July 9, 2021

Liane Randolph, Chair
California Air Resources Board
Sacramento, CA 95812

Re: 2022 Scoping Plan Update

Dear Ms. Randolph,

The undersigned groups strongly support the inclusion of natural and working lands (NWL) in the Scoping Plan Update as a key strategy to achieve the state's ambitious greenhouse gas (GHG) reduction goals. The management, health, conservation, and restoration of these lands will influence whether these resources act as a net sink or source of GHG emissions over time and it is critical to incentivize and fund NWL strategies.

We support the prioritization of GHG reduction activities that provide co-benefits and protect the state's underserved communities. California's NWL – the forests, rangelands, farms, wetlands, coast, shrublands, deserts, and urban greenspaces – offer a unique set of climate mitigation and adaptation solutions as well as a host of other co-benefits for people and nature. To help the state capitalize on this, we offer the following recommendations to the Scoping Plan Update:

- Set clear and ambitious climate goals for NWL that identifies GHG reduction opportunity by region and landscape;
- Include a review of upcoming and past actions on the landscape and their impacts on future climate strategies;
- Utilize federal, state, regional and local, plans and policies to inform the Scoping Plan Update;
- Prioritize NWL climate strategies that provide multiple benefits;
- Prioritize NWL climate strategies that benefit socially disadvantaged communities and underserved populations;
- Address the intersection of NWL climate strategies with the decarbonization of other sectors.

These recommendations are explained in more detail below.

Thank you for your consideration. We look forward to discussing these initial recommendations with you.

Sincerely,

Jeanne Merrill
Policy Director
California Climate and Agriculture Network

Sydney Chamberlin
Climate Policy Associate, California Climate Change Program
The Nature Conservancy

Chuck Mills
Public Policy and Grants Director
California ReLeaf

Paul Mason
Vice President, Policy and Incentives
Pacific Forest Trust

Pamela Flick
California Program Director
Defenders of Wildlife

Juan Altamirano
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Audubon California

Ellie Cohen
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The Climate Center

Katie Patterson
California Policy Manager
American Farmland Trust

Nick Jensen, PhD
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California Native Plant Society

Neil S.R. Edgar
Executive Director
California Compost Coalition

Steve Frisch
President
Sierra Business Council

Adam Livingston
Director of Planning and Policy
Sequoia Riverlands Trust

Jo Ann Baumgartner
Executive Director
Wild Farm Alliance

Dave Henson
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Occidental Arts & Ecology Center

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Senior Land Use Manager
Save Mount Diablo

Jo Ann Baumgartner
Director
Wild Farm Alliance

Ken Knight
Your Children's Trees

Claire Robinson
Amigos de los Rios

Jessica Sanders
Sacramento Tree Foundation

Joe St. John
Koreatown Youth and Community Center

Rhonda Berry
Our City Forest

Erin Donley Marineau
Tree Davis

Susan Britting, Ph.D.
Executive Director
Sierra Forest Legacy

Jackie Higgins, PLA, ASLA
Balboa Park Conservancy

Michael Wellborn
President
Friends of Harbors, Beaches and Parks

Comments:

1. Scale of Carbon Sequestration: Set A Clear, Ambitious and Immediate Goals for Natural and Working Lands that Identifies Reduction Potential by Region or Landscape

The magnitude of GHG reduction potential from California's vast natural and working lands cannot be overlooked. Studies suggest that different management, restoration and conservation strategies across California's landscapes can reduce over 500 MMT of CO2e by 2050.[1] Given the pace that we need to reduce emissions, California should pursue the most ambitious scenario to maximize GHG benefits from NWL.

At the same time, without thoughtful, timely action to ensure the resilience of these lands, we risk losing their potential to serve as significant carbon sinks. And worse, if we fail to act now, California's natural and working lands could increasingly become a net source of emissions - while losing their ability to provide vital co-benefits that are essential to our long-term resilience.

To this end, we urge CARB to set clear and ambitious goals for natural and working lands in the forthcoming Scoping Plan Update. This will advance multiple benefits for the climate and California, and help the state meet its long-term climate goals with more certainty. In setting these goals, we urge CARB to be able to identify greenhouse gas reduction opportunities by different landscapes and regions. This is important as regional conditions will vary and affect emission reduction opportunities. Such regional and landscape specific information can also inform local governments' efforts as they develop and implement climate action plans. Setting goals or identifying GHG reduction opportunities for certain landscapes or regions may require additional research if there is currently not enough data to support setting a goal, and we

[1] Chamberlin, S. J., Passero, M., Conrad-Saydah, S., Biswas, T., Stanley, C. K. Nature-based Climate Solutions: A Roadmap to Accelerate Action in California. 2020.
https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_Pathways12-4.pdf

encourage that funding be directed to support this research. We urge more analysis and modeling be done to identify GHG reduction opportunity in land types such as shrublands and deserts, which may offer significant carbon sequestration benefits from avoided land conversion but would benefit from additional research.

Recommendation: Set an ambitious GHG emission reduction goal for California's natural and working lands that is aligned with available scientific analyses, regional and landscape differences, and the urgency to address climate change.

2. Ensure the Scoping Plan Reflects Upcoming and Past Actions on the Landscape; Include Land Use Policy Pathways, Strategies in the Scoping Plan.

It is critical that the Scoping Plan integrate lessons learned from past actions (like forest, wetland, and grassland management) along with strategies that anticipate future change (like increased development and land conversion). To this end, the Scoping Plan Update must have a robust inclusion of the land use issues as they relate to NWL climate strategies.

Conditions on the landscape are dynamic due to a myriad of factors including climate change, drought, species movement, a growing population, increased development and sprawl. It is critical to plan for a changing landscape and reflect on past actions to anticipate future change.

- *Integrate Land Conservation and Stewardship in Land Use Planning and Development to Maximize Climate Benefits*

Urban sprawl development threatens to undermine the state's efforts to curb GHG emissions, provide affordable, transit-rich housing, and conserve some of the world's most productive agricultural lands and biodiverse wildlands. According to a 2018 CARB report, the state's regions are not on track to reduce transportation-related GHG emissions and related vehicle miles traveled, as intended when the Sustainable Communities Strategies requirements for regional governments were established by Senate Bill 375 (2008).[2]

Ongoing sprawl development further exacerbates the problem by increasing GHG emissions associated with construction and large carbon-footprint homes.[3] Further, sprawl into the wildland urban interface (WUI) has, and will continue to, increase fire risk through development in high fire risk landscapes.[4] Fragmentation of habitat, loss of native plants, and increased sources of

[2] California Air Resources Board. 2018 Progress Report: California's Sustainable Communities and Climate Protection Act. November 2018.
[3] Jones, C. and Kammen, D.M. Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density. Environmental Science and Technology. 2014. 48, 895-902.
[4] Citation: Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. (2019). Observed impacts of anthropogenic climate change on wildfire in California. Earth's Future, 7, 892–910. https://doi.org/ 10.1029/2019EF001210 Received 14 MAR 2019 Accepted 28 JUN 2019

ignition from power lines, cars, and other human-related activities have resulted in intense fires throughout the state. Unless there is significant change in land use planning and development, the state will not reach its climate targets of 40 percent reductions in GHG emissions below 1990 levels by 2030 and carbon neutrality by 2045.

Integrated land use planning and development can offer an important way out of California's dual housing and climate crises while accommodating an increase in population. According to the Governor's Office of Planning and Research, "…with compact, smart growth development, California can reduce the amount of land that is needed to accommodate the state's population of 50 million by nearly 75 percent relative to business as usual (BAU) land use policies."[5]

Additional impacts on land use come from rising temperatures and greater weather extremes that will impact water resources in the state. As droughts are becoming the norm across the west, agricultural land is at greater risk of going out of production and being converted to other uses, threatening additional GHG-intensive sprawl development. Other competing land uses from biofuels production to large-scale renewable energy development require additional focus on integrated land use planning (see more below on the intersection with decarbonization of other sectors).

As such, land use challenges and opportunities for NWL climate strategies must be included in the Scoping Plan and policy pathways outlined for the state to advance its efforts to achieve Sustainable Communities that center equity, resilience, and conservation.

