Expanding prescribed grazing for wildfire resilience in California: A Brief on opportunities and strategies for strengthening wildfire preparedness and resilience efforts

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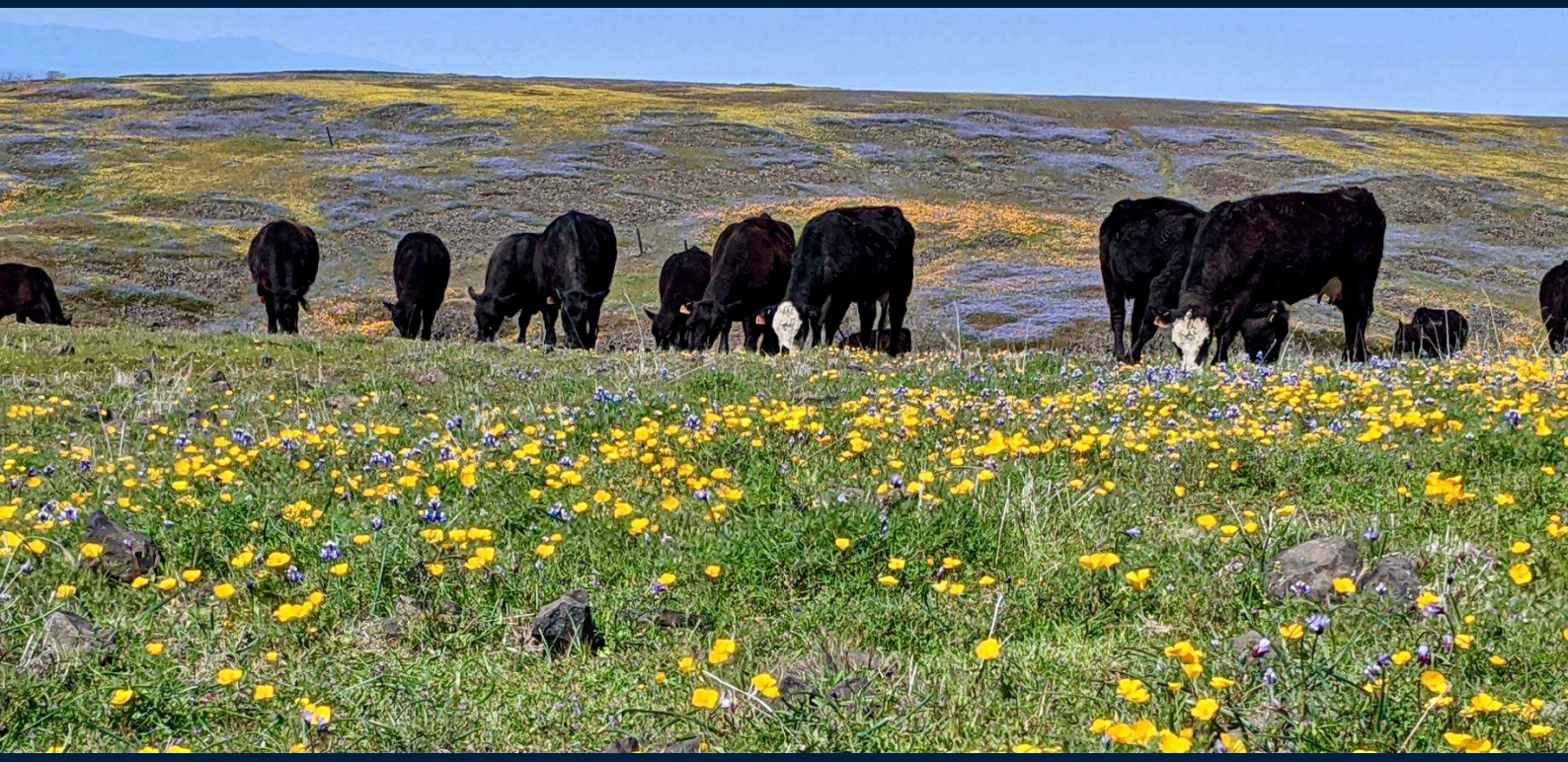
Expanding prescribed grazing for wildfire resilience in California



A Brief on opportunities and strategies for strengthening wildfire preparedness and resilience efforts

2025

EXPANDING PRESCRIBED GRAZING FOR WILDFIRE RESILIENCE IN CALIFORNIA: OPPORTUNITIES AND STRATEGIES FOR EFFECTIVE FUELS MANAGEMENT

A Brief uniting statewide and regional perspectives to strengthen California's wildfire preparedness and resilience efforts

March 2025

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Cover: Top - Cattle graze on a state-managed ecological reserve to reduce thatch and control non-native grasses, promoting the growth of native plants (*Photo*: L. Roche). Bottom - A contracted goat herd helps manage fine fuels and shrub encroachment on private land (*Photo*: B. Soares Shapero).

