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Ms. Mary Nichols
Chairman
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Dear Chairman Nichols:

Thank you for providing the Pacific Southwest Region of the Forest Service the opportunity to provide written comments on the development of the Cap and Trade Auction Proceeds Investment Plan.

We would like to encourage the State to include restoration of California's public and private forests in its investment strategy for California's cap and trade auction proceeds. We believe that investments in forest restoration are consistent with the goals of AB 32 and California's climate mitigation strategy because forests are among the few places that can significantly help offset the rate of human-caused carbon emissions. Increased forest restoration supports sustainable communities by providing more opportunities for renewable biomass energy development, including the potential production of low carbon biofuels. Forest restoration can be targeted to benefit economically disadvantaged communities, complementing the State's investments in transportation and energy efficiency.

The 20 million acres of national forest system lands in California clean the air we breathe and deliver 50% of the state's clean surface water. These essential ingredients are at risk as fire severity increases, temperatures rise, drought periods increase, and budgets for natural resource work decline. We think it is critical to consider investments in all forest lands, regardless of jurisdiction, in any carbon sequestration strategy. Natural processes, such as the movement of water, fish, wildlife, fire and smoke, do not follow and are not contained within political boundaries.

The Scoping Plan for Implementing AB 32 estimated that sustainable forest practices should achieve at least five million metric tons of carbon reduction through sequestration. The Scoping Plan identified the following forestry sector opportunities for additional greenhouse gas (GHG) reductions:

- Forest Conservation
- Forest Stand Improvement
- Reforestation and Afforestation
- Urban Forestry
- Fuels Management

Investments in the state's wildland and urban forests can benefit disadvantaged communities, sustainable communities, and energy efficiency. This would be consistent with the State's investment priorities for this first plan. The California Environmental Protection Agency (Cal/EPA) recognized that many Californians live among multiple sources of pollution and that some people and communities are more vulnerable to the effects of pollution than others. It is important to identify disadvantaged communities that face multiple pollution burdens so programs and funding can be targeted appropriately toward raising the economic and environmental status of the most affected communities. For this reason, Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) developed a science-based tool for evaluating multiple pollutants and stressors in communities, the California Communities Environmental Health Screening Tool (CalEnviroScreen). This tool is the next step in the implementation of the Agency's 2004 Environmental Justice Action Plan and will be important for achieving the Agency's environmental justice goals.

Based upon the CalEnviroScreen Statewide results dated January 2013, the top 5, 10, and 15% highest scoring census zip codes are from the California border with Mexico to Sacramento. There are 9 national forests adjacent to or near these top 5, 10, and 15% highest scoring census zip codes. Though not in the top 5, 10, and 15% highest scoring census zip codes, the area from Sacramento to Redding also scored high in the CalEnviroScreen. There are an additional two national forests adjacent to or near these disadvantaged communities.

Because of the proximity of the national forests to these disadvantaged communities, we believe that the wildland and urban forests represent the most powerful and expandable terrestrial opportunity to remove carbon dioxide from the atmosphere and safely store carbon in trees. We believe that your goal is achievable and that national forests can help.

We would like to make the following key points that illustrate how investments in the state's wildland and urban forests can benefit disadvantaged communities, sustainable communities, and energy efficiency.

- AB 1532 specifically authorizes utilization of revenues for GHG reduction associated with natural resource management and conservation and forestry.
- Investing allowance auction revenues in California's forested landscapes will help maintain and increase forest carbon stocks.
- These investments will create resilient forests that are well positioned to adapt to a changing climate while achieving myriad other environmental and economic co-benefits.
- The Forest Service manages 20 percent of the total land base and half of the forested land in the state.
- National Forest System lands can contribute significantly to California's climate mitigation plans and we are very interested in helping the State achieve its goals.
- The 2010 California Forests and Rangelands Assessment found that many of our forests are at risk to increased severe wildlife, insects, and disease because of the increased accumulation of understory vegetation that is occurring with the absence of disturbance, changing climate, and increased human pressures.

