be viable management options depending on infestations. All herbicide application shall follow the San Mateo County Agricultural Commissioner's office restricted pesticide permit application requirements.

The following treatment practices have proven effective as a means to help control the species listed below. Current MROSD-initiated treatment practices, if different than below, may continue or the following treatment practices may be implemented. New treatment practices may also be utilized with MROSD approval as part of the adaptive management requirement of this plan. Suggested rangeland management techniques discussed in previous portions of this plan, including rotational grazing at a moderate level of intensity, will help to control, but not eradicate, many of the plant species discussed below.

The MROSD Integrated Pest Management Plan and EIR shall be followed for any pest management activity on the property by MROSD and the cattle grazing lessee. The lessee is amenable to herbicide treatment of invasive brush and thistles, but would prefer that MROSD be responsible for the herbicide application. The lessee currently has effectively cleared areas using a brush rake that may require some follow up spraying (Photo 2). Dense areas of coyote brush (Photo 7 midground) may be cleared in similar fashion with possible follow up spraying if necessary. Discing shall be avoided in lieu of brush raking and mowing. Spot application of herbicide use on coyote brush resprouts and thistle concentrations is preferred in lieu of larger area spray applications. Creating of grassland mosaics within coyote brush areas will benefit grazing and wildlife. As stated in the IPM (2015) Glyphosate will likely be the primary herbicide used on thistles and brush on

rangelands.

Poison hemlock

Because poison hemlock is poisonous to humans, it is recommended that gloves and masks be worn while removing this species. Soil disturbance must be minimized in any control method. Hand pulling is effective for small infestations; it is not necessary for the entire root system to be removed. Timing is critical; however, since pulling when seeds are viable would spread the seeds.

Mowing in spring and late summer over several seasons has been effective; subsequent mowings are required to control newly sprouted plants emerging from the soil seed bank. Post-emergent herbicides shown to be effective include glyphosate plus surfactant, all applied in late spring. (Author's note: surfactants are generally not approved for use in wetland or streamside areas.) Glyphosate plus surfactant (trade name: Roundup) has been effective at the rate of 1.0 lb/acre, especially at the rosette stage.

Bull thistle/Milk thistle

Mowing and hand cutting shortly before plants flower is an effective means of control. Spot application of the herbicide glyphosate has been shown to be effective during the rosette growth stage. Cattle and horses may also eat the plant prior to the growth of the harder and larger spines, especially milk thistle.

Italian thistle

Herbicides are most effective during life states other that the rosette stage; Glyphosate (as Roundup), has been shown to be effective (Bossard, 2000).

Livestock grazing using sheep or goats has shown promising results in trials in Australia. Seedlings cannot establish in areas of dense groundcover, and thus should be considered for control of re-invasion after initial control measures.

Coyote brush

If the MROSD is to manage grassland bio-diversity and fuel loads, then, reduction of coyote bush (also hemlock and thistles) into grassland areas shall be implemented as a part of this plan.

Field experience has shown that early summer to early fall mowing and/or brush raking of more dense infestation areas, before seeds are set is effective at helping to control the spread of coyote bush and other invasives into grassland areas. If raking creates soil disturbance, the reseeding with annual rye grass or an annual grass rangeland mix, as approved by MROSD may be necessary.

Follow up intensive rotational grazing after a winter and spring grass cover is established is important as new growth coyote bush shoots will occur within the mowed or raked areas. The mowing should be at a two-inch height to avoid ground disturbance and follow existing

topographic contours in a curvilinear fashion. Mowed or raked slopes shall be 20 percent or less-usually what a wheel tractor can be operated on with necessary wheel and bumper weights. A small dozer with a brush rake attached to the blade is acceptable with a follow drag to smooth out disturbed areas. Keep the blade above ground level and let the rake clear the brush and not the dozer blade.

A setback of 25 feet from all drainages or gully areas shall be observed. In sandy soil areas, to control erosion, mow only where there is a developed grass understory. Repeated mowing will be necessary in three to five years. For summer and early fall mowing, a fire control brush rig may be needed because of the potential for spark-generated fires. Spring mowing shall not occur because of potential impacts to ground nesting bird species. Otherwise, mowing shall be restricted to foggy mornings in the summer and early fall.

This plan therefore proposes that raking/mowing shall occur in areas of infestation followed by follow up spot spraying of Round up and later rotational grazing into those pasture areas. Carrying capacity may be increased by 25 to 50 percent or more with the reduction of coyote bush canopy cover in grassland areas. Wildfire fuel loads will be decreased. Native trees including willows shall not be mowed.

Feral pigs

Exclusionary fencing of springs; and trapping for control as authorized by the MROSD. Springs, seeps, ponds, and watercourses within rangeland areas are especially susceptible to damage from feral pigs. As discussed above, spring sources, should continue to be fenced or boxed to exclude feral pigs if they occur in the future. Follow any other IPM suggestions for management.

6.0 MONITORING PROGRAM

This monitoring program for grazed MROSD lands must ensure that the specified rangeland uses are in compliance with the applicable land use regulations and the land stewardship goals, objectives, and implementing guidelines.

Monitoring programs will adhere to the MROSD guidelines listed below.

Monitor vegetation response to grazing on District lands.

- *Monitor forage utilization and distribution by grazing animals to assure appropriate amounts of residual dry matter remain on the ground to achieve desired resource management objectives.*

- *Monitor livestock use levels and infrastructure condition to insure conformity with lease provisions to contribute to improved management.*

- *Monitor wildland conditions with an emphasis on documenting the location, distribution and abundance of native grasses, wildflowers, and other native flora and fauna.*

- *Monitor non-native vegetation response to grazing with an emphasis on documenting the location, distribution and abundance of target invasive species.*

To satisfy the above requirement, the following checklists and photo point monitoring forms are to be utilized for the rangeland monitoring program on an annual basis in the fall prior to rainfall. The monitoring program implementation shall be the responsibility of the MROSD staff. In addition, the yearly rotation schedule, herd type, and stocking rates shall be provided to the MROSD by the grazing lessee prior to the fall monitoring, and included with the fall monitoring report.

Natural climatic changes, geologic processes, and biologic cycles that are beyond the lessee control shall be noted, as applicable, in the checklist monitoring discussion summaries. Natural processes may include, but are not limited to, drought, flooding, landslides, fault movements, wildfires, and vegetation responses to climate changes such as global warming, drought, invasive noxious plants, pathogens, and pests.

Monitoring shall require the use of techniques consistent with the University of California Cooperative Extension, the U.S. Department of Agriculture Natural Resources Conservation Service, and the U.S. Department of the Interior Bureau of Land Management monitoring and management practices for working landscapes.

The following photo point monitoring checklist and the rangeland/habitat health checklist have been established for evaluating the property pasture grazing areas and include the following:

The checklists include those items that require yearly inspection to assure that rangeland management practices are consistent with this grazing management plan. Existing photos

utilized in this plan may also be utilized as photo points for the monitoring. We suggest that photo points be used that best characterize the grazing management. A completed photo point and checklist is included at the end of this section including the monitoring methodology used in the completion of the checklist. The photo point and checklist completion shall be repeated yearly in the fall. Additional photo point locations may be added at the discretion of the MROSD.

Monitoring results can also be used as a guideline for any future adaptive management changes that may be shown to be necessary from the monitoring. For example, prolonged drought may cause a reduction in carrying capacity in order to still achieve the minimum residual dry matter performance standards.