Background

In 2021, the California Forest Management Task Force developed California's Wildfire and Forest Resilience Action Plan, incorporating collective recommendations from local, state, federal, and tribal governments, as well as private organizations, to improve wildfire prevention and resilience.

To support the 2025 Action Plan update, the Task Force established a Prescribed Grazing Work Group to bring together statewide and regional perspectives on opportunities, considerations, and key actions to increase the pace and scale of prescribed grazing across California. This group includes state and federal agency representatives as well as prescribed grazing practitioners, all brining diverse backgrounds, geographies, and experiences.

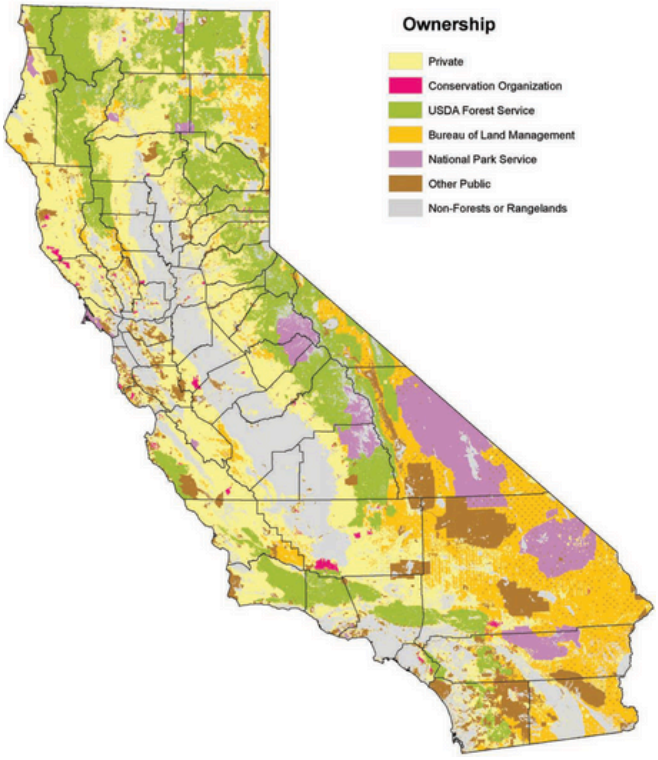


Fig 1. Map of land ownership across California's forests and rangelands. Data Source: Ownership, FRAP, v15_1 (FRAP 2017).

Fig 2. Grazing with cattle and other livestock reduces fine fuels annually. *Photo*: D. Eastburn.

Harnessing prescribed grazing for wildfire resilience

California's recent history of catastrophic wildfire underscores the urgent need to leverage every available tool to adapt to changing conditions and build wildfire resilience. Prescribed livestock grazing — the planned management of livestock to achieve resource goals — offers a cost-effective, landscape-level tool for region-specific fuels management and post-fire recovery across the state . This overview highlights the **opportunities**, **considerations**, and **key actions** for integrating prescribed grazing into broader fuels management strategies.

Wildfire & Landscape Resilience Interagency Treatment Dashboard

INTERAGENCYTRACKINGSYSTEM.ORG

Opportunities for leveraging prescribed grazing to build wildfire resilience

As state and federal agencies scale up efforts to treat a combined one million acres annually, prescribed livestock grazing offers significant potential to help enhance community protection of life and property, support ecological goals, create local economic opportunities, and advance the goals of California's Wildfire and Forest Resilience Action Plan. Livestock grazing is the most widespread land use activity in California, covering ~30 million acres [5-6], and is already frequently used to achieve multiple conservation goals on private, state, and federal lands [7-11]. This presents significant opportunities to integrate grazing into broader fuels management and restoration strategies to mitigate wildfire intensity and frequency and build post-fire resilience.

