PRESCRIBED HERBIVORY FOR VEGETATION TREATMENT PROJECTS

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Prescribed Herbivory for Vegetation Treatment Projects

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OVERVIEW

This document was produced by the Range Management Advisory Committee (RMAC) to provide assistance in implementing prescribed herbivory projects by foresters in the CAL FIRE Vegetation Management Program (VMP) and others contemplating fuel reduction projects consistent with the Vegetation Treatment Program Environmental Impact Report (VTP Program EIR).[A1] The VTP Program EIR (PEIR) envisions using a combination of prescribed fire, mechanical treatments, manual treatments, prescribed herbivory, and herbicides to strategically reduce hazardous fuel loading within the State Responsibility Area (SRA). The information included in this document should aid the VMP Foresters in identifying environmental conditions where prescribed herbivory may be the best treatment alternative in terms of cost and environmental impact to achieve the fuel reduction objectives. While aimed at Cal Fire VMP implementation, the information contained herein also applies to anyone seeking to implement a prescribed grazing program for vegetation management.

"Prescribed Grazing", "prescribed herbivory", "contract grazing", "service grazing", "precision grazing", or "targeted grazing" is the management of vegetation with grazing or browsing animals to achieve specific ecological, economic, safety, and/or management objectives. Under the VTP PEIR it is the intended outcome to use domestic livestock to remove and/or

,reduce, and/or trample on wildlands to reduce the costs and losses associated with wildfires and to enhance the condition of landscapes for a variety of purposes.

.[A3] [A4]

The types of domestic livestock considered include sheep, goats, and cattle, although horses and other herbivores may be creatively utilized to accomplish similar tasks. In recent decades, emphasis has been placed on sheep and goats as the favored livestock for VTP projects in dense or brushy habitats because of their grazing and browsing habits, relative ease of transport, and need for additional infrastructure, among other logistical benefits.[A5]

Depending on the project, an important consideration is that livestock raised in a similar region to the prescribed herbivory project will often have broader consumption preferences. Cattle may also be preferred in larger open spaces like grassland and woodland habitats due to their diet preferences and potential for longer treatment periods. Combinations of these animals, depending on project size and vegetation types, can be effective in creating fuel breaks in grass and shrub fuel types, and maintaining fuel breaks in grass, shrub, and timber fuel types, as well as reducing ladder fuels and fine fuels across the landscape. Effective use of livestock requires the appropriate combination of animals, stocking rates, and timing. [A6]

Determining the goals and objectives of the user[A7] are critical in evaluating the potential use of prescribed herbivory, also referred to as “prescribed grazing”, “targeted grazing” or “service grazing.” In general, CAL FIRE initiated projects will include hazardous fuel reduction as the primary goal of the project. Resource protection[A8] [A9] and habitat and habitat enhancements such as noxious weed treatment may be a secondary goal of projects. This paper provides guidance on the following:

- benefits and limitations of using livestock,
- factors to consider in a site evaluation,
- general animal characteristics,
- best management practices,
- contracting considerations,
- CEQA considerations, and
- resources for more information.

BENEFITS

Prescribed herbivory can offer a variety of benefits in comparison to other proposed vegetation treatments included in the VTP Program EIR. Herbivory is a historic, natural way of removing [A10] biomass and[A11] can yield a quality protein product for commercial benefit. Herbivores are essentially “biological masticators” that can reproduce themselves and covert biomass into a consumable product. In addition to the management of fine fuels loads to achieve desired conditions for wildfire, prescribed herbivory may also improve or maintain desired plant species, Improve or maintain quantity & quality of forage, Improve or maintain water quality & quantity, Improve or

maintain riparian & watershed function, reduce soil erosion, Improve soil health and Improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife.

Consider using prescribed herbivory in the project when the following concerns arise:

- Proximity to structures, when compared to risks of using prescribed fire or mechanical treatments[A13] .
- Steep slopes, when compared to prescribed fire, manual, or mechanical treatments.
- Soil compaction and surface disturbance, when compared to mechanical treatments.
- Noxious weed control, when compared to manual or mechanical treatments.
- Air quality and liability when compared to the use of prescribed fire.
- Noise, when compared to mechanical and some manual treatments.

LIMITATIONS

There may be environmental, social, or project constraints that make prescribed herbivory an inappropriate treatment to consider, including, but not limited to, the following:

- Timing constraints on treatment implementation, especially in relation to the size and maturity of the vegetation.
- Browsers prefer to eat the leaves and shoots and leave the larger woody material (one inch or larger) behind. Seasonal variations also affect the palatability and nutritional quality of vegetation.
- Goats may eat the bark of some tree species, which may kill the tree by girdling. This can be controlled through appropriate stocking rates, management practices on site and during treatment, and limiting their duration on site[A14] .
- [A15] Herbivory may only remove live one- and ten-hour fuels (those less than about one inch). Prescribed grazing may be used in conjunction with other vegetation treatments if larger materials need to be treated or a high quantity of dead fuels are present on-site.

SITE EVALUATION

Several characteristics and parameters of the site must be evaluated prior to designing a grazing/browsing management plan including, but not limited to, the following:

Vegetation Characteristics

Prescribed herbivory should be considered when the targeted vegetation to be reduced or modified is grass, forbs, or shrubs[A16] . Herbivores may also be appropriate in

forested vegetation types when the targeted vegetation is shrubs and brush, such as in fuel break maintenance. Vegetation characteristics to evaluate include:

- Species Composition: Understanding the vegetation species on the ground will aid the grazing operator in identifying the appropriate animal for the job. Any noxious specieson site should be identified. Any potentially toxic species to livestock should be identified. This information may dictate project timing by considering when the vegetation is most palatable, if the noxious weeds can be grazed before seed set to minimize seed production, or avoiding noxious weeds that have already set seed to minimize seed spread.. [A17]
- Height: Goats can browse only as high as they can get their mouth when standing on their hind legs, or about 7 feet. Any vegetation higher than this is unlikely to be adequately grazed to meet fuel reduction goals.
- Diameter: Goats can browse shrub and tree stems up to approximately 1 inch in diameter. Material of greater diameter will likely be left on site, denuded of any smaller stems, branches, and leaves.
- Density: The relative density or quantity of the vegetation to be removed or modified will aid in determining the number of animals and the length of time necessary to complete the job.

Environmental Characteristics

Herbivores have the potential to damage other resources if their movement is not closely controlled. Potential resources of concern are watercourses, sensitive wildlife habitat, cultural resources, and any desirable vegetation to be left on-site. Special consideration may also need to be provided to neighboring landowners and residents when developing a prescribed herbivory project. Sensitive resources need to be identified and mitigation measures developed for their protection during project development. Any identified sensitive areas should be clearly marked in the field and identified on any project maps. The protection measures need to be included in the vegetation treatment plan and clearly communicated to the herder and project manager, including a pre-operational field visit when appropriate.

Infrastructure

Moving herbivores to the site generally requires trucks and trailers[A18] . Once the animals are onsite, water and containment to he project site and potentially within the project to the desired vegetation must be addressed.

- Roads: Transportation of herbivores generally is by tractor trailer or pick-up truck with livestock trailer typically between 18’-30’, depending on the number of animals. It is important to note if the site has an adequate turn around and loading/unloading area to facilitate large truck traffic. This does not have to be directly at the project site as animals can be moved moderate distances on foot to the project area. Also note if there are access roads throughout the project area, and if the loading area will be different than the unloading area.
- Water: All herbivores require water onsite. Sheep and goats consume up to 2-gallons per animal per day, whereas cattle can require up to 25-gallons a day depending on climatic factors. Water can be from a water supply line to a

portable water trough, an on-site stock pond, mobile water tank and trailer, or can be shipped in by a water tender. All available water sources in the general project vicinity should be identified during project development.

- Containment: Herbivores will need to be contained to the project boundaries or smaller subunits [A19] within the project area to control animal movement. This containment aids in managing the intensity of site impact and duration of grazing in the project area, protects on and off-site sensitive resources, and helps to protect the herbivores themselves from predators.[A20] Cattle, sheep, and goats require fencing and typically herding dogs are utilized; in addition, sheep and goats will generally utilize guard and herding dogs and an on-site herder. Portable electric fencing is a common tool for grazing operators, but any existing fences or barriers to animal movement should be identified.