Photo Point Checklist #1 Description of Monitoring Items:

Representative photo points are instrumental in determining overall landscape and vegetative changes over time that may be related to management, infrastructure, climate, natural processes such as fire and flood, and biological processes. A photo point form is included as Photo Point Monitoring Checklist #1 and shall be utilized yearly in the fall by the monitors for each photo point location. The initial photo point determinations in this plan will provide the representative baseline condition for that specific area of the rangeland that is to be monitored as long as grazing occurs. All photo point locations shall be shown on an ortho-photo topographic base Monitoring Photo Location Map along with GPS coordinates and direction of photo for each photo point and entered into the MROSD GIS mapping system. A larger-scale map can be made available if desired. Photo points shall be representative of rangeland, and resource community landscapes within the grazed areas. At each photo point location, the description of monitoring items checklist shall be completed through methodology described at the end of this section on a completed example of Photo Point Checklist #1 and Rangeland-Habitat Health Checklist #2 that are used to illustrate the monitoring protocol.

___ Rangeland-Habitat Health – if this can be determined from the photo, and then complete Checklist #2 for each applicable photo point location. Not applicable photos could include a photo of road maintenance or water trough infrastructure.

___ Residual Dry Matter (RDM) Average Inches per Slope %: ___0-30% ___>30% is based on UCCE (2003) and NRCS (2000) prescribed grazing performance standards. The performance standard for a moderate level of grazing is an average minimum of two to four inches RDM for slopes of 0 to 30 percent (about 600 to 1,000 pounds per acre of dry matter) and four to six inches RDM for slopes greater than 30 percent (about 1,000 to 1,200 pounds per acre of dry matter). Adequate levels of residual dry matter are important for providing next years annual and perennial grassland seed crop, for promoting the vigor of perennial grasslands, for reducing erosion and sedimentation, and for preserving water quality and rangeland health.

Example for 0-30% slope: In some areas rangeland will show evidence of extensive grazing. Residual vegetation is patchy with some areas grazed to less than one inch and other areas with greater vegetation remaining. Bare ground showing evidence of pocket gopher activity

may exist. Golf ball objects are clearly visible at a distance of 10 feet and mostly visible at a distance of 20 feet. In some areas rangeland will typically show clear evidence of grazing. Seed stalks may be heavily utilized or trampled. Considerable ground cover and leaf litter may be present. Some bare soil will be apparent including pocket gopher activity, visible from a distance of 20 feet. Many golf ball sized objects are partially visible at a distance of 10 feet, and some may be barely visible at a distance of 20 feet.

Example for greater than 30% slopes: In some areas rangeland may show evidence of considerable grazing use. Seed stalks may be heavily utilized. Ground cover is essentially complete. Little bare soil is apparent except for occasional pocket gopher activity and livestock/game trails. Some golf ball sized objects may be visible or only barely visible at a distance of 10 feet but seldom visible at a distance of 20 feet.

Exempt from the RDM performance standards include the following:

- Pastures that are burned, roads, tanks and reservoir sites, and rock outcrops.

- Areas within one hundred (100) yards of watering troughs, water tanks, salt licks, holding fields/traps, animal handling corrals, or where animals may naturally congregate due to topography or weather.

- Areas of low fertility due to insufficient soil depth, sand, or quality and steep slopes regardless of grazing pressure.

- Areas with extensive tree or shrub canopy cover.

- Areas subject to periodic insect infestations such as from grasshoppers and crickets.

- Areas subject to feral pig ground damage, or other wild animal use and disturbance.

A measure for impairment or non-compliance can be identified from Residual Dry Matter performance standards. In an above average rainfall year and in an average rainfall year, the residual dry matter performance standards should be met as described above. In below average rainfall years performance standards may be exceeded but not for more than two years in a row. In above average rainfall years, stocking may necessarily increase to achieve target performance standards. Ranch operational management should be able to adapt to lower rainfall amounts and distribution over a two-year period. Long-term impairment of resources will not be permanent if management changes meet performance standards within the two-year period.

___ Plant Communities Observed: Include a list of plant communities viewed in the photo such as annual grassland, coyote brush shrubland, wetland, woodland, etc. based on Section 4 of this plan. Also include relative abundance of perennial grasslands if present. Note if coyote bush areas have been mowed and plant resprouting over successive years of monitoring.

___ Wildlife Observed: Especially important for photo points at the ponds, and grasslands per Section 4 of this plan.

___ Grazing Infrastructure Maintenance: Important for fencing and water trough and water tank maintenance. Look for wildlife escape ramps on troughs, spring exclusionary fencing, and gravel pads at the troughs.

___ Access Road Maintenance Observations: Important items include minimal grading, mowing, culvert rip rap and gully repair.

___ Yearly Rainfall in Inches and Distribution: Annual precipitation records are an important part of any monitoring effort and shall be included in each yearly monitoring report on the spaces provided in the relevant monitoring checklists. A comparison with available average rainfall and average rainfall distribution records shall be made yearly to ascertain whether or not the rainfall was normal in monthly amount and distribution for the monitoring year.

___ Invasive Species: note species and relative abundance.

In summary, the choosing of the representative photo point and the checking of the monitoring items is part of the monitoring protocol. It is expected that a walking transect of the foreground areas of the photo point be completed as a part of filling in the appropriate checklist items. Some photo points may be only representative of landscapes so no detailed checklist evaluations would be made other than to note landscape changes over time and the possible causes of such changes. The time spent at each photo point will necessarily be variable depending on the checklist requirements. Time may vary from a few minutes to about one half hour in most cases.

A blank Checklist #1 form is included on the following page. Additional pages may be attached as needed.

MIDPENINSULAR REGIONAL OPEN SPACE DISTRICT
OCTOBER FARM GRAZING MANAGEMENT PLAN
PHOTO POINT MONITORING CHECKLIST #1 – PAGE #__PHOTO #__

Monitors: **Date:** **Location:**

DESCRIPTION OF MONITORING ITEMS: Limited to within Photo

___ **Rangeland-Habitat Health (if checked complete Checklist #2)**

___ **Residual Dry Matter (RDM) Average Inches per Slope %: ____0-30% ____>30%**

___ **Plant Communities Observed:** **Perennial grasses:***

___ **Wildlife Observed:**

___ **Grazing Infrastructure Maintenance:**

___ **Access Road Maintenance Observations:**

___ **Yearly Rainfall in Inches:** **Distribution Normal: Yes or No**

___ **Invasive Species*:**

* Relative abundances: 1 – none seen; 2 – 1 to 10 plants; 3 – 10 to 100 plants; 4 - >100 plants

PLACE PHOTO HERE

N

W o E

S

Compass Quadrant

GPS Coordinates

See monitoring photo point location map for photo locations and direction of photos.

Rangeland-Habitat Health Checklist #2:

Rangeland and habitat health will require a yearly evaluation in the fall of seventeen Indicators that are shown on Checklist #2. These factors have been previously discussed in the plan and will be utilized for the determination of overall rangeland and habitat health as well as for soil conditions, erosion occurrences, plant community and reproduction characteristics, invasive plant problems, and overall plant mortality and stress. Overall health of the habitat communities is easily incorporated in this checklist per applicable representative photo point. These factors shall be observed and recorded in checklist form at each applicable designated photo point location. This method is to be used as a qualitative indicator to see what you may want to monitor quantitatively that can help guide management responses. Use the NRCS Range or Ecological Site descriptions from the soil survey for baseline information.

The rangeland and habitat health indicators have been developed by the Natural Resource Conservation Service (1997)(revised in 2007 and 2015) for Californiaworking landscapes in order to assess departures from normal characteristics. Overall normal rangeland health maintains or improves soil fertility, reduces erosion and sedimentation, improves water quality, allows for plant community biodiversity and management, and provides suitable habitat for wildlife.

For the evaluation, the rangeland and habitat health Indicators are evaluated in categories that range from normal with none to slight deviations from normal, to not normal with extreme deviations from normal that are to be filled in on Checklist #2. A summary discussion is also to be included for deviations from normal and for rainfall amounts and distribution.