Fig 3. Targeted grazing focuses on specific vegetation or landscape management. *Photo*: D. Macon.

Fig 4. Planned grazing supports multiple ecosystem services. *Photo*: T. Schohr.

Livestock grazing (cattle, sheep, and goats) is increasingly recognized as a cost-effective tool for reducing wildfire risk, while also providing a range of other ecosystem benefits [12,13]. Planned grazing can support multiple ecosystem services — including food and fiber, biodiversity and habitat, carbon sequestration and security, and water flow and supply . In terms of fuels management, grazing can reduce flammable shrubs [14] — including those that ignite easily and contribute to ember cast — break up continuous fine fuels and decrease overall fuel biomass [12,13,15-19]. These changes to fuel profiles can alter fire behavior by slowing its spread and reducing intensity, which helps create defensible space. Additionally, grazing can play key roles in maintaining and restoring landscapes post-fire [20]. See Box 1 for additional information on the spectrum of grazing management strategies.

Opportunities
...continued

Different vegetation treatments, such as prescribed burning, mechanical thinning, and grazing, provide distinct benefits that can complement each other in joint strategies for effective land management [21]. Integrating prescribed burning and grazing can enhance effectiveness of both treatments: prescribed grazing reduces flammable plant material that could otherwise intensify fire behavior, while prescribed burning improves forage for livestock and wildlife. For post-fire reforestation efforts, prescribed grazing can assist with site-preparation, helping to restrict shrub encroachment and other competitive vegetation [15,22]. Prescribed grazing can also be an effective tool in addressing fuel-loading near wildland-urban interfaces (WUI) and within urban and suburban communities, especially where other fuels management tools, such as herbicides or prescribed fire, may be restricted.

Fig 5. Grazing can complement other fuels management tools, like prescribed fire. *Photo*: D. Macon.

Fig 6. Matching livestock species and class of animal to the landscape and project objectives is essential for successful prescribed grazing. *Photo*: L. Roche.

Livestock grazers have well-documented expertise in managing fuel loads and mitigating wildfire risks [23] and are uniquely positioned to contribute to coordinated regional strategies across land ownership boundaries. Establishing and maintaining regional partnerships to support joint strategies will require sustained funding, streamlined regulations, and access to technical support resources. Several federal and state agencies–including USDA-USFS, USDI-BLM, and CDFW– are actively collaborating with stakeholders on expedited procedures for implementing fuels reduction projects. These efforts represent significant opportunities for expanding the use of grazing across public and private lands.

Considerations and guidance

Effective prescribed grazing strategies for managing fuel loads in fire-threatened communities must integrate environmental, economic, and social considerations. While land management is inherently site-specific, evidence-based principles for successful grazing management[24] provide key guidelines, outlined below.

- **Adaptive management and planning:** Successful grazing strategies depend on adaptive management and flexibility. Local managers need to proactively develop written plans [24,25] that address timing, intensity, duration, frequency, and distribution of grazing to achieve ecological health and livestock production goals. Grazing plans should also incorporate monitoring, checkpoints and strategic triggers, and protocols for making necessary adjustments.

- **Ecological health and sustainability:** Well-planned grazing can support biodiversity, soil health, and other critical ecosystem services while ensuring protection for sensitive species and habitats. Prescriptions must consider the needs of both target and non-target plants to perform critical functions (e.g., photosynthesis, reproduction), and should be timed accordingly to maximize effectiveness [1,2]. Both local knowledge and science-based technical information are essential for understanding a site's potential for reaching management objectives.