Scale

The size of the project and the amount of vegetation to be removed will have a strong influence on the economics of prescribed herbivory projects. As with mechanical treatments, the move-in and set-up costs are somewhat fixed regardless of project size. [A21] Herbivores also become more productive once they are familiar with the vegetative characteristics of the site. Larger projects will likely result in bids that are cheaper per acre or per animal day than smaller projects. However, small projects may still be competitive with other vegetation treatment methods, so the size of the project should not discourage the use of herbivores. The contracting section below goes into further detail on this topic.

ANIMAL CHARACTERISTICS

Generally animal[A22] s can be divided into two categories, grazers and browsers; each category may overlap significantly depending on species, stage of life, availability of forage, animal genetics, or previous training of animals. Cattle and sheep fall into the category of “grazers,” and tend to prefer the bulk cellulose of grasses and forbs. Goats fall into the broad category of “browsers,” and tend to feed on more readily digestible leaves and shoots of shrubs and trees within their reach. All these animals have a limited ability to shift among these feeding strategies.

Utilizing multiple species together on the same site can be very effective for fuel reduction projects, particularly when the target vegetation is a combination of grass, forbs, and shrubs. Taking advantage of the dietary preferences of each herbivore can result in a more complete fuel reduction project. Grazing animals such as sheep or cattle will consume the grass and forbs, while browsing animals such as goats will consume the woodier material within their reach (up to 7 feet high).

Fuel reduction will also be dependent on the stocking rate, or the number of animals per unit area (density), over the specified lengths of time. Prescribed herbivory is generally performed at high stocking densities for short periods of time to encourage the animals to compete amongst each other for limited resources. This strategy encourages the

animals to uniformly consume [A23] all the vegetation present and not preferentially browse and graze on only the most nutritious vegetation available. This strategy also aids in animal health as the livestock balance the amount of nutritious and less-nutritious vegetation in their diet over short time periods. It is not uncommon to see stocking rates equivalent to 450-900 of sheep or goats per acre for a 24-hour period.

Consumption per day of both grazers and browsers can be calculated by the following general rules:

- Goats will eat approximately 3[A24] % of their body weight per day of the dry matter weight of the forage being consumed.
- Sheep, horses, and cattle will eat approximately 2%[A25] of their body weight in dry matter per day.

A 100-pound goat would consume approximately12 pounds of green[A26] brush per day. If the project objective is to reduce one ton (2,000 pounds) of brush per day from a specified area, it would take approximately one hundred seventy (170) 100-pound goats to accomplish that objective.[A27] By calculating the amount of biomass to be removed, the proper number of animals and length of the foraging period can be calculated. This guidance will help during the contracting phase of project development. There is not a typical mob size for multi-species systems; however, one herder can handle up to 1,500[A28] head of goats and sheep and one semi-truck can transport approximately 400-450 goats and sheep, 35 cows, or 70-100 stockers (calves). The ratio of grazers to browsers can be tailored to the targeted vegetation to be removed.

Forage species being targeted for herbivory may not always provide a nutritionally adequate diet for the animals; therefore, mineral, or protein supplements may be required to maintain animal health and productivity. Toxic plants can be a challenge, particularly with sheep.[A29] Goats seem to be frequently resistant to most serious toxins but may limit their intake of scrub or forbs depending on the time of year or elevation. See University of California Agriculture and Natural Resources publication on livestock poisoning by plants in California (Forero et al. 2011). The experienced contract grazer[A30] will be able to identify any special constraints on the site and may be able to suggest seasonal project timing that will best meet the project's objectives.

BEST MANAGEMENT PRACTICES

There are important best management practices to integrate into the design of a prescribed herbivory project to minimize or mitigate potential environmental or social impacts.

- Identify and establish appropriate buffer zones around environmentally sensitive areas such as riparian zones, sensitive plants, threatened or endangered animal habitat and archaeological resources.
- To prevent introduction of seeds from undesirable plant species to the site, consideration should be given to where the animals are coming from, and

whether viable seeds of undesirable species are present. If this is the case, the herd should be fed a weed free diet for three days [A31] prior to being introduced to the grazing site. Any supplemental feed brought on site should be free of noxious weeds.

- Use the highest appropriate stocking density to achieve uniform utilization of the targeted vegetation.
- Post signs informing public of danger of electric fences and unleashed guard dogs when the project area is open to the public. Discuss public interactions with the on-site herder and grazing project manager.
- Conduct appropriate public outreach so that the public will understand the project objectives. The general public will be very interested in what the animals are doing and why. Consider project signage or a one page pamphlet or brochure available on-site describing the overall project, its objectives, and how herbivory is helping to achieve those objectives.

- Confirm [A32] that the grazing operator has well thought-out animal care procedures and protocols in place to ensure the animals are cared for in a responsible, humane fashion (ample stock watering, safety from predators, and careful animal observation and action for accidents, sickness or disease).
- Consultation with Certified Range Managers (CRM) when rangeland practices are being applied on forested landscapes or as appropriate. [A33] [A34]
- Develop a monitoring program that determines the effectiveness of the grazing/browsing program compared to the original planned results. [A35]

CONTRACTING

The following key points should be addressed in a contract with the grazing operator. A sample contract [A36] and Request for Proposals (RFP) are included in the appendices of this document for further guidance on this subject.

Finding the right Contract Grazing Operator for the project

There are a number of contract grazing outfits [A37] performing prescribed herbivory projects to meet specific objectives (ex. fuel reduction, invasive weed control, etc.), most often using some combination of goats, sheep and sometimes cattle. The size and scale of these operators vary, from smaller operations using only a few dozen head to commercial operations with upwards of 2,000 head performing year-round grazing services. Determining the project's acreage and the targeted vegetation type and quantity will help determine the best contract grazer for the project. Often a Request for Proposal (RFP) or Request for Quote (RFQ) defining the project location and scope is announced to the general public and contract grazers are able to provide a bid or quote on the project (see Appendix A for an example RFP). Through this process the CAL FIRE project manager can determine which operator may be the best fit for the project.

A list of contract grazers can be found online through the links provided at the end of this document.[A38] Please take note that these are not the sole operators performing these services. Active contract grazers in the area can be found by contacting other organizations in the region that use prescribed grazing as a management tool. Some organizations to check with are local Resource Conservation Districts (RCD), Fire Safe Councils (FSC), or local city and county public works departments.

Site Assessment

Before a contract grazer is able to develop a quote and scope of work for a project, it is common for the project proponent to schedule a tour of the site(s) that are being proposed for grazing. This allows the contract grazer to assess a variety of factors to determine the appropriate number of head, species and ratio of animals needed, water access points, fencing type required, truck and trailer access, and camp trailer sites (when an on-site herder is necessary). Inviting proposed contract grazing operators to become familiar with the site will allow for the most accurate cost quote and approach to achieving the project's goals using prescribed grazing. Consider designating a day during the RFP period for potential bidders to tour the project site.

Cost Structures

The acreage, duration, time of year, and the project complexity are taken into consideration when contract grazers develop quotes. There are three general types of cost structures for contract grazing services.

- The first cost structure is quoting the service fee by placing a charge per head per day. For example, if there are 500 head of goats proposed to graze, a contract grazing operator might charge x cents per head per day. If the project is to consist of 30 days, the quote would be $ (500 goats x $0.50/day x 30 days)[A39] . It should be made clear whether transportation costs are folded into the cost per head per day, or are a separate, additional cost.[A40]

- The second cost structure, common in grazed areas [A41] around urban and suburban peripheries, is a service fee per acre grazed for a proposed project. Smaller acreage often is of greater cost per acre than large acreage, typically due to the transportation needs and impact of changing vegetation characteristics on animal performance. Again, it should be made clear whether transportation costs are folded into the cost per head per day, or is a separate, additional cost. Prices for contract grazing services will vary by region and project, however industry standard in 2014 in the urban periphery of the Bay Area ranged from $300-$1,000 an acre for the service of targeted grazing for fire hazard reduction and/or stewardship goals. Most of these parcels

being grazed were less than 100 acres and generally are in the range of 5-20 acres. [A42]

- A third cost structure is a grazing license where the grazer pays to graze the property, generally on a per-acre basis or a per-animal-unit basis. This structure would be more common with cattle grazing on larger landscapes with a longer treatment period and existing infrastructure such as fencing and water. Grazers are willing to pay to graze a property if the input costs are low (i.e. existing fences and water), if the grazing season is long enough to offset the cost of shipping in and out, and if it coincides with the seasonality of their other grazing leases and production schedule. [A43] [A44]

The highest demand months for contract grazers tend to be during the end of the spring growing season through the late summer months and sometimes early fall, depending on annual rainfall. This also varies from region to region. During those heightened demand months contract grazers often charge a premium for their services. Conversely, during the off-season months of fall and winter service fees may be less as the demand for contract grazing services is reduced during this time of year. Multi-year contracts are also desirable and factor into contract prices.

