LOCAL-REGIONAL GRAZING GUIDANCE

Recommendations and Best Management Practices for Developing and Implementing Prescribed Grazing Plans

Range Management Advisory Committee

An advisory committee to the California State Board of Forestry & Fire Protection

Approved December 10, 2026

Chair: Dr. Marc Horney
Vice-Chair: Dr. Stephanie Larson

The Board's mission is to lead California in developing policies and programs that serve the public interest in environmentally, economically, and socially sustainable management of forest and rangelands, and a fire protection system that protects and serves the people of the state.

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Stakeholder Input was also provided via a Stakeholder Input Survey, and a link to the anonymous responses is provided in this document.

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EXECUTIVE SUMMARY

'Prescribed Grazing' is defined in statute (**California Public Resources Code [PRC] § 4004.5**[1]) as the lawful application of grazing by a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or conservation goals, including reducing the risk of wildfire by reducing fuel loads, controlling undesirable or invasive plants, and promoting biodiversity and habitat for special status species. Prescribed grazing may involve any kind of grazing animals that can be managed effectively for this purpose. In the United States, cattle, goats, and sheep are most used.

California Senate Bill (SB) 675: Prescribed grazing: local assistance grant program: Wildfire and Forest Resilience Task Force (2023-2024),[2] enacted on January 1, 2025, directs the Range Management Advisory Committee (RMAC) to develop guidance on nine specific topics for local or regional grazing plans that include **prescribed grazing** as a tool for vegetation management. The RMAC formed Regional Action Teams (RATs) in early 2025 based on four regions established by the Wildfire and Forest Resilience Task Force: Northern, Sierra-Cascade-Inyo, Coastal Inland, and Southern. These teams comprised stakeholders from members of the public and rangeland organizations, members of the RMAC, representatives from private industry, fire ecologists with expertise in the full range of California's vegetation communities, and various local, regional, state, and federal agencies and organizations, including the California Department of Fish and Wildlife (CDFW) and University of California Cooperative Extension (UCCE) Livestock and Natural resources Advisors and Specialists. The RMAC also solicited and addressed input from stakeholders via public webinars, planning meetings, a publicly-disseminated Stakeholder Input Survey, email correspondence, and comments received during a 30-day public comment period.

This Local-Regional Grazing Guidance was developed to cover the entire state and includes locally- and regionally-based contextual recommendations and guidance where appropriate. That is, best management practices that apply for some regions may not be feasible or recommended for use in other regions, so recommendations are best adopted recognizing one size may not fit all, and local and regional contexts will dictate the most appropriate approach. The Local-Regional Grazing Guidance is intended to be an evolving document, with revised versions developed over time as new resources, information, and research results become available.

[1] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4004.5&lawCode=PRC
[2] https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB675

I. INTRODUCTION

California Senate Bill (SB) 675: Prescribed grazing: local assistance grant program: Wildfire and Forest Resilience Task Force (2023-2024)[3] directs the Range Management Advisory Committee (RMAC) to develop guidance for local or regional prescribed grazing plans as a tool for vegetation management. These recommendations address nine (9) specific topics using information provided by Department of Fish and Wildlife personnel, fire ecologists with expertise in the full range of California's vegetation communities, and University of California Cooperative Extension Livestock and Natural resources Advisors and Specialists. The RMAC also solicited and compiled input from a diverse array of California stakeholders representing public agencies, private industry, conservation organizations, non-profits, and the public.

'Prescribed Grazing' is defined in statute (**California Public Resources Code [PRC] § 4004.5**[4]) as the lawful application of grazing by a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or conservation goals, including reducing the risk of wildfire by reducing fuel loads, controlling undesirable or invasive plants, and promoting biodiversity and habitat for special status species. Prescribed grazing may involve any kind of grazing animals that can be managed effectively for this purpose. In the United States, cattle, goats, and sheep are most used.

This document ("Local-Regional Grazing Guidance") provides statewide and local or regional grazing guidance recommendations as mandated by SB 675 and is referred to as the 'Grazing Guidance' throughout this document. This Grazing Guidance document is organized into six main sections as follows:

I. Introduction

Provides an overview of SB 675, the role of the RMAC in SB 675 implementation, and the other sections and information contained in this Grazing Guidance.

II. Implementation and Public Review Process

Provides a brief description of the public and internal process followed for the development of the Grazing Guidance.

III. Local-Regional Grazing Guidance

Includes guidance on the nine items identified in SB 675, which are referred to as **Grazing Guidance Elements** (GGEs) throughout this document. The nine **GGEs** for which

[3] https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB675
[4] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4004.5&lawCode=PRC

guidance is provided are as follows:

(1) Best practices for identifying and selecting priority areas for prescribed grazing.

(2) Best practices for developing project plans and metrics for applying, monitoring, and evaluating the effectiveness and impacts of prescribed grazing.

(3) Best practices for using prescribed grazing to increase the diversity and abundance of native species and decrease the abundance of invasive species, including through adaptive management, exclusion areas, wildfire-friendly fencing, and monitoring.

(4) Recommendation for securing sufficient land resources, including forage, needed to pasture livestock when not engaged in a prescribed grazing project.

(5) Best practices for building community support and engaging with public and private landowners to improve the implementation and outcomes of a prescribed grazing plan.

(6) Methods to identify opportunities to house and maintain shared grazing infrastructure.

(7) Best practice to use prescribed grazing to support and enhance prescribed burns and other vegetation management projects.

(8) Best practices for use of prescribed grazing for reducing wildfire risk in and near fire-threatened communities, as that term is defined in paragraph (2) subdivision (b) of Section 4124.5.[5]

(9) Other recommendations to increase the pace and scale of prescribed grazing at the local and regional levels, where appropriate.

IV. Conclusion and Next Steps

V. List of Citations

This section includes full references for in-text citations, as well as a list of additional references for further reading.

VI. Appendices

This section includes further information on the implementation of SB 675 in terms of the development of this Local-Regional Grazing Guidance, including: a list of acronyms used in this document (**Appendix A: Acronyms**); a list of definitions to support users of

[5] Public Resources Code Section 4124.5, paragraph 2 of subdivision b states:
(2) For purposes of this subdivision, "fire-threatened communities" means those communities in high and very high fire hazard severity zones, identified by the State Fire Marshal pursuant to Section 51178 of the Government Code, or Article 9 (commencing with Section 4201) of this code, or on the "Fire Risk Reduction Community" list maintained by the board pursuant to Section 4290.1.
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4124.5&lawCode=PRC

this document in navigating the process of developing a grazing plan (**Appendix B: Definitions**) further details and links for the Wildfire and Forest Resilience Task Force ('Task Force') and a brief description of the development of the four regions around which the Grazing Guidance is structured (**Appendix C: Regional Approach**); results from efforts to glean stakeholder input (**Appendix D: Stakeholder Input Survey Results** and **Appendix E: Response to Public Comments**); and additional resources to support prescribed grazing planning (**Appendix F: Supplemental Resources**).

II. IMPLEMENTATION AND PUBLIC REVIEW PROCESS

The Governor signed SB 675 into law in September 2024, and SB 675 was enacted on January 1, 2025. A Budget Change Proposal (BCP) was submitted to the Department of Finance to provide resources for the implementation of SB 675; however, the BCP was not funded. Therefore, to leverage external resources to support implementation of SB 675, the RMAC formed Regional Action Teams (RATs) in early 2026 to plan development of the local or regional grazing guidance.

Regional Approach

The Local-Regional Grazing Guidance was developed to cover the entire state and include locally- and regionally-based contextual recommendations and guidance where appropriate based on the four regions developed by the Task Force (also see **Regional Profiles and Resource Kits**[6]). Locally- and regionally oriented planning is essential for successful vegetation management on California rangelands. The state's landscapes vary dramatically in climate, soils, topography, and plant communities. These differences shape how vegetation grows, responds to grazing, and accumulates fuel, meaning that a strategy effective in one region may be ineffective—or even harmful—in another. By grounding management in regional conditions, land managers can tailor grazing intensity, timing, and duration to local ecological dynamics, protect sensitive species and habitats, and more effectively reduce wildfire risk. Regional guidance ensures that management decisions reflect the unique opportunities and constraints of each part of the state, leading to more sustainable and resilient rangeland ecosystems. Regional heterogeneity and ecological variability justify regionally tailored rangeland (and vegetation) management guidelines (Fuhlendorf et al. 2017).

[6] https://wildfiretaskforce.org/regional-resource-kits-page/

General Rangeland Types by Region

Northern California (Klamath Mountains, Modoc Plateau, North Coast ranges)

- Montane meadows
- Conifer and oak woodland savannas
- Shrub-steppe (sagebrush, bitterbrush)
- Annual and perennial grasslands

Sierra-Cascade-Inyo (Sierra Nevada foothills, Cascade Range, Inyo mountains)

- Oak woodland and chaparral foothills
- Montane meadows and subalpine rangelands
- Pinyon–juniper woodlands
- High desert shrublands (sagebrush, saltbush)

Coastal Inland (Central Coast ranges, inland valleys, Bay Area hills)

- Oak savanna and woodland
- Coastal prairie and annual grasslands
- Chaparral and coastal scrub
- Riparian corridors

Southern California (Transverse & Peninsular ranges, deserts, coastal valleys, canyon lands)

- Oak Woodland
- Desert shrublands (creosote bush, saltbush, Joshua tree)
- Chaparral and coastal sage scrub
- Pinyon-juniper woodlands
- Annual grasslands in valleys and foothills

More detailed information on the counties represented in each region and formation of the regions by the Task Force (WFRTF 2021) is provided in **Appendix B: Regional Approach**. Each RAT represented one of the four regions and was tasked with: (1) providing input into each of the nine GGEs specified in SB 675, (2) reviewing and revising drafts, and (3) responding to comments. The Vice-chair of the RMAC coordinated with RATs and Board staff and other support staff to develop the Grazing Guidance through a variety of input processes.

The RMAC held a statewide virtual kickoff meeting on April 28, 2025, with over 130 participants. Discussions centered around opportunities and barriers to permitting prescribed grazing and initiated the formation of team members for each RAT to coordinate on the

development of the Grazing Guidance (see the **Livestock Grazing Management Resources**[7] webpage for actions and resources related to SB 675).

Stakeholder Input Survey

In the summer of 2025, the RMAC shared an online Stakeholder Input Survey to over 2,000 individuals from local, regional, state, and federal government agencies; Board of Forestry and Fire Protection ('Board') and RMAC listservs; academic institutions; and individuals previously engaged in SB 675 efforts. Anonymous responses to the survey questions were shared with the public on the RMAC website and via various listservs. The combined results revealed several recurring themes and challenges associated with implementing prescribed grazing (**Table 1**; also see questions on the Stakeholder Input Survey and full log of anonymous responses, see **Appendix D: Stakeholder Input Survey Results**).

Table 1. Summary of Results from RMAC SB 675 Stakeholder Input Survey

Survey Responses	Key Issues or Needs	Notes or Examples
Infrastructure & Access	Fencing, water systems, access	Need for secure fencing, reliable water, and physical access to sites
Transportation & Logistics	Transportation, timing (scheduling, coordination)	Coordinating livestock movement and project timing
Labor & Grazing Capacity	Labor availability, availability of livestock, need for grazers	Shortage of experienced grazers, cost of labor, and adequate livestock numbers
Ecological Management	Invasive species, special-status species, predators	Requires adaptive management to balance grazing and conservation goals
Integrated Management	Combining with other treatments (mowing, burning, herbicide)	Grazing as part of a broader vegetation management strategy
Administrative & Regulatory	Administration (Certified Rangeland Manager [CRM], permits), California Environmental Quality Act compliance	Need for centralized tracking and streamlined permitting and regulatory compliance processes; a system connecting users to CRMs is needed for grazing planning
Financial	Funding & costs	Limited funding for planning, implementation, infrastructure, grazing, labor, and management
Risk Management	Insurance & liability	Challenges obtaining or affording adequate coverage

[7] https://bof.fire.ca.gov/board-committees/range-management-advisory-committee/livestock-grazing-management-resources

Survey Responses	Key Issues or Needs	Notes or Examples
Wildland–Urban Interface (WUI)	Grazing near developed areas	Requires coordination with residents, Fire Safe Councils, and public and private land managers
Knowledge & Perception	Lack of knowledge about grazing; preference for herbicides; concerns about livestock	Need for education, outreach, and demonstration of grazing benefits

Input was also received from members of SB 675 RATs during internal planning meetings, which included members of the public as well as representatives from the RMAC, private industry, and various local, regional, state, and federal agencies and organizations. Representatives of the State Water Resources Control Board, the California Air Resources Board, and the Humane Farming Association also provided input via comments or letters emailed to Board staff and circulated to RAT leaders.

Public Comment Period

Following the September 11, 2025 RMAC meeting, at which the draft Grazing Guidance was presented, a public comment period was opened from October 8 through November 7, 2025. Information on providing public comment on the draft was posted on the Board and RMAC websites and emailed to RAT leaders for dissemination, as well as to Board and RMAC listservs.

During the public comment period, comments were received from representatives of the Water Board, California Natural Resources Agency, and other stakeholders, and are included as **Appendix E: Response to Public Comments**. Comments were reviewed and addressed as appropriate (i.e., if they fell within the scope of the Grazing Guidance). All comments received during the public comment period were shared publicly during the November 14, 2025 RMAC meeting, including how they were addressed (or if they were not addressed, why).

All input received via email, meetings, webinars, the Stakeholder Input Survey, and during the public comment period was considered in the Grazing Guidance. The final draft of the Grazing Guidance was unanimously approved at the December 1, 2025 RMAC meeting, and finalized and approved by the Board at its December 10, 2025 meeting.

III. LOCAL-REGIONAL GRAZING GUIDANCE: Grazing Guidance Elements

The following subsections comprise the nine Grazing Guidance Elements (GGEs) identified in SB 675. Each GGE subsection begins with **Key Takeaways**, followed by general recommendations to support the GGE, and then more detailed locally- or regionally relevant recommendations and/or contextual considerations where appropriate.

(1) Best practices for identifying and selecting priority areas for prescribed grazing.

Key Takeaway

Identifying and selecting priority areas for prescribed grazing requires **assessing ecological conditions, risk factors, and landowner goals**. Focusing on areas with the greatest potential for fuel reduction, habitat improvement, or forage enhancement ensures that grazing efforts deliver the highest ecological and operational impact.

California has a long history of landscapes changing and evolving around wildfire. Stories from early Spanish explorers provide insight into how Native Americans used fire to maintain grasslands for hunting, oak tree germination, and acorn production (Anderson 2005). Burning is a "natural" vegetation management method (i.e., occurs naturally on the landscape), that when combined with grazing, can create a mosaic of different age classes of intermixed shrubland, forest, and grasslands, resulting in a diverse and healthy landscapes that support diverse ecosystem services (Keeley 2002).

Regions of California identified as fire-prone have increasingly focused on fuels reduction management to decrease the presence of excess and decadent vegetation, thereby reducing the severity and spread of wildfires (Nader et al. 2007). Grazing in these areas can be effective in minimizing flame height, fire intensity, and the risk of fire spread. CAL FIRE and other entities continue to implement fuel-reduction projects across California's fire-prone regions to reduce wildfire behavior and severity. These efforts focus on creating breaks in fuel continuity to slow fire spread and decrease intensity, ultimately helping to protect both communities and natural resources (Ratcliff et al. 2022, Roche and Macon 2025).

While California's Mediterranean shrublands are ecologically adapted to periodic fire, identifying and adopting strategies to reduce the prevalence and impact of severe wildfires in

shrublands and grasslands is key to reducing their destructive impact. Grazing as an extensive land use occurs on roughly 33% of land area statewide and has been frequently adopted by state and local agencies as a fuels management practice (Barry and Huntsinger 2021, Ratcliff et al. 2022, Siegel et al. 2022). Research by Russell and McBride (2003) highlighted that coyote brush (*Baccharis pilularis*) tends to dominate large, ungrazed landscapes. Notably, in the Berkeley Hills, researchers observed a significant increase in coyote brush density following a 51-year suspension of grazing, suggesting the absence of grazing may contribute to the proliferation of fire-prone shrub species. While Management of rangelands, including brushlands and shrublands with or without the application of grazing, should carefully consider and balance the need for conservation of sensitive or protected habitats with fire risk and needs at the local scale (Siegel et al. 2022). Adaptive protocols and monitoring can ensure desired goals are achieved and provide opportunities for course correction if management outcomes are not as expected (Ratcliff et al. 2022, George et al. 2020). A thorough understanding of existing environmental factors supports more effective site selection, and these factors must be considered when selecting and prioritizing areas for prescribed grazing (Dressing 2003, Ratcliff et al. 2022).

Recommendations for Grazing Guidance Element #1

Like other fuel reduction practices, grazing, if not carefully planned and managed, may have significant negative impacts on environmental and cultural resources. The following factors in a site evaluation warrant further discussion:

a. Identify and Assess Sensitive and Priority Resources

Managers should begin by clearly stating the purpose for the project and resources to be protected (Schohr et al. 2021). With that in mind, managers may seek appraisal by local fire professionals (e.g., local fire departments, **Department of Forestry and Fire Protection**[8] (CAL FIRE) units, or staff with a **local Fire Safe Council**,[9] **Prescribed Burn Association**,[10] or other fire management organization) to assess how vegetation in the project area might best be modified to protect the structure(s) or other resources of concern (Macon 2021). For example, methods may focus on reducing fire intensity, flame length or height, or ember cast (Ratcliff et al. 2022). Managers may then consider the tools available for making those modifications in the short-term. If prescribed grazing is among them, managers should seek out one or more grazing service providers (i.e., 'Grazing Operators' in this document) or other professionals with

[8] https://www.fire.ca.gov/
[9] https://cafiresafecouncil.org/
[10] https://calpba.org/

experience in grazing management (Powell 2021, Schohr et al. 2021). Professionals with this knowledge include experienced local Grazing Operators; state-**Certified Rangeland Managers**[11] (CRM); or local staff with **U.C. Cooperative Extension**[12], the **Natural Resources Conservation Service**[13] (NRCS), or your local **Resource Conservation District**.[14] Discuss how vegetation modifications suggested by fire professionals could be accomplished in the project area by prescribed grazing – and identify locations and desired outcomes that prescribed grazing would be most effective to support the goals and objectives of the project (Macon 2021, Ratcliff et al. 2022).

A site evaluation should document and assess the condition of natural resources and existing infrastructure and identify needs prior to implementation of a grazing plan. Site evaluations should at least include documentation of habitat types and vegetation communities, soil characteristics, slope, watercourses, and potentially sensitive resources. The State Lands' Grazing Packet (RMAC 2025a) provides a Management Action Plan (MAP) template which covers the development of grazing management plans, and Section 2.0 provides a thorough description of the various resources that should be assessed prior to or as part of the development of a grazing plan. Targets for grazing practices—such as reductions in height/density/biomass and connectivity between herbaceous or woody plant canopies—are best established in conversations between property managers, local fire professionals, and Grazing Operators.