A measure for change can be identified from the Rangeland-Habitat Health Checklist when listed indicators show "moderate to extreme or becoming not normal". The MROSD and lessee should work together to reverse the changes as conditions are noted in the monitoring reports if due to grazing operational management. In working landscapes, changes can usually be reversed so as to avoid irreversible changes to the resources. Climatic, geologic, and biologic processes beyond the lessee control may also be a source of impairment and should be stated as such.

A blank Rangeland-Habitat Health Checklist #2 form is included on the following page.

MIDPENINSULAR REGIONAL OPEN SPACE DIST.

OCTOBER FARM GRAZING MANAGEMENT PLAN

RANGELAND-HABITAT HEALTH CHECKLIST #2 –

RANGE SITE: DATE_____PAGE #___ PHOTO #___

Rangeland-Habitat Health Indicators (none to common)	Extreme or Not Normal (poor)	Moderate to Extreme or Becoming Not Normal	Moderate or Changing From Normal	Slight to Moderate or Near Normal	None to Slight or best Normal
Rilling					
Water Flow Patterns					
Soil Pedestalling					
Bare Ground Occurrence					
Gullying stable to active					
Wind Erosion or Deposition					
Litter Movement					
Soil Surface Erosion Resistance					
Soil Surface Loss					
Surface Runoff/Plant Types					
Soil Compaction Layers					
Plant Community Types					
Plant Mortality					
Litter Amount (RDM)					
Yearly Plant Production					
Invasive Plants					
Perennial Plant Reproduction if plants are present					

Vicinity Rainfall:_____ Normal Year ___ Yes ___No
Average Year Vicinity Rainfall:
_____

CONCLUSIONS:

DISCUSSION ITEMS:

The completed Checklists #1 and #2 shall be compiled and placed in a three ring binder with the monitoring year date shown on the tab. If a Checklist item does not apply place an NA – not applicable in the appropriate column. Monitoring shall commence in the fall of 2016 so the first tab date will be 2016. The MROSD shall be responsible for safeguarding all binders. Subsequent monitoring year photos, checklists and tabs shall be placed in the binder.

Some of the representative photos used in this plan may also be utilized as photo monitoring points. For example, Photo 7 can be used to monitor landscape changes over time; Photos 2, 5, 6, 7, and 8 can be used to monitor residual dry matter, rangeland/habitat health, and invasive plants; and Photos 1, 3, and 4 can be used to monitor the properties infrastructure use and maintenance.

A short executive summary shall be included in the monitoring report that summarizes the results of each monitoring year for each of the grazing areas and compared to the previous year(s) monitoring results in text and/or tabular form. The results of each monitoring year shall then be discussed amongst the MROSD staff to see if any adaptive management changes are required to be implemented.

The results of the yearly monitoring will determine if any anticipated or unanticipated adaptive management changes are necessary. This plan attempts to foresee anticipated changes and proposes conservation management practices that are responsive to such changes. However, unforeseen changes may occur that may require plan updates as determined by MROSD as a part of this plan or more detailed quantitative monitoring methods.

MROSD may also choose, in addition to the yearly monitoring, to have detailed research studies performed by academic researchers that would yield more in-depth data on rangeland trends and long-term habitat responses to grazing.

A graphic example of a representative Photo Point Monitoring Checklist #1 and Rangeland-Habitat Health Checklist #2 for the Photo 2 East pasture grassland/coyote brush are included on the following pages to illustrate the methodology for these two checklists. The area is actively grazed by cattle and has been cleared and has less coyote brush encroachment.

The photo point was chosen to illustrate annual grassland habitat, to monitor for potential invasive species, and to evaluate the possible raking and mowing/grazing effectiveness on coyote brush in the future. The photo was taken on March 17, 2016. The actual future monitoring would be done in the fall before fall rains.

The monitoring protocol for this photo point is as follows on the next page:

MIDPENINSULAR REGIONAL OPEN SPACE DISTRICT
OCTOBER FARM GRAZING MANAGEMENT PLAN
PHOTO POINT MONITORING CHECKLIST #1 – PHOTO #2

Monitors: Orrin Sage/Cindy Sage **Date:** 3/17/2016 **Location:** October Farm upper East pasture foreground.

DESCRIPTION OF MONITORING ITEMS: Limited to within Photo foreground

X **Rangeland-Habitat Health (if checked complete Checklist #2)**

X **Residual Dry Matter (RDM) Average Inches per Slope %:** >12" 0-30% ___ >30%

X **Plant Communities Observed:** Annual grassland **Perennial Grasses:*** 2

X **Wildlife Observed:** two deer

___ **Grazing Infrastructure Maintenance:** NA

X **Access Road Maintenance Observations:** good grass cover over secondary access road

X **Yearly Rainfall in Inches:** several inches below normal **Distribution Normal** – no, poor rains in February. Soils wet in March.

X **Invasive Species:*** 2 – coyote bush and thistles

***Relative abundances: 1 –none seen; 2 – 1 to 10 plants; 3 – 10 to 100 plants; 4 - >100 plants.**

Compass Quadrant: NW GPS Coordinates: N37 23 943 W122 23 048 477' elevation

See monitoring photo point location map for photo locations and direction of photos. 6-9

Methodology for the above photo point:

Choose a Representative Photo Point Location.

The area was chosen for the coyote brush shrub management, and grassland habitats.

Take the photo and record the compass bearing quadrant location of the photo and the GPS coordinates and elevation on the photo point form. A permanent photo point marker such as a steel tee post or a flexible fiberglass marker may be used, but only if acceptable by MROSD.

Fill in the General Form Information.

This includes the monitoring form page and photo point number, the names of the monitors, the date, and the location. The location of the photo point will also be shown on a Monitoring Photo Location Map. This photo is the same as Photo 2 in the plan that is shown on the Photo Location Map.

Description of Monitoring Items.

Check the applicable monitoring items that you have photographed. Make your field observations of the area within this photograph. The field observations will require a walking transect of the field of view in the foreground of this photograph and filling in the appropriate checklist information.

In the case of this photo we have checked the following:

X Rangeland-Habitat Health – proceed to completing Checklist #2 as shown on the next page.

Rangeland-Habitat Health – by checking this item, you must then complete Checklist #2 (completed on the next page) that evaluates rangeland/habitat health Indicators that are described in the plan. This checklist also requires a discussion of rainfall amounts and distribution.

MIDPENINSULAR REGIONAL OPEN SPACE DIST.

OCTOBER FARM GRAZING MANAGEMENT PLAN

RANGELAND-HABITAT HEALTH CHECKLIST # 2 –

RANGE SITE: Loamy DATE: 3/17/2016 PHOTO # 2

Rangeland-Habitat Health Indicators (none to common)	Extreme or Not Normal (poor)	Moderate to Extreme or Becoming Not Normal	Moderate or Changing From Normal	Slight to Moderate or Near Normal	None to Slight or best Normal
Rilling					X
Water Flow Patterns					X
Soil Pedestalling					X
Bare Ground Occurrence					X
Gullying stable to active					X
Wind Erosion or Deposition					X
Litter Movement					X
Soil Surface Erosion Resistance					X
Soil Surface Loss					X
Surface Runoff/Plant Types					X
Soil Compaction Layers					X
Plant Community Types					X
Plant Mortality (perennials)					NA
Litter Amount (RDM)					X
Yearly Plant Production					X
Invasive Plants					X*
Perennial Plant Reproduction if plants are present					NA

Vicinity Yearly Rainfall: 27″ Average Year Vicinity Rainfall: 32″	Normal Year Distribution	___ Yes	X No Poor Feb.

CONCLUSIONS: Coyote brush encroachment into grassland.
Is being managed.

DISCUSSION ITEMS: Follow up monitoring this fall.

Rangeland Health Indicators are normal except for the invasive plants that are being managed. The two NA – not applicable Indicators are checked since perennial grasses were not observed.