- This risk can jeopardize our ability to help provide carbon storage as prescribed in the Scoping Plan.
- We have a plan for restoring our forests and that plan calls on us to increase the pace and scale of forest restoration work from approximately 200,000 acres per year to approximately 500,000 acres per year. (Enclosure 1)
- Our restored forests will help California meet its climate change goals by adding more carbon to the large trees, while protecting them from stand-replacing fires.
- We do not expect increases to our budgets to help us reach the desired pace and scale of our restoration work.
- Using some of the revenues from your cap and trade auction will rightfully reinvest funds from the sale of carbon allowances into carbon storage in forests.
- The use of forest materials for renewable bio-energy production maximizes the GHG reduction benefits in a variety of ways when compared to disposing of forest materials by open pile burning.
- This low-risk, high-return investment will reduce greenhouse gasses by sequestering more carbon and reducing the risk of GHG emitting catastrophic wildfire.
- Many investments in the forest sector actually result in a net removal of carbon from the atmosphere, rather than simply slowing the rate of emission, as would be the case in most other investment categories.
- While fire is a fundamental aspect of California's ecology, investments in fuel reduction projects can help reduce the intensity of fires, making forest carbon stores more stable by increasing the resiliency of the forest to the inevitable wildfire.
- Investments in forests are outside of the "cap" and therefore achieve greater emission reductions than investments in "capped" sectors.
- SB 535 requires that the Investment Plan allocate at least 10% of the funds to projects **within** disadvantaged communities, and requires that at least 25% of the funding **provide benefits to** these communities.
- In the state's urban areas, where 95% of all Californians reside, population density coupled with high vehicular traffic and industrial emissions is contributing to more communities with some of the worst air quality in the nation.
- Increasing canopy cover through creating and sustaining urban and community forests can reverse that trend. It also moderates the urban heat island effect and its associated energy use and health impacts.
- Urban forests are beneficial for sustainable communities because they also provide aesthetic and emotional benefits to communities by supporting common wildlife species,

improving or reconnecting fragmented habitats and restoring areas degraded through years of neglect.

- More than 95% of Californians live in an urban area and depend on the multiple ecosystem services, social, and economic benefits of urban forestry.

- Urban forests also improve the aesthetic and emotional connection between people and nature, provide local jobs, reduce residential energy consumption, and benefit disadvantaged communities.

- Urban forests increasing shade that reduces heat island effect, protecting public health, lowering cooling bills, and saving energy.

- Urban forests improve air and water quality, reduce urban runoff from impervious surfaces leading to reduced municipal water treatment costs and energy use.

- Using some of the revenues from your cap and trade auction will rightfully reinvest funds from the sale of carbon allowances into carbon storage in forests.

- Investment in forest restoration and urban forestry can be accomplished through existing state programs; conservancies such as the Sierra Nevada Conservancy are well positioned to deliver a forest restoration grant program on both public and private lands and there is an existing solid partnership between Calfire/Forest Service and community organizations that currently deliver an effective urban forestry program that could easily be expanded.

Here are a few statistics that you may find helpful:

1. A California Energy Commission funded life-cycle analysis of fuel-hazard reduction work in the Northern Sierras has shown:

- Thinning forests resulted in a 22 percent reduction in the number of acres burned by wildfires. A dramatic drop in fire severity was also observed.
- Taxpayers saved $246 million in avoided wildfire damage to assets and savings in avoided fire suppression costs.
- Thinning material could have produced $1.58 billion in renewable energy.
- A substantial offset of fossil fuel was consumed to generate the same amount of potential renewable energy.
- Climate benefits included a 65 percent net reduction in greenhouse gas emissions.
- There were no significant adverse effects to water, wildlife, soil or other public trust resources.

2. A current Forest Service study that is nearing publication will show that several national forests, including some in California, have already reached deteriorated conditions that now

make them net emitters of carbon rather than important sources of carbon storage. We cannot let this trend continue if we hope to contribute to California's climate mitigation strategy.

3. We were a part of an ad hoc forest sector cap and trade work group that developed a paper showing the benefits of forest sector investments. (Enclosure 2)

We hope you can see that our restoration plan will help us help you attain verifiable and secure increases in carbon storage on our national forests. But we cannot reach our restoration goals with anticipated budgets and resources. We hope the State of California will invest some of the revenues from its cap and trade auction towards assisting in the restoration of California's forests. Thank you for your consideration.