Further, to meet the state's goal of providing 100% renewable energy by 2045 (SB 100), it is estimated that one million acres of land will need to be converted for renewable energy siting.[6]

- *Restore Carbon Stocks Through Improved Management and Conservation*

Restoring more natural levels of carbon in natural and working lands presents a cost-effective opportunity to mitigate GHG emissions and the largest opportunity to safely remove excess CO_2 already in the atmosphere. A synergistic benefit is that many actions which increase net carbon stocks also improve resilience in natural systems like wetlands and forests, among others.

Mining, diking, urbanization, and other conversions have reduced the extent of natural wetlands, including vernal pools, coastal wetlands and riparian areas, by more than 90% across California.[7]

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[5] OPR. A Strategy for California @ 50 million: Supporting California's Climate Goals. The Governor's Environmental Goals and Policy Report. Nov. 2015. Page 12.

[6] Under the high electrification scenario set forth in the 2021 SB 100 Joint Agency Report, an average of 2.7 GW/year of solar and 0.9 GW/year of wind will need to be built each year to stay on track for 2045 goals. A back of the envelope calculation on the land use needed each year suggests that is on the order of ~36,500 acres for wind and ~22,100 acres for solar each year for the next 25 years, resulting in more than a million acres of land needed.

[7] https://mywaterquality.ca.gov/eco_health/wetlands/extent/loss.html

These ecosystems are incredibly effective carbon sinks and can also serve to mitigate sea level rise, provide protection from stormwater surges, reduce flood risk, offer groundwater filtration and improve water quality – all while providing important habitat and a host of recreation opportunities. The state should prioritize the conservation of existing wetlands and support the restoration and construction of degraded wetlands to ensure that these systems can serve as net carbon sinks while protecting adjacent communities.

Like wetlands, forests provide tremendous carbon storage opportunities. Decreasing the intensity of commercial forest management to allow increased growth and carbon stocks is the greatest near-term opportunity to remove CO_2 from the atmosphere. "Middle aged" and older forests grow quickly and increase live carbon stocks in the near term. This is an immediate opportunity to increase carbon stocks in the next decade, and for longer term climate goals.

California must continue to invest in both active forest restoration and permanent conservation of forest ecosystems, in which we are working to re-create more natural structure, including bigger, older, and more fire-resistant trees. Collectively, improving forest management (including increasing harvest rotation age and using selective harvesting methods), restoring forest cover in riparian areas, and restoring oak woodlands will create healthier forests that sequester carbon and are more resilient to fire, drought and climate change, with significant co-benefits.

To ensure carbon sequestration increases over time, the state should prioritize and substantially increase ecological thinning and restoration actions where the benefits are secured with a reliable commitment to management that stabilizes and/or increases above ground carbon stocks, while simultaneously creating structurally complex, diverse and resilient forests. Projects that provide multiple co-benefits such as water quality and security should also be prioritized.

In addition, we appreciate the efforts underway to work with tribes and learn from their long history of cultural land management. Partnerships like these are critical for successful management and restoration of our lands.

Recommendations:

1. *Include a land use section of the Scoping Plan that brings together strategies to reduce VMTs and biological carbon emissions through compact, infill development of affordable housing and urban greenspaces with conservation of natural and working lands at the urban and suburban edges, and prioritize conservation and restoration actions that restore carbon stocks in California's natural lands.*
2. *Couple active forest restoration with long-term or permanent commitments to climate resilient management that maintains and increases carbon stocks, such as through working forest conservation easements.*

3. Utilize Federal, State, Regional, Local, Plans and Policies to Inform the Scoping Plan Update

There are numerous other plans and policies that can inform the Scoping Plan Update. We offer the following, but this list is not meant to be exhaustive. We have also attached our comments on the Climate Smart Strategy that includes references to other plans and policies. In addition to the reports the administration is currently working on (e.g. the Climate Smart Strategy, the State Adaptation Plan, and the Pathways to 30x30 report), we should look back at recent work to inform the Scoping Plan Update, including:

- Environmental Goals and Policy Report: https://opr.ca.gov/docs/EGPR_Nov_2015.pdf
- Sustainable Communities Act: https://ww2.arb.ca.gov/resources/documents/tracking-progress
- Natural Community Conservation Planning: https://wildlife.ca.gov/Conservation/Planning/NCCP
- TerraCount: https://maps.conservation.ca.gov/terracount/
- Staff Report: Administration of the Affordable Housing and Sustainable Communities (AHSC) Program. July 10, 2014: https://la.streetsblog.org/wp-content/uploads/sites/2/2014/08/AHSC_Admin_Staff_Report.pdf
- Next Ten's 2019 California Green Innovation Index. Oct. 8, 2019: https://www.next10.org/publications/2019-gii
- Intergovernmental Panel on Climate Change, 2018: Summary for Policymakers: https://www.ipcc.ch/sr15/chapter/spm/
- Ag Resilience Act (HR 2803): https://www.congress.gov/bill/117th-congress/house-bill/2803/text?r=3&s=1

Note that we do not recommend using the assumptions in the CALAND model; the landscape restoration and conservation efforts modeled in that effort were based on subjective assessments of what was politically feasible, rather than what was biologically or physically feasible.

4. Prioritize NWL Climate Strategies that Provide Multiple Benefits

As EO-N-82-20 states, natural and working lands sustain our economy, support our unique biodiversity, provide local access to nature, contribute to the global food supply, support outdoor heritage and provide clean water and air.[8] Sustaining these lands is critical to tackling environmental, social, and economic challenges.[9] There is also increasing evidence of the importance of nature for human mental and physical well-being. A recent report[10] released by the

[8] https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf
[9] Id.
[10] https://www.ipbes.net/events/launch-ipbes-ipcc-co-sponsored-workshop-report-biodiversity-and-climate-change

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) demonstrates the intrinsic linkage between climate and biodiversity.

In California's agricultural economy, consumer demand continues to grow for organic and sustainable food. Sustainable agricultural management that is based on the conservation of natural resources, reduced synthetic inputs and biological management can provide a host of climate benefits. Those include increased carbon sinks and reduced nitrous oxide and methane emissions, groundwater recharge, drought mitigation, flood risk reduction, fire mitigation, enhanced biodiversity and habitat (inlcuding pollinator services), and reduced nitrate leaching while improving water quality.[11] Other benefits include a more resilient food production system and better and more equitable economic outcomes for farmers, ranchers, and farmworkers and improved healthy food access.

In a similar vein, conservation and/or restoration efforts across California's public and private landscapes carry numerous resource quality and habitat benefits. Some of these benefits are critical in protecting Californians and ensuring equitable access to needed resources. For example, in source watersheds, restoration of forests and meadows helps to protect and enhance vital water supplies for the state. Further, increased protections on public lands through designation of new parks, wildlife refuges, wilderness areas, or national conservation lands or increased protections for federal roadless areas will also provide carbon sequestration, and air and water quality benefits. Many of these benefits also support biodiversity conservation and align with the state's Pathways to 30x30 efforts. Additional benefits, like flood risk reduction and increased groundwater recharge, can protect communities directly from the unavoidable impacts of climate change.

These lands also provide job opportunities to neighboring communities, many of which are vulnerable and disadvantaged. For example, urban forest planting serves as a major source of green jobs with enormous potential for further local job creation in communities where it is needed most.[12] And restoration of rural forests and watersheds provide good jobs in areas that have some of the highest unemployment in the state. At the federal level, the Climate Stewardship Act would reestablish the Civilian Conservation Corps to create tens-of-thousands of new jobs as well as support rural reforestation efforts with a goal of establishing 2.5 billion additional trees on U.S. Forest Service and Department of Interior lands and adding $100 million for the U.S. Forest Service Community Forest Program in 2021.

[11] The State Water Efficiency and Enhancement Program (SWEEP) is currently under review to improve the program's efforts to not only address surface water use efficiency but also groundwater sustainability. Such on-farm technical assistance and financial incentives approaches remain popular among producers and can make lasting changes in on-farm water management.

[12] For more information, see: https://californiareleaf.org/resources/green-jobs/

Recommendation: The Scoping Plan Update should prioritize strategies that provide multiple benefits.