X Residual Dry Matter – this item is checked because the photo point includes residual dry matter in the grazed grassland area. Average height is greater than 12 inches on 0 to 30 percent slopes and far exceeds performance standards of two to four inches. Observation for RDM needs to be done in the fall for accurate results since the grass was still growing in March when the photo was taken. RDM will diminish about five percent per month in the summer after annual grassland growth has ceased.

X Plant Communities Observed – this item is checked and the plant communities would include annual grassland and coyote brush scrub. Plant community health and function was evaluated in Checklist #2. A walking transect in the foreground was conducted. Perennial grasses were absent and the relative abundance was recorded.

X Wildlife Observed - none.

Grazing Infrastructure Maintenance – no troughs or fences were in the photo so this item would not be checked.

X Access Road Maintenance Observations – good grass cover over secondary access road.

X Yearly Rainfall in Inches from the closest rainfall station would be included at the end of the rainfall year on September 30th. Rainfall seasonal distribution would also be included. Thus far rainfall was about five inches below the 32-inch normal and distribution was poor in February.

X Invasive Species would also be noted along with their relative abundance of coyote brush and thistles in the photo.

In summary, the choosing of the representative photo point and the checking of the monitoring items is part of the monitoring protocol. It is expected that a walking transect of the foreground areas of the photo point be completed as a part of filling in the appropriate checklist items. Some photo points may be only representative of landscapes so no detailed checklist evaluations would be made other than to note landscape changes over time and the possible causes of such changes. The time spent at each photo point will necessarily be variable depending on the checklist requirements. Time may vary from a few minutes to about one half hour in most cases.

The results of the yearly monitoring will determine if any anticipated or unanticipated adaptive management changes are necessary. This plan attempts to foresee anticipated changes and proposes conservation management practices that are responsive to such changes. However, unforeseen changes may occur that may require plan updates, quantitative monitoring, or research, as determined by the MROSD.

7.0 REFERENCES

7.1 Plan Preparers

Orrin Sage, Ph.D Geological Sciences (emphasis sedimentology); Principal Sage Associates; California Board of Forestry Registered Certified Rangeland Manager #64. Agricultural Resources sections.

Cindy Sage, B.A. Zoology, M.A. Geological Sciences - environmental multidisciplinary degree in geology and biological resources; Owner Sage Associates. Natural Resources sections.

7.2 Persons/Organizations Consulted

Midpeninsula Regional Open Space District Representatives

Clayton Koopmann – Rangeland Ecologist

Grazing Lessee

Doug Edwards

7.3 Bibliography

Ascent Environmental, 2015, Midpeninsula Open Space District Integrated Pest Management Program EIR.

Allen-Diaz, Barbara, and others, 1998, Detecting Channel Morphology Change in California's Hardwood Rangeland Spring Ecosystems: Journal of Range Management v. 51.

Allen-Diaz, Barbara, and Jackson, Randall, D., March 2000, Grazing Effects on Spring Ecosystem Vegetation of California's Hardwood Rangelands: Journal of Range Management, v. 53.

Barbour, M.G. and J. Major, 1988. Terrestrial Vegetation of California. California Native Plant Society, Sacramento, CA.

Barrett, R.H., 1980. Mammals of California Oak Habitats: Management Implications. IN: Ecology, management, and utilization of California oaks. US Dept. of Agriculture, Forest Service. General Technical Report PSW-44.

Bossard, C., J.M. Randall, and M. Hoshovsky, editors, 2000. Invasive Plants of California's Wildlands. University of California Press.

Budzinski, Ray, and others, March 2005, Big Dipper/Silva Properties Rangeland Assessment: EcoLogic.

Camp Dresser & McKee, and others, 1993, California Storm Water Conservation Management Practice Handbooks.

Chamberlain, David J., and Doverspike, Mark S., April 2001, Water Tanks Protect Streambanks: Rangelands v. 23.

Cooperative Extension, 1982, Guidelines for Residue Management on Annual Range: Leaflet 21327 University of California Division of Agricultural Sciences.

Cooperative Extension, 1984, Annual Grassland Forage Productivity: Leaflet 21378 University of California Division of Agricultural and Natural Resources.

Cooperative Extension, 1985, Preliminary Guidelines for Managing California's Hardwood Rangelands: University of California Division of Agriculture and Natural Resources Publication 21413.

Cooperative Extension, 1990, Monitoring California's Annual Rangeland Vegetation: Leaflet 21486 University of California Division of Agriculture and Natural Resources.

Crampton, B. 1974. Grasses of California. University of California Press.

Faber, Phyllis and Holland, Robert, 1988, Common Riparian Plants of California: Picklewood Press, Mill Valley, California.

Federal Interagency Stream Restoration Working Group, 1998, Stream Corridor Restoration Principles, Processes, and Practices: U.S. Department of Agriculture, Washington, D.C.

Frost, Rachel A., and Launchbaugh, Karen L., December 2003, Prescription Grazing for Rangeland Weed Management: Rangelands.

George, Melvin, and others, 2007, Factors and Practices that Influence Livestock Distribution: University of California Rangeland Management Series Publication 8217.

Guenther, Keith, 1998, Residual Dry Matter (RDM) Monitoring Photo Guide: Wildland Solutions, Clyde, California.

Hickman, James C., editor, 1993. The Jepson Manual: Higher Plants of California. University of California Press.

Holechek, Jerry, and Galt, Dee, June 2000, Grazing Intensity Guidelines: Rangelands, v. 22.

Holechek, Jerry, and others, 1995, Range Management: Prentice Hall.

Holland, Robert F., October 1986. Preliminary Description of the Terrestrial Natural Communities of California. Non-Game Heritage Program, Department of Fish and Game, State of California Resources Agency.

Holland, V. L., and Keil, David J., 1995, California Vegetation: Kendall Hunt Publishing Company, Iowa.

Jensen, Wayne, June 2000, Central Coast Agriculture Highlights: U. C. Cooperative Extension.

McDougald, Neil, and others, 1996, Establishing Livestock Carrying Capacity From GIS & Range Science Research: Oaks & Folks publication.

Munz, P.A.,1974. A Flora of Southern California. University of California Press.

Munz, P.A. and D.D. Keck, 1973. A California Flora and Supplement. University of California Press.

Nader, Glenn, and DiTomaso, Joseph M., 1998, Starthistle Control: University of California Cooperative Extension Sutter/Yuba Counties, California.

National Research Council, 1994, Rangeland Health: National Academy Press.

San Mateo County, 2014, Annual Crop Report: Agricultural Commissioner's Office.

Sheley, Roger L., and others, February 2003, Mowing: An Important Part of Integrated Weed Management: Rangelands 25 (1).

Thomsen, Craig D., and others, 1997, Mowing and Subclover Plantings Suppress Yellow Starthistle: California Agriculture November-December 1997.

United States Department of Agriculture, 1961, Soil Survey of San Mateo Area California: Soil Conservation Service.

United States Department of Agriculture, 1980, Soil Survey of Santa Cruz County, California: Soil Conservation Service.

United States Department of Agriculture, 1969, A Supplement to the Soil Survey of San Mateo Area California: Soil Conservation Service.

United States Department of Agriculture, 1976, National Range Handbook: Soil Conservation Service.

United States Department of Agriculture, 1979, Recommended Plan of Conservation Management Practices: Soil Conservation Service Planning Staff, Davis, California.

United States Department of Agriculture, 1990, Proceedings of the Symposium on Oak Woodlands and Hardwood Range Management: Pacific Southwest Research Station General Technical Report PSW-126.

United States Department of Agriculture, 1996, Conservation Standards and Specifications Technical Guide Section IV: Natural Resource Conservation Service.

United States Department of Agriculture, 1997, National Range and Pasture Handbook: Natural Resource Conservation Service.

United States Department of Agriculture, 1998, A User Guide to Assessing Proper Functioning Condition for Stream Areas: TR 1737-15 Natural Resources Conservation Service, Bureau of Land Management, Forest Service.