The Contract

Public agencies within the state of California have been using contract grazing for more than two decades and detailed contracts have been developed to address the needs and concerns of both the agency and the contractor. The contract generally stipulates insurance qualifications, labor details[A45] , grazing schedules and terms of an annual or multiple year contract. Project proponents should inquire with local or regional public agencies known to use contract grazing as a vegetation management tool for sample contracts common in the project area. A sample contract is included in Appendix B of this document as an example of the general items that should be covered in a prescribed grazing contract.

CEQA CONSIDERATIONS [A46]

The project manager should investigate whether a prescribed herbivory project falls under one of the existing programmatic CEQA documents prepared by the Department. If it does, the program EIR will have a checklist that confirms whether the project is within the scope of that EIR, as well as any potentially significant impacts from the project and corresponding mitigation measures. Upon certification of the Vegetation Treatment Program (VTP) Program EIR, most prescribed herbivory projects will be covered by that EIR's checklist.

If the prescribed herbivory project does not fall under a program EIR checklist in whole or in part, it will require the completion of a separate CEQA Environmental analysis. The analysis may result in the filing of a Notice of Exemption or the completion and filing of a CEQA checklist and associated environmental documents (Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report). The Sacramento Headquarters Environmental Protection staff can provide guidance on the appropriate analysis and documentation.

An example environmental analysis has been provided in Appendix C as a reference for projects that are outside of the scope of the VTP Program EIR, or that are proposed prior to the certification of the VTP Program EIR and do not fall under one of the existing CAL FIRE programmatic CEQA documents. The example environmental analysis provided was conducted by the Bureau of Land Management (BLM) under the National Environmental Policy Act (NEPA). While the NEPA process differs slightly from CEQA, this document provides a look at some of the environmental impacts to consider during the CEQA process.

APPENDICES [A47]

A. Sample Request for Proposal (RFP) for Contract Grazing Services

B. Example Contract for Contract Grazing Services

C. Example Environmental Assessment for Prescribed Herbivory Projects

RESOURCES [A48]

Prescribed Grazer Contacts:

Please note that the RMAC has not verified the contact information provided on these lists nor does the RMAC endorse the contract grazers listed.

California Wool Growers Association
http://www.woolgrowers.org/targeted_grazing/producer.html

Public Agencies known to use prescribed herbivory:

- Please note this list is not inclusive of all public agencies that use prescribed herbivory but is included as a guide for the types of local agencies that may have experience using contract grazing services.

Resource Conservation Districts

East Bay Regional Parks District
Cities of Lincoln, Oakland, Rocklin, and San Francisco
San Mateo County Parks and Recreation
Santa Clara County Parks and Recreation
Mid-Peninsula Open Space District (San Mateo and surrounding counties)
City of Petaluma
City of American Canyon

Prescribed Herbivory Resources:

American Sheep Association. Targeted Grazing: A Natural Approach to Vegetation Management and Landscape Enhancement – A Handbook on Grazing as an Ecological Service. American Sheep Association, 2006. http://www.woolgrowers.org/targeted_grazing/handbook.html Accessed 8/22/14.

Navaez, Nelmy. Prescribed Herbivory to Reduce Fuel Load in California Chaparral. University of California, Davis. ProQuest, 2007. PhD Dissertation.

Ingram, Roger S., Morgan P. Doran, and Glenn Nader (2013). Planned Herbivory in the Management of Wildfire Fuels, Herbivory, Dr. Breno Barros (Ed.), ISBN: 978-953-51- 1052-1, InTech, DOI: 10.5772/48673. Available from: http://www.intechopen.com/books/herbivory/planned-herbivory-in-the-management of-wildfire-fuels

Range Management Advisory Committee (916) 653-8007
http://www.bof.fire.ca.gov/board_committees/range_management_advisory_committee/

APPENDIX A

Sample Grazing RFP [A49]

The following Request for Proposal (RFP) is from a project the City of Rocklin noticed in 2014. It is included here as an example of the subjects that should be covered to give potential contract grazers a clear understanding of your project. Your project may require greater or lesser detail than this example. To receive accurate quote for your project, the RFP must fully disclose the project location

and scope, including any constraints that need to be addressed during project implementation. It is common to include a site tour for interested contractors prior to the close of the open bidding process to give them a full understanding of the site conditions.

In addition to the information included in the sample RFP below, a complete RFP should include a project location map, any special permit conditions, and a copy of the grazing contract you expect the applicant to enter into.

APPENDIX B

SAMPLE RX GRAZING CONTRACT

APPENDIX C

Example Environmental Analysis[A51]

The following environmental analysis was performed by BLM to meet the requirements of the National Environmental Policy Act (NEPA) for a prescribed grazing project designed to control invasive weeds in El Dorado County. The California Environmental Quality Act (CEQA) has slightly different requirements than NEPA. This document is provided here to show how another public agency, the BLM, has addressed the environmental impacts of prescribed herbivory. These same impacts would be likely be identified and addressed under a mitigated negative declaration or environmental impact report under CEQA.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Mother Lode Field Office

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El Dorado Hills, CA 95762

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EA Number: CA-180-15-27

Proposed Action: Prescribed grazing of sheep to control yellow starthistle and medusahead at Cronan Ranch and Magnolia Ranch.

Location: BLM-administered land within portions of T 11 N, R 9 E, Sections 8-11, 16, 17, 21, El Dorado County.

1.0 **Purpose and Need for the Action**

1.1 **Background**

Invasive plants are defined as "non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health," based on the definition provided in Executive Order 131121[1]. Invasive plants are compromising the ability to manage BLM lands or a healthy native ecosystem. Invasive plants can create a host of environmental and other effects, most of which are harmful to native ecosystem processes, including: displacement of native plants; reduction in functionality of habitat and forage for wildlife and livestock; increased potential for soil erosion and reduced water quality; alteration of physical and biological properties of soil; loss of long-term riparian area function; loss of habitat for culturally significant plants; high economic cost of controlling invasive plants; and increased cost of keeping systems and recreational sites free of invasive species.

[1] EXECUTIVE ORDER 1311 INVASIVE SPECIES (1999) - directs federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.

The method for invasive species control that will be analyzed in this EA is grazing by sheep. The use of domestic livestock to control weeds requires "prescribed grazing" in which the kind of animals, and the amount and duration of grazing are designed to control a particular species while minimizing impacts to perennial native vegetation. In order for prescribed grazing to be effective, the right combination of animals, stocking rates, timing, and rest must be used. Grazing should occur when the target plant is palatable and viable seeds can be reduced.

1.2 **Need for Action**

This EA has been prepared to analyze and disclose the environmental consequences of implementing prescribed sheep grazing for weed control on BLM lands within the 1,342-acre Cronan Ranch and 735-acre Magnolia Ranch BLM properties. The proposed

action is needed to reduce the adverse impacts associated with a large infestation of noxious weeds in the project area – specifically, yellow starthistle (*Centaurea solstitialis*) and medusahead (*Taeniatherum caput-medusae*). Historic and current land use practices have created extensive infestations of these species throughout the project area.

The project area falls within the South Fork American River Special Recreation Management Area (SRMA). This SRMA receives a high amount of recreation due to the presence of the South Fork of the American River and a large trail network which encourage numerous recreational opportunities such as horseback riding, mountain biking, hiking, camping, fishing, kayaking and rafting. Vehicles, bicycles, horses, pets and recreationists have contributed to the spread of weeds throughout the project area.

Weed infestations have altered the appearance of Cronan Ranch and Magnolia Ranch and affects the use of trails and other areas. Because of its spiny nature, yellow starthistle deters the use of lands for recreation. Both medusahead and yellow starthistle form monocultures which crowd out native plants. Starthistle is also known to significantly alter water cycles and deplete soil moisture reserves in annual grasslands and foothill woodland ecosystems. Because these infestations use deep soil moisture reserves earlier than associated natives such as blue oak or purple needlegrass, native species can experience drought conditions even in years with normal rainfall (Benefield *et al*. 1998, Gerlach *et al*. 1998). The increasing expansion of invasive plants in the project area has led to a loss of habitat function and reduced the quality and quantity of forage for wildlife, impaired visual aesthetics, altered soil productivity, and increased the potential for soil erosion and adverse impacts on water quality.