5. Prioritize NWL Climate Strategies that Benefit Socially Disadvantaged Communities and Underserved Populations

The Scoping Plan Update should prioritize NWL climate strategies that provide multiple benefits, including improved outcomes for economically disadvantaged communities and underserved populations, including socially disadvantaged farmers and ranchers. These benefits include improved air and water quality, reduced threats from wildfire, improved climate resilience, greater economic outcomes and employment opportunities.

As stated by the Equity Advisory Panel, "too often, equity is not appropriately considered, planned for, executed, or evaluated in government programs. It is important to commit to and practice racial equity in the design of strategies."[13] In this update, CARB should ensure underserved communities and socially disadvantaged farmers and ranchers, as defined by the Farmer Equity Act of 2017, are prioritized and that limited resources provide maximum benefits to these communities and underserved producers. We note that there is much more work to be done in this space and it is critical it be done hand-in-hand with members of underserved communities to inform the state's efforts. These efforts should include the Office of Planning and Research's platform to understand community vulnerabilities.

Twenty-five million acres of land suitable for nature-based climate solutions falls within disadvantaged and low-income communities. This accounts for more than 60% of all suitable land (for nature-based climate solutions) in California.[14] By improving air and water quality, promoting open space, expanding urban forests and supporting ecosystem health, natural and working lands benefit these communities directly, while also helping to increase climate resilience.

A recently released paper by The Nature Conservancy found that reducing wildfire severity through thinning and prescribed burns *alone* offers the opportunity to reduce GHGs on over 9.5 million acres of low-income communities, many of which are located in the North Coast, Sierra Nevada and Southern Cascades regions.

[13] Equity Advisory Panel Summary: https://www.californianature.ca.gov/pages/get-involved page. 3
[14] Nature-Based Climate Solutions: A Roadmap to Accelerate Action in California: https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_Pathways12-4.pdf

- *Urban Forestry and Green Infrastructure*

Ninety-five percent of Californians live in urban areas where trees and related green infrastructure support a myriad of human health, socioeconomic, and ecological benefits that range from cleaner air and water to green jobs to local access to nature. Urban forests are the single most effective tool to combat the "urban heat island" effect, and extreme heat. Extreme heat events pose a serious threat to public health, infrastructure, agriculture, and water and energy resources. A 2015 urban forestry study showed that an increase in tree canopy cover from the study area's current 10 percent to a targeted 25 percent resulted in an average daytime cooling benefit of up to 35°F in residential neighborhoods at the local scale.[15]

Disadvantaged and low-income communities have experienced various environmental pollution for decades. Now these communities need to simultaneously address environmental issues but also adapt to the changing climate including as extreme heat.

There is a strong need for more trees and urban greenery, especially in areas that the State has identified as priority populations in addressing climate change: low-income blocks in the U.S. have, on average, 15.2% less tree cover than high-income blocks, and summer temperatures are 1.5°C hotter with the former.[16]

- *Sustainable Agriculture and Healthy Food Systems*

Small and mid-scale farms make up the vast majority of California farms.[17] Socially disadvantaged farmers, defined as farmers of color, make up nearly a quarter of California farmers. Farms operated by Latino and Asian American farmers are among the fastest growing segment of California's agricultural industry. Small and mid-scale farmers and socially disadvantaged farmers are also among the least resourced and least prepared to address a changing climate, but their contribution to our food security and rural communities makes them essential partners in climate solutions. As the state deepens and expands its efforts to build a more resilient food and farming system, the Scoping Plan should emphasize the need for resources for those farmers, farmworkers and rural communities most at risk.

Recommendation: Prioritize NWL climate strategies that center equity and provide multiple environmental, public health and economic co-benefits.

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[15] https://www.sciencedirect.com/science/article/pii/S161886671400106X

[16] https://academictimes.com/tree-inequality-is-rampant-in-cities-and-its-killing-low-income-people-and-people-of-color/

[17] USDA 2012 Agricultural Census. www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/California/st06_1_001_001.pdf

6. The Scoping Plan Should Address the Intersection of Natural and Working Lands Climate Benefits with Decarbonization of Other Sectors

Land-based actions and outcomes intersect with the work to decarbonize other sectors in a variety of ways. Efforts to reduce VMTs can be enhanced with promotion of infill and conservation of natural and working lands. The promotion of distributed generation (e.g., rooftop solar), energy storage, and energy efficiency reduces the need for utility-scale renewable energy, which will decrease the amount of land needed for energy generation. Increased urban forest canopy reduces energy demand and make communities more walkable and bikeable. On-farm renewable energy, especially solar and wind, offer real opportunities to further the state's efforts to supported distributed generation. Alternative manure management practices in the dairy and livestock industries can reduce potent methane emissions while producing products like compost that support healthy soils sequestration strategies. These land-based decarbonization efforts and related efforts should be explored in the Scoping Plan Update. We also offer the following on forest bioenergy issues:

Woody material generated as a biproduct of forest restoration or commercial management is sometime converted to energy, a positive alternative to open pile burning of the waste material. However, energy supply from forest biomass must always be scaled to rely only on the amount of material that is generated by ecological restoration and as a byproduct of commercial timber harvest, so that it is driven by being a waste disposal mechanism.

The siting and air quality impacts of bioenergy facilities raise a number of other environmental and social justice concerns. Our groups are dedicated to ensuring clean air and clean water for all. We believe that siting biomass facilities in California Clean Air Act non-compliant air basins should be avoided to reduce pollution burdens on disadvantaged communities, unless those facilities can be shown to reduce emissions from other sources of burning.

Recommendation: Prioritize actions that decarbonize other sectors and protect natural and working lands thereby providing multiple co-benefits. In addition, new bioenergy facilities should generally be located in air quality basins in compliance with federal and state standards and should incorporate emissions control technologies to ensure they remain within state, federal, or tribal standards. This precludes the siting and building of additional biomass facilities in non-compliant air basins, like the Central Valley, unless a net reduction in emissions can be achieved.

7. Conclusion

California needs to approach restoration, conservation, and improved management of natural and working land with the same level of urgency that we are pursuing the transformation of our transportation and energy sectors – even more so because earlier actions bear greater carbon

sequestration and adaptation benefits. We appreciate your consideration and stand ready to help support CARB's efforts to update the target for the natural and working lands sector in achieving the State's carbon neutrality goal and better integrate the role of this sector through the Scoping Plan.[18] Please reach out to any of us to engage in further discussion or if there are any questions.

[18] As directed by EO N-82-20*:* https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf

ATTACHMENT: Natural and Working Lands Climate Smart Strategy

May 25, 2021

California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Re: Natural and Working Lands Climate Smart Strategy

Dear Deputy Secretary Hansen,

The undersigned groups strongly support the elevation of natural and working lands as a key strategy to address and combat the impacts of climate change. As the state develops its *Natural and Working Lands Climate Smart Strategy* ("Strategy"), we strongly urge the incorporation of the goals, practices and policy recommendations attached to this document. While these proposals reflect shared interests among our collective groups, individual groups may offer additional recommendations specific to their organizations.

California's natural and working lands – the forests, rangelands, farms, wetlands, coast, deserts, and urban greenspaces – offer a unique set of climate solutions as well as a host of other co-benefits for people and nature. As EO-N-82-20 notes, natural and working lands sustain our economy, support our unique biodiversity, provide local access to nature, contribute to the global food supply, support outdoor heritage and provide clean water and air.[19] Sustaining these lands is critical to tackling environmental, social, and economic challenges.[20]

As a global biodiversity hotspot, California has long been a leader in:

- The conservation of high-value ecosystems, establishment of urban green spaces, and sustainable agricultural production, and;
- The development and implementation of innovative climate policies designed to reverse climate change.

The state has a landmark opportunity to merge these two strategies and increase the conservation, resilience, and stewardship of our natural and working lands. To do so, it should augment the Administration's proposed May Revision of the budget for landscape conservation, greening urban spaces and related technical assistance.

[19] https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf
[20] Id.

As the state develops the Pathways to conserving at least 30 percent of California's land and coastal waters by 2030 in order the support the global effort to combat the biodiversity and climate crises, it is important that the Strategy complement these efforts to prioritize and conserve lands that provide climate resilience and biodiversity protection.

The magnitude of this opportunity cannot be overlooked. Numerous scientific studies illustrate the potential; these can be used to inform practices and identify areas of emphasis to optimize outcomes. We strongly support a science-based approach and investing in the research needed to make informed decisions as the State implements its climate strategies.