United States Department of Agriculture, 2000, Prescribed Grazing: Natural Resources Conservation Service Code 528A.

United States Department of Agriculture, 2005, Interpreting Indicators of Rangeland Health: NRCS Version 4.

United States Department of Agriculture, 2005, Monitoring Manual: ARS Jornada Experimental Range.

United States Department of Agriculture, 2007 and 2015 California Rangeland Health Evaluation Matrix: NRCS Davis, California.

United States Department of the Interior, 1988, Fences: Bureau of Land Management.

United States Department of the Interior, 1998, Assessment of Rangeland Health Standards, Contributing Factors and Appropriate Actions: Bureau of Land Management Hollister District.

United States Department of the Interior, 1998, Rangeland Health Standards and Guidelines for California and Northwestern Nevada Final EIS: Bureau of Land Management.

University of California, 1951, California Grasslands and Range Forage Grasses: California Agricultural Experiment Station Bulletin 724.

University of California, 1963, California Range Brushlands and Browse Plants: Agricultural Experimental Station Extension Service.

University of California Cooperative Extension, 1982, Guidelines for Residue Management on Annual Range: Leaflet 21327 Division of Agricultural Sciences.

University of California Cooperative Extension, 1990, Monitoring California's Annual Rangeland Vegetation: Leaflet 21486 Division of Agriculture and Natural Resources.

University of California Cooperative Extension, 1994, "How To" Monitor Rangeland Resources: Division of Agriculture and Natural Resources.

University of California Press, 2000, Invasive Plants of California's Wildlands.

University of California Cooperative Extension, 2003, California Guidelines for Residual Dry Matter (RDM) Management on Coastal and Foothill Annual Rangelands: Publication 8092.

Weltz, Mark, and others, 1998, Influence of Abiotic and Biotic Factors in Measuring and Modeling Soil Erosion on Rangelands: State of Knowledge: Journal Range Management v. 51.

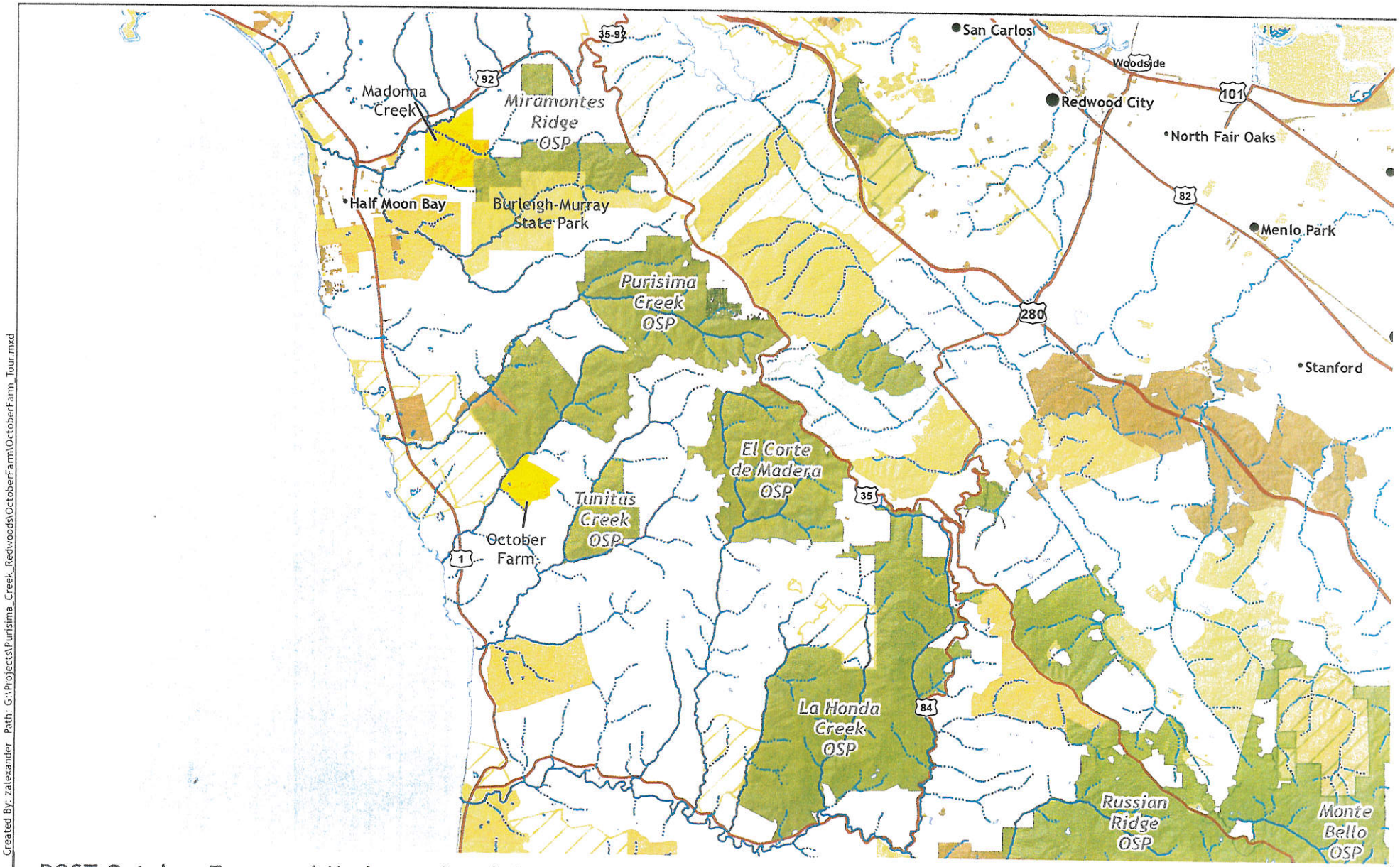
Western Livestock Journal, April 2001, Water Tanks Have Advantages Over Ponds.

Western Livestock Journal, February 3, 2003, Water Wisdom Boosts Cattle Performance, Protects Environment.

Willms, Walter D., and others, September 2002, Effects of Water Quality on Cattle Performance: Journal of Range Management 55 (5).

APPENDIX A

MAPS



POST October Farm and Madonna Creek Properties

- Tour Sites
- MROSD Preserves
- Other Protected Open Space or Park Lands
- Watershed Land
- Other Public Agency
- Non MROSD Conservation or Agricultural Easement
- Private Property