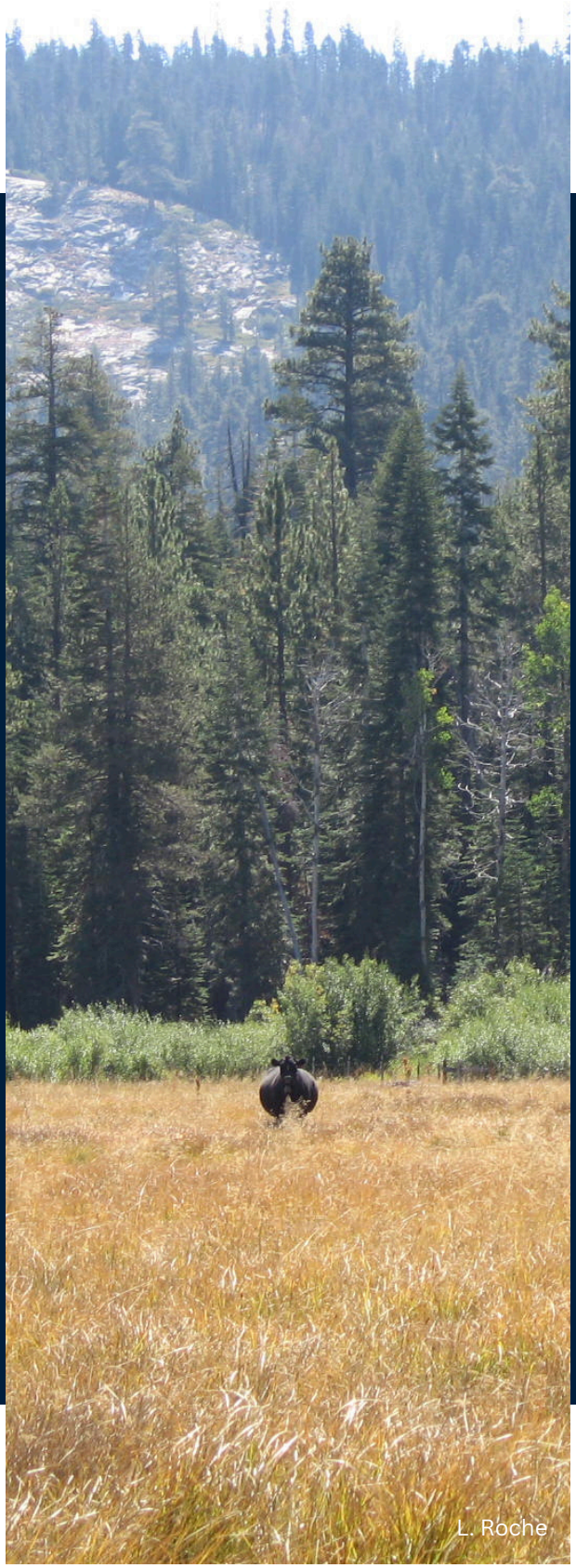
- **Livestock management and well-being:** Ranch-level trade-offs between livestock production and fuels management goals are a critical consideration, especially with more intensive prescriptions (Box. 1). For example, the optimal timing for managing fuels may coincide with declines in forage palatability and nutrition, which can impact animal productivity[1,2]. Therefore, a comprehensive herd health program is essential for maintaining animal health, performance, and the long-term sustainability of livestock operations.

Region-specific grazing strategies must be collaborative, context-specific, and outcome-based. These efforts should focus on identifying local goals, challenges, and opportunities using multiple information sources—such as monitoring data, technical support, and local experiential knowledge—throughout the decision-making process. Proactive planning will help manage uncertainties and trade-offs, while also enabling partners to more effectively resolve potential conflicts.

Fig 7. Successful grazing strategies require adaptive, evidence-based, and collaborative management that integrates ecological health, livestock well-being, and local goals while addressing challenges and trade-offs. *Photo*: D. Rao

Key actions

The following key actions outline strategies to expand and integrate prescribed grazing into land management, policy, research, and collaboration efforts across California.


L. Roche

Map and prioritize grazing projects for fuel reduction, post-fire resilience, and community protection

- **Inventory current grazed acreage** across the management spectrum (see **Box 1**), including:
  - Fuel reduction as an **incidental benefit** of grazing (e.g., permitted grazing on federal allotments)
  - Fuel reduction as a grazing **co-benefit** (e.g., grazing leases on recreational, municipal watersheds, or other public/quasi-public lands providing livestock forage while reducing fuel loads)
  - Fuel reduction as a **primary focus** of grazing (e.g., targeted grazing prescriptions to establish fuel breaks, address WUI fuel loads, or to protect strategic resources or infrastructure)
- Identify **priority landscapes** where grazing can strategically protect vulnerable communities, human health and safety, critical infrastructure, and high-risk ecosystems
- Develop **map-based analysis** to identify high-risk fuel areas, integrating **constraints** and **opportunities** for prescribed grazing