These nature-based resources are at risk if we do not act now. Without thoughtful, methodical action to ensure the resilience of these assets, we risk losing the potential for our rural lands and urban green infrastructure to serve as significant carbon sinks – helping the state to protect our communities from extreme climate impacts and to successfully achieve the goals of the Strategy. If we fail to act now, we in fact risk that these lands could become a net source of emissions while losing their ability to provide numerous co-benefits.

The undersigned groups strongly urge the state to include the recommendations outlined in this letter in its *Natural and Working Lands Climate Smart Strategy.* We appreciate your consideration and stand ready to help support this effort. Please reach out to any of us to engage in further discussion or if there are any questions.

Jeanne Merrill
Policy Director
California Climate and Agriculture Network

Sydney Chamberlin
Climate Policy Associate, California Climate Change Program
The Nature Conservancy

Chuck Mills
Public Policy and Grants Director
California ReLeaf

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Pamela Flick
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Defenders of Wildlife

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Audubon California

Ellie Cohen
Chief Executive Officer
The Climate Center

Arohi Sharma
Water Policy Analyst
Natural Resources Defense Council

Nick Jensen, PhD
Conservation Program Director
California Native Plant Society

Nick Lapis
Director of Advocacy
Californians Against Waste

Michael Dimock
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Adam Livingston
Director of Planning and Policy

Roots of Change

Jo Ann Baumgartner
Executive Director
Wild Farm Alliance

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Ken Knight
Your Children's Trees

Jessica Sanders
Sacramento Tree Foundation

Dan Flanagan
Friends of the Urban Forest

Michael Flynn
Common Vision

Irene Calimlim
Fathers and Families of San Joaquin

Catherine Martineau
Canopy

Joe St. John
Koreatown Youth and Community Center

Sequoia Riverlands Trust

Sibella Karus
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Dave Henson
Director
Occidental Arts & Ecology Center

Matthew Baker
Policy Director
Planning & Conservation League

Michael Wellborn,
President
Friends of Harbors, Beaches and Parks

Zoe Siegel
Director of Climate Resilience
Greenbelt Alliance

Manny Gonez
TreePeople

Claire Robinson
Amigos de los Rios

Mona Cummings
Tree Fresno

Erin Donley Marineau
Tree Davis

Mark Kenyon
North East Trees

Rhonda Berry
Our City Forest

Jackie Higgins, PLA, ASLA
Balboa Park Conservancy

Recommendations for the Climate Smart Land Strategy

The following are recommendations to apply to the Climate Smart Land Strategy. The first part reflects a set of overarching goals to apply to the Strategy. The second part identifies key practices and related policies that should be prioritized across different land types. The third part offers cross-cutting policy recommendations to accelerate nature-based climate strategies and the final part suggests metrics to assess progress over time.

Overarching Goals

Climate smart land strategies should focus on the following overarching goals:

- **Conserve and enhance.** Conserve and enhance California's natural and working lands to ensure they exist in the future to provide climate, biodiversity, and other critical benefits.

- **GHG mitigation/carbon sequestration.** Manage, restore, and conserve the state's natural and working lands to attain at least a third of the reductions needed to achieve California's carbon neutrality goal and prevent these lands from becoming a net source of emissions.

- **Resilience.** Ensure that our communities are buffered from extreme climate events (e.g., fire, floods, drought, heat and sea level rise) through stewardship of natural and working lands, and that our natural systems can persist through climate stresses and disturbance, including ensuring species populations will be able to shift in response to climate change (i.e., maintaining habitat connectivity).

- **Biodiversity.** Protect and restore California's native species and rural and urban ecosystems, securing them from decline and extinction.

- **Human health.** Create better public health outcomes, especially for those disproportionately impacted by pollution, by promoting walkability, active transportation, local access to nature, clean air and water, and greater connectivity to healthy and resilient food supplies.

- **Water.** Enhance water quality and safe drinking water, retention in soil, stormwater capture, and groundwater recharge.

- **Just Transition Workforce Development.** Promote equitable job creation and training programs across the ecosystem spectrum to build thriving economies that provide dignified, ecologically sustainable livelihoods as well as ecological resilience.

- **Equity.** Ensure frontline and underrepresented communities are prioritized in these strategies and resources are directed to the communities who need them the most.

Working across these goals, we urge the State to optimize climate benefits across multiple landscapes in its Strategy.

Practices and Related Policies to Prioritize

Below, we offer a suite of practices to prioritize in the Strategy.

1. *Conserve, Restore, and Improve the Management of Forests to Increase Carbon Sequestration and Reduce Emissions*

Forest conservation, restoration and improved management provide multiple climate benefits such as carbon sequestration and reduced emissions. In addition, these actions strengthen the many benefits forests provide; these benefits include mitigating extreme weather events, protecting and restoring biodiversity, fire mitigation, air quality improvement, and improving water storage,[21] filtration, and timing of runoff. Forests also offer a host of recreation and employment opportunities. Along with the conservation of existing forests, actions that can achieve these benefits include ecological thinning, prescribed burning, post-wildfire reforestation, the restoration of oak woodlands and riparian restoration.

- **Restore Forests and Improve Forest Management:**

California must continue to invest in both active forest restoration and permanent conservation of forest ecosystems, in which we are working to re-create more natural structure, including bigger, older, and more fire-resistant trees. Collectively, improving forest management (including increasing harvest rotation age and using selective harvesting methods), restoring forest cover in riparian areas, and restoring oak woodlands will create healthier forests that sequester carbon and are more resilient to fire, drought and climate change, with significant co-benefits.

To ensure the multiple ecological benefits of older forests accrue over time, the State should prioritize ecological thinning and restoration actions where the benefits are secured with a reliable commitment to management that stabilizes and/or increases above ground carbon stocks, while simultaneously creating structurally, complex, diverse and resilient forests. Projects that provide multiple co-benefits such as water quality and security should also be prioritized.

We also appreciate the efforts underway to work with tribes and learn from their long history of cultural land management. Partnerships like these are critical for successful management and restoration of our lands.

- **Maintain Land Integrity and Climate Smart Management with Conservation Easements:**

Conservation easements are an important tool to meet climate resiliency and conservation goals by preventing land use conversion and maintaining the integrity of our natural and working lands for future generations. These voluntary but perpetual and enforceable agreements are negotiated with the landowner, run with the land, and can be applied across all land types. Conservation easements can prevent sprawl development and provide an opportunity to partner with

[21] Research shows that forest restoration can increase water flows from watersheds by 5-20%, decrease flood risks by 25-40%, and extend cold water flows by 2-3 weeks into the hot summer months. (https://www.pacificforest.org/wp-content/uploads/2017/07/HWC-Book_Web.pdf)

landowners and provide financial resources to make non-development options economically feasible.

Working forest conservation easements are important tools that – like other conservation easements – prevent development and fragmentation and maintain the forest land base. But they also include provisions to guide future management and restore structural complexity to the forest in nuanced, site specific ways. These voluntary instruments achieve durable, enforceable changes in management that increase carbon richness and habitat values and help soften the management differences between private managed timberland and public lands. Utilizing tools such as working forest conservation easements to protect and restore private forest lands, we are able to change management to achieve outcomes that take many decades and are otherwise unlikely to occur given the financial realities of timber management. This, in turn, presents a prime opportunity to increase carbon stocks while also providing the multiple benefits discussed above.

Importantly, the substance of working forest conservation easements can vary widely, and the State should establish "best practices" to guide broader application of these instruments.

- **Coordinate with Federal Forest Initiatives:**

There is also an opportunity to align efforts in California with the federal government. As forests provide natural infrastructure for watershed health, conservation actions can capture federal infrastructure funding. Where possible, regional planning efforts should be structured to optimize the ability to secure federal water infrastructure funds. Additionally, the Climate Stewardship Act would reestablish the Civilian Conservation Corps to create tens-of-thousands of new jobs as well as support rural reforestation efforts with a goal of establishing 2.5 billion additional trees on U.S. Forest Service and Department of Interior lands and adding $100 million for the U.S. Forest Service Community Forest Program in 2021.