Figure 1 Vicinity Map October Farm

Midpeninsula Regional Open Space District *(MROSD)*

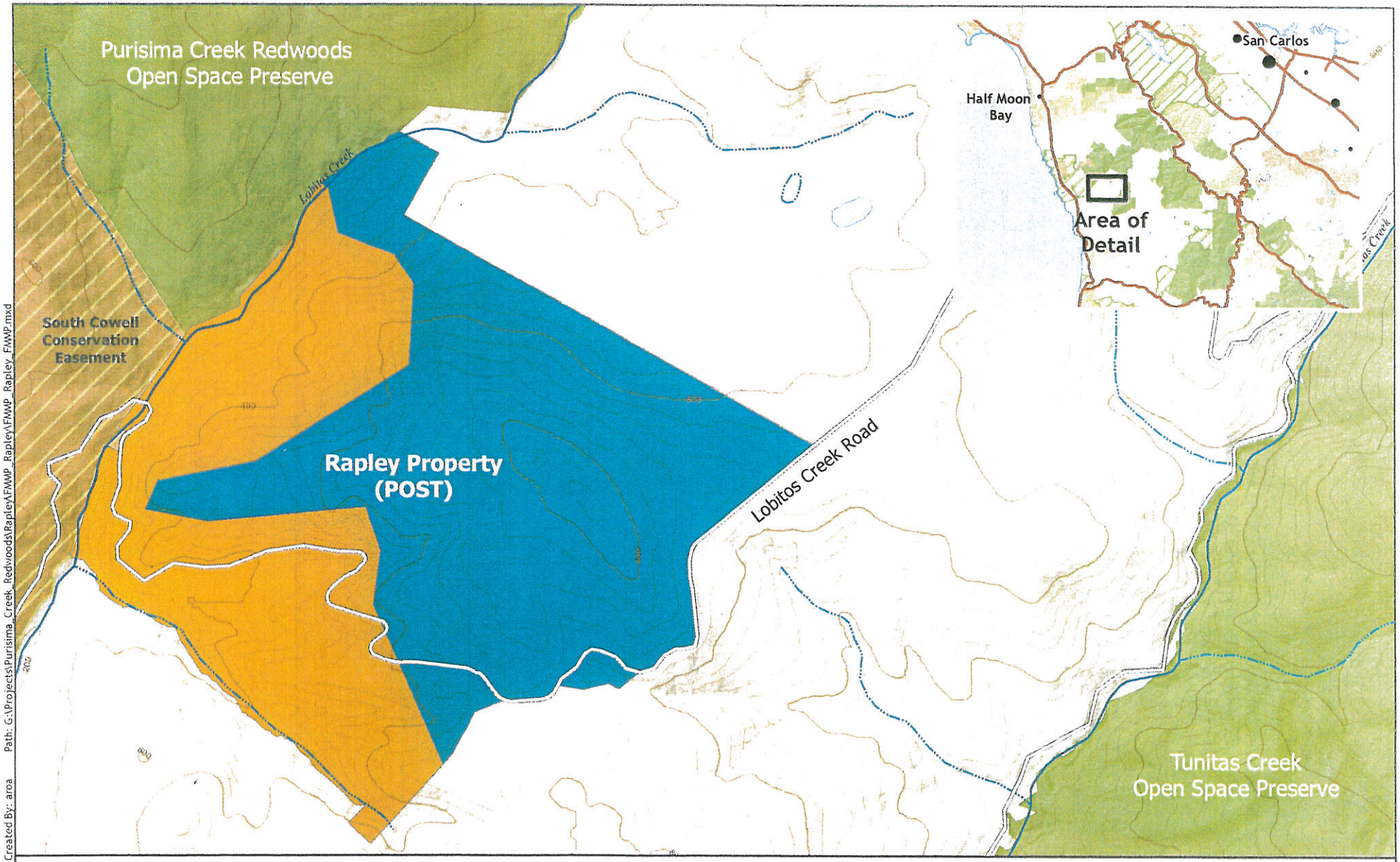
November, 2011

0 1 2 4 Miles

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

Created By: zalexander Path: G:\Projects\Purisima_Creek_Redwoods\OctoberFarm\OctoberFarm_Tour.mxd

Attachment 2



FMMP Data, POST (Rapley) Property

Granzing Land: Type G (167.5 Acres)

Other Land: Type X (115.0 Acres)

Midpeninsula Regional
Open Space District
(MROSD)