Various forms of control for yellow starthistle have been implemented in the project area. In the spring of 2013 and 2014, herbicide application was used along trails and parking lot perimeters to create a buffer for recreationists from yellow starthistle. Herbicides have been very successful in treating starthistle but are labor intensive and expensive to apply to large areas of land. Mowing and/or weed whacking has been used along trails following herbicide application to keep vegetation that was not affectively treated with herbicides out of the trail corridor. Mowing/weed whacking is also used in place of herbicides in places that are inaccessible to herbicide application. These methods are also labor intensive across large tracts of weed-infested land.

Appendix C

Example Environmental Analysis (NEPA)

Control of yellow starthistle with goat grazing was attempted years ago but this method was unsuccessful at significantly reducing weed densities. Goats primarily graze woody species and were not present throughout the season to control the yellow starthistle that grew back. Control of medusahead has not been attempted previously. Another EA (CA-180-12-13) analyzed potential methods of weed control at Cronan, including herbicides and prescribed fire. Prescribed fire has yet to be implemented because the timing of the treatment coincides with the season of highest fire danger. Use of fire is also limited because of the topography of the project area. Steep slopes and narrow ridges make prescribed fire difficult to use in some of the area. Because medusahead and yellow starthistle cover such a large section of the project area, prescribed grazing would be a more economical weed control method which would allow the BLM to treat a larger area with less labor and expense.

1.3 **Public Participation, Scoping and Issues**

Fred Hunt, Soil Technician for El Dorado County & Georgetown Divide Resource Conservation Districts, brought the idea of prescribed sheep grazing at Cronan to the BLM. He was working with a rancher and wanted us to consider using prescribed sheep grazing for weed control.

This EA will be made available for public review on BLM's NEPA webpage. The review period is 15 days. Additionally, local Native American tribes will be contacted to determine whether they have an interest in the proposed action.

1.4 **Conformance with Applicable Land Use Plans**

The Proposed Action is consistent with the Sierra Resource Management Plan Record of Decision (ROD), approved in February 2008. In Section 2.4 of the ROD for Vegetative Communities, it lists the following objectives: manage vegetation (including invasive species removal) to improve habitat conditions for particular wildlife species; and control invasive species and increase native plant species using early detection, rapid response, and prevention measures. Section 2.4 also lists the following management actions:

> Prevent, eliminate, and/or control undesired non-native vegetation or other invasive species using an Integrated Pest Management approach that combines biological, cultural, physical, and chemical tools to minimize economic, health, and environmental risks.
>
> Use prescribed fire, mechanical mastication, herbicides, manual removal, seeding, propagation, and planting or combinations of these methods to promote healthy, diverse vegetation communities.
>
> Implement and meet national BLM policies consistent with the Partners Against Weeds Initiative (DOI 1998) and Executive Order 13112.

The Proposed Action is also consistent with The South Fork American River Draft Management Plan (March 2003) which contains the following management guideline for noxious weed control:

> Each parcel along the South Fork American River shall have a Noxious Weed Control plan to expedite the BLM policy to eradicate populations of noxious weeds.

The Proposed Action is in conformance with The Cronan Ranch Management Plan (February 2007) which lists specific management actions for noxious weeds:

> All known populations of noxious weeds will be treated for eradication or reduced rates of spread. All methods of weed treatment may be considered including manual, mechanical, biological, and chemical methods.

1.5 **Tiering to the Bureau-wide Programmatic Vegetation EIS**

This EA tiers to the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) (BLM 2007a), which analyzed the impacts of using herbicides (chemical control methods) to treat invasive plants on public lands. In addition, this EA incorporates by reference the *Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report* (PER) (BLM 2007b), which evaluated the general effects of non-herbicide treatments (i.e., biological, physical, cultural, and prescribed fire) on public lands. The PEIS identifies impacts to the natural and human environment associated with herbicide use and appropriate best management practices (BMPs), standard operating procedures (SOPs), mitigation measures, and conservation measures for avoiding or minimizing adverse impacts. The PER describes the environmental impacts of using nonchemical vegetation treatments on public lands.

The PEIS identifies priorities including protecting intact ecosystems; maintaining conditions that have led to healthy lands; and applying mitigation measures to minimize soil and vegetation disturbance and avoid introductions of invasive species. Vegetation treatment priorities identified in the PEIS (pg. 2-7) include:

- Use effective nonchemical methods of vegetation control where feasible.
- Use herbicides only after considering the effectiveness of all potential methods.

Several management objectives in the PEIS (pg. 2-7) are considered when determining appropriate treatment of an infestation:

- Containment to prevent weed spread from moving beyond the current infestation perimeter;
- Control to reduce the extent and density of a target weed;
- Eradication to completely eliminate the weed species including reproductive propagules (this is usually only possible with small infestations).

1.6 **Relationship to Statutes, Regulations, and Plans**

The Mother Lode Field Office has prepared this IWM strategy in compliance with Department of Interior (DOI) and BLM policy and manual direction, including **DOI Manual 517 (*Integrated Pest Management*)** and **BLM Manual Section 9015 (*Integrated Weed Management*)**.

Appendix C

Example Environmental Analysis (NEPA)

Several Federal laws, regulations, and policies guide BLM management activities on public lands. The ***Federal Land Policy and Management Act of 1976*** **(FLPMA)** directs the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values." The ***Carlson-Foley Act of 1968*** and the ***Plant Protection Act of 2000*** authorize and direct the BLM to manage noxious weeds and to coordinate with other Federal and state agencies in activities to eradicate, suppress, control, prevent, or retard the spread of any noxious weeds on Federal lands.

The ***Federal Noxious Weed Act of 1974*** established and funded an undesirable plant management program, implemented cooperative agreements with state agencies, and established integrated management systems to control undesirable plant species. The ***Noxious Weed Control Act of 2004*** established a program to provide assistance through states to eligible weed management entities to control or eradicate harmful and non-native weeds on public and private lands. **Executive Order 13112, *Invasive Species***, directs Federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause (BLM 2007a).

The BLM has also produced national-level strategies for invasive species prevention and management. These include ***Partners Against Weeds*** (BLM 1996), which outlines the actions BLM will take to develop and implement a comprehensive integrated weed management program; and ***Pulling Together: National Strategy for Invasive Plant***

Management (BLM 1998), which illustrates the goals and objectives of a National invasive plant management plan (prevention, control, and eradication). The Federal Interagency Committee for the Management of Noxious and Exotic Weeds is leading a national effort to develop and implement a ***National Early Detection and Rapid Response System for Invasive Plants in the United States*** (FICMNEW 2003). The primary long-term goals of the proposed system are to detect, report, and identify suspected new species of invasive plants in the United States.

The EPA regulates pesticides (including herbicides) under the ***Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1972*** as amended in 1988. This Act establishes procedures for the registration, classification, and regulation of all pesticides. Before any herbicide may be sold legally, it must be registered by the EPA. The EPA may classify a pesticide for general use if it determines that it is not likely to cause unreasonable adverse effects to applicators or the environment. A pesticide that is classified for restricted use must be applied by a certified applicator and in accordance with other restrictions.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action is to implement prescribed sheep grazing for weed control at Cronan Ranch and Magnolia Ranch. Properly managed livestock grazing can help to remove litter, recycle nutrients, stimulate tillering of perennial grasses, and reduce seedbanks of invasive plants (DiTomaso and Smith 2012). Grazing would ideally involve anywhere from 300 to 500 sheep and could occur during the months of March through September depending on the rainfall and subsequent vegetative growth for that year. Sheep would be removed at an optimal RDM (Residual Dry Matter) level, before overgrazing occurs. The timing, duration and stocking rates are subject to change based on observed responses of the habitat to the grazing regimes. Grazing would take place in the open grasslands and blue oak savannah where large infestations of weeds occur. Forested areas would not be grazed.

A shepherd and sheep dogs would be on site to manage the flock, directing them to different grazing areas and maintaining the flock within that area before moving to the next area. This would help ensure uniform grazing throughout the project area and ensure that the prescribed grazing is adhered to. Without herding, sheep may congregate in one area and ignore another area. This could lead to overgrazing in one area and not enough grazing in another.

The amount of time the sheep will stay in any particular area will depend on the amount of meduahead/yellow starthistle. Some areas may require only a few hours' worth of

grazing while others may require several days' worth. Effectively grazing several days' worth of herbaceous vegetation may require the use of temporary electric fencing. The herder would install temporary poly-wire electric fencing that would contain the sheep in one area for an extended time. The electric fencing also could be used to keep sheep out of certain areas as directed. The fencing provides a very mild shock that does not harm animals or people.