2. *Strategically Manage Lands to Reduce Adverse Impacts of Fire*

As fires burn more severely and frequently, many of the benefits natural and working lands provide to the state go up in smoke. When managing its lands, California should seek to substantially increase the use of prescribed fire, where appropriate, and ecological thinning to reduce surface fuels, restore, maintain and enhance complex forest structure, remove flammable non-native invasive species, restore native species in damaged and type-converted vegetation, and create fire resilient ecosystems. Many of California's ecological systems evolved with regular fire which contributed to their health, succession, and dispersal. Past harvest, a long history of effective fire-suppression, climate change, patchwork management, funding shortages, and development into the wildland-urban interface (WUI) have exacerbated the incidence, severity, duration and extent of wildfires beyond a natural balance. In general, we have too little fire in the Sierra Nevada and too much fire along our central coasts and southern coasts and interior.

Improved planning and conservation actions are critical to minimize development into the WUI, which not only fragments habitats and reduces the ability of these lands to sequester carbon, but also increases the risk of fire.

California's Wildfire and Forest Resilience Action Plan[22] explains that "California's diverse landscapes and communities require regionally tailored strategies and actions. Protecting California's communities and natural places from the impacts of catastrophic wildfire cannot be achieved through a 'one size fits all' solution." Therefore, we recommend that the State promote strategies and actions based on science and tailor solutions to specific regional needs.

Additionally, agriculture will play an ongoing and significant role in wildfire prevention in California. Through vegetative management practices like prescribed grazing and controlled or cultural burns, working in partnership with Tribal leaders, farmers and ranchers can assist with land stewardship efforts that prevent catastrophic fires. More is also needed to support the safety and wellbeing of the workers who are on the frontlines of extreme weather events like wildfires.

3. *Conserve and Manage Lands for Sustainable Agriculture*

California is home to nearly 70,000 farms and ranches, situated on 24.3 million acres of land[23] and agriculture employs more than 800,000 people statewide.[24] Sustainable agricultural management that is based on the conservation of natural resources, reduced synthetic inputs and biological management, can provide a host of climate benefits. Those include increased carbon sinks and reduced nitrous oxide and methane emissions, groundwater recharge, drought mitigation, flood risk reduction, fire mitigation, enhanced biodiversity and habitat, and reduced nitrate leaching while improving water quality.[25] Other benefits include a more resilient food production system and better and more equitable economic outcomes for farmers, ranchers and farmworkers.

- **Conserve Farmland:**

Each year, California loses an average of 50,000 acres of agricultural land, most of it to urban conversion.[26] Conservation of these lands are an essential component of the state's efforts to promote a smart growth strategy. These efforts must focus on infill, compact development that increases affordable, transit-rich housing while protecting agricultural land at the urban/suburban edge and avoids rural ranchette conversion. The Sustainable Agricultural Lands Conservation and Affordable Housing and Sustainable Communities programs, along with improved SB 375 implementation, are key strategies to support a climate smart land use strategy.

- **Healthy Soils:**

[22] https://www.fire.ca.gov/media/ps4p2vck/californiawildfireandforestresilienceactionplan.pdf
[23] https://www.cdfa.ca.gov/statistics/PDFs/2018-2019AgReportnass.pdf
[24] http://calag.ucanr.edu/Archive/?article=ca.2016a0011
[25] The State Water Efficiency and Enhancement Program (SWEEP) is currently under review to improve the program's efforts to not only address surface water use efficiency but also groundwater sustainability. Such on-farm technical assistance and financial incentives approaches remain popular among producers and can make lasting changes in on-farm water management.
[26] https://www.conservation.ca.gov/dlrp/fmmp/Pages/Fast-Facts.aspx

Agriculture can increase carbon sinks and reduce potent greenhouse gas emissions through a diversity of on-farm management practices, including healthy soils practices that reduce the use of synthetic inputs, increase soil organic matter and increase woody biomass on the land. In 2017, the state established California Department of Food and Agriculture's (CDFA) Healthy Soils Program to provide the technical, financial, demonstration project and research resources needed to support farmers in transforming their soil and woody biomass practices.

As we look to scale this work, we need to get carbon deeper into the soil profile through deeply rooted plants, cover crops, hedgerows, etc. It is also important to stack farm management practices. Single practices (e.g. conservation tillage by itself) will not develop the kind of carbon sinks one can achieve with multiple beneficial practices. Systems approaches like organic agriculture, prescribed grazing management, and other conservation management practices that stack practices can have some of the biggest benefits to carbon sequestration and reduced GHG emissions overall.[27]

- **Manure Management:**

The state has embarked on efforts through CDFA's Healthy Soils Program and the Alternative Manure Management Program to provide technical and financial assistance along with demonstration projects to reduce GHG emissions in this sector while providing multiple environmental and economic benefits. The Healthy Soils Program provides support for prescribed grazing, which takes a conservation management approach to herd size and rotation of animals on pasture and grasslands, helping to improve carbon stocks. The Alternative Manure Management Program provides grants to implement dry dairy manure management and limited pasture-base strategies that reduce methane emissions. This work can be scaled up and improved by allowing producers to apply for all the relevant practices regardless of which application they complete (e.g. allowing prescribed grazing incentives under AMMP). Additionally, more coordination with US Department of Agriculture Natural Resource Conservation Service to scale up these efforts will be needed.

- **Climate Smart Water Practices:**

Improved soil organic matter in agricultural lands can significantly increase water holding capacity and protect against drought and flood conditions. Water that stays in a watershed can help preserve basin flows and riparian systems during low-flow periods. Improved soil management can also reduce nitrate leaching and improve water quality. The State Water Efficiency and Enhancement Program (SWEEP) is currently under review to improve the program's efforts to not only address surface water use efficiency but also groundwater sustainability. Such on-farm technical assistance and financial incentives approaches remain popular among producers and can make lasting changes in on-farm water management.

- **Organic Transition/Support for Biological Pest Management:**

Supporting farming systems that take low-input, biological and conservation management approaches can achieve multiple benefits. The state should consider expanding upon federal efforts by supporting conventional producers in transitioning to organic farm management in ways that increase biodiversity on-farm and reduce the use of synthetic inputs. Efforts to expand

[27] For a literature review on agricultural practices that provide climate benefits, see: https://calclimateag.org/wp-content/uploads/2018/12/Climate-Change-Solutions-2018.pdf

alternatives to toxic pesticides and move toward biological pest control and integrated pest management will also be necessary to protect worker and public health and address increased pests as the state experiences rising temperatures.

- **Align State and Federal Agricultural Opportunities:**

There is a great opportunity to align climate smart agricultural practices in California with efforts underway at the federal level. With this in mind, solutions in the state should be scalable and provide a pathway forward for state-federal coordination. The Biden Administration is encouraging the adoption of climate-smart agricultural practices.[28] At the same time, the Agriculture Resilience Act, introduced by Congresswoman Chellie Pingree (D-Maine), seeks to support agriculture in reaching net zero emissions while scaling up and reforming farm bill conservation programs. Many of ARA's proposed areas of funding build upon California's Climate Smart Agriculture programs. There is also an opportunity to enhance coordination with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) to scale up these practices.

4. Enhance Urban Forestry and Urban Greening for Climate and Public Health

Ninety-five percent of Californians live in urban areas where trees and related green infrastructure support a myriad of human health, socioeconomic, and ecological benefits that range from cleaner air and water to green jobs to local access to nature. Urban forests are the single most effective tool to combat the "urban heat island" effect, or extreme heat. Extreme heat events pose a serious threat to public health, infrastructure, agriculture, and water and energy resources.[29] Extreme heat events are already increasing in severity in California, as evidenced by the record-setting temperatures of 2020. In fact, Southern California is the only place in the nation where heat related deaths occur during winter months.[30] A 2015 urban forestry study showed that an increase in tree canopy cover from the study area's current 10 percent to a targeted 25 percent resulted in an average daytime cooling benefit of up to 35°F in residential neighborhoods at the local scale.[31]

Urban forests also provide nearly 20% of the total forest carbon sequestration benefits in the U.S.,[32] and are the primary sequestration mechanism for urban areas.[33] These figures coupled with State data showing total pollution removal estimated at almost 24,000 metric tons with a value of $1.1 billion demonstrate what a critical tool urban greening is for climate and public health benefits.[34]

There is a strong need for more trees and urban greenery, especially in areas that the State has identified as priority populations in addressing climate change: low-income blocks in the U.S.