August, 2011

Miles
0 0.2 0.4

Figure 2 October Farm

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

Attachment 2

Attachment 2

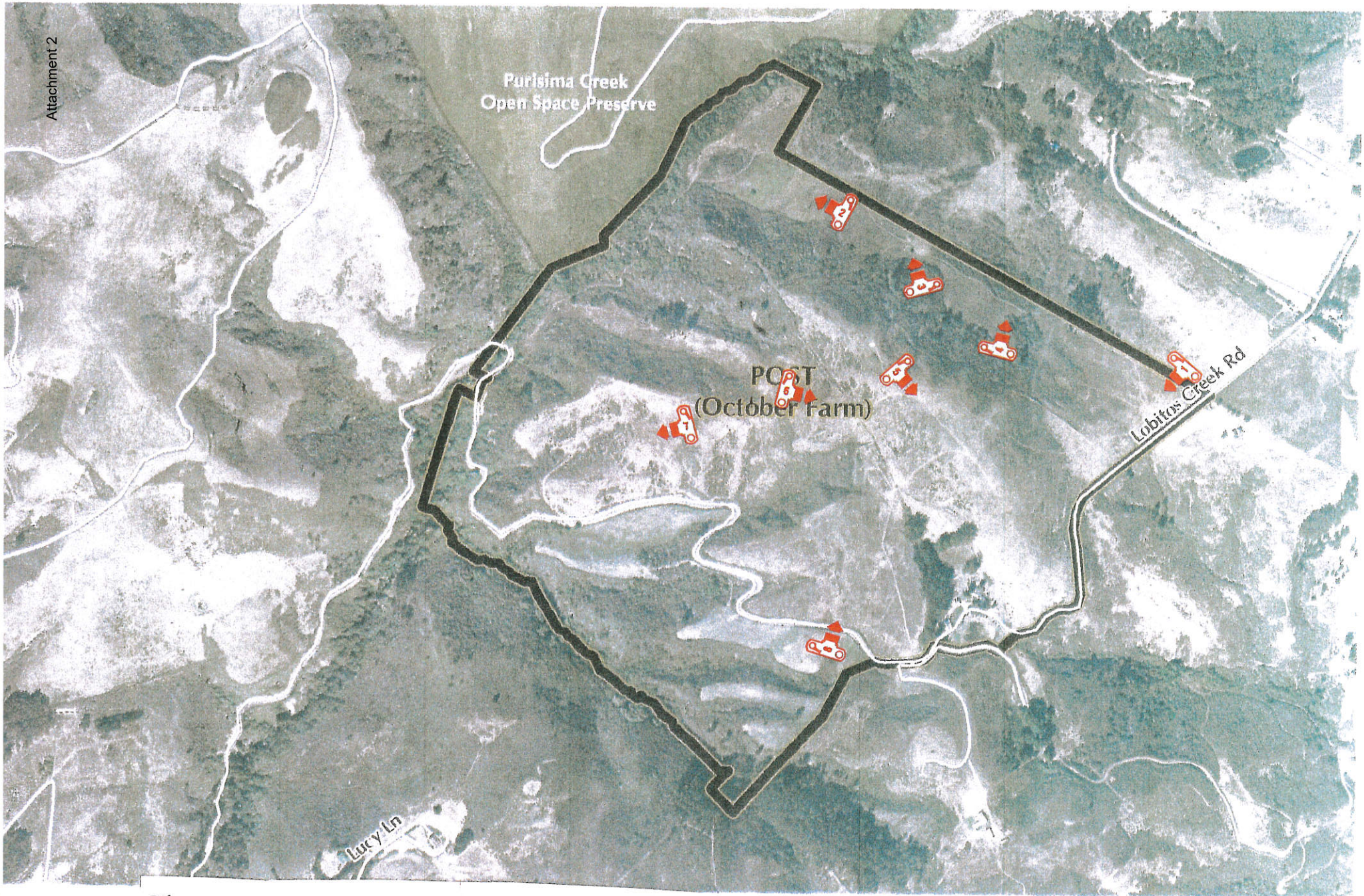


Figure 3 **Aerial Photo and Photo Location Map**

Direction of Photos

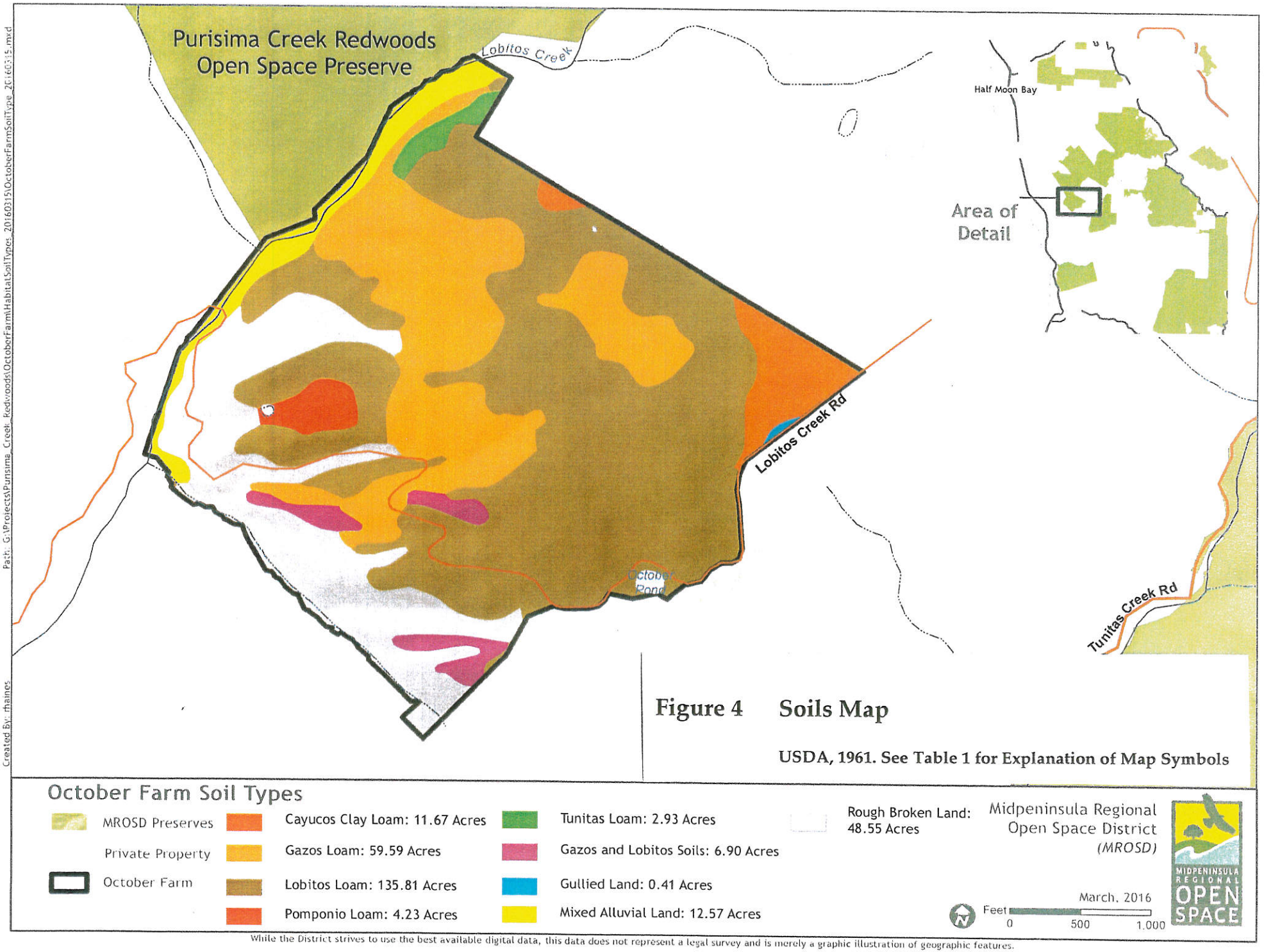
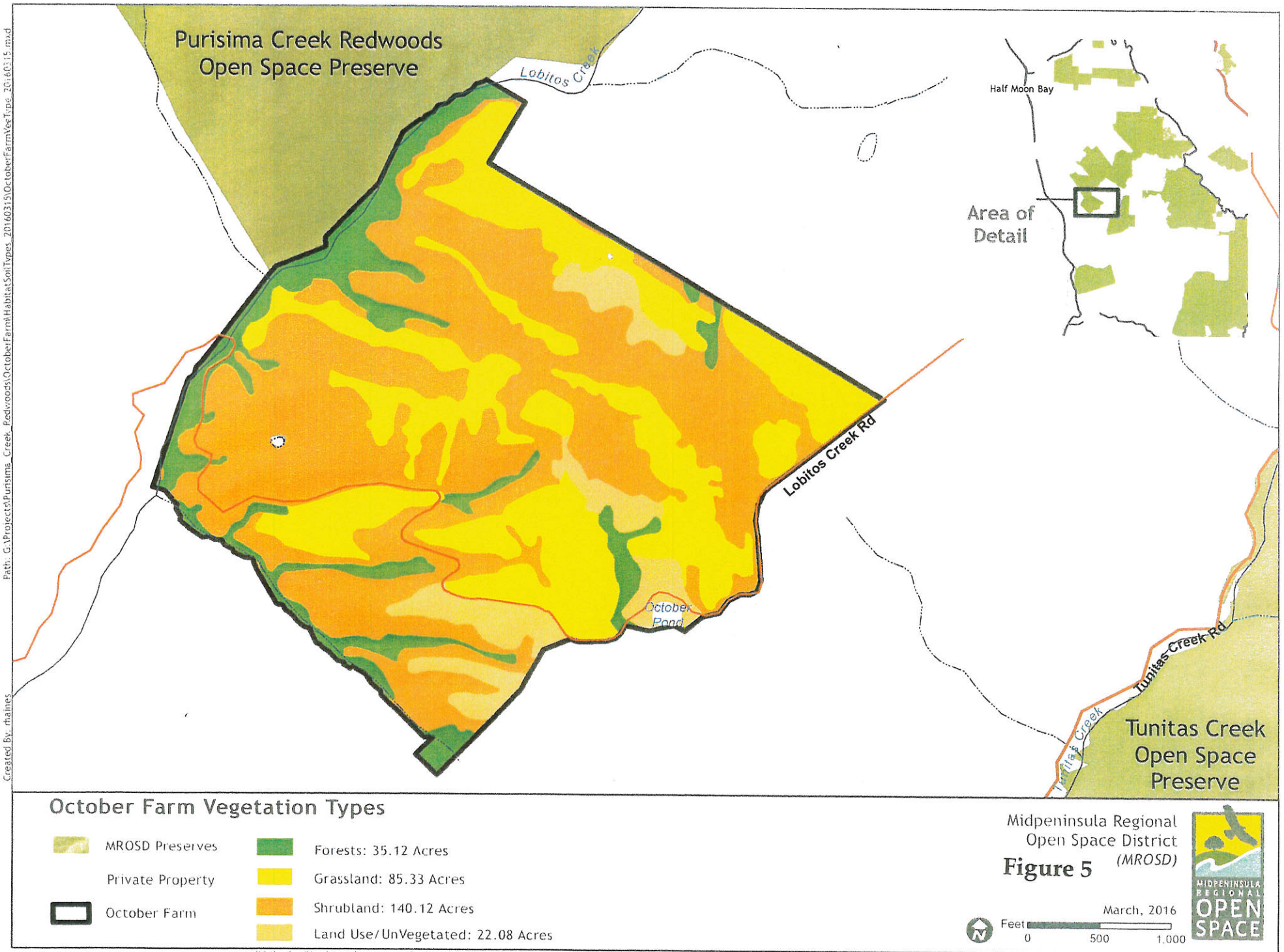


Figure 4 Soils Map

USDA, 1961. See Table 1 for Explanation of Map Symbols

Attachment 2



Path: G:\Projects\Purisima_Creek_Redwoods\OctoberFarm\Habitat\SoilTypes_20160315\OctoberFarmVegType_20160315.mxd