Sincerely,

/s/ Barnie T. Gyant (for)
RANDY MOORE
Regional Forester

Enclosures

cc: Christine Nota
Jerry K Bird
Martin Dumpis
Larry Swan
Bruce Goines

CA National Forest System (NFS) lands that need some type of restoration effort is 6-9 million acres	Forest Stand Improvement (Thinning)	Fuel Management	Reforestation	CA NFS land Annual Totals	Urban Forestry
Baseline 2013 Existing Program is approximately 200,000 acres/year.	46,000 acres (planned PCT and estimated CT)	93,000 acres (WO assigned target)	12,000 acres planned	151,000 acres plus 49,000 acres of miscellaneous restoration projects such as meadow restoration, stream channel restoration, etc.	**Baseline** 200,000,000 existing trees 100,000 trees are added annually.
Annual Carbon Benefits of Existing Program	20.0 $MMgCO_2e$	@ 10 Mg of C/Ac (rounded off from 10.6 Mg of C/Ac) = one year 930,000 Mg of C (3.4 $MMgCO_2e$)	2.7 $MMgCO_2e$	26.1 $MMgCO_2e$	4.5 $MMTCO_2e$ (baseline) + 0.75 $MMTCO_2e$ (100,000 trees planted) = 5.25 $MMTCO_2e$
2020 Goal Increase pace and scale of restoration efforts to move towards approximately 500,000 acres/year.	74,000 acres	Approximately 400,000 acres (past maximum all lands accomplishment over a two year period was 675,000 acres with $450 million (average of 337,500 acres per year for $225 million per year))	25,000 acres	Approximately 500,000 acres which would include miscellaneous restoration projects such as meadow restoration, stream channel restoration, etc.	**2020 Goal** Plant an additional 300,000 trees annually. 203,200,000 total trees planted (100,000 baseline trees annually plus the additional 300,000 trees annually).
Annual Carbon Benefits by implementing the 2020 Goal	67.9 $MMgCO_2e$	@ 10 Mg of C/Ac (rounded off from 10.6 Mg of C/Ac) = one year 4,000,000 Mg of C (14.7 $MMgCO_2e$)	5.6 $MMgCO_2e$	88.2 $MMgCO_2e$	5.25 $MMTCO_2e$ (baseline) + 2.25 $MMTCO_2e$ (300,000 additional trees planted annually) = Total of 7.50 $MMTCO_2e$
Additional Annual Carbon Benefit Realized from Accelerating Program from 200,000 to approximately 500,000 acres/year.	47.9 $MMgCO_2e$	3,007,000 Mg of C per year (or in aggregate over 8 years (FY13-FY20) = 24,056,000 Mg of C) (11.3 $MMgCO_2e$)	2.9 $MMgCO_2e$	62.1 $MMgCO_2e$ (338% increase)	2.25 $MMTCO_2e$ (43% Increase) Additional carbon benefit realized from planting an additional 300,000 trees annually.

Table 1: National forest ecological restoration programs and carbon benefits.

Assumptions

- Carbon benefits from fuels treatments considered the net difference between Carbon decreases from fuel treatment and subsequent wildfire and Carbon decreases from wildfire without prior fuel treatment. Consideration was given to post-wildfire live vegetation carbon retention in each, and this was used to make a simplified Carbon sequestration estimates for fuel reduction treatments (based on generalized Carbon sequestration estimates provided by *Forest Ecology and Management* 261 (2011) 1115–1120 "High-severity wildfire effects on carbon stocks and emissions in fuels treated and untreated forest" by Malcolm P. North and Matthew D. Hurteauc).

- Inherent forest ecosystem variability, combined with the various fuel treatment methods available, presents potential opportunities for additional carbon sequestration. The values included above are designed to be conservative. As such, no attempt was made to account for the highly variable levels of vegetation surviving wildfires and continuing to accumulate carbon with the planted trees, nor of the materials removed and utilized for biofuel or forest products (such as lumber).

- New investment will allow California National Forest to increase their capacity to complete restoration work and they should be able to complete approximately 500,000 acres a year by 2020.

- Urban Forestry – Funding baseline is at $2,000,000 combined for State and Federal agencies. Increasing funding to $4,000,000 and planting an additional 300,000 trees annually above the baseline of 100,000 trees annually.

Forest Sector Investment Opportunities for California's Cap & Trade Allowance Auction Revenue*

Executive Summary

Almost one-third of California is forestland. These forests present the safest, most expandable method for actually *removing* CO2 from the atmosphere. However, California's forests are under significant threat. Investment of allowance auction revenue in forest-sector projects, including in disadvantaged communities in rural and urban areas, would fulfill the letter and spirit of the relevant laws, and would help ensure that forests are part of the climate change reduction solution, rather than a source of emissions.