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[28] https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/27/fact-sheet-president-biden-takes-executive-actions-to-tackle-the-climate-crisis-at-home-and-abroad-create-jobs-and-restore-scientific-integrity-across-federal-government/

[29] It has been ranked as one of the top five global health risks in the World Economic Forum Global Risk Assessment every year since 2014, and as one of the five that will have the biggest impact every year since 2017.

[30] https://cphd.ph.ucla.edu/sites/default/files/downloads/Kalkstein%20WInter%20Heat%20Mortality%20%282%29.pdf

[31] https://www.sciencedirect.com/science/article/pii/S161886671400106X

[32] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018

[33] The estimated CO2 stored in urban forests in California totaled 103 million metric tons in 2015.

[34] https://frap.fire.ca.gov/media/3180/assessment2017.pdf

have, on average, 15.2% less tree cover than high-income blocks, and summer temperatures are 1.5°C hotter with the former.[35]

Planting more urban forests is also a major source of green jobs with enormous potential for further local job creation in communities where it is needed most.[36]

Fortunately, California already has the tools, program, expertise and plans in place to implement a transformative approach to urban green infrastructure as part of the broader Strategy. This effort should include all the following:

- **Scale up CAL FIRE's Urban and Community Forestry Program (UCFP):**
This program guides urban forestry funding, best practices, and technical assistance. The skilled staff of CAL FIRE regional urban foresters work with local governments and community groups to adapt their urban greening strategies to 21st century resiliency needs, especially in those underserved areas that are consistently and disproportionately impacted by climate change and systemic redlining.

- **Adopt the recommendations of numerous State plans and strategies:**
Actions and opportunities to increase canopy across our disadvantaged communities, prioritize maintaining our existing mature trees, and strategically integrate urban green infrastructure as a necessity rather than amenity to our built environment that are outlined in existing State plans and should be integrated into the Strategy.

- **Coordinate all State programs engaged in urban forestry:**
Programs should be coordinated to utilize best planting and management practices, follow state guidance on best urban forestry practices, and consult or coordinate with CAL FIRE – the State's designated authority on urban forestry. This is a low-cost, simple step that could ensure the thousands of tree plantings supported by the State outside the UCFP have the best chance to thrive and survive in California's evolving climate.

- **Support the California Natural Resources Agency (CNRA) urban green infrastructure programs:**
These programs include Urban Greening, River Parkways, and the Environmental Enhancement and Mitigation Program, which play a key role in meeting the goals detailed in the aforementioned State plans, with the Urban Greening Program playing an especially important role in bringing benefits to disadvantaged and underserved communities.

- **Access Federal Funding Opportunities:**
At the federal level, Biden's executive order, referenced above, emphasizes the importance of equity, climate, and jobs. Urban forests provide this trifecta and, like other natural and working lands strategies, leadership in this sector in California can be scaled up at the federal level and take advantage of federal funding opportunities such as:
    - The EJ Legacy Pollution Cleanup Act, which includes $25B in funding for urban forestry.

[35] https://academictimes.com/tree-inequality-is-rampant-in-cities-and-its-killing-low-income-people-and-people-of-color/
[36] For more information, see: https://californiareleaf.org/resources/green-jobs/

- The Climate Stewardship Act, discussed above, which would reestablish the Civilian Conservation Corps to create tens-of-thousands of new jobs as well as create the Reforest American Grant Program which has a goal of planting 100 million urban trees over the next decade and 400 million by 2050 and add $100 million for the U.S. Forest Service Community Forest Program[37] in 2021.
- The TREES Act,[38] which would establish a tree-planting program under the Department of Energy to decrease energy usage and is modeled after the successful program partnership between Sacramento Tree Foundation and Sacramento Municipal Utility District.

5. *Conserve and Restore Wetlands, Riparian Areas, and Other Blue Carbon Ecosystems for Climate and Habitat Resilience*

Mining, diking, urbanization, and other conversions have reduced the extent of natural wetlands, including vernal pools, coastal wetlands and riparian areas, by 90% across California.[39] These ecosystems have the potential to provide tremendous climate benefits and are incredibly effective carbon sinks. In addition, wetlands, riparian areas and other coastal habitats mitigate sea level rise, provide protection from stormwater surges, reduce flood risk, offer groundwater filtration and improve water quality while providing important habitat and a host of recreation opportunities. Conserving and restoring wetlands are critical practices to include in the State's Strategy and to this end, we propose the following goals and actions be included in the Strategy:

- **Protect and invest in potential future habitats to ensure migration space:**

Coastal and inland wetlands (e.g., Bay Delta) are threatened by climate-driven sea level rise. Over half of California's coastal marsh and freshwater wetland habitats are highly vulnerable to loss[40] with 5 feet of sea level rise. A critical strategy to mitigate potential loss is to invest in *potential future habitat,* areas with minimal development that can more easily transition to habitat, such as open space or agriculture. These areas are also projected to be inundated by sea level rise and can serve as critical migration space for wetlands. Statewide, there are close to 200 km^2 of potential future habitat, and if California prioritizes the conservation of and investment in potential future habitat areas, it would mitigate over half the projected loss of coastal habitats from sea level rise.

- **Adapt the built environment to ensure the migration of coastal wetlands:**

In more urban regions of the state, the built environment, including roads and other infrastructure, creates barriers that prevent coastal habitats, like wetlands, from moving inland. Many of these built structures are themselves also vulnerable to sea level rise. We need to simultaneously protect human community assets and enhance the extent and resilience of coastal habitats by managing this infrastructure with natural coastal processes in mind. It is critical for state agencies to collaborate across disciplines to co-design adaptation approaches for infrastructure and consider nature-based strategies and impacts. Adapting the built environment

[37] https://www.fs.usda.gov/managing-land/urban-forests/ucf
[38] https://www.congress.gov/bill/116th-congress/house-bill/5615/text
[39] https://mywaterquality.ca.gov/eco_health/wetlands/extent/loss.html
[40] This is from the TNC/SCC's *Conserving CA's Coastal Habitats* study (Heady el al. 2019) - https://www.conservationgateway.org/ConservationPractices/Marine/crr/library/Documents/TNC_SCC_CoastalAssessment_lo%20sngl.pdf

can yield dividends, both through increased resilience of the built environment, as well as through the protective services provided by coastal habitats.

- **Incorporate California's goal of no net loss of wetlands and long-term net gain of wetlands:**

The Strategy should incorporate strategies for the avoidance of loss of wetlands and riparian areas from development.[41] The State should also finalize and find a statewide wetland gain and loss tracking system so that it would have an ongoing inventory of wetlands. In addition, the State should invest more into voluntary wetland restoration programs.[42]

- **Incorporate California's goal for coastal wetlands conservation, restoration, and creation:**

In 2020, the California Ocean Protection Council (OPC) set an ambitious goal[43] for California's coastal wetlands to protect, restore, and create an additional 10,000 acres by 2025, and increase the overall acreage by 20% by 2030 and 50% by 2040. This should be reflected in the Strategy.

- **Support and invest in research on coastal habitat and blue carbon ecosystems:**

In addition to land-based solutions, there are also climate resilience and sequestration opportunities in California's nearshore waters with eelgrass and kelp forest restoration. Found in estuaries, bays, and other shallow nearshore areas, eelgrass provides essential habitat for species, some of which are an important part of the state's commercial fishing industry, absorbs carbon, helps protect the coastline from storm surges, among other benefits. However, about 30% of the world's eelgrass has vanished since the 1870s. California's Morro Bay has lost more than 90% of its eelgrass since 2007.[44]

- **Protect and invest in eelgrass and kelp forest restoration:**

There are ongoing state programs to restore eelgrass and kelp forests and enhance climate resilience along California's coast. In addition, the California Ocean Protection Council and the California Department of Fish and Wildlife have partnered with local commercial fishermen to attempt kelp restoration at an unprecedented scale. California should direct more investment to accelerate these and other similar projects.