Areas that may benefit from prescribed grazing can often be identified by the presence of noxious weeds, toxic plants, excessive vegetation and fuel loads, signs of overuse by wildlife or livestock, and other ecological stressors. Incorporating management goals that address fine fuels is an important component of overall site management and requires monitoring outcomes around vegetation biomass and structure to assess if grazing as prescribed is effective at reducing or limiting the build-up of highly flammable fine fuels, which may reduce wildfire risk and support safer and more effective emergency response (Burrows et al. 2015, RMAC 2025b, Taylor 2006).

Livestock, especially when repeatedly concentrated in a particular area for extended periods, can impact sensitive resources, which can include riparian areas, wetlands, surface waters, sensitive plant communities, wildlife habitat, cultural/historical resources, and highly erodible soils (Bear et al. 2012, NRCS 2015). Negative impacts of improperly managed grazing may may

[11] https://bof.fire.ca.gov/projects-and-programs/professional-foresters-registration/rpf-crm-rosters/
[12] https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension
[13] https://www.nrcs.usda.gov/
[14] https://carcd.org/page/interactive-rcd-map

include compacted soils, increased erosion leading to sedimentation in nearby water bodies, and introduction of excess nutrients, pathogens, and invasive species. This can impair water quality, reduce aquatic habitat, and harm native fish and amphibian populations (George et al. 2011). To manage and reduce or avoid negative impacts to resources, where known, 1) specific mitigations specific to the issues should be included in the grazing management plan, and 2) managers should include preventative and emergency actions around the potential for impacts to resources resulting from unplanned fire or natural disaster (Dressing 2003).

Habitats may also be disturbed through the alteration of vegetation structure and abundance, associated noise, and physical presence of livestock and managers. Some ground-nesting birds, small mammals, and native pollinators may be particularly vulnerable if livestock disturb nests or reduce the diversity and cover of plants that provide food and shelter (National Research Council 2002). Moreover, grazing plans should consider culturally sensitive resources and incorporate site-specific planning to avoid damaging areas of archaeological, spiritual, or historical importance to indigenous communities and communities with ancestral ties to the land (Donahue 1999).

Communities and infrastructure are often prioritized for fire protection and fuels-management based on factors such as population density, the presence of critical facilities (e.g., hospitals, utilities), and their location within the Wildland–Urban Interface (WUI), where human development meets flammable vegetation. Fuel-reduction treatments are frequently concentrated around these high-risk areas because reducing fuel loads near structures has been shown to significantly decrease the likelihood of structure loss during wildfires (Ott et al. 2023). Agencies also prioritize treatment where evacuation routes, powerlines, and water supply systems are vulnerable, since protecting these components is essential for emergency response and community resilience (Moritz et al. 2022).

b. Consider Infrastructure

Describing and addressing the current state of existing infrastructure ensures that the prescribed grazing objectives are achievable and sustainable over time. Infrastructure may include roads, established trails, watering points, water tanks, wells, and permanent fencing, all of which may serve as the backbone of an effective grazing management plan. The placement and condition of infrastructure components directly influence livestock distribution, forage use, animal health, and environmental outcomes. This step also facilitates adaptive management, allowing landowners to prioritize upgrades or repairs that support both ecological goals and livestock productivity. Therefore, it is essential to evaluate and document the condition of existing infrastructure within the area to be grazed, especially if additional infrastructure is

needed to facilitate the grazing plan and achievement of desired outcomes (Teague et al. 2013).

Well-designed and maintained roads and access routes are vital for transporting equipment and livestock, checking on livestock (e.g., herd health checks), and managing livestock placement and grazing schedules. Deteriorated or eroded roads can hinder management efforts and increase the risk of environmental damage, such as sediment delivery into nearby waterways. Additionally, roads in disrepair may limit emergency access or delay movement of livestock, reducing the ability of grazing managers to identify and respond quickly to changes and needs to achieve goals of the grazing plan (Clary and Leininger 2000). Therefore, if repairs or replacement of infrastructure are planned after wildfire or other damage, managers should consider and plan designs to facilitate accessibility and practicality for the use of prescribed grazing in vegetation management efforts, as well as to support improved emergency access and response in the future.

Water points, for instance, are critical in influencing livestock movement and concentration patterns. Poorly placed or malfunctioning water systems can lead to overgrazing near water sources and underutilization of forage in more remote areas (Gerrish 2004). Impacts to areas surrounding water infrastructure may differ between permanent and temporary/mobile watering systems (Porath et al. 2002, Rawluk et al. 2014). Ensuring that water infrastructure is operational, properly distributed, and accessible helps achieve more uniform grazing pressure—often a goal of prescribed grazing (NRCS 2023b).

Fencing—whether permanent or temporary—must be evaluated for its ability to contain livestock and create appropriate grazing units. Fences that are broken, poorly maintained, or improperly placed provide less control over livestock and can compromise any grazing system, allowing livestock to return to previously grazed areas before adequate plant recovery, leading to overgrazing and long-term degradation of vegetation and other resources (Teague et al. 2013). In fire-prone landscapes, it is also advisable to consider wildfire-friendly fencing designs, using metal fenceposts or non-flammable materials to reduce potential hazards of wooden fenceposts acting as fuels during fire events. Replacement of fencing is often prohibitively costly for individual Grazing Operators, so efforts to reduce fence damage in the event of a fire can support continued grazing management in burned landscapes (see Paige 2008). Temporary fencing or herding techniques can keep livestock out of these zones, allowing recovery and protecting biodiversity (Barry and Huntsinger 2021; also see **GGE #3 Recommendations d**: Incorporate Exclusion Areas and Buffer Zones and **e**: Prioritize Wildlife-Friendly Infrastructure).

c. Set Goals and Objectives

When planning a prescribed grazing project, clearly defining management goals is a critical first step. Establishing specific goals—such as reducing invasive species, improving habitat quality, or

decreasing fuel loads—guides decisions throughout the process. Careful consideration at the landscape scale of project size and the amount and type of vegetation to be removed is essential to ensure both ecological effectiveness and operational efficiency, especially when choosing the species to graze. Landscape attributes influence decisions such as the species, number, and type of livestock, duration and timing of grazing periods, and suitability of the landscape for grazing (Engle and Weir 2000, Weir 2020).

Larger management areas may benefit from multi-species or sequential grazing strategies that can effectively manage vegetation structure while minimizing or avoiding overgrazing. For example, goats are particularly effective for reducing woody and shrubby biomass, while cattle and sheep may be more appropriate for managing grasses and herbaceous cover (Hart et al. 1993, NRCS 2023b). Breed selection also influences outcomes, and some breeds can be more effective than others, while some breeds of one species may be just as effective as an alternative species (Dumont et al. 2007). The spatial scale and topography of the project area also affect infrastructure needs—such as fencing, water access, and herding labor—and determines how much of the area can be grazed within a given timeframe without compromising plant recovery or soil health (Holechek et al. 2011).

Similarly, the amount and type of vegetation targeted for removal directly affects the number of grazing animals (stocking rates) and how long they graze (grazing intensity) in a given area (density). Heavier fuel loads or dense stands of invasive annual grasses, such as ripgut brome (*Bromus diandrus*) or wild oats (*Avena fatua*), may require more intensive, short-duration grazing to reduce biomass before seed set, a critical window for disrupting invasive species cycles (DiTomaso et al. 2013). Conversely, sparsely vegetated areas or landscapes dominated by sensitive native species may require lighter grazing or seasonal exclusion to avoid degradation (i.e., manipulating stocking rate, density, timing, and/or duration via temporary fence designs or herding techniques to manage impacts) (Bartolome et al. 2004, Hayes and Holl 2003).

Understanding these attributes helps determine the optimal location and scale of prescribed grazing within a broader landscape management strategy. For instance, smaller, prescribed grazing units can be strategically placed in high risk wildfire severity zones, fuel break zones, or near other critical infrastructure or high-value habitat to meet specific fire mitigation or conservation goals (Launchbaugh and Walker 2006). In contrast, broadscale rangeland restoration may demand a more flexible, adaptive grazing system that considers multiple paddocks and longer-term monitoring (Teague et al. 2013).

Ultimately, aligning project goals, scale, and vegetation types and condition with livestock grazing strategies, grazing/browsing preferences, and animal behaviors can better ensure that prescribed grazing supports both ecological resilience and landowner goals and objectives (e.g.,

restoration, fire fuels reduction). This balance is key to long-term sustainability and the resilience of communities and ecosystems.

d. Manage for Different Vegetation Types, Goals, and Animal Health

When assessing an area's suitability for grazing, it is important to first identify the types of forage present and how they respond to grazing variables (e.g., duration of grazing, species grazing preferences, frequency). Understanding the nutritional value of available vegetation and the dietary needs of grazing animals is fundamental to the success of a prescribed grazing project. Different plant species and growth stages provide varying levels of protein, fiber, and energy, which influence animal performance and overall herd health. Matching forage quality and quantity with the nutritional requirements of livestock ensures that animals maintain good body condition while effectively achieving vegetation management goals. Regular monitoring of forage condition and animal health allows managers to adjust grazing intensity, timing, or livestock type as needed to sustain both ecological and animal well-being (Holechek et al. 2011).

Assessing plant species communities and composition also supports tailored grazing strategies, as some plants are more palatable or nutritious to certain livestock depending on the season. Understanding the growth form (i.e., grasses, forbs, or shrubs) and life-cycles (annual vs. perennial) of the dominant forage species or other present species of interest can help managers determine the appropriate timing, duration, and intensity of grazing that will support plant recovery and long-term rangeland health (Ball et al. 2001). Plants and soils recover from grazing by allocating resources stored in the rooting zone. Repeated defoliation may not allow sufficient rest between grazing periods and can reduce leaf surface area—the main site of energy production through photosynthesis—ultimately impairing root development and plant recovery (Hendrickson and Olson 2006).

Desirable vegetation, particularly native perennial grasses and forbs, can suffer if grazing intensity, timing, or frequency is not aligned with ecological needs and requirements for recovery. Overgrazing[15] can cause plant communities to transition toward dominance by invasive or unpalatable species, thereby reducing ecosystem function and forage quality (Bailey et al. 2019, Bartolome et al. 2014). Whether or not a site is "overgrazed" cannot be determined by the appearance of the site at any one point in time: factors like recovery time, stock density

[15] The term "overgrazing" is used in varying ways and may cause confusion amongst managers. A common definition of overgrazing is prolonged livestock presence that results in repeated defoliation of plants or frequent return to preferred areas, leading to reduced vegetative cover, shifts in plant species composition, and insufficient recovery time for plants, soils, and other resources (Jardine and Anderson 1919). See Mysterud 2006 for further discussion of this term and its use.

and impact, spatial scale, soil type, sensitive resources, and project objectives must be considered (Mysterud 2006). Properly managed grazing can be a tool to support and promote wildfire risk reduction, native plant recovery, biodiversity, and ecosystem resilience. Achieving such outcomes requires careful monitoring and adaptive management strategies (Launchbaugh and Walker 2006).

Understand Vegetation Characteristics (Species, Structure)

When initiating grazing on a new property, it is important to conduct a thorough evaluation of vegetation to distinguish between toxic and non-toxic species is an essential measure to protect animal health and ensure the success of prescribed herbivory (Launchbaugh and Walker 2006, Panter et al. 2011, Pfister et al. 1997). Without this foundational knowledge, prescribed grazing efforts may be ineffective or even harmful to livestock; and while animal productivity (e.g., weight gain) is not generally a primary goal of Grazing Operators conducting prescribed grazing services for fuels management and co-benefits, animal health is of ongoing concern and must be managed carefully (George et al. 2020).

In addition to identifying plant species, it is essential to evaluate the height and placement of forage across the area to be grazed. These factors influence which animals are best suited for the area, as different species have varying dietary needs, preferences, and physical capabilities (Bailey et al. 1996, Walker 1994). Moreover, management goals often consider and aim to manipulate the disposition, arrangement, and structure of species across the landscape for a variety of purposes (e.g., wildlife habitat management, sensitive resources management, fire prevention management) (DiTomaso et al. 2017 , Fuhlendorf and Engle 2001).

Regional Considerations for Grazing Guidance Element #1

Recommended vegetation management goals are identified below, and should be considered when developing prescribed grazing plans, if identified considerations are applicable:

Northern California

- Maintain perennial bunchgrasses and reduce invasive annuals (e.g., barbed goat grass [*Aegilops triuncialis*], cheatgrass [*Bromus tectorum*], medusahead [*Elymus Caput-medusae]*).
- Encourage oak regeneration and manage conifer encroachment into oak woodlands.
- Manage shrub encroachment or overgrowth (e.g., manzanita [*Arctostaphylos* spp.], ceanothus [*Ceanothus* spp.]) to balance forage and wildlife cover where appropriate.
- Protect meadow hydrology and riparian vegetation for water retention and biodiversity.
- Adapt management in areas where Native American land and resource managers have made—and may still make—traditional use of a mosaic of vegetation types, recognizing

the role of low-intensity fire (Keeley 2002).

Sierra-Cascade-Inyo

- Thin pinyon-juniper encroachment to restore sagebrush-steppe and grassland productivity.
- Manage fuels in chaparral and foothill oak zones to reduce wildfire intensity where appropriate.
- Protect and restore meadows for grazing, carbon storage, and watershed benefits.
- Maintain forage type diversity (e.g., grasses, forbs, shrubs) for both livestock and wildlife.

Coastal Inland

- Control invasive annual grasses and thistles to improve forage quality.
- Encourage oak regeneration in grazed savannas while preventing shrub encroachment.
- Maintain grass–forb balance in coastal prairie systems for livestock and pollinators.
- Reduce fuel loads in chaparral while retaining habitat values.

Southern California

- Prevent conversion of native shrublands to invasive annual grasslands (e.g., red brome [*Bromus madritensis*]).
- Reduce proliferation of invasive species encroachment and dominance (e.g., black mustard [*Brassica nigra*], star thistle [*Centaurea* spp.], and annual grasses).
- Manage chaparral and coastal sage scrub with strategic grazing/fire for fuels reduction while maintaining habitat.
- Protect desert rangelands from overgrazing and off-road disturbance to preserve cryptobiotic soils.
- Maintain connectivity and forage diversity for livestock and wildlife under arid conditions.

(2) Best practices for developing project plans and metrics for applying, monitoring, and evaluating the effectiveness and impacts of prescribed grazing.

Key Takeaway

Effective prescribed grazing requires clearly **defined objectives, measurable metrics, and systematic monitoring and evaluation**. Establishing project plans with **specific targets** for vegetation, soil, and livestock outcomes ensures that grazing practices can be tracked, assessed, and adapted over time to maximize ecological and operational benefits.

Recommendations for Grazing Guidance Element #2

a. Consider landscape goals and attributes, project scale, quality, and type and amount of vegetation to be removed to determine ideal locations for prescribed grazing.

When planning a prescribed grazing project, the first step is understanding how the scale, landscape features, and amount of vegetation to be removed will affect where and how grazing should take place. Simply putting livestock on a piece of land without assessing these factors can result in goals not being achieved, and grazing viewed as an inefficient tool to manage vegetation. Area of the grazing site (i.e., project size) matters because it directly impacts how long livestock can stay in one area, how often pastures may need rest, and what kinds of infrastructure (e.g., fencing or water systems) will be needed if not already in place. For example, larger parcels may support longer rotations with fewer repeated grazing events, which is important for forage recovery and soil protection. On smaller parcels, grazing may need to be more intensive, faster rotations, but carefully timed to avoid damaging desirable vegetation (NRCS 2023b).

The amount and type of vegetation also plays a key role. If the goal is to reduce a large amount of dense, fast-growing invasive grasses or brush, then higher-intensity grazing in short bursts may be effective, especially with goats or mixed-species herds. However, if the area to be grazed includes native perennial grasses or sensitive habitat areas, Grazing Operators will want to manage the timing of grazing to promote desired species' regrowth and maintenance of ecological balance (Bush 2006; also see **GGE #1 Recommendation d:** Manage for Different Vegetation Types, Goals, and Animal Health).

By evaluating the scale of the land, fuel loads, and management needs, Grazing Operators can identify which areas are best suited for grazing now, and which may need more preparation

(e.g., additional fencing, water access) or deferred grazing to protect plant health. Using tools like pasture maps, forage biomass estimates, and even simple visual assessments can help with this planning. Over time, matching livestock species, numbers, and grazing pressure to what the land can support (i.e., carrying capacity) will improve pasture condition, reduce erosion, and contribute to long-term sustainability. The State Lands' Grazing Packet includes detailed guidance for developing grazing plans that consider these factors (RMAC 2025a).

b. Livestock Selection Guidelines

Grazing animals influence rangelands through several connected processes. They consume foliage and other plant material, alter nutrient patterns through deposition and movement, and physically disturb soils and vegetation as they walk across the landscape (Vallentine 1990). The degree and type of impact depend on the species and breeds utilized, because diet selection, digestive physiology, mouth structure, and body size all shape how animals interact with plants. In addition, livestock vary in behavior—such as how closely they stay together, how they use slopes and rugged areas, and how far they are willing to travel—which differs not only among species, but also among breeds and even specific herds (Larson et al. 2015).

Grazing animals are generally categorized into three classes: grazers, browsers, and intermediate feeders (Bartolome et al. 2006). **Grazers**—such as cattle, elk, and horses—primarily consume grasses and grass-like plants, preferring areas with abundant ground-level forage. **Browsers**—which include goats and deer—tend to feed at eye level and prefer shrubs and forbs. Although they favor woody plants, they may consume grasses when available and typically avoid arid, dry areas. **Intermediate feeders** like sheep have flexible diets with few strong forage preferences, allowing them to graze a wide variety of plant types (see **Table 2**) (Anderson 2012). While these different classes of grazers exhibit distinct foraging behaviors, dietary needs, and habitat preferences, other factors influence grazing behaviors and outcomes, including breed, age, size, physical condition, familiarity with the local environment and vegetation, and how they are managed. Additional influences include the stage of growth and condition of target plant species, the stage of growth and condition of plant species managers want to protected or avoid grazing, and weather conditions during the grazing period (Provenza et al. 2003, Howery et al. 2010).