The shepherd would live on-site in a self-contained mobile housing unit. The unit would be placed just off the established road system near areas where the sheep were grazing. The State of California Employment Development Department would inspect the mobile housing unit every six months to ensure its safety and habitability. A BLM representative would be on site at least once a week, likely more, to monitor the grazing situation. The rancher would be onsite once a week or every other week to provide provisions to the shepherd and discuss the grazing strategy for the upcoming week.

The herder would be responsible for hauling water to the sheep in a company water truck. The water would be drawn from either a spring located at Cronan Ranch or the river depending on the location of the sheep. A hose would be temporarily installed at the spring and would transport water down the hill to the main Cronan road to make it easier for the water truck to fill up with water. The hose would be hidden in vegetation as much as possible. The truck would not leave established roads. Watering would take place from the roads or road shoulders.

When medusahead is grazed at the proper timing, livestock can dramatically reduce seed production by foraging on the top portion of the plant, eventually reducing the medusahead seedbank (DiTomaso and Smith 2012). Studies have shown that the optimal timing is in late spring after medusahead stems begin to elongate and before the seed milk stage (DiTomaso et al. 2008). The proper intensity of grazing treatments is also critical to successful control of medusahead. The most effective results occur when grazing is high intensity and short duration (DiTomaso and Smith 2012). High density, short duration, mid-spring grazing in late April to early May provided excellent control of medusahead on California grassland in the Central Valley (DiTomaso et al. 2008). Medusahead must be prevented from producing new seed for two to three years in order to deplete the soil seedbank.

Grazing is also effective in reducing yellow starthistle seed production. Sheep, goats, or cattle eat yellow starthistle before spines form on the plant. Intensive grazing in late May and June using large numbers of animals for short duration can reduce plant height, canopy size, and seed production (DiTomaso 2007). Overgrazing would be avoided because grazing more than half the grass forage would reduce the grasses' recovery rate and ability to shade out yellow starthistle. Two or three treatments per year may be needed when grazed in the rosette or bolting stage.

Appendix C

Example Environmental Analysis (NEPA)

The management objective for the Proposed Action would be to increase native plant species diversity while also reducing the extent and density of invasive weed populations. Because management of invasive weeds is not a one-time thing, follow-up treatments in successive years are also covered under this EA. Three or more years of intensive grazing management may be necessary to significantly reduce the medusahead and yellow starthistle populations (DiTomaso 2006). This EA would be effective for up to ten years of prescribed grazing if that amount of time is needed to reduce populations of invasive weeds.

Grazing success would be measured using photopoints as well as through installation of five to ten grazing exclosures. The exclosures would prevent grazing inside of them and would allow the BLM to compare changes in grazed vegetation with ungrazed vegetation over time. Percent cover of weeds and native species would be recorded before grazing begins and would be recorded annually during the first three years following grazing implementation to determine effectiveness. After the first three years, monitoring would occur every other year if grazing is still occurring. Adaptive management would be used to adjust timing, herd rates and other variables to provide for the most effective treatments.

2.2 Project Design Features

- Blue elderberry shrubs (*Sambucus nigra* ssp. *cerulea*), which provide habitat for the Federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), are present in the project area. A measure of protection would be to train the rancher, herder(s) and BLM staff to recognize blue elderberry, so that elderberry shrubs can be avoided by actions such as herding of sheep away from the elderberry shrubs.

- Pre-treatment surveys were conducted prior to the previous EA (CA-180-12-13) within each treatment unit, and each blue elderberry shrub, or group of shrubs, with one or more stems measuring one inch in diameter or greater at ground level within the treatment area will be flagged prior to implementation of the proposed action. A pre-treatment survey involved a careful count of all stems greater than one inch in diameter at ground level. The stem count followed the guidelines in Table 1, Page 12 of U.S. Fish and Wildlife Service 1999 Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999). Specifically, stems were categorized as 1-3 inches, 3-5 inches and greater than 5 inches, in riparian or non-riparian habitat, and whether they had beetle exit holes or not.

- All woody species, including shrubs and trees will be avoided to the extent possible. The rancher and herder(s) will be directed to avoid grazing of woody species. There are young oak and other native shrubs and trees in the project area that are integral to the ecosystem.

- Riparian areas such as Hastings Creek, Greenwood Creek and the South Fork of the American River would be avoided by sheep, using electric fencing as necessary to decrease the risk of erosion and sedimentation into the waterways.

- Sensitive cultural resources identified by the BLM archaeologist will be avoided. Sheep will not be watered on the identified sites. Sheep will be discouraged from bedding on the identified sites. The rancher and herder(s) will not place temporary fencing or the the mobile housing unit on the identified sites, or drive the water truck or any other vehicles on the identified sites.

- The water truck would stay on established roads. Providing water for the sheep would occur on these roads.

2.3 No Action

Under the No Action Alternative, the BLM would continue its current approach to weed management in the project area as approved by EA #CA-180-12-13. Weed treatments would include Integrated Pest Management (IPM) techniques such as herbicide application, mowing and use of hand-held brush cutters along trails and parking areas, prescribed fire, and manual treatments for small weed infestations. Because of the person-power required for mowing and physical control methods, the expense of treating large areas with herbicides, and the limited use of prescribed fire, the total area treated annually for invasive weeds under this alternative would be economically and topographically limited and much fewer acres would be treated per year than under the Proposed Action.

2.4 Alternatives Considered but Eliminated from Detailed Analysis

Other alternatives for weed control at Cronan Ranch were analyzed previously in EA #CA-180- 12-13. There are no new alternatives to analyze.

3.0 Affected Environment

Cultural Resources

Cultural resources are an important factor to consider in analyzing the potential impacts of the proposed action and other alternatives. A cultural resource study, completed in 2001 by BLM archaeologists, identified numerous prehistoric- and historic-era cultural resources within the South Fork American Planning Area, including the Greenwood Creek parcel. As part of this study, the results of previous field inventories within the

Planning Area were reviewed and additional reconnaissance level inventories were conducted by BLM archaeologists. An inventory was conducted for portions of the Cronan Ranch parcel in 2004 by BLM archaeologists. This inventory was prompted because this parcel was a new acquisition. Prehistoric and historic-era cultural resources were identified. Since the early 2000s, other cultural resource studies have been conducted by BLM archaeologists within the Cronan Ranch and Greenwood Creek parcels for various projects (related mostly to recreation, etc.). These studies have virtually all been conducted to help BLM comply with Section 106 of the National

Historic Preservation Act. They have involved field inventories and Native American consultations and have led to the identification of additional cultural resources. To date, no traditional cultural places have been identified. At this time, the project area has been extensively inventoried, though it has not been entirely inventoried at the intensive level and additional inventory may be productive.

Hydrology

The South Fork American River is a major waterway in El Dorado County, flowing from the crest of the Sierra Nevada Mountains down the western slope where it joins the North Fork of the American River in Folsom Lake. The lower American River then travels down to the Sacramento Valley and into the Sacramento River and eventually flows into the San Francisco Bay. Rainfall within the project area differs greatly. At Folsom Dam, average rainfall ranges from 32.5 inches per year, while at Placerville, only 14 miles away, average rainfall ranges around 53.6 inches per year.

The importance of water quality is evident in the American River Watershed. El Dorado County relies on the water for agricultural and municipal purposes as does the metropolitan area of Sacramento. The South Fork American River is the most popular river for commercial white water rafting in the Western United Sates. Annually, between 100 to 140 thousand visitors float the river on either privately-owned boats, or through the services of commercial outfitters. The main water source in the project area is the South Fork American which has been greatly altered since the 1850's, and has not had a natural unimpaired flow since before the Gold Rush. Water impoundments managed by PG&E, SMUD, and EID all effect the natural flow of the river. Water quality in the project area appears to be influenced by a wide variety of factors relating to man's influence on the environment. A major source of water quality degradation is related to the coliform (fecal) group of bacteria. This may come from animal waste, defective septic tank leach fields, and other undocumented sources. The primary sources of contamination appear to be located upstream of the planning area, according to the County River Management Plan.

Invasive Species

Of the vegetation communities within the project area, some are more likely than others to contain infestations of noxious weeds and other invasive plants. Blue oak savannah and open grasslands have been have been seriously degraded by widespread infestations of yellow starthistle and medusahead and other invasive annual weeds.