Created by: rhaines

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

Attachment 2

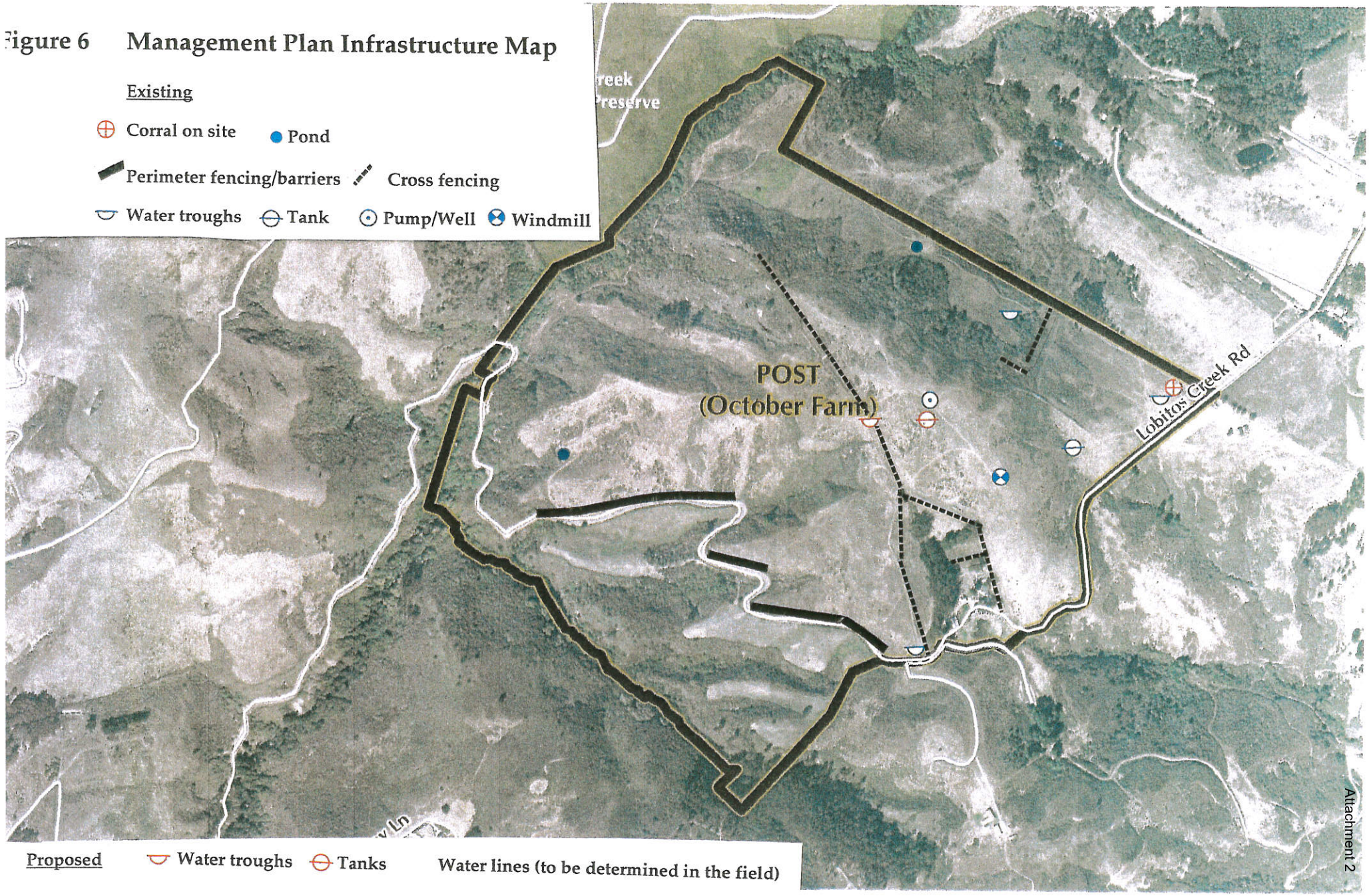


Figure 6 Management Plan Infrastructure Map
Existing
Corral on site
Pond
Perimeter fencing/barriers
Cross fencing
Water troughs
Tank
Pump/Well
Windmill
POST
(October Farm)
Lobitos Creek Rd
Proposed
Water troughs
Tanks
Water lines (to be determined in the field)
Attachment 2

APPENDIX B

PHOTOS

OCTOBER FARM GRAZING MANAGEMENT PLAN

PHOTO 1: Corrals. Note water tank and windmill on hill. March 17, 2016 to southwest. N37 23 711 W122 22 603. 676′.

PHOTO 2: East pasture. March 17, 2016 to northwest. N37 23 943 W122 23 048. 477′.

OCTOBER FARM GRAZING MANAGEMENT PLAN

PHOTO 3: East pasture pond. March 17, 2016 to northeast. N37 23 885 W122 22 956. 546′.

PHOTO 4: East pasture trough, and thistles. March 17, 2016 to southeast. N37 23 813 W122 22 809. 587′.

OCTOBER FARM GRAZING MANAGEMENT PLAN

PHOTO 5: Middle pasture ridgetop solar pumphouse and windmill March 17, 2016 to southeast. N37 23 736 W122 22 954. 821′.

PHOTO 6: West and Middle pastures hillside March 17, 2016 to southeast. N37 23 713 W122 23 079. 799′.

OCTOBER FARM GRAZING MANAGEMENT PLAN

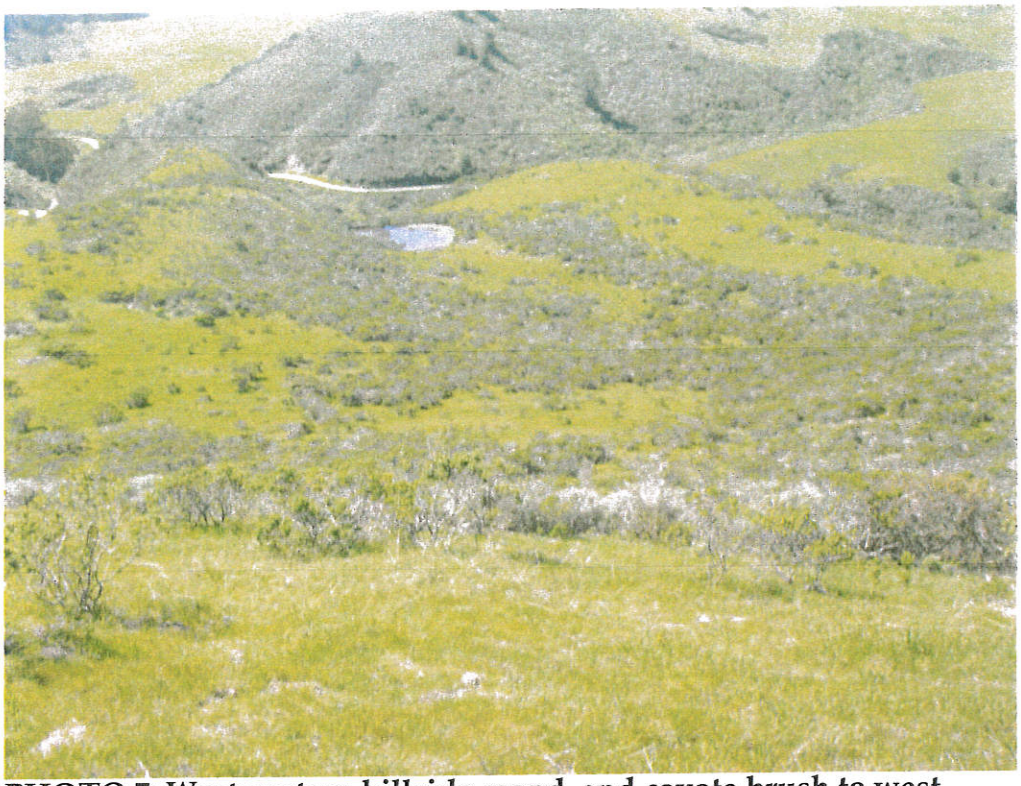


PHOTO 7: West pasture hillside, pond, and coyote brush to west March 17, 2016. N37 23 690 W122 23 237. 622′.

PHOTO 8: West pasture hillside to north March 17, 2016. N37 23 482 W122 23 047. 688′.