When selecting livestock for a specific area, it is therefore important to consider not only the vegetation type and additional factors such as topography and the presence of potential predators in the surrounding environment, but also the grazing behavior, species, and breed of the selected animals (Launchbaugh and Howery 2005). Grazing Operators that are experienced in producing the desired outcomes within a given local or regional context are critical to the planning and implementation process. Selecting an appropriate species of animal alone will not

ensure desired results, especially where the grazing environment and/or objectives are complex or unfamiliar to the animals or their manager(s). Bringing in experienced Grazing Operators who have successfully accomplished similar projects with their animals, including Certified Rangeland Managers (CRMs) is useful (RMAC 2025a). Selecting an appropriate species and breed of animal alone does not ensure desired results, especially where the grazing environment and/or objectives are somewhat complex or unfamiliar to the animals or to their manager(s) (Bailey 1999). For this reason, seeking experienced Grazing Operators who have a record of successful similar projects is advised.

Proper livestock selection aligned with forage availability, landscape characteristics, and animal behavior improves grazing efficiency and supports land management goals (see **Table 2** for a succinct chart of different livestock, diet, and forage behavior.

Table 2. Livestock Type, Diet, and Forage Behavior

Type of Livestock	Diet	Forage Behavior and Management Considerations
Cattle	*Grazer*: Grasses and grass-like plants	Selective; ideal for large areas
Goats	*Browser*: Shrubs and forbs	Access hard-to-reach vegetation. Great for brush reduction and invasive shrub control.
Sheep	*Intermediate feeder*: Grasses and forbs	Can graze more closely to the ground; ideal for targeted weed control.
Horses	*Grazer*: prefer high quality grasses	Typically used in mixed-species grazing, due to overgrazing favored areas.
Other Grazers: Deer, Elk, Bison	*Varies*	Typically considered in mixed-species grazing systems and/or when wildlife habitat and species are an important management consideration.

Source: *Anderson 2012*

Another important consideration around vegetation is that some plant species (e.g., manzanitas [*Arctylostaphys* spp.], tarweeds [e.g., *Madia* spp, *Holocarpha* spp., *Hemizonia* spp.), velvetgrass [*Holcus lanatus*]) are largely inedible to many grazing animals, including goats. For some plant species and animals, inedibility may be seasonal, as for coyotebrush (*Baccharis pilularis*) grazed by goats that have experience with that species (DiTomaso et al. 2013). Other plants can be toxic, and this may be influenced by season or stage of growth (Panter et al. 2011). Using a Grazing Operator who is experienced and familiar with all the plant species in the project area can improve the odds of successful outcomes (Rinehart 2006).

c. Plan for Monitoring of Grazing Outcomes

A host of metrics may be monitored to track results and adapt management to desired

outcomes, including measures of biodiversity for flora and fauna, soil characteristics, fuel loads, and more (Porzig et al. 2018). Monitoring for any given project or management plan should focus on the desired outcomes (i.e., results) and be utilized to inform adaptive changes in management (McCord and Pilliod 2022). This document focuses primarily on the monitoring of fuels and plant communities, particularly as they relate to fire risk and fuels reduction objectives. Managers should ensure sufficient resources are available to monitor for desired outcomes, including assessment to ensure compliance with local, regional, or state regulatory requirements (see **Appendix F: Supplemental Resources** for links to regulatory agencies). Visual assessment of forage is a critical component when assigning livestock to pastures, paddocks, or other grazing areas. Each forage species has recommended start and end heights that serve as visual indicators for when to begin and end grazing. These height guidelines help landowners manage grazing to maintain plant health and productivity. The intensity of grazing—how much forage is removed—is another key factor and should align with land management goals (Launchbaugh and Walker 2006).

Typically, the start height is determined when a plant exceeds its average growth height, at which point it begins to lose palatability and nutritional value. End height recommendations vary by species, but it is essential to remove livestock before plants are grazed too short. Grazing below the crown or root zone can severely damage plants, particularly during drought or dry periods, and significantly extend recovery time. As such, forage height should be a priority consideration in prescribed grazing plans. It directly influences plant health, regrowth capacity, and forage quality. A general rule of thumb is that taller (often older) plants tend to be lower in nutritional quality than shorter, actively growing plants (see **Table 3** below for commonly measured plant characteristics for each plant type and some selected species) (Ball et al. 2001, Briske and Richards 1995, NRCS 2025).

Table 3. Commonly Measured Plant Characteristics by Plant Type

Plant Type	Characteristics to Measure
Grasses	Canopy cover, basal area, plant height, biomass, or utilization
Forbs	Canopy cover, density, or plant height
Shrubs	Canopy cover, density, or plant height
Canada thistle	Rosette or stem density
Knapweeds	Rosette or flower density
Leafy spurge	Stem density, canopy cover, or biomass
Downy brome	Plant density or biomass

Source: *Reprinted from Launchbaugh and Walker 2006, pg. 44*

Residual Dry Matter (RDM)

Residual Dry Matter (RDM) refers to the remaining dead herbaceous biomass, primarily comprising annual grasses, when the first significant fall or winter rains initiate germination and being the growing season. Estimates of RDM (1) potential productivity (i.e., germination rates and growth) of annual grasses, given that annual grass seed germination is improved with some minimum amount of litter/vegetative cover, and (2) the potential for accelerated erosion if soil is not adequately covered by dead plant biomass (i.e., 'mulch') appropriate grazing levels for the upcoming season. The quantity of residual biomass (RDM) shows the combined effects is a function of the previous season's forage production, its consumption by animals (Bartolome et al. 2006), and its decay since the end of the growing season (Larsen et al. 2022).

Regional guidelines have been created to aid in rangeland management for livestock producers and range managers (Bartolome et al. 2006). These guidelines are intended to help managers assess the proper level of herbaceous forage use. Within the supporting guideline assessment, environmental variations are considered, resulting in various RDM guideline suggestions. If maintaining or increasing annual grassland biomass is not a desired objective for a site, criteria other than RDM should be used, such as percent utilization of key species, measurable wildlife or native plant population or habitat characteristics, or other assessment protocols for rangeland health criteria (see Pellant et al. 2020).

Regional guidelines for minimum allowable RDM were initially developed by researchers around 1980; however, the data were limited at the time of writing. As an effort to expand on these initial regional guidelines, a scorecard was developed by combining site characteristics such as rainfall, canopy cover, and slope, that affect animal use to quickly estimate grazing capacity (Bartolome et al. 2006). This approach can provide useful estimates of grazing capacity and is typically paired with Geographic Information Systems (GIS) to develop mapping of forage availability (Standiford et al. 1999).

Photo monitoring

Photo monitoring is an essential component of rangeland assessment and adaptive management, providing a permanent visual record of site conditions through time. Standardized photo points—georeferenced and marked in the field—allow for consistent, repeatable image capture at fixed locations and orientations. When conducted at regular intervals, such as seasonally or annually, photo monitoring enables detection of changes in vegetation composition, ground cover, erosion features, and evidence of grazing pressure or recovery. Photographic data serve as a qualitative complement to quantitative monitoring methods (e.g., line-point intercept, biomass sampling, or frequency transects), enhancing the interpretation of ecological trends and management outcomes. Proper metadata

documentation—including date, weather conditions, camera settings, and photo orientation—is critical to ensure data integrity and comparability across years. Collectively, photo monitoring supports long-term evaluation of management effectiveness and informs adaptive decision-making for sustainable rangeland stewardship (Hall 2001).

d. Identify Buffer Zones and Environmentally Sensitive Areas

A buffer zone is a space between some activity, device, or material and some other activity, device, or material that it could harm in some way. A classic agricultural example would be the restriction of pesticide use to some minimum distance away from residential areas, schools, or organic farming operations. With respect to grazing operations, buffers may be used to prevent sheet water flows from carrying animal wastes into waterways, to similarly prevent the transmission of pathogens into crop production areas, or protect sensitive habitats, like wetlands, cultural sites, or wildlife reserves, from plant defoliation or other alterations at critical periods. Identification of buffer zones and environmentally sensitive areas is a critical step in project planning. Buffer zones are transitional areas established between grazed lands and sensitive ecosystems or within sensitive ecosystems, such as riparian zones, wetlands, endangered species habitats, or culturally significant sites. These zones serve to protect water quality, soil health, and biodiversity by minimizing direct disturbance from livestock activities (Ford et al. 2013).

Managers should consider wet seasons when soils are saturated and more vulnerable to compaction and runoff, and plan grazing accordingly. For example, riparian areas, which are particularly sensitive to erosion and nutrient loading, should be clearly delineated and may require exclusion or restricted access to livestock depending on the season or other local constraints (e.g., environmental policies). The California Department of Fish and Wildlife (CDFW) supports maintaining vegetative buffers of an appropriate width to reduce sediment, nutrient runoff, and physical disturbance to waterways, benefiting aquatic and terrestrial species alike (CDFW 2021). In addition, habitats of special-status species, such as vernal pools or California red-legged frog (*Rana draytonii*) breeding areas, must be identified early in the planning process. Grazing may still be compatible in some sensitive habitats but may need to occur under carefully timed and monitored conditions to avoid harm to flora and fauna. Use of adaptive management strategies, such as rotational grazing schedules or temporary fencing, can help balance vegetation goals with habitat protection (Ford et al. 2013).

e. Landscape-Level Considerations

Managers must consider ownership, land-use legacy, stakeholder objectives, and long-term ecological and social resilience, and not just only immediate vegetation or fuel-management outcomes. When developing a grazing plan, landscape attributes should be considered in the

layout design of the grazing plan to achieve objectives such as maximizing forage production across the rangeland. Three key environmental factors influence this: slope, aspect, and soil type (Gersie et al. 2019). To promote consistent and healthy forage growth, it is ideal to ensure that individual grazing areas (i.e., paddocks or pastures) do not vary significantly in these characteristics. However, some variation in forage production is expected due to natural differences in terrain and soil conditions (Marty 2007, Michaels et al. 2021), and developing uniform grazing units may not be feasible, particularly in developed environments like complex WUI landscapes or more densely populated areas with high levels of permanent infrastructure.

In a prescribed grazing context where the landscape may be highly built, densely populated, or composed of fragmented patches of vegetation, forage production is rarely the primary objective. Instead, prescribed grazing is typically implemented to support services such as fine-fuel reduction, continuity breaks, and wildfire-risk mitigation, particularly in the WUI where vegetation management is essential for community protection (Huntsinger and Barry 2021, Ratcliff et al. 2022). Because these landscapes often support diverse wildlife species moving through developed and semi-natural areas, planners must also consider wildlife corridors and movement pathways, which can influence the placement and design of temporary fencing used to control livestock. Even in suburban or urban fringes, fencing and grazing infrastructure should be designed to minimize obstruction of wildlife movement, avoid entanglement risk, and maintain ecological connectivity (e.g., deer, mountain lions, coyotes, bobcats, small mammals) (Jakes et al. 2018). Together, these considerations ensure that prescribed grazing in built or heavily populated areas supports fire-resilience goals while maintaining habitat values and wildlife movement across the landscape.

Moreover, if surface water sources exist on the land prior to paddock development, keep in mind that these areas may be considered unsuitable for direct livestock use. In such cases, dedicated livestock watering systems must be installed or temporary watering sources employed. Planning the location of these water sources early in the layout process will help inform effective fencing design and livestock movement strategies (Barry et al. 2015). There are several types of livestock watering systems available, with the most common including automatic watering systems, solar-powered systems, and the use of water trucks to bring in water. Selecting the right system depends on the available grazing area, infrastructure, livestock needs, and climate conditions. Water needs and delivery systems will vary based on the landscape to be grazed, season of use, and vegetation types (NRCS 2023b).

f. Incorporate Recovery Periods

Recovery periods are a foundational component of effective prescribed grazing, especially in California's diverse and often drought-prone landscapes and highly variable inter- and intra-annual rainfall and climatic conditions. A **Recovery Period** is the time allotted for grazed vegetation to regrow and restore its vigor before being grazed again. Inadequate recovery time can result in overgrazing, reduced plant health, soil erosion, and diminished forage production over time (also see **Box 1: Continuous and Prescribed Grazing**, below).

BOX 1: Continuous, Rotational, and Prescribed Grazing

A variety of "grazing systems" exist, with various interpretations and varying practices involved in the application of each system. When properly planned, implemented, and monitored, grazing systems provide a powerful tool to adapt management to a variety of environmental and social contexts and goals (Howery et al. 2016)**.**

Continuous grazing allows livestock unrestricted access to rangeland without movement to other distinct grazing units. While simple to implement, this practice can lead to overgrazing and long-term environmental degradation due to constant pressure on forage plants. The main goal of continuous grazing is typically the production of livestock commodities. Grazing management asserts control over the timing, frequency, intensity, and selectivity of grazing. "**Rotational grazing**" systems aim to optimize these factors by allowing some areas to rest while others are grazed. All methods of responsible grazing management ultimately intend to sustain healthy soils, flora, fauna, and water resources that can sustain natural ecological processes (Bailey et al. 2019).

Prescribed grazing involves a planned schedule developed by landowners or land managers to regulate livestock movement and grazing duration. This method provides necessary rest periods for forage plants, which is essential for maintaining plant health and promoting regrowth (NRCS 2025). Without adequate rest, overgrazing can occur, causing plants to be grazed down to the soil. This stresses plants, forcing them to use more energy and resources to recover, and can ultimately reduce vigor and persistence over time (Pfost et al. 2000). This grazing strategy may incorporate components of continuous or rotational grazing (or even other kinds of "grazing systems"), depending on the objectives and environmental context.

Prescribed grazing may support long-term agricultural viability (NRCS 2025). Healthier pastures provide more consistent and nutritious forage for livestock, which translates to improved animal health, reduced feed costs, and greater productivity for ranchers. This, in turn, helps stabilize rural economies and contributes to the resilience of working lands (Gosnell et al. 2020). Investing in programs that support prescribed grazing—through technical assistance, cost-sharing, or incentive payments—has the potential to reduce future restoration costs and emergency wildfire response expenditures (Ratcliff et al. 2022).

In California's Mediterranean climate—characterized by cool, wet winters and hot, dry summers—timing is especially critical (Bartolome et al. 2006). The growing season typically occurs in late winter through spring, making this the optimal period for forage recovery. According to the Natural Resources Conservation Service (NRCS), allowing plants to recover during the active growing season is essential for maintaining healthy root systems and ensuring sustainable forage yields (NRCS 2025). Native perennial grasses, such as *Stipa pulchra* (purple needlegrass), require longer recovery periods than non-native annual grasses due to their slower regrowth rates. Several factors should be considered when designing recovery periods:

- **Forage species:** Rangelands with various species will require different recovery time. For instance, perennials need more time to recover than fast-growing annuals.
- **Soil type and moisture availability**: Rangelands will vary in their soil type. With this, note that sandy or dry soils may delay regrowth of forages.
- **Previous grazing intensity:** Differences in grazing intensity from previous season will determine how long rangelands should rest for; heavily grazed areas will need extended rest.
- **Seasonal conditions:** Drought years require longer recovery periods.
- **Monitoring outcomes:** Adaptive management based on on-the-ground conditions ensures flexibility and effectiveness.

  Sources: *Bartolome et al. 1980, Briske and Richards 1995, NRCS 2025, Launchbaugh and Walker 2006*

The University of California Division of Agriculture and Natural Resources (UCANR) recommends using adaptive grazing schedules that account for real-time forage conditions rather than rigid calendar dates. This helps protect both ecological function and livestock productivity. In practice, recovery periods can range from 30 to 90 days or even more (e.g., a year or even years), depending on these factors. Incorporating prescribed rotational or deferred grazing systems ensures that no single area is overused, allowing vegetation to maintain its resilience and ecological value, thereby supporting biodiversity, soil health, and fuel load reduction (Ratcliff et al. 2022).

g. Consider Regional Climate Factors

Understanding the climate of the region is essential for developing an effective grazing plan. California's grassland regions typically experience a Mediterranean climate—characterized by wet winters, warm, dry summers, and oceanic influences that moderate temperatures. In these Mediterranean-type ecosystems, some native plant species, particularly native annual wildflowers in vernal pools and coastal grasslands, may benefit from managed grazing that suppresses annual grasses, allowing the native wildflowers to reproduce more successfully.

Vernal pool wetlands respond to livestock grazing, exclusion and reintroduction (Marty 2007, Michaels et al. 2021).

Mediterranean-type climates are localized in the coast, valley, and foothill regions of California. This climate supports much of the state's native grasslands, chaparral, and oak woodlands, and is a key factor in rangeland and grazing management. As mentioned earlier, this climate type is characterized by wet winters, with majority of its precipitation occurring between November and March. Dry summers are another characteristic of this climate, with little to no rainfall, between spring and fall seasons. Mediterranean climates also have a distinct growing season; most native and annual plants germinate during the first rains, grow through winter (and sometimes spring), eventually dying or going dormant by the summer season (Bartolome et al. 2006).

Regional Considerations for Grazing Guidance Element #2

Table 4 provides an overview of regional climatic considerations and recommended associated management practices.

Table 4. Regional Climatic Considerations and Grazing Recommendations

Region	Climate Change Pressures	Best Practices for Recovery from Grazing
Northern California	• Warmer winters, reduced snowpack • Longer, drier summers • Increased wildfire risk • Drought stress on perennial grasses	• Extend **rest periods** after grazing during drought years • Promote **oak woodland regeneration**, protect seedlings • Restore **meadow and riparian systems** for water retention • Adjust **stocking rates annually** to precipitation
Sierra-Cascade-Inyo	• Shrinking montane meadows • Woody encroachment (pinyon-juniper) • Cheatgrass expansion • Highly variable precipitation, erosion risk	• **Exclude grazing in sensitive meadows** during dry years • **Target grazing** to slow woody encroachment, then allow recovery • Protect soils with reseeding & erosion control • Apply **adaptive stocking** with flexible herd movements

Region	Climate Change Pressures	Best Practices for Recovery from Grazing
Coastal Inland	• Shorter "green season" for annual grasses • More frequent, high-intensity wildfires • Spread of invasives (medusahead [*Elymus caput-medusae*], goatgrass [*Aegilops triuncialui*]) • Earlier drying of forage	• Use **rest-rotation** grazing aligned to shorter growing season • Apply grazing for **fuel reduction**, followed by reseeding/rest • Support **perennial grass reestablishment** through reseeding and deferred grazing • Protect **riparian corridors** as forage and climate buffers
Southern California	• Extreme heatwaves, flash droughts • Highly variable rainfall, flash floods • Expansion of invasive annual grasses (red brome [*Bromus madritensus*], *Schismus* spp.) • Increased wildfire frequency • Very slow natural recovery in deserts	• Allow **multi-year recovery** for desert shrublands • Apply **seasonal exclusions** during rare wet years to replenish seedbanks • Use grazing to reduce **flashy fuels**, then rest/reseed as needed • Use **flexible contracts** and emergency planning to facilitate rapid removal of livestock (as feasible) during drought, or extreme weather or climatic events, such as extreme heat or smoke exposure

Sources: *Balachowski et al. 2017*, *Ostoja et al. 2023*

(3) Best practices for using prescribed grazing to increase the diversity and abundance of native species and decrease the abundance of invasive species, including through adaptive management, exclusion areas, wildfire-friendly fencing, and monitoring.