Several State and federal agencies possess the needed expertise and existing programs to administer such investments. Further, peer reviewed rules and mechanisms exist to ensure that GHG emissions reductions associated with many forest carbon projects provide real, quantifiable and transparent benefits to California.

Cost-effective emission reductions from forests are coupled with a broad suite of critical co-benefits, including protecting water supplies, improving wildlife habitat, improving air quality, and creating jobs. Investments in the forest sector will achieve cost-effective reductions while also helping California prepare for climate change impacts that threaten these ecosystem services.

Absent a significant and ongoing investment in protecting watersheds and making forests more resilient, our natural environment and increasingly climate-stressed forests will be subject to insects, disease and unnaturally intense fires, jeopardizing California's most critical source of water, eroding our timberland base, threatening the viability of the forest products industry and fragmenting wildlife habitat that supports numerous threatened species.

In addition, our built environment, which is constantly expanding through ongoing rural and urban development, population growth and land use changes, will continue to adversely impact air quality for California's residents and disadvantaged communities. Investing in forest sector projects can help contain sprawling development and mitigate adverse air quality impacts.

Given this, California should prepare for climate change impacts that threaten forest ecosystem services and invest auction revenue in forest activities that further the goals and objectives of AB 32 with genuine greenhouse gas reductions as a threshold requirement.

This document contains recommendations for the investment of allowance auction revenue in the forest sector in a manner consistent with the legal requirements governing the use of these funds, and is supported by a diverse group of stakeholders.

The recommendations herein are consistent with the 2010 Fire and Resource Assessment Program (FRAP) and the AB 32 Climate Change Scoping Plan, which identified numerous forestry sector opportunities for additional greenhouse gas (GHG) reductions as further detailed in the document and summarized in the attached chart.

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* Developed by the Ad Hoc Forest Sector Cap and Trade Allowance Work Group

	Forest Conservation	Forest Improvement	Fuels Management	Reforestation/ Afforestation	Urban Forests
Description	Use of conservation easements or acquisition to avoid emissions that result from removal of forest and new GHG-emitting land uses; increase rate and amount of carbon sequestration over time; guide future management to improve resilience.	Increase rate of capture of carbon (biomass) on merchantable sized trees through thinning, planting, or removal of competing brushy vegetation.	Linear or area fuel reduction treatments to reduce fire intensity and emissions, protect communities, increase resilience of forest, develop older forest conditions	Planting of trees in areas where they have been found previously (e.g., areas burned in wildland fires, or under-stocked forestland)/planting of trees in area where they have not been present historically.	Plant new trees and properly maintain and grow existing urban forests to increase carbon sequestration in California's urban and rural areas & disadvantaged communities
Co-benefits	Create jobs, sustain state water supply, improve habitat and encourage adaptation. Associated economic activity supports disadvantaged rural economies. Secures carbon gains made from improved management.	Accelerate creation of bigger, older forest. Reduced fire hazard and associated emissions and damages. Biofuels from forest thinnings. Economic activity supports disadvantaged rural economies.	Reduced risk to life and safety; reduced costs and losses from large fires. Protection of watersheds, habitat, and water quality. Materials removed can provide biofuels. Economic activity supports disadvantaged rural economies.	Wildlife habitat, water quality, soil stability, adaptation via careful selection of planting stock. Economic activity supports disadvantaged rural economies. Restoration of fire-damaged landscapes.	Urban forests create jobs, improve water and air quality, and reduce energy consumption. Urban trees enhance communities and increase property values. Wood waste can provide a source of biofuels. Projects can be targeted to disadvantaged communities.
Scale of Opportunity	The 2010 FRAP Assessment identified over 2 million acres of private forestland at risk (high or medium) from development, with substantial additional acreage where working forest conservation easements could guide management to increase carbon stocks and ensure better management in perpetuity.	The 2010 FRAP Assessment identifies 2.6 million acres of non-reserved public and 1.8 million acres of private forestland as needing improvement due to under stocked or over stocked conditions. The National Forests have an identified need of over 266,000 acres of precommercial thinning.	The FRAP 2010 Assessment identified 7.7 million acres of forestlands (private and public) as high priority landscapes for preventing wildfire threat to ecosystem health.	The 2010 FRAP Assessment identified that 278,000 acres of non-reserved public forestlands and 253,000 acres of private forestlands need reforestation. The National Forests have an identified reforestation need of over 123,000 acres.	200 million tree planting sites identified. The FRAP 2010 Assessment identified 372 urban areas that are high priority for tree planting for energy savings and air pollution reduction, totaling 800,000 acres.
Implementing Entities and Existing Programs	Wildlife Conservation Board, State Coastal Conservancy, Sierra Nevada Conservancy, CAL FIRE, other state agencies, and US Forest Service.	CAL FIRE, Sierra Nevada Conservancy, , Resource Conservation Districts, US Forest Service, Bureau of Land Management, and Natural Resources Conservation Service	CAL FIRE, Sierra Nevada Conservancy, Sierra Coordinated Resource Management Council, US Forest Service, Bureau of Land Management, Fire Safe Councils, and local fire districts.	CAL FIRE, State Department of Parks and Recreation, US Forest Service, Bureau of Land Management, and Natural Resources Conservation Service.	CAL FIRE, US Forest Service, local governments, and state-wide, regional, and local nonprofit organizations.