6. *Conserving and Restoring Grasslands, Deserts, and Meadows as Crucial Habitat in a Changing Climate*

Grasslands, deserts, and meadows offer a host of climate benefits. They are crucial habitat and provide migration and connectivity benefits to species, which is especially important as studies predict new corridors for movement under changing climatic conditions. They also offer water quality benefits, flood control, and ground water replenishment. These lands store a significant

[41] Executive Order W-59-93 issued by Governor Wilson in 1993 established state policy guidelines for wetlands conservation in order to ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage in California. In 2019, the State Water Resources Control Board (SWRCB) reinforced this policy with the adoption of Resolution of 2019-0015, which established a State Wetlands Definition and Procedures for the discharge of dredged and fill material to waters of the State.

[42] There are several active restoration programs that should be funded to accelerate restoration, including the California Coastal Conservancy, Wildlife Conservation Board, State Water Resources Control Board, Department of Parks and Recreation, Department of Fish and Wildlife, and Department of Water Resources.

[43] CA OPC Strategic Plan, Target 1.1.7 http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20200226/OPC-2020-2025-Strategic-Plan-FINAL-20200228.pdf

[44] https://www.pewtrusts.org/en/research-and-analysis/articles/2020/10/28/california-steps-up-efforts-to-protect-and-restore-eelgrass

amount of carbon and by avoiding disturbing these lands,[45] the release of stored carbon is also avoided. Desert vegetation sequesters carbon at rates comparable to grasslands and forests; desert microbial crusts sequester and store carbon at even more considerable rates.[46] Finally, degraded lands can provide opportunities for smart renewable energy siting. Beyond direct climate benefits, a significant number of disadvantaged communities are located within these ecosystems and these lands provide essential access to nature and recreation as well as job opportunities.

In regard to these landscapes, we propose the State focus on the following actions:

- **Prioritize conservation of desert areas that provide high-priority habitats under current climate conditions and are likely to be resilient to climate change and/or support a broad array of species in the future:**

California, in partnership with the federal government, has produced a California Desert Biological Framework,[47] which was incorporated into the final Desert Renewable Energy Conservation Plan. These documents have identified the important conservation lands throughout the 20-million-acre desert region based on climate modeling to identify those lands that will become more important as the desert region experiences the effects of climate change. The state should prioritize the conservation of these lands as part of its effort to promote climate resiliency. In addition, the state should continue to support ongoing private land conservation planning, including the Apple Valley Natural Community Conservation Plan, the San Bernardino County Regional Conservation Investment Strategy (RCIS) and the Antelope Valley RCIS.

- **Maintain the carbon sequestration benefits of desert landscapes by avoiding crust and vegetation disturbance, effectively leaving desert lands intact:**

While the California deserts are one of our more intact ecosystems, the desert landscape has been destroyed by development, mining, off-highway vehicle use, and other land-disturbance activities. These activities continue to expand across the desert landscape, resulting in large amounts of carbon released into our atmosphere from the disturbed desert soils.
It is also important to note that a significant amount of carbon has been released into the atmosphere due to land use practices that lead to desertification or increasingly arid and degraded landscapes. In addition to soil organic carbon, inorganic carbon sequestration occurs in desert ecosystems through the formation of secondary carbonates.[48]

The estimates of carbon sequestration are indicative of what may be possible under ideal conditions. Realization of this potential, however, requires a vigorous and coordinated effort towards desertification control, restoration of degraded ecosystems, protection of intact desert lands, increased law enforcement to reduce illegal off-highway vehicle use, and adoption of

[45] Disturbance of desert landscapes not only causes increased emissions from this land type, but also nullifies them as carbon sinks. Once these disturbances happen to the desert crust, it takes millenniums for the desert carbon sink to regenerate; as such, avoidance of disturbance is crucial.
[46] Wohlfahrt G, Hammerle A, Haslwanter A, Bahn M, Tappeiner U, Cernusca A. Seasonal and inter-annual variability of the net ecosystem CO_2 exchange of a temperate mountain grassland: effects of weather and management. *J. Geophys. Res.* 2008;113:D08110. doi:10.1029/2007JD009286.
[47] https://conservationcorridor.org/cpb/California_Energy_Commission_2016.pdf
[48] Monger, H. C., and R. A. Gallegos. 2000. Biotic and abiotic processes and rates of pedogenic carbonate accumulation in the southwestern United States. *Relationship to atmospheric CO2 sequestration*. Pages 273–290 *in* R. Lal, J. M. Kimble, H. Eswaran, and B. A. Stewart. Eds, *Global climate change and pedogenic carbonates*. CRC/Lewis Publishers, Boca Raton, Florida.

resource management plans for land uses on arid lands. The protection of native riparian desert woodland and vegetation types is important to guard buried inorganic soil carbon stocks and carbon sequestration capacity.

- **Promote improved management to sustain grassland ecosystems**:

California's annual grasslands have been strongly affected by long-term anthropogenic change. The widespread invasion of exotic species into California's annual grasslands has result made the preserving and enhancement of native communities a priority conservation goal. These efforts can include those that reduce current stressors that threaten the ecosystem services from grasslands and actions that increase ecosystem resilience such as altering grazing practices to increase biodiversity.

- **Restore degraded grasslands, which can increase resilience to climate change along with providing protection from soil erosion, carbon loss, and other negative impacts**:

In regions where climate is expected to no longer support current communities, restoration can focus on a function such as aquifer recharge or on species expected to be more tolerant of new conditions. The state should be investing in programs and projects that restore grasslands and incentivizes better management of grasslands, including programs at the Wildlife Conservation Board and Department of Conservation and federal programs through the Natural Resource Conservation Service.

- **Increase genetic diversity, which incurs greater resilience to changing and uncertain conditions and should be considered in restoration or translocation of species**:

  Greater biodiversity, control of invasive species, and redundancy of species functional roles creates greater stability of ecosystems and is associated with greater resilience in the face of changing conditions.

Cross-cutting Policy Recommendations

The following policy recommendations are ones that apply across all land types.

1. *Prioritize equity.*

   Twenty-five million acres of land suitable for nature-based climate solutions falls within disadvantaged and low-income communities. This accounts for more than 60% of all suitable land (for nature-based climate solutions) in California.[49]

   As discussed earlier, when implementing the Strategy, the State should ensure vulnerable and disadvantaged populations are prioritized, and that limited resources provide maximum benefits to these communities, to the extent consistent with pursuing high-priority actions.

[49] https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_Pathways12-4.pdf

2. *Elevate natural and working lands in landscape and regional scale planning to conserve land and public benefits.*

In all the landscapes discussed, there is an important interplay between development, sustainable communities, and conservation. More compact development away from important natural and working lands and lands with increased risk of fire and flooding, promotes climate resiliency for both people and biodiversity. It also reduces carbon emissions created by human-caused wildfire, loss of natural systems that sequester carbon, and increased emissions from more vehicle miles traveled.

When natural and working lands are cultivated or converted into other land uses, carbon stored by the land is lost to the atmosphere. Keeping natural lands intact and healthy ensures that carbon remains in the ground and that vegetation can continue to sequester carbon from the atmosphere. In areas where development pressure is high, avoided conversion efforts should be prioritized.

In other areas, promoting infill, avoiding expansion of and into the wildland-urban interface, and reducing vehicle miles traveled can be accomplished with smart planning that integrates natural and working lands. It is important to prioritize the conservation of natural and working lands to help the state meet GHG reduction needs while also protecting people and nature from impacts of climate change. At the same time, it is equally important to ensure low-income communities are not being displaced in the process and smart growth strategies remain centered on increased affordable housing, adjacent to jobs transit, and services. There are great tools available in California to help inform these land use decisions and optimize climate benefits, including TerraCount,[50] UrbanFootprint,[51] and Greenprints.[52]

Engaging with and incentivizing local governments (counties, metropolitan planning organizations, etc.) to integrate natural and working lands into climate, land use, and infrastructure plans[53] is also critical as so many land use decisions are made at the local level. This can be accomplished through increased technical assistance, capacity building, and planning grants, along with other policy levers discussed.