Key actions

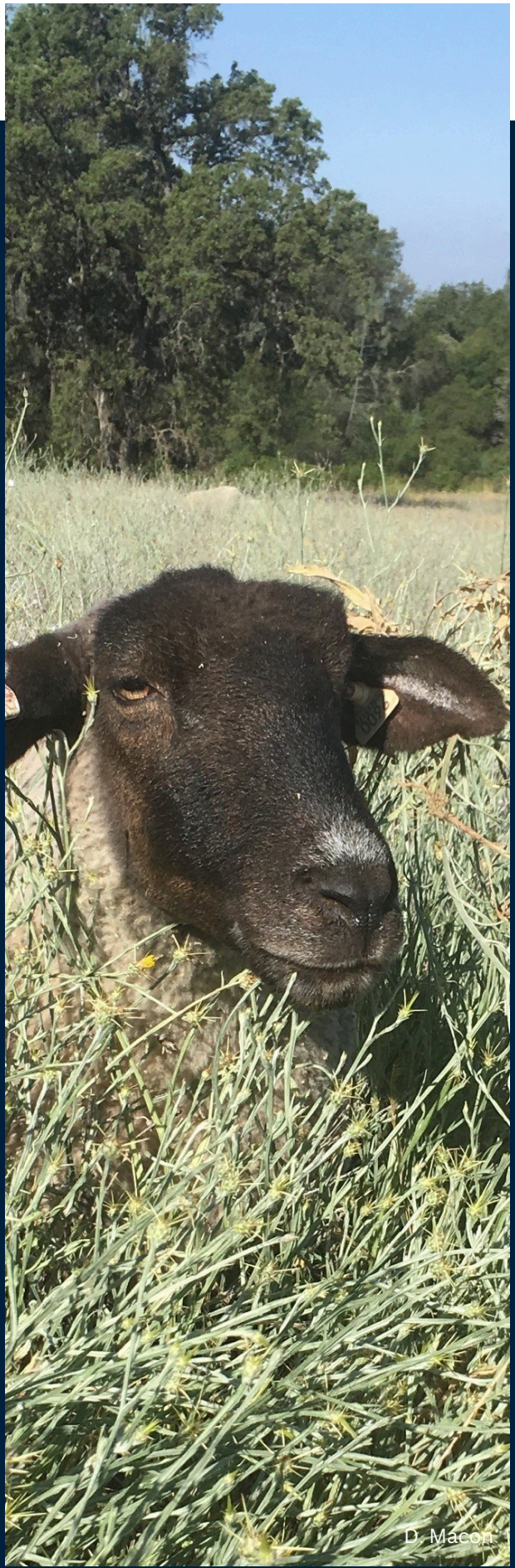
...continued

Support long-term investments in workforce development, grazing infrastructure, and economic growth

- Expand **technical training** and **support** to help prescribed grazing operators meet regulatory requirements, including supporting training and development opportunities for California Certified Rangeland Managers
- Support **business training** and **workforce development** to help new and existing livestock grazers integrate service-based models into their production systems.
- **Increase lease terms** on agency-managed grazing lands (e.g., 5-year minimums) and **expand cost-share opportunities** for permanent infrastructure development to help grazers recover investments, ensure economic viability, and support sustainable grazing practices
- **Reduce insurance rates** for homeowners and communities using **prescribed grazing for fuels reduction**

Enhance policy and regulatory support for prescribed grazing projects

- Develop **regional guidelines** and **grazing management plans** (currently in development by the Board of Forestry and Fire Protection's Range Management Advisory Committee)
- **Streamline CEQA permitting** for state-funded prescribed grazing projects, including updating CalVTP to encompass a broader range of qualifying project sites and activities
- Expedite **NEPA** analyses for prescribed grazing efforts on federal lands