Key Takeaway

Using prescribed grazing to **enhance native species and control invasives** is most effective when it incorporates **adaptive management, targeted exclusion areas, wildlife-friendly fencing where lawful and practicable, and regular monitoring**. This approach allows grazing to be adjusted based on ecological responses, promoting biodiversity while minimizing negative impacts.

Recommendations for Grazing Guidance Element #3

California's landscapes, shaped by a Mediterranean climate, support a mix of native perennial grasses, forbs, and shrubs, alongside a wide array of wildlife (Bartolome et al. 2006). However, invasive species, altered fire regimes, and land-use changes have degraded many of these ecosystems. Prescribed grazing can help restore native plant communities and improve wildlife habitat by controlling invasive species, reducing excessive biomass, and promoting desirable vegetation growth, so long as these metrics are adequately addressed in the prescription, which is consistently applied and monitored over time (Bartolome et al. 2014, Roche and Macon 2025). The support of perennial native vegetation is generally considered to be desirable, but that regime will likely require active management; removing invasive species alone will not necessarily result in a "less degraded" ecosystem (Bartolome et al. 2014).

a. Align Grazing Timing with Native Plant Phenology

One of the most critical considerations is the timing of grazing. Grazing during the active growing period of invasive annual grasses (typically late winter to early spring) can reduce their seed production while minimizing damage to slower-growing native perennials (Bartolome et al. 2014). Delaying grazing until after native plants have set seed allows for regeneration, supporting long-term population resilience (NRCS 2025).

b. Match Stocking Rates and Duration of Grazing to Carrying Capacity of the Land

The intensity and duration of grazing must be closely monitored and often largely depends on

the amount and timing of precipitation. If animals graze for too long or return too soon, this can impact native species and compact soils, whereas moderate, well-distributed grazing can open space for native seedlings to establish. Livestock should be moved before utilization exceeds 40–50% of desirable forage species (George et al. 2011).

c. Use Adaptive Management and Monitoring

Prescribed grazing is not a one-size-fits-all tool. Site conditions, weather, species composition, and land use history require adaptive management supported by robust monitoring. Establishing photo points, vegetation transects, and grazing logs helps track changes and inform future adjustments (NRCS 2023b). Adaptive monitoring is the remodeled version of monitoring programs that consider environmental and socioeconomic conditions, and improved monitoring methods and tools (Haan and Bartlett 2010). Adaptive management and monitoring using standardized, repeatable, and scalable data-collection methods is key to supporting effective management of rangelands and fuels management projects, enabling managers to learn over time, respond to changing conditions, and improve decision-making at local and landscape scales (McCord and Pilliod 2022; also see **GGE #2 Recommendation c**: Plan for Monitoring of Grazing Outcomes for further information on monitoring).

d. Incorporate Exclusion Areas and Buffer Zones

To preserve sensitive ecological features, it is best practice to implement buffer zones around riparian areas, cultural sites, and rare plant communities. Temporary fencing or herding techniques can keep livestock out of these zones, allowing recovery and protecting biodiversity (Barry and Huntsinger 2021). Excluding livestock from riparian areas is one of the most effective ways to prevent direct fecal contamination, streambank erosion, and nutrient loading into surface waters (Haan and Bartlett 2010).

e. Prioritize Wildlife-Friendly Infrastructure

Installing wildlife-friendly fencing supports safe movement for species like deer, elk, and pronghorn (Paige 2008); however, property owners and livestock grazers should be aware of the **California Food and Agriculture Code § 17121**[16] which defines a "lawful fence" for the purpose of containing livestock. It states that a fence must be "good, strong, substantial, and sufficient" to prevent them from escaping. This includes specific requirements for barbed wire fences, such as having three tightly stretched wires, posts spaced not more than one rod apart, and a top wire at least four feet high. The law also includes cattle guards as a lawful fence if constructed to an equivalent standard. This law should be considered when deciding to install a

[16] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=17121&lawCode=FAC

wildlife friendly fence. Infrastructure should accommodate both grazing needs and habitat connectivity, and temporary fencing may provide more flexible designs that can often better accommodate temporary or seasonal wildlife or livestock considerations (CDFW 2018, Jakes et al. 2018; also see **GGE #2 Recommendation e**: Landscape-Level Considerations for further information on fencing considerations and wildlife).

f. Integrate Multiple Species or Targeted Grazers

Utilizing different livestock species can enhance management. For instance, goats are effective at reducing woody vegetation and invasive shrubs, while cattle or sheep may be better suited for grass-dominated sites. Mixed grazing can mimic the diversity of natural herbivore guilds and improve outcomes (Launchbaugh and Walker 2006).

When applied thoughtfully, prescribed grazing offers a scalable, cost-effective method to manage California's rangelands for wildfire resilience, biodiversity, and productivity. To maximize benefits, land managers should prioritize adaptive planning, ecological monitoring, and stakeholder collaboration, including the Grazing Operator.

Regional Considerations for Grazing Guidance Element #3

Table 5 provides a list of Common native species, invasive species, and recommended prescribed grazing strategies across California's four rangeland regions.

Table 5. Common Native and Invasive Species by Region, and Prescribed Grazing Strategies

Region	Key Native Species	Common Invasives	Recommended Prescribed Grazing Strategies
Northern California	• Idaho fescue (*Festuca idahoensis*) • California oatgrass (*Danthonia californica*) • Blue oak (*Quercus douglasii*), Oregon white oak (*Q. garryana*) • Bitterbrush (*Purshia tridentata*)	• Cheatgrass (*Bromus tectorum*) • Medusahead (*Taeniatherum caput-medusae*) • Barbed goatgrass (*Aegilops triuncialis*) • Yellow starthistle (*Centaurea solstitialis*) • Canada thistle (*Cirsium arvense*)	• **Early spring grazing** to reduce cheatgrass & medusahead seed set • **Recovery Periods** to support perennial grasses • **Exclusion zones** for oak seedling regeneration • **Monitoring** via exclosures & RDM standards

Region	Key Native Species	Common Invasives	Recommended Prescribed Grazing Strategies
Sierra-Cascade-Inyo	• Bluebunch wheatgrass (*Pseudoroegneria spicata*) • Squirreltail (*Elymus elymoides*) • Big sagebrush (*Artemisia tridentata*), bitterbrush (*Purshia tridentata*) • Wet meadow sedges & rushes	• Cheatgrass (*Bromus tectorum*) • Medusahead (*Elymus caput-medusae*) • Whitetop (*Lepidium latifolium*) • Spotted knapweed (*Centaurea maculosa*)	• **Target early season grazing** of cheatgrass • **Exclude meadows** in dry years for recovery • Use **sheep/goats** to suppress knapweeds & shrubs • **Adaptive stocking** with mobile water/fencing
Coastal Inland	• Purple needlegrass (*Stipa pulchra*) • Blue wildrye (*Elymus glaucus*) • Coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*) • Coyote brush (*Baccharis pilularis*), toyon (*Heteromeles arbutifolia*)	• Italian ryegrass (*Lolium multiflorum*) • Medusahead (*Elymus caput-medusae*) • Barbed goatgrass (*Aegilops triuncialis*) • Yellow starthistle (*Centaurea solstitialis*)	• **Timed grazing** in spring to target goatgrass & medusahead • **Defer grazing** during purple needlegrass seed set • **Rotational rest zones** in oak savannas • **Combine grazing + reseeding** to boost natives
Southern California	• California sagebrush (*Artemisia californica*) • Black sage (*Salvia mellifera*), white sage (*S. apiana*) • Creosote bush (*Larrea tridentata*), saltbush (*Atriplex* spp.) • Joshua tree (*Yucca brevifolia*), Engelmann oak (*Quercus engelmannii*)	• Red brome (*Bromus madritensis ssp. rubens*) • Schismus grasses (*Schismus barbatus*, *S. arabicus*) • Sahara mustard (*Brassica tournefortii*) • Fountain grass (*Pennisetum setaceum*) Russian Thistle *(Salsola tragus)*	• **Timed grazing** in spring to target annual grasses & other early growing invasives • **Defer grazing** during desirable native grass seed set & wet growing season to protect native chaparral & shrub communities • **Rotational rest zones** in oak savannas & highly disturbed areas, such as burn scars • **Combine grazing + reseeding** to boost natives

Sources: *Bartolome et al. 2006, Bossard et al. 2000, Launchbaugh and Walker 2006, Ratcliff et al. 2022*

(4) Recommendation for securing sufficient land resources, including forage, needed to pasture livestock when not engaged in a prescribed grazing project.

Key Takeaway

To ensure livestock operations can support vegetation management goals while also maintaining herd health and economic viability, managers need strategies to secure **adequate forage and land base outside of prescribed grazing sites**.

Recommendations for Grazing Guidance Element #4

Securing adequate land resources during periods when livestock are not participating in prescribed or contracted grazing projects is essential to maintaining herd health and operational continuity. Grazing Operators must plan for alternative forage sources—such as leased rangeland, crop residue, irrigated pasture, or supplemental feeding areas—to meet nutritional and spatial requirements throughout the year (see **Box 2: Match.Graze**) (Launchbaugh & Walker 2006).

BOX 2: Match.Graze

Options for land leasing can be found at https://matchgraze.com/. Match.Graze is a free online platform that connects livestock producers and landowners throughout the state of California. Whether you're a landowner seeking a small flock of sheep to mow your back 40, or a producer in search of seasonal pasture for a goat herd, Match.Graze can help match animals or land base. The Match.Graze map displays pertinent data from individuals that have voluntarily submitted information to the database, such as acreage or animal type available, forage characteristics, approximate location, and contact information. The aim is to support the expanded use of grazing to achieve California's collective habitat enhancement and fuels reduction goals.

Strategic land-use planning ensures that animals can be relocated without overgrazing sensitive habitats or compromising ecological objectives on conservation lands. This may involve developing agreements with private landowners, public agencies, or grazing associations to access seasonal forage resources. Integrating forage budgeting, herd rotation schedules, and drought contingency planning helps balance livestock demand with available feed and supports the long-term viability of both grazing operations and rangeland ecosystems (Launchbaugh & Walker 2006; NRCS 2025). Key considerations and recommendations follow:

a. Consider Seasonal and Rotational Land Use

Rotational systems allow herds to move between different regions and ecotypes, as well as between grazing sites and resting pastures. Taking advantage of seasonal transhumance (i.e., herd movement) can best optimize utilization of forage growth patterns (e.g., coastal green feed in winter, mountain meadows in summer).

b. Establish Dedicated Base Pasture or Holding Areas ('Sacrifice Areas')

Livestock used in prescribed grazing programs require off-site pasture when not performing vegetation management work. Base area requirements include:

- Sufficient acreage to prevent overstocking.
- Equipped with adequate forage, water, fencing, and shelter.
- Grazing managed with rotational practices to avoid soil degradation or invasive species spread (see **GGE #4 Recommendation a**: Consider Seasonal and Rotational Land Use, above) (Barnes 2024).

Maintaining dedicated pasture ensures animal welfare and preserves the ecological integrity of both base and project lands. For example, NRCS Prescribed Grazing Conservation Practice Standard (528) emphasizes that livestock must have access to alternative grazing units or confinement areas during rest periods or off-contract times (NRCS 2023b).

c. Secure Agreements with Public and Private Landowners

In California and other western states, cooperative grazing agreements with land trusts, public agencies, or private landowners can provide seasonal pasture when prescribed grazing isn't occurring. Such partnerships can benefit both parties, as landowners receive fuel reduction or maintenance services, while Grazing Operators gain access to additional forage (Fisher 2012). Alternative forage sources can include:

- Cover crop grazing in vineyards, orchards, or annual croplands during off-season (Gaudin 2024, Planisich et al. 2021).
- Crop residue grazing (e.g., corn stalks, small grain stubble, rice fields post-harvest).
- **Conservation Reserve Program**[17] (CRP) lands when accessible under management agreements.

Organizations like the **California Rangeland Trust**[18] and **UC Cooperative Extension**[19] offer tools to help Grazing Operators formalize such arrangements.

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[17] https://www.fsa.usda.gov/resources/programs/conservation-reserve-program
[18] https://rangelandtrust.org/
[19] https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension

d. Integrate Forage Planning and Drought Resilience Strategies

Forage availability can vary due to climate, seasonal growth, and drought. To mitigate this, Grazing Operators should consider the following:

- Develop a forage budget that estimates livestock needs throughout the year.
- Maintain a drought contingency plan (e.g., supplemental feeding, destocking, leasing alternative land).
- Set aside ungrazed pastures or areas rested early in the season for later use as a "forage bank."
- Deferred grazing allows forage to accumulate for periods when animals cannot be on treatment sites.
- Stockpiling perennial grasses (e.g., tall fescue [*Festuca arundinacea*], orchardgrass [*Dactylis glomerata*] in irrigated systems, purple needlegrass [*Stipa pulchra*]) can be an important forage source for fall/winter grazing.
- Forage insurance programs can buffer against drought-induced shortages.

  Sources: *Ball 2001*, *Launchbaugh and Walker 2006*, *NRCS 2025*

Forage planning models like those promoted by UCANR's Ranch Planning resources support these decisions. Becchetti et al. (2016) recommends Grazing Operators identify emergency back-up forage for seasonal grazing in California's Mediterranean rangelands, adjusting for forage quality and precipitation.

e. Consider Infrastructure and Accessibility

Sites used for holding or base pasture must be equipped with:

- Reliable water access (e.g., troughs, stock ponds, natural sources with measures in place to prevent bacterial contamination, sedimentation and nutrient loading)
- Perimeter fencing for containment and predator control
- Shelter or shade depending on season and species
- Vehicle access for hauling and veterinary support

  Sources: *Barry et al. 2015*, *Launchbaugh and Walker 2006*, *NRCS 2025*, *Rinehart 2006*

If Grazing Operators are mobile (e.g., service providers that utilize goat herders), portable infrastructure like solar-powered electric fencing, mobile troughs, and camps may be needed. Mobile water systems and portable fencing can expand usable rangeland areas, wildlife-friendly fencing maintains conservation compatibility, and mobile contracts allow for quick relocation to available forage (Launchbaugh and Walker 2006). In general, natural water sources should be avoided as a primary livestock water source unless appropriate measures are in place to

prevent bacterial contamination, sedimentation, and nutrient loading (Barry et al. 2015).

f. Explore Partnerships, Cooperative Models, Incentives, and Cost-Sharing Programs

Forming alliances to support grazing operations when prescribed grazing projects are not currently in effect may ensure sustainability of operations and may be formal or informal. Partnerships with agencies and non-governmental organizations (NGOs) (e.g., NRCS,[20] land trusts, conservancies, watershed councils) can support coordination of forage-sharing agreements (NRCS 2023a).

Cooperative agreements, such as Livestock Cooperatives, can provide opportunities to pool herds and pasture resources for flexibility. Public–private partnerships where landowners provide pasture in exchange for ecosystem services (e.g., fire fuel reduction, invasive control) may provide alternative frameworks that could benefit both land owners and Grazing Operators (Moreddu 2016), although this may not be an economically-viable solution on a regular basis or over the long-term.

Federal and state conservation programs may also help Grazing Operators acquire or improve infrastructure. Examples include NRCS's **Environmental Quality Incentives Program**[21] (EQIP), the **California Department of Food and Agriculture**[22] (CDFA) **Healthy Soils Program**,[23] and the **USDA Farm Service Agency**[24] (FSA) **Conservation Reserve Enhancement Program**[25] (CREP). Cost-sharing programs for supplemental feed may also be options when rangeland access is restricted. Programs such as Payments for Ecosystem Services (PES) may compensate Grazing Operators for maintaining herds for prescribed grazing even when off-project.

Regional Considerations for Grazing Guidance Element #4

Regional variability in grazing management practices is influenced by the spatial extent of rangelands and proximity of urban development. In regions characterized by extensive contiguous land areas, grazing management strategies often differ from those employed in more fragmented or spatially constrained areas. Where predator presence is a management concern, management tends to favor the use of cattle over smaller ruminants. Livestock movement is commonly facilitated through strategic placement of water or supplemental feed resources, and/or active herding across pastures (du Toit 2017, Putfarken 2008).

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[20] https://www.nrcs.usda.gov/
[21] https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program
[22] https://www.cdfa.ca.gov/
[23] https://www.cdfa.ca.gov/oars/healthysoils/
[24] https://www.fsa.usda.gov/
[25] https://www.fsa.usda.gov/resources/programs/conservation-reserve-enhancement-program-crep

Conversely, in regions composed of smaller parcel sizes—especially those located near urban centers—grazing is more frequently conducted using small ruminants within relatively confined areas. These systems typically rely on portable or temporary fencing and direct oversight by on-site herders to manage animal distribution and forage utilization. Additionally, areas where public and private lands intersect may provide opportunities to expand grazing with reduced reliance on livestock transport, thereby improving logistical efficiency (Campbell-Craven 2020, Putfarken 2008.

(5) Best practices for building community support and engaging with public and private landowners to improve the implementation and outcomes of a prescribed grazing plan.

Key Takeaway

Building **community support** and **engaging public and private landowners** is essential for successful prescribed grazing. Early collaboration, clear communication, shared planning, transparency, and ongoing monitoring help ensure that grazing plans are adopted effectively, address local needs, and achieve both ecological and operational goals.

Recommendations for Grazing Guidance Element #5

a. Collaboratively Plan and Build Partnerships to Leverage Resources and Increase Buy-in

Efforts to conduct collaborative planning across a diverse stakeholder base can go far in building community support for grazing, particularly if the benefits and trade-offs are clearly identified early in the planning process. Early engagement of stakeholders prior to development of the grazing plan is essential for building support and supporting a successful grazing project and outcomes. A variety of approaches may be utilized to build engagement, include diverse backgrounds and viewpoints, and develop a grazing plan that is supported by various stakeholders in the community:

Collaborative Planning

- Co-develop grazing plans: Include landowners in creating rotation schedules, stocking rates, and timing of grazing.
- Flexibility: Adjust plans as conditions change (weather, forage growth, livestock needs).
- Incorporate traditional and local knowledge: Respect landowners' historical

management practices.

Early and Inclusive Stakeholder Engagement

- Identify all stakeholders: Private landowners, public land managers, local community groups, conservation organizations, agricultural associations, livestock Grazing Operators and tribal entities.
- Involve stakeholders from the start: Early engagement ensures concerns are addressed, and local knowledge is incorporated.
- Hold listening sessions or focus groups: Gather input on grazing objectives, local constraints, and priorities.