3. *Increase the scale of planning and implementation of land resilience activities (state, federal & local).*

- Establish 'Best Practices' where none exist to provide guidance and expectations of state-funded forest conservation easements and other conservation practices while supporting existing best practices (e.g., urban forestry) across all state-funded programs.
- Prioritize state grants to nonprofits, local governments, tribes and underserved communities with climate responsive and adaptive general plans and land use

[50] https://maps.conservation.ca.gov/terracount/
[51] ttps://urbanfootprint.com/case-studies/vision-california/
[52] For example: https://www.bayareagreenprint.org/
[53] Including climate action/adaptation plans, sustainable communities strategies, urban forest management plans, and hazard mitigation plans.

practices that encourage maintaining larger intact natural and working landscape holding; and incentivizing affordable, transit and green infrastructure-oriented infill development.
- Update SB 375 guidelines so that they effectively integrate and prioritize conservation of lands as companion to reduction of transportation emissions.
- Integrate and prioritize natural and working lands strategies into General Plan Guidelines.
- Incentivize and support local planners, especially those that serve the state's most disadvantaged communities, to integrate natural and working lands strategies into their county-level planning.

4. *Pursue policies that reduce sprawl and leapfrog development, particularly densification of areas within the Wildlands-Urban Interface (WUI) or new development within the WUI.*

    - Incentivize building more homes near existing public transit and infrastructure and where people work and go to school which will decrease vehicle miles traveled and reduce carbon emissions.
    - Address threats to California lands and biodiversity by limiting expansion in the WUI and resulting loss and continued degradation of ecosystems and wildlife corridors.
    - Prevent upzoning for new developments in areas most likely to burn.
    - Use existing information, such as that from CAL FIRE, to assess fire risk and identify those areas that are safe and those that have high risk.
    - Keep mapping efforts updated over time based on new information and a changing climate. Utilize science-based WUI and intermix boundaries as a land use planning tool in high-risk locations.

5. *Update CEQA to better account for the role of natural and working lands.*

    - Establish a California Environmental Quality Act (CEQA)-based standardized mitigation program for land use conversion, subdivision and up-zoning of resource lands to smaller ownership minimum acreages.
    - Incorporate ecosystem service valuation into CEQA's cost-benefit calculations.
    - Revise CEQA's GHG guidelines to help align the State's goals to reduce emissions from both transportation and land conversion.
    - Establish farmland and natural land mitigation programs for all state transportation and infrastructure projects.

6. *Work holistically across landscapes.*

    Forests, meadows, rangelands and other habitats are often intermingled across the landscape. Pursuing conservation and restoration of continuous areas will lead to better outcomes for climate resilience, wildlife movement and biodiversity, and watershed function than approaching different land types in isolation.

7. *Enhance landscape connectivity and species' dispersal ability (through establishments of corridors and translocation), which are both important concepts in climate change adaptation because of the expected spatial shifts in suitable habitat for plants and animals.*

   There should also be greater investment in identifying biodiversity movement and greater investment in protecting those locations, including through conservation programs at the Wildlife Conservation Board.[54]

8. *Improve regulatory efficiency and incentives for climate-beneficial land restoration and management.*

   - Reduce permitting barriers (aka "cut the green tape") for climate interventions related to land management and restoration and streamline existing programs to encourage cross agency and media innovation (e.g., on-farm compost, riparian restoration, Irrigated Lands Regulatory Program).
   - Align state grant programs and guidelines to create one efficient grant and comprehensive set of requirements rather than requiring projects obtain matching funds and meet a variety of requirements across multiple state programs. This will streamline the process and enable projects to get underway much sooner.[55]

9. *Utilize strategic partnerships and increase technical assistance to support just workforce transition and scale up implementation.*

   - Leverage funding for urban reforestation and maintenance through partnerships with utilities.[56]
   - Expand the use of Stewardship Authority[57] and Good Neighbor Authority[58] to help facilitate collaboration for ecological forestry across jurisdictions and stakeholders.
   - Scaling up the practices discussed above will require making the economic and agronomic case for the practices to producers through sustained technical assistance, outreach, and education and ensuring stable program funding.
   - Working with millions of different landowners, from rural to urban, and of varying size and sophistication, as well as thousands of local governments, will require substantial investment in technical assistance, outreach, and training programs. Resource Conservation Districts, Cooperative Extensions and qualified nonprofits will be key to facilitating the necessary actions and transformation and should be trained by and receive support from the State to enhance impact.

10. *Invest in the infrastructure that is needed to support viable working lands.*

[54] For example, the Rangeland, Grazing Land and Grassland Protection Program and Oak Woodland Conservation Program.
[55] This also supports EO-N-82-20's goal to, "align policies, programs, and funding mechanisms across state government, while identifying opportunities to catalyze and accelerate private investment and actions that contribute to the State's carbon neutrality goal."
[56] For example: https://www.smud.org/en/Going-Green/Free-Shade-Trees
[57] https://www.fs.fed.us/restoration/Stewardship_Contracting/overview.shtml
[58] https://www.fs.usda.gov/managing-land/farm-bill/gna

- Infrastructure needed to support farm products moving from farm to table has languished in the state and is not well positioned to handle disruptions, as we experienced with the COVID-19 pandemic. A diversity of investment in food and farm infrastructure is needed to support farm viability and food security in the state, from processing, cold storage, distribution to food hubs, food banks and more.
- Infrastructure investments are needed to support forest and Tribal workers engaged in remote watershed restoration and wildfire prevention work, from equipment storage to worker housing.
- To support the conversion of organic waste materials from cities and towns to compost production that is needed in rural and urban landscapes, state investments in compost facilities and food waste reduction and recycling are needed.

11. Support research.

- Continue to fund ongoing and new research by Universities and nonprofit entities to inform and support climate change science and land-based strategies to address it.
- Invest in the additional research necessary to achieve an agreed upon quantification methodology for landscape carbon sequestration. This will more easily allow existing funds to be accessed for land acquisition and show the contribution of various landscapes to the State's overall GHG reduction goals.
- Support research and assessments that help identify where conservation and restoration actions will persist under climate change and use this to guide funding.

12. Leverage federal funding for these practices.

As discussed above, there is federal funding from a variety of sources including the Land and Water Conservation Fund, Water Resources Development Act, infrastructure funding, and more. Additionally, these resources could be clearly aligned and collated into one location to better enable access to funding for farmers, ranchers, landowners and other entities.

13. Develop consistent accounting metrics.

- Monitoring and reporting guidance across state agencies, including the California Air Resources Board, that is consistent and accessible to landowners, local governments and all stakeholders will help ensure accurate and comparable data collection to track progress over time.
- Provide clear and publicly understandable and easily accessible updates annually on progress toward the state's climate resilience goals.

Metrics for Success

To begin to develop consistent accounting metrics to track success towards the state's climate goals, we offer the following examples, which are illustrative and not meant to be exhaustive.

- **Greenhouse Gas Indicators:**
  - Metric tons of carbon dioxide (CO_2) or carbon dioxide equivalent (CO_2e) sequestered or avoided as emissions

- **Ecological Indicators:**
  - Acres of natural and working lands conserved or restored;
    - Acres of lands that provide conservation co-benefits as determined by TerraCount, Comet Planner or related tools;
    - Acres of land under conservation easements; with separate accounting of conservation easements that include climate-smart management requirements;
    - Acres of land with restoration efforts underway;
    - Acres as measured by the Pathway to 30x30;
  - Acres of land covered with landscape level planning;
  - Percent increase in urban tree canopy;
  - Percent decrease in ambient temperature during high heat months in urban areas;
  - Percent of agricultural acres with on-farm technical assistance, demonstration projects, and incentives;
  - Percent of farmland converted to non-agricultural uses;
  - Percent of soil organic matter on California agricultural lands;
  - Percent of any part of the state with wetlands/riparian areas vs hard infrastructure;
  - Acres of wetlands gained and lost;
  - Percent of desert landscapes whose crust and vegetation are undisturbed;
  - Percent of the state in mature/resilient Wildlife Habitat Relationship habitat classifications.

- **Economic Indicators:**
  - Number of workers on the land;
  - Number of jobs created.

- **Infrastructure Indicators:**
  - Water holding capacity;
  - Regional and local food processing, storage and related infrastructure to support the agriculture industry and food security;
  - Changes in the timing of watershed runoff.

- **Social Justice/Equity Indicators:**
  - State programs that provide financial incentives, technical assistance and other resources to scale up this work should prioritize underserved communities,

including socially disadvantaged communities, farmers of color and small and mid-scale producers.

- We also strongly urge the State to use indicators to track progress in frontline and underrepresented communities. These should be created in consultation with members of these communities and representatives from environmental justice organizations.