Medusahead

Medusahead is a nonnative, cool-season annual grass. Plants produce tillers, but very few leaves. Medusahead has a distinctive flowerhead with two types of awns: both are flat, but the longer of the two contains barbs that point upward. Medusahead-dominated stands usually have more than 100 plants/ft^2 and the seedbank is short-lived. Plants produce up to 6,000 seeds/ft^2 of soil, propagating dense stands in succeeding years. Animals, wind, and water disperse the seed, and spread is rapid. A long, rough awn aids in animal dispersal of seed. Seeds may germinate in fall, winter, or spring; fall germination is most common. Seedlings from all seasons produce seeds by early summer. The introduction and subsequent rapid spread of medusahead has caused serious management concern because of its rapid migration, vigorous competitive nature, and low forage

value. Medusahead invasion has shifted the balance from a shrub/perennial grass ecosystem to an annual grass-dominated ecosystem (CDFA 2012).

Yellow Starthistle

Yellow starthistle is a long-lived winter annual with a deep, vigorous taproot, and bright, thistle like yellow flowers with sharp spines surrounding the base. Seed output can be as high as 30,000 seeds per square meter, with about 95% of the seed being viable soon after dispersal. Most seeds germinate within a year of dispersal, but some can remain viable in the soil for more than three years. Yellow starthistle seeds germinate from fall through spring. After germinating, the plant initially allocates most of its resources to root growth. By late spring, roots can extend over 3 feet into the soil profile, although the portion above ground is a relatively small basal rosette. This allows yellow starthistle to out-compete shallow-rooted annual species during the drier summer months when moisture availability is limited near the soil surface. It also helps explain why yellow starthistle survives well into the summer, long after other annual species have dried up, and why it can re-grow after top removal from mowing or grazing (CDFA 2012). **Soils**

Most of the parent materials for the residual soils on the parcels along the South Fork American River are either common granitic or metasedimentary or metavolcanic rock types, common in the Sierra Nevada foothills. In the canyon bottoms and riparian areas especially, are sediments of mixed origin.

Recreation

The project area falls within the South Fork American River SRMA. SRMAs are identified to address areas where recreation is the management focus. The South Fork American River SRMA receives a high amount of recreation due to the presence of the South Fork American River and a large trail network which encourage numerous recreational opportunities such as horseback riding, mountain biking, hiking, camping, fishing, kayaking, rafting, and gold panning. Prospecting – the recreational search for gold – has a special significance along the South Fork American because of the river's role in the California Gold Rush. Much of this activity takes place in the river itself, but several tributaries were also historically good sources of placer gold.

In more recent times, the South Fork American River has become one of the most heavily used rivers in America for white water rafting and kayaking. About 30 years ago, commercial white water rafting began to increase in popularity along the South Fork. It continued to increase until the mid-1990's when it peaked, and then dropped off slightly. The South Fork offers outstanding opportunities for white water recreation because of its proximity to major population centers, and year-round flows. It has become one of the nation's most popular rivers for a number of reasons, including short shuttles between access points, several trip options, high spring flows, and dependable boating flows during the summer months when other rivers have dropped too low.

Vegetation

The plant communities in the vicinity of the South Fork American River have been classified as part of the Foothill Pine Belt, which encompasses a wide variety of plant habitats (i.e., montane

hardwood-conifer, blue oak-foothill pine, mixed chaparral, riverine, and valley foothill riparian). Dominant habitats in the project area include open grassland, oak savannah, and mixed conifer forest on the north-facing slopes. The area's natural vegetation has been greatly altered since the time of the Gold Rush. Presently, a large portion of the open grassland and blue oak woodlands have been degraded by invasive plant communities.

The vegetation in the project area can be divided into four main regions and plant communities. On the uplands there are forest stands on the north and northeast facing slopes of both Clark Mountain and the hill west of Hastings Creek. On the south facing slopes of the hills north of the South Fork American River there is oak woodland and chaparral. Grasslands dominate the relatively flat to rolling portions of the parcel south

of Highway 49. Along Greenwood Creek, Hastings Creek and the South Fork American River there are well developed riparian areas.

South facing hill slopes north of the American River are dominated by interior live oak, with black oak, California buckeye, toyon, buckbrush, white leaf manzanita, keckiella, California coffeeberry, poison oak and pipe vine. The north facing slope of Clark Mountain supports a
forest stand dominated by ponderosa pine and black oak. Gray pine and incense cedar become prominent on the lower slopes. Douglas fir is a minor component. Similar vegetation is found on north facing slopes west of Hastings Creek.

The riparian area along the South Fork American River is broad and diverse. Among the prominent species are sand bar willow, arroyo willow, shining willow, valley oak, Oregon ash, white alder, Fremont cottonwood, button willow, coyote brush, mock orange, California wild grape, deer grass and scotch broom.

Grasslands are composed largely of non-native annual species. Especially in the grassland area, invasive plants are becoming monocultures, displacing both native species and other non-native species. The grassland associated invasive species of the most concern are yellow starthistle and medusahead.

White alder, black cottonwood, willow and bigleaf maple are found along the shores of the river. The natural regeneration of the riparian forest appears to be facilitated by the accretion of sediments along the riverbanks, creating more hospitable conditions for plant growth than previously possible when the area was reduced to bare rock and gravel as a result of mining. Rockiness of the site adjacent to the river has produced a narrow, more open strip of riparian forest consisting of deciduous species and intermixed with trees and shrubs more characteristic of drier upland habitats. On cool north-facing slopes along the river canyon, madrone, ponderosa pine, Douglas fir, and incense cedar are also found.

On the slopes and benches above the immediate course of the river the site is mostly covered in interior live oak woodland with a diverse complement of woody species. Interior live, blue, black and valley oak, gray and ponderosa pine are the primary tree species. Interspersed in the oak woodland are patches of chaparral with chamise, white leaf manzanita, toyon, coyote brush, buck brush, and silver lupine.

There are no rare plants known to occur in the project area. Surveys for these species were

conducted by the previous BLM botanist in the mid 2000's prior to approval of the Cronan Ranch Management Plan. The current BLM botanist has also walked a

large majority of the project area over the past three years and has never found any rare plants in the area.

Visual Resources

All lands within the project area are classified as VRM Class II. Class II requires that changes to the characteristic landscape may be seen, but should not attract the attention of the casual observer.

Wildlife

Wildlife within the project area is typical of wildlife throughout the lower foothills of the Sierra Nevada. Because of the mix of habitat types, the area supports significantly diverse wildlife populations. Over 200 species of birds may occur seasonally, or as residents, including wintering bald eagles. At least 94 species of mammals are residents, including mountain lions, bobcats, foxes, coyotes, deer, and ring-tail cats. The river itself supports rainbow and brown trout, and a variety of native fishes. The planning area contains numerous habitats including riparian, riverine, blue oak-foothill pine, mixed chaparral/chamise, montane hardwood-conifer, montane hardwood-oak and annual grasslands.

Special Status Wildlife Species:

Several sensitive species are also found in or may pass through the planning area such as:

U.S. Fish and Wildlife Service (USFWS) *Species of Concern*: Western Pond Turtle, Bald Eagle, Foothill Yellow Legged Frog
BLM *Sensitive Species:* Western Mastiff Bat, Townsend's Big Eared Bat, and Foothill Yellow Legged Frog
CDFG *Species of Special Concern*: Foothill Yellow Legged Frog

Valley elderberry longhorn beetle (VELB) is listed as threatened under the Federal Endangered Species Act. The beetle has only been found in association with its host plant, elderberry, which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley and associated foothills up to 3,000 feet. *Sambucus* can occur in several plant communities: riparian forest, savanna or grassland, oak woodland, and mixed chaparral-foothill woodland. There are known occurrences of elderberry shrubs within the project area. The VELB is more frequently encountered in riparian forest margin and elderberry savanna than other situations. Elderberry shrubs/trees with many exit holes are most often found in large, mature plants; young stands are seldom infested. The VELB seems to prefer stems for larval development and pupation which are larger than an inch or two in diameter. The beetle is most likely to occur in situations where plants are not isolated from one another.

Adults feed on the foliage and perhaps flowers, and are present from March through early June. During this period the beetles mate, and the females lay eggs on living elderberry plants. The female places the eggs singly or in small groups in bark crevices or at the

junctions of stem/trunk or leaf petiole/stem. Presumably the eggs hatch shortly after they are laid. Larvae bore into the

pith of larger stems and roots. When larvae are ready to pupate, they work their way up from the roots through the pith of the elderberry, open an emergence hole through the bark and return to the pith for pupation. The entire life cycle encompasses two years; however, the duration of each life stage is unknown. Adult emergence occurs at about the same time the elderberry flowers.