Build Trust and Transparency

- Be transparent about objectives, risks, and monitoring results.
- Share data and outcomes: Provide measurable indicators of success (e.g., forage health, soil quality, livestock performance, flashy fuel reduction, defensible space).
- Deliver on promises: Meeting deadlines, respecting landowner property, and honoring agreements fosters credibility.

Investigate and Develop Incentives and Support

- Financial or technical assistance: Cost-sharing for grazing services, fencing, water infrastructure, or forage improvement.
- Recognition programs: Awards or public acknowledgment for participating landowners.
- Access to resources: Provide expertise, tools, or equipment to reduce barriers to adoption.

Sources: *Eaton et al. 2022*, *Launchbaugh and Walker 2006*, *Ratner 2022*

b. Education and Outreach

Intentionally conducting targeted outreach and providing educational opportunities can go far in building community support. Recommendations for education and outreach include:

Clear Communication and Education

- Explain the benefits of prescribed grazing: Highlight improvements in rangeland health, forage quality, wildfire risk reduction, and biodiversity.
- Use accessible language: Avoid technical jargon; provide visual aids like maps, charts, and before/after images.
- Provide ongoing education: Workshops, field days, and demonstrations can help landowners see techniques in action. Educational signage can provide details on the reasons for the use of prescribed grazing. Information can also be provided to ensure compatibility of activities, such as recreation and grazing, including contact information

for managing Grazing Operators in case of concerns or emergency (Wolf et al. 2017).

Swanton Pacific Ranch's Fuels and Vegetation Education (FAVE) program[26] educated professionals on wildfire fuel mitigation and vegetation management to accelerate efforts for a more sustainable and fire-resilient California landscape; while the program is no longer in effect, workshop recordings and materials are available online. The RMAC also provides an annual educational workshop series (see the "Workshops" section on the RMAC's **Livestock Grazing Management Resources**[27] webpage), as do a variety of other rangeland organizations (e.g., **Western Landowners Alliance**,[28] **California Rangeland Conservation Coalition**,[29] **California Rangeland Trust**,[30] and **California-Pacific Section of the Society for Range Management**[31]).

Sharing success stories is an important component of education and outreach, as it provides a tangible example of prescribed grazing and outcomes in action (Launchbaugh and Walker 2006) (see **Box 3: Success Stories**, next page).

[26] https://spranch.calpoly.edu/fuels
[27] https://bof.fire.ca.gov/board-committees/range-management-advisory-committee/livestock-grazing-management-resources
[28] https://westernlandowners.org/grazing-lands-partnerships/
[29] https://carangeland.org/
[30] https://rangelandtrust.org/
[31] https://calpacsrm.org/

BOX 3: Success Stories

California resident Marie Hoff (2020), shared her story about her experience evacuating her home in 2017 due to a wildfire. Hoff explains how she'd never been in that situation before, and wasn't sure what to do next, "In 2017 I evacuated my home in Northern California from a wildfire for the first time in my life. I was 34 years old, had never evacuated from a fire before, and was not aware of anyone I knew who had either, despite the entirety of those 34 years taking place in California...". Hoff goes on to explain her newly founded drive for fire reduction efforts.

Just like Hoff, most Californians worry about the safety of their homes, property, and belongings because of the recurring wildfires. As an effort to spread community awareness, Hoff suggests prescribed grazing as a solution to decreasing the abundance of unwanted vegetation, ultimately decreasing the likelihood and severity of wildfires. Alongside the apparent decrease in wildfire spread, the California native includes the other benefits prescribed grazing provides. For instance, she suggests prescribed grazing is the most climate appropriate method, as grazing decreases more carbon than it emits. Additional suggestions related to food and fiber production, economical boosts, and our future climate are also mentioned.

Furthermore, California residents like Marie Hoff experience the recurring threat of wildfires and their devastating impacts. Sharing relatable stories such as Hoff's can resonate with many Californians, prompting greater interest in learning about the benefits of prescribed grazing. By increasing public awareness and understanding of its role in fire mitigation, support for implementing prescribed grazing as a proactive fire-reduction strategy may grow.

c. Addressing Landowner Concerns

Early and often engagement with stakeholders may ameliorate potential problems longer term (See **GGE #5 Recommendation a**: Collaboratively Plan and Build Partnerships).
Recommendations to address landowner concerns include:

Engage and Include Landowners

- Conduct outreach to and listen to landowner needs and community concerns.
- Tailor grazing plans to accommodate other land uses (e.g., recreation, wildlife habitat).
- Provide clear information on liability, fencing, water access, and animal management to reduce perceived risks.

Sources: *Coon et al. 2020*, *Fisher 2012*

Provide Information on Ongoing Monitoring and Incorporate Feedback

- Regular check-ins: Maintain communication with landowners and the community

throughout the grazing cycle, and in between bouts of grazing to prepare communities for the presence of livestock and associated management activities so they know what to expect.

- Celebrate milestones and leverage public-facing grazing activities: Positive reinforcement maintains engagement and motivation (e.g., arrival and departure of animals in a public space, acres treated, education/volunteer participation).

Sources: *Fisher 2012, Jones et al. 2024*

d. Engage Community Champions and Grazing Advocates

Well-regarded landowners, local ranchers, or prescribed grazing professionals can act as liaisons to the public or other organizations that may benefit from more information about prescribed grazing (Fisher 2012). A variety of online resources may assist land managers in connecting with these Grazing Operators:

- Match.Graze,[32] a California Grazing Exchange connecting livestock producers & those with available cropland or forage to graze
- Member Directory[33] of the California Woolgrowers Association[34]
- Find a goat herd for hire[35] with Goats on the Go[36]
- Perennial Grazing LLC[37], a sheep and goat grazing service provider for Napa, Marin, Sonoma, Solano, Mendocino, Colusa, Lake, Yolo, Sacramento and Amador Counties

e. Community Integration: Host Demonstration Projects and Field Days

Organizations and Grazing Operators conducting prescribed grazing may benefit from hosting publicly-accessible and widely advertised field days, tours, and demonstrations on site, such as inviting stakeholders and other relevant parties to observe grazing in action (i.e., see animal behavior, fuel reduction, and habitat restoration outcomes firsthand). Opportunities to integrate community members include:

- Leverage local networks: Partner with extension services, ranching associations, fire safe councils, academic institutions, and conservation groups, where appropriate.
- Showcase success stories: Peer-to-peer examples often resonate more than top-down

[32] https://matchgraze.com/
[33] https://californiawoolgrowers.org/industry-contacts/member-directory/
[34] https://californiawoolgrowers.org/
[35] https://www.goatsonthego.com/affiliate-directory
[36] https://www.goatsonthego.com/
[37] https://www.perennialgrazing.org

guidance.

- Encourage community ownership: Position grazing plans as a shared effort benefiting the whole ecosystem.
- Provide educational resources and contacts to answer questions: Resources could include printed materials, websites, and signage on the grazing site.
- Highlight case studies to share additional information and outcomes at different sites and for varying contexts and communities.

Sources: *Sustainable Farms 2022, SARE 2016*

Sonoma County UCCE (Morrow 2024) evaluated several grazing case studies to document the different grazing programs and collaboratives in Sonoma County. The results highlighted that there is not a one-size fits all approach to utilizing livestock and grazing as a tool for vegetation management and land stewardship. These case studies show that there are many ways grazing programs and collaboratives can be set up and function effectively. Whether you are a single property owner or have neighborhood buy-in, grazing for vegetation management is possible and can be adapted to best suit landscape goals. Regional case studies can assist in prioritizing areas for grazing and coordinate efforts to increase the scale and impact of projects.

Regional Considerations for Grazing Guidance Element #5

Regional variability significantly influences collaborative planning and partnership development for grazing initiatives (Huntsinger and Barry 2021, Roche and Macon 2025). In areas with extensive land holdings, there may be fewer potential partners to leverage resources, whereas regions with higher urban density often provide more opportunities for stakeholder engagement and partnership building (Huntsinger and Barry 2021, Fisher 2012). However, urban-proximate areas may also face a greater diversity of competing land-use interests, where grazing represents just one of several strategies to achieve ecological or social objectives and increase stakeholder buy-in. These differences highlight the need for region-specific approaches to optimize grazing opportunities and foster effective collaboration among public and private land managers (Huntsinger and Barry 2021, Fisher 2012, Roche and Macon 2025).

(6) Methods to identify opportunities to house and maintain shared grazing infrastructure.

Key Takeaway

Successful identification of shared grazing infrastructure opportunities relies on **mapping existing resources; collaborative planning with landowners, fire departments, fires safe councils, and municipalities; logistical feasibility; and flexible designs** that can evolve with herd and forage needs.

Recommendations for Grazing Guidance Element #6

Grazing infrastructure—such as portable fencing, livestock water systems, corrals, and handling equipment—is critical to the success of prescribed grazing projects. However, individual landowners and producers often face high start-up costs that limit their ability to implement or expand grazing as a land management tool. Start-up grazing businesses are encouraged to identify other grazers and coordinate opportunities to purchase, house, and maintain shared infrastructure that can be accessed by multiple producers, agencies, or community organizations. Methods to identify opportunities may include:

a. Inventory, Assess, and Allocate Local Resources

Survey existing grazing infrastructure available through **Resource Conservation Districts**[38] (RCDs), **UC Cooperative Extension**,[39] County Agricultural Departments, and producer groups (e.g., **California Cattlemen's Association**[40] [CCA], **California CattleWomen**,[41] **California Wool Growers Association**[42] [CWGA]). Inventory and map permanent or temporary storage locations of all fencing, water systems, corrals, feed storage, and other facilities in use and assess their condition and capacity. In allocating resources, evaluate logistical and operational Factors by considering access, water and power availability, and maintenance responsibilities. Prior to purchasing new infrastructure, utilize Cost-Benefit Analysis frameworks to compare costs of building new infrastructure versus sharing or upgrading existing resources (MISA 2003). When

[38] https://carcd.org/
[39] https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension
[40] https://calcattlemen.org/
[41] https://cattlewomen.org/
[42] https://californiawoolgrowers.org/

purchasing or procuring infrastructure, prioritize multi-use and adaptive infrastructure, including modular, flexible, or movable facilities to accommodate changing herd and forage needs. Finally, monitor and adapt as needed to Grazing Operator and land management needs by regularly and periodically tracking usage, assessing effectiveness, and adjusting siting or design as necessary Jones 2024, MISA 2003, NRCS 2025.

b. Develop Regional Partnerships and Share Infrastructure

By engaging landowners and stakeholders, Grazing Operators may find opportunities to establish cooperative agreements with landowners, ranchers, land trusts, and agencies to share infrastructure resources across properties. Survey local and regional interest, explore partnerships, and address constraints such as zoning or liability (Barry et al. 2007, Ciraolo 2024). Also see **GGE #4 Recommendations c**: Secure Agreements with Public and Private Landowners and **f**: Explore Partnerships, Cooperative Models, Incentives, and Cost-Sharing Programs, which delves more deeply into building partnerships and leveraging shared resources.

c. Establish Centralized Equipment Hubs

Once actions such as those described in recommendation a above are conducted, develop storage and management facilities (i.e., "tool libraries") for prescribed grazing equipment, maintained by local agencies or producer networks. Also see **GGE #4 Recommendations c**: Secure Agreements with Public and Private Landowners and **f**: Explore Partnerships, Cooperative Models, Incentives, and Cost-Sharing Programs, which further explore shared infrastructure.

d. Funding and Incentives

Leverage grants, cost-share programs, and community investment funds to purchase and sustain shared infrastructure (see **GGE #9 Recommendations a:** Expand and Streamline Funding Opportunities and Technical Support and **d:** Strengthen Collaboration and Partnerships, and **GGE #4 Recommendations c**: Secure Agreements with Public and Private Landowners and **f**: Explore Partnerships, Cooperative Models, Incentives, and Cost-Sharing Programs, which further explore funding, cost-share programs, and shared infrastructure opportunities).

e. Training and Access Systems

Once regional partnerships have been established and shared infrastructure identified, create clear guidelines, reservation systems, and training programs for safe use of shared equipment (see **GGE #4 Recommendation f**: Explore Partnerships, Cooperative Models, Incentives, and

Cost-Sharing Programs**,** which further explore partnerships and shared infrastructure).

f. Monitoring and Maintenance Plans

Within any formal or informal partnerships or cooperative, clearly assign responsibility for equipment upkeep to ensure long-term functionality and equitable use. A preliminary list of resources (i.e., suggested Start-Up Tools) have been identified to support infrastructure development and coordination:

- **Prescribed Grazing Start Up Tool Kit**[43]
- **California Cattlemen's Association**[44]
- **California Woolgrowers Association**[45]

By coordinating shared resources, California can expand grazing as a sustainable land management practice, increase wildfire resilience, and strengthen agricultural communities (see **GGE #4 Recommendation f**: Explore Partnerships, Cooperative Models, Incentives, and Cost-Sharing Programs**,** which further explore partnerships and shared infrastructure).

Regional Considerations for Grazing Guidance Element #6

Regional differences strongly influence the coordination and use of shared grazing equipment. In areas with extensive rangelands, equipment such as water pumps, fencing materials, and supplemental feeders may need to be mobile and robust to cover large pastures, but fewer neighboring partners may limit opportunities for shared use (Barry et al. 2015, NRCS 2025). Conversely, in regions with smaller parcels, particularly those near urban centers, there may be more potential partners, such as local ranchers, municipalities, or conservation organizations, enabling more frequent and efficient sharing of portable or temporary equipment (Campbell-Craven 2020, Jones et al. 2024, Sustainable Farms 2022). By tailoring equipment-sharing strategies to regional conditions, California can expand grazing as a sustainable land management practice, enhance wildfire resilience through more effective fine-fuel management, and strengthen the social and economic cohesion of agricultural communities (Jones et al. 2024, MISA 2003).

[43] https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:9c64bf97-f463-4df5-adb7-845b7a30d6dc
[44] https://calcattlemen.org/
[45] https://californiawoolgrowers.org/

(7) Best practice to use prescribed grazing to support and enhance prescribed burns and other vegetation management projects.

Key Takeaway

Prescribed grazing is most effective when it's **strategically timed, targeted, and integrated with prescribed burns and other vegetation management practices**. It reduces fuels, prepares sites for fire, maintains regrowth of flashy fuels, supports ecological recovery, and can enhance safety and effectiveness of burn operations.

Recommendations for Grazing Guidance Element #7

Grazing can be a practical and economical management tool for fire fuel reduction objectives in California grasslands. For example, cattle grazing can reduce rangeland fuels in several ways; the most important way is by removing fine fuels, reducing vegetation biomass and height rangelands (Strand et al. 2014). Prescribed grazing manages the height and structure of our grasslands, which can lead to a change in fire behavior. Grazing reduces the amount of standing fine fuels (i.e., grasses) that can carry the fire: in general, the taller the grass the longer the flame length. Flame length is the distance measured from the average flame tip to the middle of the flaming zone at the base of the fire fires. Flame length is an indicator of fire line intensity. Researchers found flame lengths of 8 inches or lower were seen as a critical threshold that allows fire fighters to use direct measures (such as heavy equipment) on the ground to fight fires. Below four inches, fires can be fought using hand tools. However, in extreme fire weather with very low dead fuel moisture and wind speeds up to 40 miles per hour, fine fuel loads may need to be reduced even more (Ratcliff et al. 2022).

Even if fine fuels are controlled, the management of shrublands is often forgotten. Shrubland ecosystems account for approximately 38% of California's burned areas from 2000–2020 (Calhoun et al. 2022) but there is relatively little research into management strategies to mitigate fire impacts in shrublands. To better understand the influence of vegetation regrowth following catastrophic fires, vegetation management practices should be integrated to achieve landscape and landowner goals (Shobe 2021, Larson and Becchetti 2025). Efforts to control brush control were greatly reduced in in the 1980s as the practice was losing favor for many reasons: permitting, concerns that the environmental impact was too high, prohibitive costs, among others (Larson and Becchetti 2025). However, knowledge of ecosystem functions was also lost, including how grazing helped maintain a previous prescribed fire or mechanical

treatments, and how these efforts helped reduce fire footprints that would occur from a lightning strike or another man-caused ignition (Keeley 2002). With the devastating fires California has experienced over the past 20 years, there's a growing interest in managing range and forest lands, lessening wildfire severity. Thus, we explore if shrubland (i.e., brushland) management could be a key component to resilient communities and healthy rangelands (Shobe 2021, Larson and Becchetti 2025).

While California's Mediterranean shrublands are ecologically adapted to periodic fire, identifying, and adopting strategies to reduce the prevalence and impact of severe wildfires in shrublands is key to reducing their destructive impact. One potential such strategy is livestock grazing, an extensive land use (occurring on roughly 33% of land area statewide) that is also frequently adopted by state and local agencies as a fuel management practice (Barry and Huntsinger 2021, Ratcliff et al. 2022, Siegel et al. 2022). With expanded livestock grazing efforts, especially in California shrublands, maintaining rangeland health following catastrophic fires may be achieved.

a. Combine with Other Vegetation Management Tools

California wildfires are directly linked to topography, weather, vegetation, and human activities (intentional, such as arson, or unintentional, like roadside fire starts). Though factors like topography and weather are uncontrollable, vegetation is manageable through prescribed grazing and prescribed fire. With this, fire frequency and intensity can be significantly reduced by decreasing the continuity of fuels on the landscape (Schohr et al. 2021).

Properly managed prescribed grazing can reduce fire intensity by reducing fuel load and trampling fine fuels, reducing fuel continuity. Grazing on its own removes fine fuels like grasses and shrubs, and may reduce fuel ladder vegetation around and at the base of trees, lowering flame height, fire speed and spread (Davies et al. 2010). Grazing can also support preparation or maintenance of fuel breaks, and may be strategic utilized along roads, trails, or other perimeters to create low-fuel zones that assist in prescribed burns and emergency response (Grupenhoff and Molinari 2021). An integrated approach that combines grazing with mechanical thinning, herbicide treatments, or seeding may maximize ecological benefits. Grazing can also enhance post-burn recovery in some instances, where it helps control invasive species and promotes native vegetation regrowth (Davies et al. 2010).

Prescribed burns may also decrease the intensity of wildfire by eliminating flammable materials such as underbrush, wood, and pine needles, while reducing the speed of spread. Other vegetation treatments (e.g., manual or mechanical methods or herbicide application) may complement grazing and/or burning, and can be integrated when grazing or burning is temporarily infeasible, not appropriate, or prohibited (Launchbaugh and Walker 2006).

b. Integrate Grazing into Vegetation Management Planning

The goals and objectives of the grazing project, particularly as they relate to vegetation, should be clearly related to the grazing management plan and strategies. By coordinating with fire and land managers early in the planning process, Grazing Operators may better ensure that grazing aligns with prescribed burn schedules, restoration goals, and availability and capability of key personnel (Taylor 2006). Setting clear objectives is essential to the planning process (e.g., reduce fine fuels, control invasive species, improve forage quality, or prepare sites for fire). Assessment and monitoring of rangeland conditions is also a critical step in the planning process to ensure appropriate application of grazing (e.g., species, stocking rates, duration) (Bailey et al. 2019). Therefore, it is necessary to evaluate fuel loads, vegetation types, topography, and sensitive habitats before grazing.