Forest Sector Investment Opportunities for California's Cap & Trade Program Allowance Auction Revenue

February 28, 2013

Almost one-third of California—31 million acres—is forestland, and urban areas comprise an additional 5 million acres. The state's wildland and urban forests represent the most powerful and expandable terrestrial opportunity to remove carbon dioxide from the atmosphere and safely store carbon in trees. In addition to greenhouse gas (GHG) reduction benefits, forests provide water, protect watersheds and water quality, improve air quality and habitat, provide sustainably-produced forest products and biomass for renewable energy production, and offer opportunities to invest in disadvantaged communities. Additionally, urban forest projects reduce emissions by providing shade that reduces the energy used for cooling homes.

Unfortunately, these forested landscapes face a host of pressures that threaten their ongoing ability to provide critical human and ecosystem services. Competition from more lucrative land uses, such as residential and commercial development, and agricultural uses like vineyards, can drive conversion of forests to other uses. Chronic budgetary constraints at the local level have resulted in poor to non-existent maintenance of our state's urban forests. Similarly, constrained budgets and other factors have resulted in low levels of maintenance of much of the public forestlands in the state.

Past management and nearly a century of fire suppression have led to dramatically unnatural and excessive fuel loads that increase forests' susceptibly to severe, damaging fires. New threats from invasive insects and diseases are currently taking a significant toll on some tree species. A shifting and unpredictable climate is causing unprecedented stresses on California's native forest ecosystems. **Absent a concerted effort and investments from both public and private stakeholders to counteract these trends, the services and benefits that we rely on from our forests may be greatly diminished in the future.**

The opportunity now exists to strategically and sustainably invest in the forest sector and protect these vital resources while remaining consistent with the AB 32 Climate Change Scoping Plan and applicable state laws.

Specifically, the Scoping Plan identified the following forestry sector opportunities for additional greenhouse gas (GHG) reductions:

- Forest Conservation
- Forest Stand Improvement
- Reforestation and Afforestation
- Urban Forestry
- Fuels Management

An additional forestry sector opportunity, which is crosscutting with several of the above activities, is the use of forest materials for renewable bio-energy production. The use of material in this manner maximizes the GHG reduction benefits in a variety of ways, particularly when compared to other alternatives of disposing of forest materials, such as open pile burning. Further, as identified below, these forestry sector opportunities also offer a number of

significant environmental, economic, and social co-benefits in addition to GHG reduction. All recommended forestry sector investments also meet a high level of transparency and legal nexus, with several also addressing the needs of disadvantaged communities.

CO-BENEFITS

The forest sector presents a number of cost-effective opportunities for investments that achieve substantial environmental and economic co-benefits in addition to carbon sequestration. These multi-benefit projects would increase forest resilience and promote the many important services California's forests provide, including:

- Ensuring a long-term carbon bank
- Serving as the predominant source of the state's water supply;
- Sustaining habitat for many fish and wildlife species;
- Supporting aesthetic and recreational uses of our forest resources;
- Reducing wildland fire threats to life and property, while improving air quality and maintaining other environmental values;
- Creating healthier, cleaner, and safer communities with a higher quality of life;
- Diversifying and stabilizing rural forest economies;
- Supplying a sustainable source of lumber and other forest products that continue to sequester carbon throughout their useful life;
- Providing non-exportable forestry-related jobs in both rural and urban areas;
- Producing renewable energy from hydropower and biomass;
- Supporting extensive recreational and tourism opportunities and the associated benefits to local economies.