Key actions

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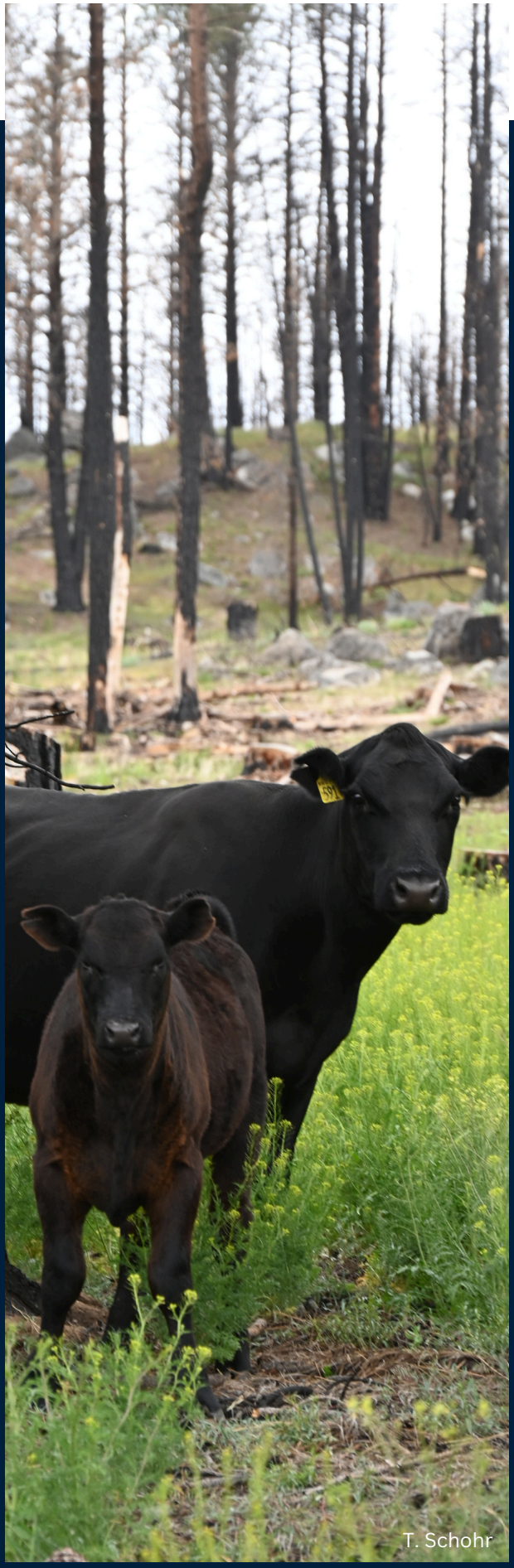
Expand monitoring and applied research activities

- Develop **standardized contract performance metrics** and **vegetation removal criteria** to quantify the amount of fuels removed or modified
- **Incorporate total acres grazed** and associated fuel reduction benefits (i.e., incidental, co-benefit, or primary; Box 1) into **state and national target reporting**, as permitted by agency guidelines
- Fund **applied research** on s**caling up prescribed grazing** as part of **regional, integrated strategies** for fuels management, ecosystem resilience, and local economic opportunities
- **Support management-scale research** on how strategies across the grazing management spectrum (Box 1) can be used to build fire-smart landscapes

Accelerate community engagement and cross-boundary collaborations

- **Integrate prescribed grazing** into goals of the **California's Wildfire and Forest Resilience Action Plan**
- Fund **regional prescribed grazing coordinators** to enhance capacity for collaboration across state, federal, and private land boundaries
- Provide funding to **expand outreach and education** for resource professionals, policy decision-makers, and other stakeholders on integrating prescribed grazing into joint strategies at regional scales



T. Schohr

Box 1. Grazing spectrum

Grazing can be adaptively managed by adjusting the number and type of animals (e.g., cattle, sheep, and goats), as well as the timing, intensity, duration, frequency, and spatial distribution of grazing. This results in a spectrum of management strategies, ranging from extensive to intensive, each of which offers opportunities to positively impact fuel loads and wildfire resiliency. At one end of the spectrum, traditional, production-based management focuses on optimizing grazing to support meat, fiber, and milk production, which can yield incidental benefits such as an annual reduction in fine fuels. With increasing management intensity and planning, livestock grazing can also be prescribed to deliver conservation co-benefits, such as reducing fuel loads, managing invasive plants, and promoting biodiversity and wildlife habitat. More intensive targeting prescriptions ("targeted grazing") focus on specific vegetation goals as the primary objectives. While all livestock grazing contributes to fuels reduction, this spectrum of strategies enables managers to address diverse regional needs for fuels management and post-fire resilience.

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