As discussed in **GGE #2 Recommendation c**: Plan for Monitoring of Grazing Outcomes), understanding RDM levels and how to measure it is an essential component in grazing planning. Site-specific guidelines should be created to aid in rangeland management for livestock producers and range managers, supporting assessment of the proper level of herbaceous forage use (Bartolome et al. 2006). Within this assessment, environmental variations are considered and may result in various RDM guideline suggestions depending on a variety of factors (e.g., locations, goals and objectives, topography, sensitive resources).

c. Select Appropriate Livestock and Stocking Rates

Select appropriate livestock and stocking rates based on vegetation type and management goals. Goats are generally effective for shrub and woody fuel reduction, while cattle are generally efficient at consuming fine herbaceous fuels (Barry 2015, Barry and Huntsinger 2021, DiTomaso 2000). Adjust stocking rates and duration to avoid overgrazing, maintain soil health, and ensure sufficient fuel reduction without damaging desirable plant communities (Barry 2015, Barry and Huntsinger 2021; also see the **Table 2** on livestock selection in **GGE #1 Recommendation b**: Livestock Selection Guidelines).

d. Time Grazing Appropriately

Ecosystems and resources may be impacted differentially across seasons or years, or when combined with other vegetation management tools. Synchronizing grazing to best complement timing of a prescribed burn can be very effective to manage fuel loads. When implementing grazing before burning, use livestock to reduce fine fuels in advance of prescribed burns, especially in areas where high fuel loads could lead to uncontrollable fire behavior. Strategic timing and intensity of grazing prior to burning can help ensure that fuel loads are at optimal levels for safe and effective prescribed fire application (D'Antonio et al. 2002).

Grazing post-burning can maintain reduced fuel loads and prevent rapid regrowth of invasive species or excessive biomass accumulation. Patch-burn grazing (PBG) is a grassland management practice that mimics the natural interplay of fire and grazing. Grazers, such as cattle, preferentially feed in recently burned patches, leaving unburned areas to accumulate vegetation, which then serves as fuel for future burns. This creates a dynamic, shifting mosaic of burned and unburned, grazed and ungrazed patches, increasing habitat heterogeneity—variability in vegetation structure, composition, and density—which is fundamental to supporting biological diversity (USNPS 2021).

e. Address Site-Specific Considerations and Safety Concerns

Addressing site-specific considerations to tailor practices to local ecosystems, sensitive areas, and management objectives is essential in the efficacy and efficiency of grazing planning. Consider soil type, slope, climate, and proximity to communities or critical infrastructure when planning grazing and burning (Stuth 1996). Engaging stakeholders such as landowners, agencies, and fire professionals in planning and implementation will ensure safety, compliance, and shared objectives (Macon 2021, Roche and Macon 2025).

To ensure safety of personnel and animals, managers should follow all regulations for the area, confirming that grazing doesn't violate local fire safety, water quality, or land management regulations or requirements (Dressing 2003, Roche and Macon 2025). Livestock safety and health are a primary concern, as they are doing the "good work" of grazing and reducing fuels. Animals should be protected from fire hazards and water and shade must be available during burns (Macon 2021, Powell 2021). To verify compliance and animal health and safety compliance, managers must maintain records of grazing and burn schedules to track effectiveness and compliance (Macon 2021, Roche and Macon 2025).

Livestock management strategies that consider local conditions, resources, and objectives are more likely to be successful and continue over longer periods, providing long-term vegetation management and supporting wildfire mitigation goals. Spatially-targeted grazing can focus livestock on high-fuel load density areas, areas of invasive plant encroachment, and specific defensible space surrounding infrastructure. However, multiple benefits may be targeted, and in most cases, livestock should still be managed to avoid overgrazing and ensure recovery of native species (Dressing 2003, Roche and Macon 2025).

Adjust stocking rates to match livestock density to vegetation type, growth stage, and ecological objectives. Consider seasonal variation in flora, fauna, and other on-site resources, avoiding sensitive wildlife nesting seasons or periods when vegetation, soils, or other identified resources are most vulnerable (Dressing 2003). In addition to intensity and seasonality, other factors that can be manipulated to address such resource concerns include species selection,

stocking rates, duration, and frequency of grazing (Dressing 2003, Roche and Macon 2025).

f. Monitor, Evaluate, and Adapt

Monitoring is essential to assess outcomes of prescribed grazing strategies and informs continued management for improved outcomes over time (Roche & Macon 2025; NRCS 2025). Monitoring should at a minimum include tracking of vegetation response and outcomes, including evaluation of fuel load reduction, regrowth rates to better target grazing, and evolving plant community composition (Ratcliff et al. 2022, NRCS 2025). This allows for adaptive management in which Grazing Operators and managers learn from current practices and can then adjust factors around grazing management (e.g., grazing duration, intensity, or location) based on observed outcomes. Coordination and review of monitoring outcomes should occur with prescribed burn or other vegetation management teams to better ensure that management strategies complement fire management goals and other vegetation treatment tools (also see **GGE #2 Recommendation c** and **GGE #3 Recommendation c** for further discussion of adaptive management and monitoring) (Roche & Macon 2025, NRCS 2025).

Regional Considerations for Grazing Guidance Element #7

Regional differences play a critical role in designing and implementing best practices for prescribed grazing to support and enhance prescribed burns and other vegetation management projects. In expansive rangeland areas, strategically applied grazing — particularly in large contiguous landscapes — can reduce fine fuels, creating safer conditions for burns while preserving forage and supporting ecosystem function. In contrast, fragmented parcels near urban-wildland interfaces often require more targeted grazing strategies (e.g., smaller livestock, rotational grazing) to manage fuel loads in those more constrained areas (Tanaka et al. 2023). Additionally, regions with varying topography, soil types, and vegetation communities may necessitate adjustments in timing, intensity, and duration of grazing to achieve desired vegetation outcomes while minimizing ecological impacts. By accounting for these regional differences, land managers can optimize the integration of prescribed grazing with fire and other vegetation management practices, enhancing landscape resilience, biodiversity, and wildfire preparedness (Roche & Macon 2025, Ratcliff et al. 2022).

(8) Best practices for use of prescribed grazing for reducing wildfire risk in and near fire-threatened communities, as that term is defined in paragraph (2) subdivision (b) of Section 4124.5.[46]

Key Takeaway

Implementing prescribed grazing **in and near fire-threatened communities** is a proactive measure to **reduce wildfire risk**. By strategically managing livestock to control vegetation, communities can **enhance resilience to wildfires** while promoting ecological health.

Recommendations for Grazing Guidance Element #8

a. Strategically Plan Grazing and Engage Local Communities and Organizations

As described in **GGE #'s 4**, **5**, and **6**, collaborative planning and engagement with local communities, landowners, and fire management agencies to coordinate grazing activities can better align them with broader wildfire mitigation strategies and produce improved outcomes.

Stakeholders can provide input to identify priority areas for fuel reduction near homes, roads, and infrastructure in the WUI, and fire management agencies and other resource organizations can contribute to the development of explicit goals for fuel load reduction, defensible space, and ecosystem protection. Integration with a **Community Wildfire Preparedness Plan (CWPP)**[47] can support alignment of prescribed grazing projects with local CWPPs and regional wildfire prevention strategies to maximize effectiveness and secure community buy-in.

b. Prescribed Grazing Implementation

Planning to include strategic timing and intensity of grazing to targeted grazing areas for fuels management is critical early on and throughout implementation of the grazing plan (Schachtschneider et al. 2024). For example, Pre-Burn Grazing before prescribed burns can

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[46] Public Resources Code Section 4124.5, paragraph 2 of subdivision b states:
(2) For purposes of this subdivision, "fire-threatened communities" means those communities in high and very high fire hazard severity zones, identified by the State Fire Marshal pursuant to Section 51178 of the Government Code, or Article 9 (commencing with Section 4201) of this code, or on the "Fire Risk Reduction Community" list maintained by the board pursuant to Section 4290.1.
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4124.5&lawCode=PRC

[47] https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/california-cwpp-toolkit

reduce fuel loads, thereby lowering fire intensity and aiding in fire control, while Post-Burn Grazing can help control invasive species and supports the regeneration of native vegetation (Roche and Macon 2025, Taylor 2006).

Factors that may be adjusted to influence outcomes include species selection to match to the vegetation types and site needs, such as choosing goats for shrubs and ladder fuels, sheep or cattle for fine grasses; or mixing species together to address multiple needs. Stocking rates and grazing duration can be altered to achieve desired RDM levels before peak fire season, typically involve aiming for fuel levels that minimize fire spread and intensity. Other variables that can be altered include placement of fencing and water, herding strategies, or use of virtual fencing to concentrate grazing in high fire-risk zones, such as around community perimeters (in the WUI), evacuation routes, and critical infrastructure (Schillings et al. 2024). Note, wildlife-friendly fencing is generally preferred, but is not always feasible (e.g., state law requires grazing animals to be contained on the property and fencing must be permanent and relatively impenetrable to livestock; see Paige 2008).

Seasonal factors and timing also should be considered to allow for grazing schedules to be adjusted as needed around sensitive resources and management needs. Moreover, identifying targeted grazing areas based on vegetation management and fire protection needs and considerations will more likely produce desired outcomes (Schachtschneider et al. 2024). Focusing grazing efforts in areas where wildlands meet urban development (i.e., in the WUI) can create defensible spaces. Identification and prioritization of grazing in areas with high fuel loads and proximity to communities can address high fire-risk zones. Grazing may also be prescribed to manage invasive plant species that contribute to increased fire hazards, particularly fine fuels (Davies et al. 2022). As previously discussed, monitoring and evaluation are critical to inform implementation and adaptation of the grazing plan and should include regular assessment of vegetation conditions and adjustment of grazing practices to maintain desired fuel reduction levels (Roche & Macon 2025, NRCS 2025).

c. Develop Clear Grazing Agreements and Consider Liability

Use of clearly articulated grazing agreements (generally, "contracts" in the context of Prescribed Herbivory for land management support) that specify grazing objectives, animal care, timing, access, roles and responsibilities, and liability are strongly recommended (RMAC 2025a, RMAC 2025b). Land management agencies should aim to work with experienced prescribed grazing contractors, such as those recommended by the **California Wool Growers Association's Targeted Grazing Committee**[48] or **Contract Grazers (UC Agriculture and Natural**

[48] https://californiawoolgrowers.org/targeted-grazing/

Resources),[49] to ensure best practices and animal welfare standards are met.

d. Assess Fire Risk and Consider the WUI

Grazing has been used in the WUI to help protect cities from the threat of wildfire. Integration of prescribed grazing with other vegetation management practices can provide improved outcomes beyond one individual vegetation treatment tool. Complementary strategies combined with prescribed grazing, such as prescribed burns and mechanical thinning, may better achieve comprehensive fuel reduction (Rutherford 2025).

Prescribed grazing is increasingly being used as a management tool in recreation areas and the WUI to reduce fuel loads and shrub density. In practice, grazing lowers surface fuels (1- and 10-hour fuels) and can reduce structural continuity of dense brush stands by trampling of fine fuels which are further incorporated into the soil via hoof action, which reduces ignition risk (Nader et al. 2007). When browsing species are used, they can trim ladder fuels, mimicking the fire-pruning effects of low-severity fires and raising the height to live crown. These outcomes make prescribed grazing an effective strategy for managing fuel breaks, the WUI, and ingress/egress routes after the initial treatment of larger fuels, as well as for preventing excessive regrowth of grass and brush and disrupting the continuity of fuel loads (Taylor 2006).

Begin with mapping and assessing community boundaries, vegetation types, and fire hazard severity zones to identify the highest priority areas for fuel reduction (see Fire Hazard Severity Zones[50]). Prioritizing grazing treatments may involve a focus on zones such as community edges, evacuation routes, and places with heavy fuel accumulation where grazing can most effectively reduce fire danger (Barry 2015, Davies et al. 2022). Continuous monitoring of fuel reduction outcomes and adaptive management is necessary to ensure the approach remains effective over time (Derner et al. 2022). Engaging local agencies, landowners, and residents is essential to ensure the risk assessment reflects real conditions and that prescribed grazing projects have community support (Barry 2015, Biggs et al. 2021).

Regional Considerations for Grazing Guidance Element #8

Regional differences are a critical consideration when implementing best practices for prescribed grazing to reduce wildfire risk in and near fire-prone communities. In expansive, rural rangelands, grazing can be applied strategically across large landscapes to reduce fine fuels and ladder fuels, creating fuel breaks that facilitate fire suppression and lower wildfire

[49] https://ucanr.edu/site/central-sierra-livestock-natural-resources/contract-grazers
[50] https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

intensity. In contrast, smaller or fragmented parcels near urban-wildland interfaces require more intensive, prescribed grazing approaches, often using small ruminants and rotational systems to manage vegetation within limited spaces while minimizing conflicts with other land uses. Topography, vegetation type, and local climate also influence grazing timing, intensity, and duration, as these factors affect fuel accumulation and fire behavior. By tailoring prescribed grazing strategies to these regional characteristics, land managers can more effectively reduce wildfire risk, protect communities, and enhance ecological resilience (Schachtschneider et al. 2024).

(9) Other recommendations to increase the pace and scale of prescribed grazing at the local and regional levels, where appropriate.

Key Takeaway

Expanding prescribed grazing at local and regional levels requires **collaboration, incentives, education, streamlined planning, adaptive management, and shared infrastructure** to make grazing more **accessible, effective, and widely adopted** for ecological and operational benefits.

Recommendations for Grazing Guidance Element #9

Supporting previously recommended practices with policy incentives, technical assistance, and research partnerships will be essential to scale up positive outcomes. In addition to the recommendations in the previous eight GGEs, which also support the increased pace and scale of prescribed grazing, a variety of other strategies would further bolster these efforts:

a. Expand and Streamline Funding Opportunities and Technical Support

While prescribed grazing has been called out as a priority in SB 675 and other state efforts, few state resources have been invested to incentivize this practice in California. In the 2020/21 Fiscal Year (FY), only 4 out of 105 (<4%) of Wildfire Prevention grants included grazing (Shobe 2023). A 2022/23 BCP (see the California Natural Resources Agency and partners' **FY 22/23 Nature-Based Solutions Budget Change Proposal**[51]) requested "$10 million for CALFIRE to

[51] https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/bof-website/board-committees/range-management-advisory-committee---rmac/rmac-document-archive/4-nature-based-solutions-budget-change-proposal_ada.pdf?rev=0cf01e018842459bb3815c6a39439439&hash=886EAAA152581DBD97B9890BB81E72B4

provide additional funding for hazardous fuel reduction projects in and near fire threatened communities," and further stated that "Grazing is an important and proven activity type in the mitigation of hazardous fuel reduction and community wildfire preparedness. This additional funding would allow CAL FIRE to expand grazing fuel reduction opportunities throughout California, and increase the total number of acres treated," the $10 million for prescribed grazing was not included in the final budget bills negotiated with the legislature that year. Moreover, the Board's Budget Change Proposal in response to the resources needed to support implementation of SB 675 was also not funded in the state's final budget bill. Therefore, state funding is critically needed to support the State's stated priorities, including prescribed grazing.

Cost-sharing programs, funding resources such as grants, and freely-accessible technical assistance and support could better position Grazing Operators, particularly new operations, to contribute to efforts to better manage landscapes with prescribed grazing. Some resources and recommendations follow:

- Cost-sharing programs: Subsidize prescribed grazing services, fencing, water systems, or livestock infrastructure to lower barriers to adoption. Subsidies could be provided by local community funding pools, or legislatively mandated and structured by natural resource organizations. For example, the NRCS's **Environmental Quality Incentives Program**[52] (EQIP) provides cost-sharing on cross fencing and water development for prescribed grazing activities.
- Funding Resources: Grants and incentives may encourage participation through government or non-governmental organization (NGO) funding for prescribed grazing projects.
    - Utilize **CAL FIRE Wildfire Prevention Grants**:[53] These grants fund prescribed grazing projects in and near fire-threatened communities. The program covers costs for planning, fencing, water infrastructure, and implementation. See **CAL FIRE's Grant Programs Infographic**[54] for additional grant resources.
    - **The 2025-26 Budget: Proposition 4 Spending Plan**[55] enables agencies such as CAL FIRE to provide grants for fuel reduction, which explicitly includes prescribed grazing as an eligible activity. This funding can be used for planning, implementation, and necessary infrastructure such as fencing and livestock watering systems, lowering operational barriers for landowners and grazing

[52] https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program
[53] https://www.fire.ca.gov/what-we-do/grants/wildfire-prevention-grants
[54] https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/calfire-website/what-we-do/grants/other/grants-process-infographic.pdf?rev=45a1dfbfa6294efe867024e9cc76a861&hash=7FDE14A3F4F3ECD1145746AEEC90A019
[55] https://lao.ca.gov/Publications/Report/4958

contractors. Proposition 4's funding and policy provisions will help increase the pace and scale of prescribed grazing across California, especially in fire-threatened communities and wildland-urban interfaces.

- Community supported grazing programs may provide funding for strategic community-wide applications of prescribed grazing (e.g., **Graze Ojai: Ojai Valley's Community Supported Grazing Program, Ojai Valley Fire Safe Council**,[56] **Sonoma and Gold Ridge Resource Conservation Districts' Land Smart Grazing Program**,[57] and **Fibershed's Community Grazing Cooperatives**[58]).