4.0 Environmental Effects

4.1 Impacts of the Proposed Action

Cultural Resources

The proposed action has been analyzed by the BLM archaeologist to determine whether it would affect significant cultural resources, in accordance with Section 106 of the National Historic Preservation Act. Negative effects to sensitive archaeological sites (those with archaeological deposits) typically occur when the ground is subject to disturbance, leading to the displacement of artifacts and features, and thus diminishing the scientific research value of the site. Congregation of sheep in a very small area, such as at a watering station, can cause ground disturbance, as the high intensity of sheep use ("hoof traffic") quickly removes vegetation, allowing sheep to displace artifacts and features. If soils are moist (from rain, etc.) at the location, this can exacerbate ground disturbance and negative effects to archaeological deposits. Watering the sheep would involve the use of a watering truck which could also cause ground disturbance if soil moisture is high and under other conditions. The watering station and watering truck would not be placed on a sensitive site. Likewise, the mobile housing unit would not be placed on a sensitive site. Placement of electric fences would involve driving stakes into the ground which would result in negligible ground disturbance, though it is preferable to not place the fences in a sensitive site. The best method to reduce or eliminate impacts will be to avoid cultural resources that could potentially be negatively affected by the proposed treatments. Sensitive cultural resources in the project area will be identified by the BLM archaeologist and avoided by the rancher and herder(s). Therefore, there would be no negative effects to cultural resources potentially eligible for inclusion on the National Register of Historic Places.

Hydrology

Hooved animals can increase surface runoff by reducing vegetation cover through herbivory and trampling and by compacting the soil and disturbing the soil surface. However, impacts to water quality from grazing would be minor and short-term whereas

invasive plants can create long term conditions that modify water quantity and quality. Directly or indirectly, invasive plants can affect streambank stability and sediment input and the turbidity, temperature, dissolved oxygen, and pH of the stream. Water uptake by some invasive plants such as yellow starthistle can also reduce water quantity. Reducing the number of acres degraded by weed infestations would reduce sedimentation in water bodies, improve nutrient cycling, and help return the landscape to normal fire cycles (BLM 2007a).

Invasive Species

In general, vegetation treatments have the potential to affect most plant species in much the same way: all are intended to cause mortality or injury to target plants, which may vary in intensity

and extent. Weed management through grazing offers an effective and often resource-efficient means of treating and managing undesirable vegetation across a larger landscape area. Short term loss of vegetation in these areas would occur until more desirable species filled in the bare areas. Eradicating and/or controlling weed infestations benefits native plant communities by decreasing the growth, seed production, and vigor of undesirable species, thereby releasing native species from much of this competition.

Recreation

Weed treatments using grazing would have some short-term negative impacts but more substantial long-term positive impacts. In general, direct impacts to recreational users and opportunities would result primarily from temporary closures of areas being treated. These closures would be implemented for safety reasons. The guard dogs associated with the sheep could be aggressive if humans or other dogs approached the herd. Electric fences would be used in high use areas to minimize the risk of negative interactions with the public. A sheep herder will be onsite at all times to control the dogs and thus minimize negative encounters with the public. The Proposed Action would result in long-term benefits to recreationists due to the large area of invasive weeds treated with grazing. This would result in more habitat improvement and improved recreation access which should outweigh the short-term negative impacts.

Soils

Biological control of vegetation using sheep would result in some effects to soils. Their hooves can cause shearing and compaction of soil which could reduce water infiltration and soil productivity by eliminating pore spaces used for water storage and air exchange (BLM 2007b). The effects would be dependent on the intensity and duration of the

treatment and would typically last until a vegetation layer is restored at a treatment site. The sheep could additionally alter nutrient cycling processes in soils by depositing organic nitrogen in urine and feces. The BLM would closely monitor the duration and grazing intensity to keep soil disturbance to a minimum. A shepherd and sheep dog(s) would direct a flock to different grazing areas and maintain the flock within that area before moving to the next area. This would help ensure uniform grazing of the target weeds. Without herding, sheep may congregate in one area which could lead to overgrazing. A shepherd would minimize soil disturbance by employing appropriate livestock dispersion techniques, including fencing to prevent damage to riparian and other sensitive areas.

Vegetation

The sheep would likely affect non-target vegetation through browse and trampling. Domestic animals selectively feed on palatable species which would change species composition over time. Elimination or reduction of non-native species would benefit native plant communities by removing competition from weeds. This would provide more resources (e.g., water, light, and nutrients) to native plants, allowing them to reestablish sites previously dominated by weeds.

Medusahead and yellow starthistle would be grazed while still young and palatable. Fencing would likely be used to contain the sheep in areas with monocultures of weeds. This would increase the effectiveness of the weed control and reduce impacts to native species. The BLM

would closely monitor and manage the grazing to avoid effects to native plant communities on treatment sites and maximize the treatment of weeds.

Visual Resources

The use of sheep grazing for weed control would cause minimal effects to visual resources. The sight of domestic animals for public users could be unfavorable. Trampling and consumption of vegetation would temporarily alter the grasslands appearance. However, areas that are dominated by invasive species are usually less visually aesthetic and deemed to be impacted by humans and hence not “natural.” In general, grazing would have short-term negative effects and long-term positive effects on visual resources. Negative impacts to visual resources would begin to disappear as more desirable vegetation replaced the removal of invasive species.

Wildlife

The ecological effects of weed invasions on wildlife habitat have been studied. Invasive plants displace native vegetation and unlike the native vegetation they displace, invasive species typically have little value for native wildlife. Because of the spines that yellow starthistle and other thistles produce, they can discourage access by wildlife even into areas that would otherwise provide forage or other resources. Medusahead provides limited forage to wildlife species due to its high silica content.

Prescribed grazing could have some short-term negative impacts but would result in substantial long-term positive impacts for wildlife. Impacts from grazing could include displacement and habitat modification. The presence of sheep and sheep dogs could cause wildlife to move elsewhere to avoid interactions. Sheep would be grazing vegetation that may provide cover or food for certain wildlife species. Grazing could change the composition and distribution of vegetation but could also improve the palatability and nutritional value of forbs, grasses, and some shrubs.

Implementing the Proposed Action would give BLM the best ability to restore native plant communities and their function for the benefit of all wildlife. The negative impact of loss of vegetation cover following treatment in areas of dense weeds would be temporary and more than offset by the long-term benefit of enhanced plant species diversity and forage quality.

Special Status Wildlife Species:

Sheep are known to prefer herbaceous vegetation over woody species. If elderberry shrubs are inadvertently grazed, sheep are extremely unlikely to graze on the larger (1 plus inch) stems, which are the stems where VELB, if present, would preside. In addition, VELB exit holes were not present on any of the stems. The possibility of inadvertent grazing of the host plants will be further reduced by the proper control of sheep as specified in the Project Design Features. Potential project effects would be avoided, mitigated or reduced to non-measurable by implementation of the Project Design Features listed in Section 2.2; therefore, the BLM has

determined that the proposed action would have No Effect to the valley elderberry longhorn beetle.

4.2 Impacts of the No Action Alternative

Cultural Resources

Grazing would not occur under the No Action Alternative. The small amount of soil disturbance from electric fence placement would not impact cultural resources. While

native plants identified as being important in traditional subsistence, religious, or other cultural practices could benefit from prescribed grazing and subsequent weed reduction, the spread of invasive species may or may not increase erosion on cultural sites depending upon the nature of the invasive species. If weed encroachment causes soil erosion, artifacts may be exposed and collected or displaced; losing their context. The direct loss of cultural resources due to erosion and exposure as well as replacement of native species would occur over the long term. As weeds spread, native plants available for use by Native American groups would be reduced.

Hydrology and Water Quality

Under the No Action Alternative there would be no impacts such as potential surface runoff by reducing vegetation cover through grazing and trampling and by compacting the soil and disturbing the soil surface. However, invasive plants would continue to create conditions that modify water quantity and quality. Directly or indirectly, invasive plants can affect streambank stability and sediment input and the turbidity, temperature, dissolved oxygen, and pH of the stream.

Invasive Species

Under the No Action Alternative, much less acres would be treated annually than under the Proposed Action because of the increased labor, time, and cost associated with physical and chemical control options; therefore, invasive species would spread at a faster rate.

