Sierra Nevada/Southern Cascade Landscape Strategy

Developed by Plumas Corporation

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Vision-Goal-Intention-Scope:

VISION: To attain ecologically sustainable landscapes and rural communities that are resilient to fire and other forest disturbances while enhancing public safety under a changing climate.

GOAL: Restore forest structure, composition and watershed function utilizing the natural range of variability to ensure water quality and yield, carbon balance, wildlife habitat, and sustainable rural communities.

INTENTION: Utilize an all hands/all lands approach to implement diverse management strategies and community infrastructure economies that leverages energy and wood product values to accomplish ecological landscape goals.

SCOPE: This Strategy initially targets the interior California developed source water basins shown on the attached map, however these strategy elements are applicable to all wildland areas of California.

Landscape Description:

The region encompassed by the Sierra Nevada Southern Cascade (SNSC) Landscape Strategy extends from the Tehachapi Mountains northward to the Oregon border and westward to the Klamath Mountains, then southward in the Coast Range to Clear Lake. The area within the Strategy boundary includes the entire area covered by the Sierra Nevada Conservancy, as well as portions of 13 National Forests, and 28 California counties. See Plate 1 "*Map of the Sierra Nevada/Southern Cascade Landscape Strategy".*

Strategy Approach:

This Strategy is organized into four Elements: 1) Forest Structure and Composition; 2) Community Forest Infrastructure; 3) Hydrologic Function and Response; and 4) Performance Monitoring and Research. It is expected that there is sufficient developed scientific knowledge within the region to design sound actions to begin implementing this **30-year** Strategy. The Strategy is intended to change the trajectory of these montane landscapes, not necessarily to fully achieve desired conditions within the Strategy period. Each Element will discuss landscape structural conditions and/or proposed activities, and illustrate potential ecosystem benefits, including forest dependent wildlife, while integrating with other Elements. Implementing this strategy will require substantial involvement from a suite of Federal, State, local and private entities. Policy changes that foster landscape management by-product uses and allow for full utilization of managed/prescribed fire will be crucial. Performance monitoring and research would be undertaken to validate, or invalidate, the expected outcomes and adapt strategies as needed.

This Strategy synthesizes and builds heavily from previous planning efforts in the region, including but not limited to: Pacific Forest Trust, *California's Key Source Watershed Infrastructure*; Association of California Water Agencies, *Improving the Resiliency of California's Headwaters – A Framework*; Sierra Nevada Conservancy, *Watershed Improvement Program*; Sierra Meadow Partnership, *Sierra Meadows Strategy*; USDA Forest Service, *Toward Shared Stewardship Across Landscapes*; California Natural Resources Agency, CAL FIRE, CalEPA, and the *California Forest Carbon Plan*. The goal of this Strategy also aligns with recent State reviews, such as *Little Hoover Report #246* and the Legislative Analyst's Office *Improving California's Forest and Watershed Management*, 2019.

In order for this Strategy to be successful, all four Elements below must be addressed synergistically and co-equally at all spatial scales, with a willingness on the part of all participants to innovate and take risks.

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<u>Element #1:</u> Forest Structure and Composition

The intent of this element is to reverse the trend of forests in this region from younger, denser stands and closed canopies to larger trees with wider spacing and more open canopies. Ideally, this results in a forest composition, structure and function within the range of expected conditions under natural disturbance regimes that will provide a resilient net sink of carbon. It is recognized that desired stand compositions and ages will vary by dominant and co-dominant stand species. Stands approximating these thresholds would allow adequate sunlight for a diverse scattered understory of shrubs and deep-rooted perennial grasses. Additionally, the desired canopy threshold would allow for more through-fall of rain and snow, reducing canopy interception and evaporation, while still providing sufficient daily shade periods through the seasons. Adding a matrix of finer deep-rooted understory structure will optimize rainfall and snowmelt infiltration while providing structural habitat and forage diversity for wildlife. Key concepts are noted below:

- Initial entry should utilize thinning prescriptions adaptable to existing stand structures and site conditions to remove suppressed understory, reduce fuel loads and establish incremental reduction of canopy.
- Initiate a prescribed fire regime to further reduce/control duff depths and retard shade-tolerant conifer regeneration.
- Between 5 and 10 years after initial entry evaluate stand response for tree dominance. Commercially remove co-dominants and larger suppressed trees, if warranted. Continue the prescribed or natural fire regime.
- At 20 years, evaluate stand response and commercially remove selected dominants to achieve an overstory of >30" average diameter (on sites that support large trees) with the beginning of scattered regeneration. Continue prescribed or natural fire regime.
- At 30 years the desired future condition trend should become manifest.