LEGAL CONSIDERATIONS

Proceeds from the cap and trade auction must be invested in activities that help advance the goals of AB 32. The primary goal of AB 32 is to reduce California's greenhouse gas emissions to 1990 levels by 2020. The statute also identifies secondary goals, including: "Maximize additional environmental and economic benefits for California, as appropriate."[1]

In addition to the goals identified in AB 32, the enactment of AB 1532 (Perez) provided additional guidance on the goals and objectives to be considered when developing the investment plan for the cap and trade revenue.

This law requires the investment plan to do all of the following:

(1) Identify the state's near-term and long-term greenhouse gas emissions reduction goals and targets by sector[2];

[1] Health and Safety Code 38570(b)(3)

[2] It should be noted that the Sustainable Forest target in the 2008 Scoping Plan – to maintain 5 MMTCO2 of sequestration annually – is now widely believed to significantly underestimate current sequestration, as well as the opportunity for additional gains from new investments. As such, the Investment Plan should consider the 2008 Scoping Plan goals and targets for the Forest Sector as minimums, and aim for greater reductions.

(2) Analyze gaps, where applicable, in current state strategies to meeting the state's greenhouse gas emissions reduction goals by sector; and
(3) Identify priority programmatic investments of moneys that will facilitate the achievement of feasible and cost-effective greenhouse gas emissions reductions toward the achievement of greenhouse gas reduction goals and targets by sector[3], consistent with subdivision (c) of Section 39712.

AB 1532 specifically authorizes utilization of revenues for GHG reduction associated with natural resource management and conservation and forestry [Health and Safety Code § 39712(c)(3)]. Investing allowance auction revenues in California's forested landscapes will help maintain and increase forest carbon stocks. These investments will create resilient forests that are well positioned to adapt to a changing climate while achieving myriad other environmental and economic co-benefits.

A legal review prepared in March 2012 by the Emmett Center on Climate Change and the Environment at UCLA reinforces the need to rely on existing statutes and case law to guide the appropriate expenditures of auction revenues. This study notes that "projects that reduce greenhouse gases, paid for from the specialized auction revenue fund, will be low risk even if they aim to achieve multiple purposes. This is especially true when all purposes reflect AB 32 goals."

Dedicating allowance revenues to California's forests represents just such an opportunity. This low-risk, high-return investment will reduce greenhouse gasses by sequestering more carbon and reducing the risk of GHG emitting catastrophic wildfire, while satisfying the multiple legal requirements of AB 32, AB 1532, and SB 535.

AB 1532 further dictates:

(b) Moneys shall be used to facilitate the achievement of reductions of greenhouse gas emissions in this state consistent with this division and, where applicable and to the extent feasible:
(1) Maximize economic, environmental, and public health benefits to the state.
(2) Foster job creation by promoting in-state greenhouse gas emissions reduction projects carried out by California workers and businesses.
(3) Complement efforts to improve air quality.
(4) Direct investment toward the most disadvantaged communities and households in the state.
(5) Provide opportunities for businesses, public agencies, nonprofits, and other community institutions to participate in and benefit from statewide efforts to reduce greenhouse gas emissions.
(6) Lessen the impacts and effects of climate change on the state's communities, economy, and environment.

[3] It is our hope that this document helps identify gaps in current state strategies and programmatic investments in the forest sector, as required by subsections (2) and-(3) of this section.

Many investments in the forest sector meet all six of these criteria, and actually result in a net removal of carbon from the atmosphere, rather than simply slowing the rate of emission, as would be the case in most other investment categories.

Further, it is worth noting that investments in forests are outside of the "cap" and therefore achieve greater emission reductions than investments in "capped" sectors. Capped sectors are required to achieve reductions under the regulation, so additional investments in these sectors reduce the compliance burden for capped entities, but without achieving additional emission reductions overall.

TRANSPARANCY

High quality carbon inventories, accounting, and monitoring are essential for the credibility of GHG emission and sequestration. In some cases, the"production functions"for GHG emissions and sequestration are well understood. For example, the methodologies for assessing GHG benefits for forest conservation projects are well developed. In other cases, such as fuel reduction activities, better information and additional research is needed. Since these kinds of information are essential to transparent and credible GHG emission reduction and sequestration efforts, it may be necessary for funds to be made available to support inventories, accounting, monitoring, and related research needed in the forestry sector and other sectors.