- Technical assistance: Organizations with technical expertise (e.g., **UCCE Livestock Advisors**,[59] **NRCS**[60]) may offer guidance on development and implementation of grazing plans, monitoring, and adaptive management.

b. Streamline Environmental Review and Permitting

The **California Environmental Quality Act**[61] (CEQA) and other regulatory or permitting requirements may constrain grazing or otherwise require additional documentation to be developed and/or permits to be obtained. This is an ongoing challenge for many Grazing Operators and organizations, as the process to develop compliant environmental documentation or obtain permits can be time-consuming, require high levels of technical knowledge, and be extremely costly. Recommendations for improving compliance with such requirements include:

- Simplify regulatory processes: Reduce hurdles for grazing on public or shared lands where appropriate and feasible.
- Investigate regional planning frameworks: Align local grazing projects with larger-scale vegetation management and wildfire mitigation strategies**.**
- Utilize the **California Vegetation Treatment Program**[62] (CalVTP) where available for CEQA Streamlining. The CalVTP streamlines CEQA compliance for fuels management projects, covers prescribed grazing as a treatment activity, and provides high-level environmental analysis via its Program Environmental Impact Report (PEIR). By using the CalVTP EIR, project proponents can reduce the time and cost of CEQA review, making it

[56] https://firesafeojai.org/project/community-supported-grazing-program/
[57] https://www.wildoathollow.com/communitygrazingcooperatives
[58] https://fibershed.org/programs/climate-beneficial-agriculture/community-grazing-cooperatives/
[59] https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension
[60] https://www.nrcs.usda.gov/
[61] https://oag.ca.gov/environment/ceqa#:~:text=CEQA%20requires%20that%20state%20and,in%20overseeing%20and%20enforcing%20CEQA.
[62] https://bof.fire.ca.gov/projects-and-programs/calvtp-homepage-and-storymap

easier to implement prescribed grazing and other vegetation treatments across the state. To further expand prescribed grazing at local and regional scales, agencies and land managers are encouraged to prioritize use of the CalVTP where it is available and provide training on its application, supporting more efficient wildfire resilience and ecological restoration efforts.

- The Project Specific Analysis (PSA) is the required environmental compliance document for a vegetation management project: **PSA Template**[63]
- **Project-Specific CEQA Findings and Statement of Overriding Considerations Template**[64]
- CalVTP Project Example including Prescribed Herbivory: South Coast Herbivory Project: **CalVTP Project ID 2023-21**[65] Project-Specific Analysis (Note: all approved CalVTP PSAs and environmental documentation can be found on the **CalVTP Environmental Documentation webpage**[66]).

c. Build Technical Capacity and Regional Coordination

Efforts to support regional planning can be made by encouraging long-term, landscape-scale planning and coordination among **California Tribes**[67] (also see the Native American Heritage Commission[68]), **California Prescribed Burn Associations**,[69] **California Fire Safe Councils**,[70] **California Association of Resource Conservation Districts**,[71] **UC Cooperative Extension**,[72] and state agencies to maximize the effectiveness of prescribed grazing.

As previously discussed in detail in **GGE #'s 4**, **5**, and **6**, regional centers and partnerships may facilitate shared grazing equipment and infrastructure to reduce individual project costs and logistical barriers. Shared and scalable infrastructure can reduce costs and expand access to

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[63] https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/bof-website/projects-and-programs/calvtp-homepage-and-storymap/navigating-the-calvtp/calvtr--program-eir-and-supporting-ceqa-documents/vol-ii-program-environmental-impact-report-appendices/template-psa-checklist-508-compliant.dotx?rev=d7229fb4c93147c1a90726ae349055e1&hash=A3545116194F39F8043A42EC9EE59DA1

[64] https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/bof-website/projects-and-programs/calvtp-homepage-and-storymap/navigating-the-calvtp/calvtr--program-eir-and-supporting-ceqa-documents/supporting-ceqa-documents/cwqa-findings-and-statement-of-overriding-considerations_ada.docx?rev=05db58e2a39b4e9b8f13c2d795034c37&hash=AD98DBCCED2D897DA316FD468574945A

[65] https://calfire.box.com/s/xw1ruyjhtigj3q1rghwibs7s5mdulq9z

[66] https://calfire.app.box.com/s/kgi5bojlewg0mlioka1ce7pj3nz7t16v

[67] https://www.ihs.gov/california/index.cfm/tribal-consultation/resources/list-of-federally-recognized-tribes-in-ca/

[68] https://nahc.ca.gov/

[69] https://calpba.org/

[70] https://cafiresafecouncil.org/

[71] https://carcd.org/

[72] https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension

grazing across multiple properties or entire communities. Shared water and fencing systems, as well as mobile or modular infrastructure facilitate flexible and efficient livestock movement across landscapes. **Match.Graze**[73] is an example of a source that connects contract grazers with available herds and locations open for grazing.

Further efforts include the RMAC's annual educational series that provides workshops and field tours that delve into a variety of grazing aspects, particularly grazing for fuels management in recent years, and emphasizes the importance of logistics, planning, and collaboration and provides information on funding sources and the development of grazing agreements and grazing management plans (see **GGE #5 Recommendation b**: Education and Outreach). Examples of past workshops can be found under the Workshops section on the RMAC's **Livestock Grazing Management Resources**[74] webpage. The past **Fuels and Vegetation Education (FAVE) Program by Swanton Pacific Ranch - Cal Poly, San Luis Obispo**[75] provided workshops with educated professionals on wildfire fuel mitigation and vegetation management to accelerate efforts for a more sustainable and fire-resilient California landscape.

d. Strengthen Collaboration and Partnerships

As previously discussed in detail in sections for in **GGE #'s 4**, **5**, and **6**,a variety of strategies may be employed to increase participation, engagement, and overall support and demand for prescribed grazing to manage vegetation and fuel loads, and may include:

- Public-private partnerships: Leverage collaborations to access additional resources and expertise. Encourage public and private landowners to offer grazing contracts, thereby increasing the pool of land available for prescribed grazing, particularly when animals are not engaged in active projects.
- Increase availability and capacity for technical support (e.g., see the **Rancher Technical Assistance Program – California Cattle Council**[76]).
- Build community support by implementing outreach and education campaigns to demonstrate the benefits and safety of prescribed grazing, addressing concerns and building local buy-in.
- Cross-agency coordination: Work with fire districts, conservation agencies, and agricultural extension services to align grazing with regional land management goals.
- Landowner networks: Facilitate peer-to-peer learning among ranchers and landowners

[73] https://matchgraze.com/
[74] https://bof.fire.ca.gov/board-committees/range-management-advisory-committee/livestock-grazing-management-resources
[75] https://spranch.calpoly.edu/fuels
[76] https://calcattlecouncil.org/rtap/

to share best practices and success stories.

Sources: *Fisher 2012, Roche & Macon 2025, Wilmer et al. 2018*

e. Enhance Education and Outreach

- Workshops and field days: Demonstrate grazing techniques and best practices, fuel reduction methods, and ecological benefits.
- Community engagement: Educate local communities on the role of grazing in wildfire mitigation, soil health, and forage management.
- Accessible resources: Provide guides, maps, and online tools to support landowners in implementing grazing.

f. Promote Monitoring and Adaptive Management

- Track progress: Collect data on vegetation, fuel loads, soil health, and livestock performance to assess effectiveness.
- Adaptively manage: Adjust grazing intensity, timing, or location based on monitoring results to improve outcomes.

Regional Considerations for Grazing Guidance Element #9

Regional considerations are essential when developing strategies to increase the pace and scale of prescribed grazing at local and regional levels. In large, contiguous rangelands, expanding grazing may involve coordinated management across multiple landowners, investment in mobile infrastructure such as water systems and fencing, and integration with broader landscape-level vegetation management plans. In smaller or fragmented parcels, particularly near urban or suburban areas, scaling grazing may rely on partnerships with community organizations, flexible use of small ruminants, and portable or temporary infrastructure to facilitate rapid implementation (Moritz et al. 2022). Across all regions, fostering collaboration among private landowners, public agencies, and local stakeholders, providing training and technical assistance, and streamlining permitting processes can accelerate adoption and enhance the effectiveness of prescribed grazing as a tool for fuel management, wildfire risk reduction, and ecosystem resilience.

IV. CONCLUSION AND NEXT STEPS

This Local-Regional Grazing Guidance is intended to be an evolving document to be updated over time as new resources, information, and research results become available. As the RMAC does not have a budget or dedicated staffing, and funding was not available to support the development of this guidance, the RMAC has attempted on an abbreviated timeline (due to delay of bill passage by one year) to best address statewide, local, and regional considerations

around prescribed grazing, with the intention of supporting the increased pace and scale of prescribed grazing for fuels management and other co-benefits. The RMAC will continue to work to build increased state support, capacity, and resources dedicated to this effort over time to provide the best guidance and resources where possible. To further increase the utility of this document, the RMAC hopes to, as time and resources permit, develop information on potential funding sources, and information on navigating California Environmental Quality Act (CEQA) compliance pathways, where required. Please visit the **RMAC webpage**[77] for more information and new information resources as they become available.

[77] https://bof.fire.ca.gov/board-committees/range-management-advisory-committee

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VI. APPENDICES

Appendix A. Acronyms

CAL FIRE	Department of Forestry and Fire Protection
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CRM	Certified Rangeland Manager
FAC	Food and Agriculture Code
MAP	Management Action Plan
NRCS	Natural Resources Conservation Service
RDM	Residual Dry Matter
RMAC	Range Management Advisory Committee (RMAC)
PRC	Public Resources Code
UCANR	University of California Agriculture and Natural Resources
UCCE	University of California Cooperative Extension
USDA	United States Department of Agriculture
WUI	Wildland Urban Interface

Appendix B. Definitions

These definitions were extracted from the State Lands' Grazing Packet (RMAC 2025a), which is a guidance document designed to inform the development of grazing agreements and management action plans (i.e., grazing plans alone or as part of a larger land management plan). This list represents a subset of the definitions, as provided within the State Lands' Grazing Packet, that are applicable to this document (i.e., this Local-Regional Grazing Guidance), and some have been modified for use in the context of prescribed grazing, specifically.

Adaptive management	An approach to making decisions and adjustments to better meet goals based on changes, new information, and feedback.
Agency	Refers to a Government Organization within a state or national government that is responsible for the administration or oversight of a specific area of study, field, or sector; for example, CDFA or CDFW.
Agreement	A negotiated and legally binding arrangement between parties.
Continuous grazing	Allowing animals access to a single pasture or grazing unit for the entire growing season. Rest/escape of plants to complete their development is accomplished by limiting stocking rates to light to moderate levels.
Contract grazing	When a Grazing Operator is hired to provide a grazing treatment on a property, generally for the purpose of meeting a specific objective or outcome. In the context of this document, this generally refers to Prescribed Grazing services. Such services may be paid, or "payment" may be in the form of forage.
Contractee	A person or business that enters into a contract with another entity that provides services.
Contractor	A person or business that that enters into a contract to provide services.
Damage	Harm caused to something in such a way as to impair its value, usefulness, or normal function.
Destruction	The process of causing so much damage to something that it no longer exists or cannot be repaired.
Fine fuels	Small, lightweight, flammable materials that ignite easily and burn quickly, such as grasses.
Fire fuels	Any combustible material that can burn when exposed to heat and oxygen. In the context of this document, combustible wildland vegetative materials, living or dead.
Fuels	See "Fire fuels" above.

Grazer	Livestock or wildlife that consume mostly grasses.
Grazier	A human who manages grazing animals. Also see Grazing operator.
Grazing Agreement template	An outline used as guidance in developing a legal contract between Landlord and grazier. In the context of the State Lands Grazing Packet, this is Appendix C (RMAC 2025a).
Grazing operator	A human who manages grazing animals. This term is used throughout the State Lands Grazing Packet (RMAC 2025a) and this document to refer to the livestock manager or owner who enters into a Grazing Agreement. Also see Grazier.
Grazing season	The time of year in which animals are given access to a property.
Grazing service providers	A livestock producer that can be hired to perform contract grazing.
Grazing unit	Area to be grazed within a designated boundary.
Infrastructure	Any improvements made on the land for management purposes (e.g., temporary or permanent improvements, including temporary or permanent fences, handling facilities, roads, corrals, portable or permanent water tanks, wells).
Landlord	The property owner who rents out the property to a tenant (in this context, the Grazing Operator). This term is used to refer to the organization that owns or manages the land on which Prescribed Grazing is to be applied.
Land manager	An individual or entity responsible for actively managing a particular property and implementing any associated resource management plans or land management plans associated with a particular property.
Managed grazing	A grazing technique in which variables (such as stock density, timing, duration) are manipulated to meet stated management goals.
MAP template	Management Action Plan Template, or Appendix D in the State Lands Grazing Packet (RMAC 2025a). Intended to guide the management of lands, including grazing activities, and is generally referenced in a related grazing agreement.
Manager	An individual or entity responsible for oversite of a particular operation (i.e., land manager or livestock manager).
Objectives	Statements of specific measurable conditions to be achieved (e.g., what, how, when). Also see Performance Standards.
Overgrazing	When a plant is eaten or trampled and re-eaten or trampled without an adequate recovery period (i.e., roots and aboveground foliage have fully

	recovered from the previous grazing event). A generalized and often over-used or mis-used term referring to damage due to excessive grazing impacts. Such impacts must be specified with verified quantities stated. Generally used in reference to perennial grasses, although may also be used in other habitat types.
Parcel	A part or portion of land.
Pasture	A grazing unit in which livestock are confined.
Permanent improvement	A fixed addition or change to land that is not temporary or portable.
Prescribed grazing	Defined in statute,[78] prescribed grazing is the Lawful application of grazing by a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or conservation goals, including reducing the risk of wildfire by reducing fuel loads, controlling undesirable or invasive plants, and promoting biodiversity and habitat for special status species. Prescribed grazing may involve any or multiple kinds of livestock (see also Launchbaugh and Walker 2006).
Rangeland	Any expanse of land not fertilized, cultivated or irrigated that is suitable, and predominately used for grazing by domestic livestock and wildlife. These include the Conifer Woodland, Hardwood Woodland, Shrub, Grassland, Desert Woodland and Desert Shrub classes as well as some habitats within the Wetland and Hardwood Forest classes (FRAP 2017).
Residual Dry Matter	The amount of old plant material left on the ground during the non-growing season, often measured at the start or end of the new growing season. Often called "RDM."
Residue	The amount of vegetation left on the ground after grazing. Also see Residual Dry Matter.
Rotational Grazing	A livestock management practice that involves moving animals through multiple pastures, of which, one pasture is grazed, while the other pastures rest, allowing plants to recover between grazing.
Sacrifice area	A portion of a property that is designated for heavy utilization, such as a feeding area during drought or a staging area for shipping, as a means of sparing the rest of the property from these activities. Also called 'sacrifice zones'.
Seasonal grazing	When grazing is restricted to a portion of the year.

[78] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4004.5&lawCode=PRC

Site	The piece of land on which something is located; in this context, generally a defined location or area where grazing or other land management actions occur.
Sustainable	An operation that can remain viable in the long-term, by minimizing impacts on natural resources, while maintaining financial stability.
Targeted grazing	The application of livestock grazing at a specified season, duration and intensity to accomplish specific vegetation management goals. The term "targeted" refers to the specific plant or landscape that is the aim of controlled grazing practices (Launchbaugh and Walker 2006). Often, prescribed grazing, is a generalized equivalent.
Temporary	Portable or not permanent, when referring to infrastructure.
Under-utilization	Grazing (i.e., removal of vegetation) performed at a level resulting in leaving on-site quantities of residual vegetation that exceed resource management and sometimes contracted goals.
Wildland-Urban Interface	The geographical intersection of two disparate systems: wildland and the built environment (i.e., structures, infrastructure). At this interface, structures and vegetation are close enough that a wildland fire could spread from vegetation to structures, or from structures to vegetation (FRAP 2017). Commonly, WUI or "the WUI".

Appendix C: Regional Approach

Regional Action Teams

Regional Action Team (RAT) Leads were formed for each region. The Local-Regional Grazing Guidance was developed to cover the entire state and include locally- and regionally-based contextual recommendations and guidance where appropriate based on the four regions developed by the Task Force (Regional Profiles and Resource Kits[79]). These regions are as follows (Counties marked with an [*] are covered within multiple regions):

Region 1: Coastal Inland

- **Team Lead(s):** Dr. Marc Horney, mhorney@calpoly.edu & Devii Rao, deviirao@ucanr.edu
- **Counties:** Alameda, Contra Costa, Fresno*, Kern*, Kings, Madera*, Marin*, Mariposa*, Merced, Monterey, San Benito, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Stanislaus, Tulare*, Ventura*

Region 2: Sierra-Cascade-Into (SCI)

- **Team Lead(s):** Mark Gutierrez, pilotcreekranch@gmail.com & Noah Lopez, noah@wrstrat.com
- **Counties:** Alpine, Amador, Butte*, Calaveras, El Dorado, Fresno*, Inyo, Kern*, Lassen, Madera*, Mariposa*, Modoc*, Mono, Nevada, Placer*, Plumas, Shasta*, Sierra, Siskiyou*, Tehama*, Trinity*, Tulare*, Tuolumne, Yuba*

Region 3: Northern

- **Team Lead(s):** Dr. Stephanie Larson, slarson@ucanr.edu
- **Counties:** Butte*, Colusa, Del Norte, Glenn, Humboldt, Lake, Marin*, Mendocino, Modoc*, Napa, Placer*, Sacramento, Shasta*, Siskiyou*, Solano, Sonoma, Sutter, Tehama*, Trinity*, Yolo, Yuba*

Region 4: Southern

- **Team Lead(s):** Cole Bush, bcb@shepherdesslandl.co & Joel Kramer, joel.kramer@rcdsandiego.org
- **Counties:** Imperial, Los Angeles, Orange Riverside, San Bernardino, San Diego, Ventura*

[79] https://wildfiretaskforce.org/regional-resource-kits-page

Appendix D: Stakeholder Input Survey Results

- **Survey:** https://calfire.app.box.com/s/v447vd0xl740ummnmun9m88v8b4fbjsh/file/2404916967645?sb=/details
    - Prescribed Grazing Stakeholder Input survey for SB 675. Survey was sent out to a variety of stakeholders: Agency, Grazers, Public and Private Landowners, Educators, Planners, and others.
- **Survey Results:** https://calfire.app.box.com/s/v447vd0xl740ummnmun9m88v8b4fbjsh/file/2406209629696?sb=/details
    - Results were compiled into an excel file to review. File is organized by question.