<u>Element #2:</u> Community Forest Infrastructure

The flora and fauna of this region are components of the contemporary carbon cycle under which all current planetary ecosystems have evolved. Effective utilization of this contemporary carbon, supplanting inputs of atmospherically-destabilizing fossil carbon, can provide value-added destinations for the materials removed as part of Element #1 above. Currently, much of the region is beyond the cost effective transportation range of materials from the forest floor to useful destinations. Developing this infrastructure to accommodate the current and projected supply of materials will be challenging. There will be a need for innovative public-private partnerships, with some facilities/products initially benefiting from policy changes/incentives.

- Identify and incubate regional communities that can benefit from wood-fueled power plants which will be sufficient in number and appropriate in placement to keep material transport times under 2 hours from a supply source.
- Provide education and training to rebuild and sustain the depleted pool of firms and skilled workers to perform the necessary forest health, fuel reduction and watershed restoration projects throughout the region.
- Encourage changes in CPUC policy to incentivize the use of wood generated power in California's renewable energy portfolio.
- Develop long-term forest-generated material supply opportunities to foster investment in residential pellet stove fuel manufacturing and similar alternative fuel products.
- Seek opportunities to establish value-added wood product manufacturing to supplant, wherever possible, petrochemical-based plastic products.
- Market the landscape benefits of such products as addressing fire resilience, forest health and water reliability (Green-branding).
- Strive to co-locate the above described facilities in order to optimize the allocation and distribution of materials as demands fluctuate.

Element #3: Hydrologic Function and Response

Changes in the function of the hydrologic cycle in the region and land use impacts from the pre-European era forward, have been profound. Changes in infiltration, evapo-transpiration and stream channel/meadow conditions have significantly altered the timing and magnitude of stream flows within, and ultimately outside of the region. A changing climate regime is only exacerbating these effects. The region's water yields have, and hopefully will continue to provide, most of California's agricultural and municipal water supplies. To augment activities that reduce canopy interception and evapo-transpiration while fostering optimal soil infiltration as proposed in Element #1, concurrent efforts will be needed to restore stream/floodplain connectivity while rehabilitating watershed road systems.

- Existing roads are necessary for landscape management, although their outsized impacts to watershed hydrology may need to be mitigated with rehabilitation and/or re-location measures.
- Roads tend to concentrate runoff and subsurface flows. Re-dispersing these concentrated flows to a "normal" as quickly as practicable can minimize erosion and disruptions in the infiltration achieved above.
- Many stream channels in the Sierra Nevada and southern Cascades, from headwater brooks to main stem channels, have lost connectivity to their naturally evolved floodplains/meadows.
- Stream channel incision, along with floodplain/meadow disconnection resulting from road and railroad fills and levees has severely reduced the natural reservoir volumes in the region.

Suggested strategies to reverse these concerns include:

- Fostering greater infiltration, inundation and lower velocities, which further capitalizes on the natural infrastructure to deliver flows later into the dry season.
- Restoring floodplain connectivity to most channels, which is technically feasible using a well-stocked tool box of techniques.

Element #4: Research, monitoring and validation of outcomes

Research and monitoring is an essential component of any natural resource management activity. All projects should have some minimum level of qualitative and quantitative monitoring to assure stakeholders that the project is performing as expected or, if not, to direct future project management in order to rectify identified issues. Focused research should be conducted to establish defensible ecosystem service outcomes resulting from the activities in the prior three elements, in line with current efforts such as Sierra Meadow Restoration Research Partnership (carbon), the Sierra Meadow Hydrology Monitoring (water) and others. Research and monitoring funders should recognize that definitive outcomes are rarely achieved in the traditional 3-year research grant cycle. That recognition will be needed to support efforts that may require several decades to complete. Steps required to attain research and monitoring goals include the following:

- Maintain and extend current regional monitoring and research efforts at sampling intervals and study periods appropriate to the landscape response.
- Apply robust monitoring and research investment to meet these objectives.
- Utilize all research and monitoring resources; PSW/PNW, universities, NGO's, and governmental agencies.
- Prepare a Summary Report at the end of each 5-year period, detailing landscape treatment accomplishments as well as progress to date in ascertaining changes in **fire, water** and **carbon** regimes.