While more work may be needed to better quantify the GHG benefits and costs of some projects, it is clear that these projects have significant potential to sequester carbon and reduce emissions over time. Moreover, forest sector projects provide multiple and substantial co-benefits that should be taken into consideration when evaluating these projects.

DISADVANTAGED COMMUNITIES

In addition to the investment considerations outlined above, SB 535 requires that the Investment Plan allocate at least 10% of the funds to projects within disadvantaged communities, and requires that at least 25% of the funding provide benefits to these communities. Forests can play a pivotal role in both urban and rural disadvantaged communities in meeting these obligations around the state through job creation, energy savings, improved public health, safety, environmental and community well-being.

An American Lung Association Report published in 2012 provides California with the dubious distinction of capturing the top 5 spots on worst air polluted cities in the nation. Increasing canopy cover through creating and sustaining urban and community forests can reverse that trend. It also moderates the urban heat island effect and its associated energy use and health impacts. Forest sector investments can also provide aesthetic and emotional benefits to communities by supporting wildlife species, improving or reconnecting fragmented habitats and restoring areas degraded through years of neglect.

Many rural communities in the forested areas of California are facing very difficult economic and social conditions due to a number of factors, including significant contraction in the forest products industry. Communities dependent on this sector as a significant contributor to their economy have not seen other sectors develop sufficiently to mitigate these impacts. Median family income is among the lowest in the state in some of these rural communities, with an above average percentage of families living below the poverty line. The conditions in these

communities often go deeper than the current economic distress and will be more difficult to address, even as economic conditions improve at the state level.

Investing in forest restoration efforts will not only have the positive impacts described elsewhere in this document, but will make a significant difference in the economic and social well-being of these communities that are found in both urban and rural areas.

SPECIFIC EXAMPLES OF APPROPRIATE FOREST SECTOR PROJECTS

An analysis by CAL FIRE (CAL FIRE 2010) indicated that status quo management of forestlands in the state would sequester over 30 MMCO2E (net) annually over a ten-year period. Investments in additional forestry sector projects have the potential to assure that this level of net sequestration is attained (e.g., through avoiding land use conversion, forest degradation, reduction of fire threat, and addressing forests pests) or exceeded (e.g., through projects that will increase the rate of net sequestration and increase the stock of carbon stored in forests).

Investment opportunities in the forest sector generally fall into the five categories detailed below. Note that there are existing, scalable state programs ready to accept funding and immediately implement these projects. Federal entities such as the Forest Service, Natural Resources Conservation Service, and Bureau of Land Management also have capacities to help realize these opportunities. While not discussed in its own section below, use of woody materials from forestlands and urban forests for bioenergy is another area that has potential to reduce overall carbon emissions in the long term by replacing fossil fuels with renewable fuels. As compared to open pile burning, use of woody biomass in energy plants greatly reduces the release of a number of criteria air pollutants.

FOREST CONSERVATION

Conservation of forests threatened with conversion or degradation is a key action that both prevent the emissions associated with loss of forest stocks while also securing additional carbon sequestration into the future. Protecting and enhancing California's forest carbon banks can be achieved through either conservation easements or fee title purchase.

Conservation easements allow the state or qualified land trusts to collaborate with the landowner to develop site-specific guidelines for enhancing resource values, including increased carbon storage, while keeping the property in private ownership and management. While more expensive, fee title acquisition allows the state or non-profit partners to directly manage strategically important threatened forest for the public good when such conservation cannot be achieve in a public-private partnership. Both approaches can facilitate increased public access and recreation.

Additional co-benefits of forest conservation include:

- Improved forest management for climate and habitat benefits, including site-specific conservation prescriptions and support for adaptation;
- Watershed conservation to maintain water sources and quality;
- Prevention of sprawling land use patterns that lead to auto-dependency, increased carbon dioxide emissions, and resource inefficiencies.