Appendix E: Response to Public Comments

Public Comments on SB 675 Local-Regional Grazing Guidance Draft released October 8, 2025:

Received by Deadline Nov 7, 2025

Peter Hopkinson, East Bay Regional Parks District

Received via email October 10, 2025

Comment or Input	Response or Action Taken	Additional Notes
In the RDM section, starting on page 18, all citations to the classic Bartolome et al. UCANR RDM guidelines refer to the 2002 version. The current version is from 2006 (https://anrcatalog.ucanr.edu/Details.aspx?itemNo=8092). Unless there is a specific reason to cite the earlier 2002 version, I suggest citing the 2006 revision. Also, the link in the full reference for Bartolome et al. 2002 takes one to Lisa Bush's *Grazing Handbook*, not Bartolome et al. 2002.	Updated to 2006 version. Corrected the link.	None.
The explanation of the research underlying the RDM guidelines strikes me as confusing. Perhaps you should ask Jim Bartolome to review it – jwbart@berkeley.edu.	Thank you, we will ask him to join the RMAC meeting, and if not, for members or stakeholders to comment on this section to improve clarity.	None.
As regards Lisa Bush's *Grazing Handbook*, I found it in the Additional Resources section cited as: UCANR. (2016). Grazing Handbook: A Guide for Resource Managers in Coastal California. This	Thank you, that is correct. If it is not cited in the text, it will be in the Additional	None.

citation is incorrect. Author is Lisa Bush, date is 2006, and it was published by the Sotoyome Resource Conservation District.	Resources. Citation corrected.	
As far as I know, the following is a bogus citation: Bartolome, J. W., Barry, S., Griggs, T., & Hopkinson, P. (2014). Grazing for biodiversity on California's rangelands: A conservation practitioner's guide. California Rangeland Conservation Coalition. https://rangelandconservation.org/wp-content/uploads/2016/12/Grazing-for-Biodiversity-2014.pdf I think it's a mishmash of a couple of publications, perhaps hallucinated by AI(?). If it isn't, as one of the supposed authors, I'd appreciate a copy of the document! The link is broken.	Agreed, I also do not know who put this in or where it came from. Likely to delete this if cannot find source and verify the context.	None.
This publication is listed twice in the list of references: Bartolome, J.W., Barbara H. Allen-Diaz, Sheila Barry, Lawrence D. Ford, Michele Hammond, Peter Hopkinson, Felix Ratcliff, Sheri Spiegal, and Michael D. White "Grazing for Biodiversity in Californian Mediterranean Grasslands," Rangelands 36(5), :36-43, (1 October 2014). https://doi.org/10.2111/Rangelands-D-14-00024.1 Bartolome, James W. Barbara H. Allen-Diaz, Sheila Barry, Lawrence D. Ford, Michele Hammond, Peter Hopkinson, Felix Ratcliff, Sheri Spiegal, and Michael D. White. 2014. "Grazing for Biodiversity in Californian Mediterranean Grasslands," Rangelands 36(5), 36-43, (1 October 2014)	Deleted duplicate; believe this is the Bartolome et al. 2014 paper cited in text.	None.
I meant also to note that in the section "Identify Buffer Zones and Environmentally Sensitive Areas", on page 20, a good reference to cite may be: Ford, L.D., P.A. Van Hoorn, D.R. Rao, N.J. Scott, P.C. Trenham, and J.W. Bartolome. 2013. Managing Rangelands to Benefit California Red-legged Frogs and California Tiger Salamanders. Livermore, California: Alameda County Resource Conservation District. Available here: https://ucanr.edu/sites/default/files/2022-09/372808.pdf It's a practical guide and so may be useful to practitioners.	Thank you, reviewed source content and replaced with this one.	None.

Looking at the list of references further, I found several instances of duplicated references, quite a few totally incorrectly cited publications, and links that take one to the wrong publication. The list of references probably needs an eager grad student to revise it thoroughly.	Thank you; we have asked a graduate student to work on this. It is a long process, and many authors did not provide consistent or any citations, so it has been a lift to correct them. We will find and correct all issues.	None.

Paul Hann, State Water Resources Control Board

Received via email November 7, 2025

Comment or Input	**Response or Action Taken**	**Additional Notes**
Section 1.a. Identify and Assess Sensitive Resources: Add a definition for sensitive resources. For example, "Sensitive resources can include riparian areas, wetlands, surface waters, sensitive plant communities, wildlife habitat, cultural/historical resources, and highly erodible soils.	Added.	Need citation to support statement.
Livestock has the potential to produce concentrated pollutants causing adverse impacts to water quality. To prevent this impact, the Water Boards recommend the text be modified in the sections below for guidance during grazing operations. • *Section 1, page 9:* include watercourses in the sentence starting with "Site evaluations…" to highlight the importance of receiving water bodies in the planning process. • *Section 1.A. Identify and Assess Sensitive Resources*: please add the following clarifying language to the text: "Livestock, especially when concentrated in a particular area for extended periods or without rotation, can trample riparian areas, compact soils, and increase erosion and sedimentation in nearby water bodies, **as well as introduce excess nutrients and pathogens**." • *Section 2, paragraph d, Identify Buffer*	Added. Added	None. **Authors verify** citation is sufficient to support this statement or provide additional if not.

Zones and Environmentally Sensitive Areas: Specify buffer zone widths based on slope, soil, and livestock density. For example, consider the buffer strip widths recommended in the Natural Resource Conservation Service's Field Office Technical Guidance (FOTG)on Contour Buffer Strips and Riparian Forest Buffer[1], or California Vegetation Program Programmatic Environmental Impact Report (CalVTP PEIR) Standard Project Requirement HYD-3 Water Quality Protections from Prescribed Herbivory[2] i. Include sentences referenced in the CalVTP HYD-3 and GEO-1 Suspend Disturbance during Heavy Precipitation: "Water should be provided for grazing animals in the form of an on-site stock pond or a portable water source located outside of environmentally sensitive areas. Grazing animals should be herded out of an area if accelerated soil erosion is observed. Prescribed herbivory should avoid occurring on saturated soil conditions. Precipitation patterns should be considered when planning timing of grazing." ii. Explicitly state "prescribed grazing should avoid wet seasons when soils are saturated and more vulnerable to compaction and runoff." 1 https://www.nrcs.usda.gov/conservation-basics/land/forests/agroforestry-systems/contour-buffer-strips 2 https://cdnverify.bof.fire.ca.gov/media/kyxlm0rz/attachment-a-standard-project-requirements-and-mitigation-measures-checklist_ada.pdf	Did not add the reference to contour buffer strips, as the NRCS guidance explicitly states this is for use in "cropland, including orchards, vineyards and nut crops" (https://www.nrcs.usda.gov/sites/default/files/2022-09/Contour_Buffer_Strips_332_CPS_9-14.pdf). Did not add reference to the CalVTP PEIR SPRs, as they are under revision, and those particular items may change, so we would prefer a different resource to reference. Added sentence about considering wet soils, but not to the same extent as requested by Water Boards, as not conducting prescribed grazing during rainfall would be context-dependent.	**Request that authors offer** other thoughts to address these comments at the Nov 14th meeting. **Request that authors offer** other thoughts to address these comments at the Nov 14th meeting. **Authors consider** if this is sufficient.
• *Section 2, paragraph e, Landscape-Level Considerations:* Water Boards recommend including the following definitions for		

distance to off-stream drinking water options: i. Steep/rough= no more than ¼ -½ mile ii. Rolling = no more than ⅜ -¾ mile iii. Level = no more than ¾ - 1 mile • *Section 2, paragraph e, Landscape-Level Considerations:*, following this paragraph, add a new subsection titled "Management Considerations" with the following example: "Cattle can cause soil compaction, streambank damage, and increased risk of nutrient and bacterial contamination if unmanaged; to avoid this, rotate livestock frequently, avoid wet areas, and provide off-stream water sources to protect water quality."	Not added because no citation is provided and this is very specific, and we do not have a citation that could potentially support these specific recommendations. Did not add because changes structure of document.	**Will request authors** consider these recommendations and offer alternative guidance. **Will request Authors** advise if subsection should be added, or if the content should be moved. **Citation** is needed to support this.
• *Section 3, paragraph c, Use Adaptive Management and Monitoring*, include a recommendation to use grazing logs to strengthen understanding when adaptive management is needed. Grazing logs should generally include the following information: 1. Date in / Date Out. 2. Ground cover / bare ground notes 3. Riparian or sensitive area status 4. Soil condition 5. Invasive species observations 6. Management actions taken 7. Date in / date out 8. Ground cover / bare ground notes 9. Riparian or sensitive area status 10. Soil condition 11. Invasive species observations 12. Management actions taken • *Section 4, Paragraph 3, Consider Infrastructure and Accessibility* i. Natural sources should not be used as a primary livestock water source unless appropriate measures are in place to prevent bacterial contamination, sedimentation, and	Not added without citation, as this is a very specific list, and we want to ensure the citation fits the recommendation. Moreover, this document is not necessarily meant to get into the nitty gritty of management or monitoring, so I am not sure this level of detail is appropriate here. Added first bullet item (i), but whole subsection still needs citations.	**Will ask Authors to consider** if this level of detail should be included, and provide a citation to support this, or other metrics in an alternate monitoring/adaptive mgmt grazing log. Will **ask authors to provide** support for statements in

nutrient loading. ii. include in the sentence- "(e.g., troughs, stock ponds, natural sources with appropriate measures in place to prevent bacterial contamination, sedimentation and nutrient loading)"	Did not add all of the second item (ii), but did add stock ponds, because this is already stated in the sentence added in the first bullet point.	this subsection. None.

Received after Deadline

Loretta Moreno, California Natural Resources Agency

Received via email November 8, 2025

These comments were reviewed and addressed as feasible given the scope of the document and feasibility with the constrained timeline, as they were received after the public comment period had closed.

Link to locked draft: https://calfire.box.com/s/x37jqz93b6m6kf3eudhejh37vbnq33go

Appendix F: Supplemental Resources

Information Databases

- Google Scholar online research database: https://scholar.google.com/
- RangeDocs online range-related database: https://docs.rangelandsgateway.org/
- Rangelands Atlas: https://www.rangelandsdata.org/atlas/
- Rangelands Hub: https://rangelands.ucdavis.edu/information-hub
- Rangeland Inventory Monitoring Evaluation (RIME) Data: https://www.blm.gov/programs/natural-resources/rangelands-and-grazing/rangeland-resources/rime-data

Range and Grazing-Related Organizations and Programs

- **Board of Forestry and Fire Protection** Registered Certified Rangeland Managers: https://bof.fire.ca.gov/projects-and-programs/professional-foresters-registration/rpf-crm-rosters/
- **California Association of Resource Conservation Districts**: https://carcd.org/
  - District Map: https://carcd.org/page/interactive-rcd-map
- **California Cattle Council**: https://calcattlecouncil.org/
- **California Cattlemen's Association** (CCA): https://calcattlemen.org/
- **California CattleWomen**: https://cattlewomen.org/
- **California Department of Food and Agriculture** (CDFA): https://www.cdfa.ca.gov/
  - Healthy Soils Program (HSP): https://www.cdfa.ca.gov/oars/healthysoils/

  - Rancher Technical Assistance Program – California Cattle Council: https://calcattlecouncil.org/rtap/
- **California Fire Safe Councils**: https://cafiresafecouncil.org/
- **California-Pacific Section of the Society for Range Management** (Cal-Pac SRM): https://calpacsrm.org/
- **California Prescribed Burn Associations**: https://calpba.org/
- **California Rangeland Conservation Coalition** (CRCC): https://carangeland.org/
- **California Rangeland Trust**: https://rangelandtrust.org/
- **Conservation Reserve Program** (CRP): https://www.fsa.usda.gov/resources/programs/conservation-reserve-program
- **California Woolgrowers Association** (CWGA): https://californiawoolgrowers.org/
  - Targeted Grazing Committee: https://californiawoolgrowers.org/targeted-grazing/
- **Fibershed's Community Grazing Cooperatives**: https://fibershed.org/programs/climate-beneficial-agriculture/community-grazing-cooperatives/
- **Goats on the Go**: https://www.goatsonthego.com/
- **Ojai Valley's Community Supported Grazing Program, Ojai Valley Fire Safe Council**: https://firesafeojai.org/project/community-supported-grazing-program/
- **Perennial Grazing LLC:** https://www.perennialgrazing.org/
- **Sonoma and Gold Ridge Resource Conservation Districts' Land Smart Grazing Program**: https://www.wildoathollow.com/communitygrazingcooperatives
- **University of California Cooperative Extension** (UCCE), **University of California Division of Agriculture and Natural Resources** (UCANR): https://ucanr.edu/site/division-agriculture-and-natural-resources/about-uc-cooperative-extension
  - Contract Grazers: https://ucanr.edu/site/central-sierra-livestock-natural-resources/contract-grazers
- **USDA Farm Service Agency** (FSA): https://www.fsa.usda.gov/
  - Conservation Reserve Enhancement Program (CREP): https://www.fsa.usda.gov/resources/programs/conservation-reserve-enhancement-program-crep
- **USDA Natural Resources Conservation Service** (NRCS): https://www.nrcs.usda.gov/
  - Environmental Quality Incentives Program (EQIP) https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program
- **Western Landowners Alliance**: https://westernlandowners.org/grazing-lands-partnerships/

Regulatory Agencies

In California, livestock grazing may be regulated by multiple agencies depending on land ownership, environmental context, and the type of activity involved. A summary of some of the regulatory requirements that apply to grazing and potential considerations are provided below for some state agencies that may regulate grazing activities. This is not intended to be an exhaustive list nor provide any form of legal guidance. Managers should consult with the local, regional, state, and federal agencies or special districts as appropriate based on the location of the area planned for grazing and the potential impacts to protected resources. Other regulators not included in this list may include county planning departments, Regional Air Districts,[80] the California State Lands Commission,[81] California State Parks,[82] California Department of Transportation[83] (CalTrans), and federal land-management agencies such as the U.S. Forest Service[84] and Bureau of Land Management[85] (BLM). Additional regulation may occur through the U.S. Fish and Wildlife Service,[86] National Marine Fisheries Service[87] (NMFS), flood-control districts, and water or irrigation districts when grazing affects protected species, waterways, or public infrastructure.

- **California Air Resources Board** (CARB): https://ww2.arb.ca.gov/homepage
  Grazing operators are generally not regulated by the California Air Resources Board for the act of grazing itself. However, operators must comply with CARB regulations related to diesel equipment, off-road engines, portable equipment, heavy-duty trucks, dust emissions (via local air districts), and any prescribed burning conducted alongside grazing activities. Only large-scale confined livestock operations fall under CARB's methane and greenhouse-gas reporting programs.

- **California Coastal Commission** (CCC): https://www.coastal.ca.gov/
  Under the Coastal Act, existing agricultural uses, including livestock grazing, are typically considered a *principal permitted use* within the Coastal Zone. Grazing alone does not require a Coastal Development Permit (CDP) if it is an ongoing, legally established use; does not involve "development" as defined in PRC §30106,[88] and does not degrade Environmentally Sensitive Habitat Areas (EHAS) or water quality. However, some associated actions are considered development and can trigger CCC review, including

[80] https://ww2.arb.ca.gov/california-air-districts
[81] https://www.slc.ca.gov/
[82] https://www.parks.ca.gov/
[83] https://dot.ca.gov/
[84] https://www.fs.usda.gov/
[85] https://www.blm.gov/d8-home
[86] https://www.fws.gov/
[87] https://www.fisheries.noaa.gov/
[88] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=30106

installation of new, permanent infrastructure or other activities that may be associated with the grazing project, such as creation of new access routes or fuel breaks. Most grazing regulation is applied through county-level Local Coastal Programs certified by the CCC.

- Local Coastal Programs (LCPs): https://www.coastal.ca.gov/lcps.html
- Coastal Act: https://www.coastal.ca.gov/coastact.pdf

- **California Department of Fish and Wildlife**: https://wildlife.ca.gov/
  Livestock grazing operators must comply with CDFW regulations when grazing activities may affect wildlife, streams, riparian areas, wetlands, or listed species. Operators must avoid "take" under the California Endangered Species Act, obtain Lake and Streambed Alteration Agreements for work in or near streams, protect nesting birds, avoid impacts to sensitive habitats, and ensure that grazing infrastructure or timing does not degrade wildlife resources. Routine grazing on existing rangelands generally does not require CDFW permits unless it triggers specific Fish and Game Code protections.
  - Natural Communities List and California Natural Diversity Database (CNDDB): https://wildlife.ca.gov/Data/CNDDB
  - Lake and Streambed Alteration (LSA) Agreements: https://wildlife.ca.gov/Conservation/LSA
  - California Endangered Species Act: https://wildlife.ca.gov/Conservation/CESA

- **State Water Resources Control Board** (SWRCB): https://www.waterboards.ca.gov/
  Grazing operators are generally not regulated by the California Air Resources Board for the act of grazing itself. However, operators must comply with CARB regulations related to diesel equipment, off-road engines, portable equipment, heavy-duty trucks, dust emissions (via local air districts), and any prescribed burning conducted alongside grazing activities. Only large-scale confined livestock operations fall under CARB's methane and greenhouse-gas reporting programs. Some useful websites include:
  - Grazing Management: https://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia/1e_graz.html
  - Nonpoint Source Program – Rangelands and Grazing: https://waterboards.ca.gov/lahontan/water_issues/programs/nps/rangelands-and-grazing.html
  - Regional Water Quality Control Boards: https://www.waterboards.ca.gov/about_us/contact_us/rwqcbs_directory.html

RMAC Resources

The RMAC webpage[89] includes information on livestock grazing in California; prescribed grazing for wildfire resilience, mitigation, and co-benefits; contacts for staff and members of the RMAC and Board of Forestry & Fire Protection; and a Livestock Grazing Management Resources webpage with links to past field tour and webinar content from previous RMAC events, including:

- 2025 California Rangeland Conservation Coalition and Russell Rustici Symposium SB 675 Presentations
- 2024 RMAC Conservation Grazing Educational Workshop
- 2023 CA Wildfire Conference Resources on Prescribed Grazing and Burning
- 2023 Prescribed/Targeted Grazing Resources List: Supplementary Resources List[90]
- 2023 RMAC Educational Series
    - Navigating the application and permitting process for wildfire fuels treatment using targeted grazing
    - Targeted grazing for fuel reduction: Case studies from east bay regional parks district
    - Targeted grazing for fuel reduction: case studies from the Rancho Jamul Ecological Reserve and Hollenbeck Canyon Wildlife Area
    - Ecological management of fire-prone landscapes: prescribed grazing in the Ojai Valley
    - Prescribed herbivory for fuels reduction: grazing planning and permitting in the state of California
    - Salinas River Vegetation Management Project: grazing for fuels reduction in a riparian corridor
    - Prescribed grazing planning for wildland fuels reduction
    - Applying for a wildfire prevention grant – with a focus on prescribed grazing projects

2025 Task Force Strategic Action Plan Prescribed Herbivory Working Group

- Wildfire and Forest Resilience Task Force: https://wildfiretaskforce.org/
- Roche, L. M., D.K. Macon. 2025. Expanding prescribed grazing for wildfire resilience in California: A brief on opportunities and strategies for strengthening wildfire preparedness and resilience efforts. Technical Report. Available online: https://rangelands.ucdavis.edu/blog/expanding-prescribed-grazing-wildfire-resilience-california.

[89] https://bof.fire.ca.gov/board-committees/range-management-advisory-committee
[90] https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/bof-website/board-committees/range-management-advisory-committee---rmac/workshop-resources/prescribed-grazing-resource-list-final.pdf?rev=ecef882697e6465ca6e5925fc98c1a06&hash=7236417169E67FD43CF557E6EE04977D