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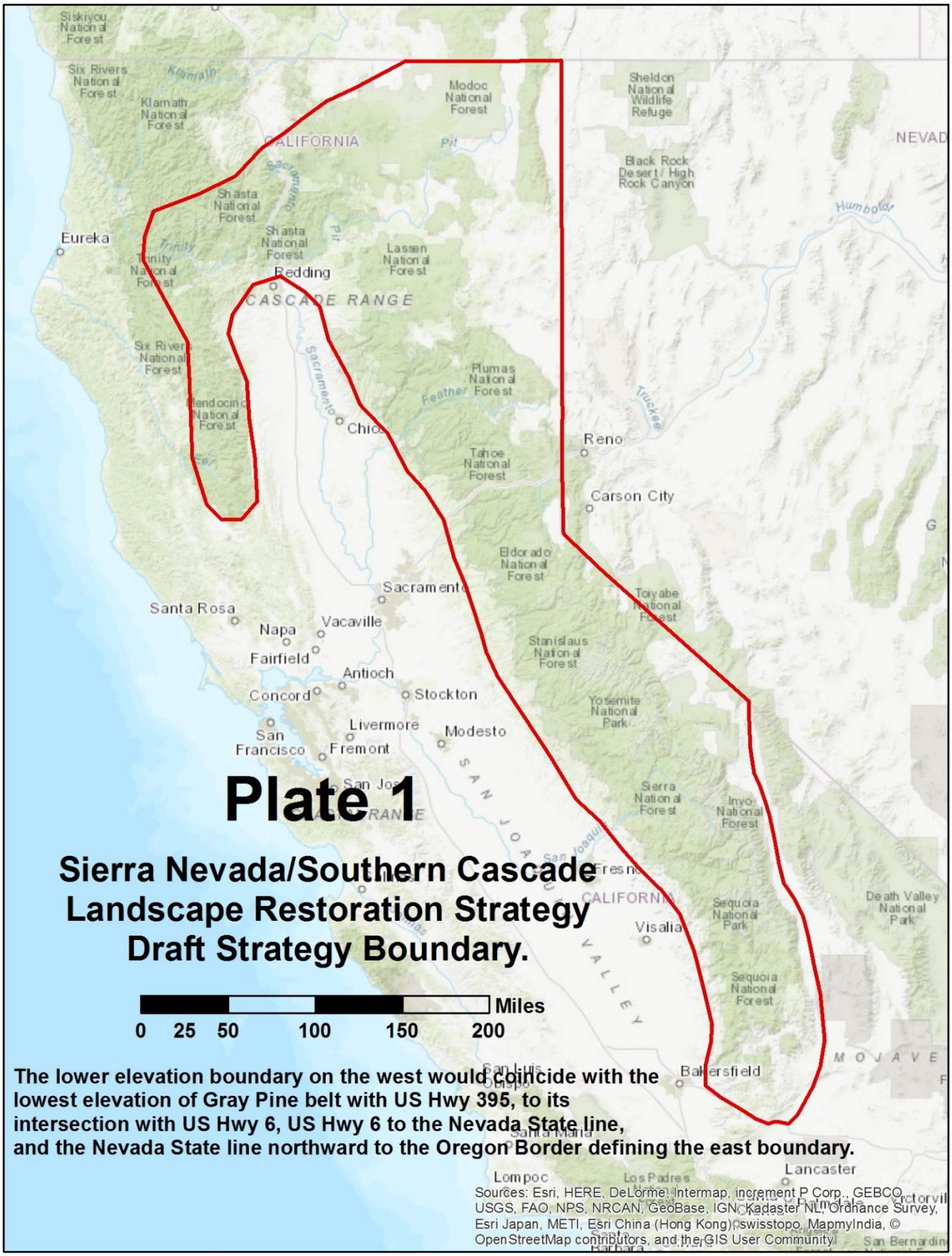

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