Soils

This alternative would not have impacts from grazing to soils such as shearing and compaction of soil which could reduce water infiltration and soil productivity. The sheep would not potentially alter nutrient cycling processes in soils by depositing organic nitrogen in urine and feces. While some short-term reduction in potential erosion of treated areas would accompany the smaller amount of weed treatments, over the long term soils would suffer due to decreased soil quality and decreased ability of plant roots to hold soil in place in areas dominated by invasive species.

Recreation

By not implementing grazing for weed management, the short-term conflicts with visitors resulting from temporary closures of areas to reduce grazing conflicts would not be an issue.

Potential negative interactions between recreationists and grazing sheep or the sheep dogs would not occur. However, over the long term, weed infestations would continue to expand and recreationists would be impacted by the decline in the quality of the recreational opportunity, both aesthetically and physically, i.e., from restricted access due to spiny weeds like yellow starthistle.

Vegetation

Under the No Action Alternative, sheep would not impact non-target vegetation through browse and trampling. However, native plant communities would not benefit from the elimination or reduction of non-native species competition through grazing. Weeds would continue to outcompete native species and spread at a faster rate; adversely affecting native plant populations.

Visual Resources

Because no grazing would take place under this alternative, visual resources would not be temporarily altered by trampling and consumption of vegetation and public users would not see domestic animals. However, areas that are dominated by invasive species are usually less visually aesthetic and weeds would continue to spread across these areas in the future.

Wildlife

Wildlife would not be impacted by sheep grazing or sheep dogs under this alternative. However, invasive plants are of limited utility to wildlife and degrade wildlife habitat. The No Action Alternative would allow more habitat to become infested with weed species, degrading the habitat even further.

4.2 Cumulative Impacts

Lands along the South Fork of the American River, from Chili Bar to Salmon Falls (including the project area), will continue to be a popular and heavily used area for recreation over the next 25 years and likely well beyond. Recreationists and other user groups have contributed, and will continue to contribute to, weed infestations on BLM and other lands within the South Fork corridor by acting inadvertently as vectors for weed introduction and spread. If weeds are not effectively controlled, native plant communities will continue to be degraded and will negatively impact recreational experiences, visual resources, and the ecology of the river corridor. The Proposed Action would have the most beneficial effect on native plant communities and recreation over the long term by reducing the spread of weeds the most through the ability to use prescribed sheep grazing as a control method to treat large infestations of yellow starthistle and medusahead.

5.0 Agencies and Persons Consulted

- Jack Hamby – CA BLM State Office Rangeland Management Specialist and Noxious and Invasive Weed Coordinator

Appendix C

Example Environmental Analysis (NEPA)

- Fred Hunt – Soil Technician, El Dorado County & Georgetown Divide Resource Conservation Districts
- LeeAnne Mila – El Dorado County Department of Agriculture
- Dominique Minaberrigarai - Diamond Sheep Company

5.1 BLM Interdisciplinary Team

Reviewers:

_____

Cultural Resources Specialist

_____

Outdoor recreation planner/VRM specialist

_____

NEPA Coordinator/Botanist

_____

Wildlife biologist

5.2 Availability of Document and Comment Procedures

This EA, posted on Mother Lode Field Office's website (www.blm.gov/motherlode) under Information, NEPA (or available upon request), will be available for a 15-day public review period. Comments should be sent to the Beth Brenneman at Bureau of Land Management, Mother Lode Field Office, 5152 Hillsdale Circle, El Dorado Hills, CA 95762 or emailed to bbrennem@blm.gov.

6.0 References

Appendix C

Example Environmental Analysis (NEPA)

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Appendix C

Example Environmental Analysis (NEPA)

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2007b. Vegetation Treatments on BLM Lands in 17 Western States, Final Programmatic Environmental Report (PER). Reno, Nevada.

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U.S. Fish and Wildlife Service (USFWS). 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento, California.

Appendix C

[A1]**RMAC Member:**

Could we consider this update to be more broadly directed to an audience that is considering or proposing rx grazing in CAL FIRE WFPGs? It's been my experience witnessing that this white paper has become a primary resource for many orgs/agencies/private landowners/managers, not just VMP Foresters.

[A2]**RMAC Member:**

received negative feedback about using the descriptor "remove". consider "reduce".

[A3]**RMAC Member Comment**

WUI openspaces should be considered, which are not always forests and rangelands. ie. scrubland, coastal chaparral, etc.

[A4]**RMAC Member Response:**

See added language in front. Maybe that addresses this comment.

[A5]**RMAC Member:**

also have less water requirements.

[A6]**RMAC Member:**

species type(s), stocking rates, timing and duration of treatment.

[A7]**RMAC Member:**

not just the user but the of the project at large considering all decision-makers and those potentially impacted.

[A8]**RMAC Member:**

include habitat, biodiversity?

[A9]**RMAC Member:**

additional benefits listed below

[A10]**RMAC Member:**

Should this be reducing instead of removing, since the same change was mentioned above?

[A11]**RMAC Member:**

also can be less fossil fuel dependent than alternative treatments

[A12]**RMAC Member:**

sequestering

[A13]**RMAC Member:**

due to public objections due to liability

[A14]**RMAC Member:**

additional supplementation of protein and mineral often reduces animals interest in girdling.

[A15]**RMAC Member:**

Most often not true in many CA contexts. I suggest removing. Operator knows best for their stock.

[A16]**RMAC Member:**

add tree understory?

[A17]**RMAC Member:**

described grazing to reduce seed dispersal based off of timing of treatment

[A18]**RMAC Member:**

at times livestock is herded to site if grazing on adjacent property.

[A19]**RMAC Member:**

describe what this means if needed.

[A20]**RMAC Member:**

re-work sentence?

[A21]**RMAC Member:**

Is this true? Wouldn't a larger job require more loads of animals (shipping is very expensive), more fencing supplies and set up, potentially more water infrastructure, etc.? Some costs are fixed whether it is a large job or small, but I would think some costs increase as the job size increases.

[A22]**RMAC Member:**

ruminants

[A23]**RMAC Member:**

Or trample

[A24]**RMAC Member:**

site

[A25]**RMAC Member:**

site this percentage. my experience is that sheep eat more!

[A26]**RMAC Member:**

does not need to be green

[A27]**RMAC Member:**

This is presumably in here so that someone without experience can get an idea of how to calculate animals needed. But, the guidelines are in dry matter (3% of body weight) and the example is green (12% of body weight). How does someone without experience understand this? Should this be further clarified, should it all be put in the same "units"? Should there be a general conversion factor for pounds of veg on the ground to dry wt.? It seems a little confusing as is.

[A28]**RMAC Member:**

completely based on context. I'd reduce this number, omit, or add "historically". This is not current industry standard even with commercial sheep outfits it my experience.

[A29]**RMAC Member:**

add footnote or in-line reference to UC Extension's common toxic plants to livestock

[A30]**RMAC Member:**

grazing operator

[A31]**RMAC Member:**

referred to as a "flush"

[A32]**RMAC Member:**

what does confirming look like in this context?

[A33]**RMAC Member:**

When would this consultation be necessary and what information specifically to rx grazing would that CRM need to be able to provide? I'd add consultation with grazing operator and/or CWGA targeted grazing committee rep?

[A34]**RMAC Member Response:**

Any time you are practicing range management on forested land, a CRM should be consulted. Could add a reference to the CRM guidelines or Statute language.

[A35]**RMAC Member:**

goals of the project

[A36]We will want to update this to the SLGLLM deliverable(s), or at least provide a link to them.

[A37]**RMAC Member:**

Seems a little informal, maybe replace with contract grazers or contract grazing businesses.

[A38]**RMAC Member:**

Should we name matchgraze and CWGA tg directory inline?

[A39]Need to update more realistic numbers even if just a hypothetical situation

[A40]**RMAC Member:**

This is the less common structure and should be placed below.

Also, not just a per head per day charge but also mention durations that can be weekly or monthly charge.

[A41]I prefer the original.

[A42]**RMAC Member:**

Update. Also add a sentence about inflation and service fee increases.

[A43]If this type of grazing structure larger landscapes for an entire season) isn't compatible with VTP projects feel free remove this bullet point.

[A44]**RMAC Member comment**

[A45]**RMAC Member:**

is there any reference information we should provide about labor details?

[A46]**RMAC Member:**

What needs to be updated here if anything?

[A47]**RMAC Member:**

SELECT NEW SAMPLES/EXAMPLES

[A48]**RMAC Member:**

UPDATE

[A49]**RMAC Member:**

UPDATE!

[A50]UPDATE.

[A51]UPDATE