Implementation: The Wildlife Conservation Board, Coastal Conservancy, Sierra Nevada Conservancy, CAL FIRE or other state agencies that already have programs in place are well-equipped to administer the easement and acquisition programs. Nonprofit land trust organizations or local open space districts are often important partners in these transactions. CAL FIRE is well-positioned to oversee the quantification of the carbon that would be sequestered under the terms of an easement, while the Department of Fish and Game can ensure that easements are properly managed biologically and contribute to achieving the goals of the State Wildlife Action Plan by creating a resilient forest environment. Easement compliance is monitored annually by a state agency or a qualified land trust, and may be structured to require no ongoing cost to the state.

FOREST STAND IMPROVEMENT

Many of California's forests, notably those held by smaller forestland owners and lands managed by the US Forest Service and other public agencies, are unnaturally dense due to decades of fire exclusion and minimal levels of management. Hundreds of thousands of acres of forest are in need of thinning to improve growth rates and to remove fire-prone vegetation. These forests will accumulate carbon more quickly and store more carbon over time if they are returned to a healthier, more natural condition.

Investments in forest stand improvement, such as thinning, will increase the rates at which carbon is sequestered and captured in larger, longer lasting trees. These projects also often contribute to the reduction of fuel loads, thus helping to reduce the intensity of fires and making forest carbon stores more stable by increasing the resiliency of the forest to the otherwise inevitable stand replacing wildfire. The near-term carbon emissions associated with thinning or other forest management projects can be reduced if the waste material is used at a local biomass facility to generate energy, and will eventually be offset through the increase of stand growth following treatment.

These forest improvement investments also reduce forest susceptibility to climate stressors such as drought, insects, and disease. Further, they also accelerate the development of older forest habitat conditions that have been shown to sequester carbon at a greater rate than younger forests and provide important wildlife habitat values. Overall, healthy, stable forests are more biologically rich and ecologically diverse than overgrown, unthinned forests.

The co-benefits of improved forest management include:

- Accelerating the creation of older forest conditions;
- Creating renewable energy through biomass utilization;
- Improved management of water supply and quality;
- Providing access within and through forest ecosystems for wildlife, improving connectivity and movement across forest landscapes;
- Creating immediate blue-collar jobs in the woods, especially in disadvantaged communities, which are particularly important while timber harvesting is at a historic low due to the slow construction economy;
- Improving water quality (thereby requiring less in the way of downstream treatment) and aquifer recharge; and,
- Reducing fire damages and associated GHG emissions and suppression costs.

Implementation: This program could be administered by a number of entities through existing programs, including CAL FIRE, the Sierra Nevada Conservancy, the Natural Resources Conservation Service, local Resource Conservation Districts, and the US Forest Service and Bureau of Land Management on federal lands. Stand improvement activities should be coordinated with state or federal wildlife agencies to guide habitat outcomes. Existing legal tools could be applied to ensure lasting carbon sequestration benefits.

FUELS REDUCTION

Large portions of California have forests that are at very high risk of wildfire, and many of these forests are at increased risk because of high fuel loads resulting from past management actions and a legacy of fire suppression. While fire is a fundamental aspect of California's ecology, investments in fuel reduction projects can help reduce the intensity of fires, making forest carbon stores more stable by increasing the resiliency of the forest to the inevitable wildfire. The near-term carbon and particulate emissions associated with the thinning and pile burning can be partially offset if the waste material is used at a local biomass facility to generate energy, and will eventually be offset through the release of growth following treatment. While fuels reduction is a promising measure for increasing carbon sequestration, further study is needed to better quantify its net carbon sequestration benefits.

Important co-benefits of forest fuel reduction and its effects on wildland fires include:

- protection of water quality, benefitting water supply and fisheries;
- providing short-term increases in water yield;
- reducing costs and losses associated with wildland fires, including suppression costs to federal, state, and local governments; and,
- providing fire fighters with safer areas from which to fight fires.

Implementation: CAL FIRE has fuel reduction programs focused on nonfederal lands, and the Sierra Nevada Conservancy funds fuel reduction on public and private lands through grants to Fire Safe Councils, local/State/federal agencies and other partners. The Forest Service and Bureau of Land Management conducts fuels management work on federal lands. The Forest Service and other federal agencies also provide grant monies for fuels reduction work on nonfederal lands. These monies are utilized through CAL FIRE, the state and local Fire Safe Councils, local Fire Safe Councils, local fire agencies, and other cooperators.

REFORESTATION AND AFFORESTATION

Replanting areas that were formerly forested or are currently under-stocked offer significant carbon sequestration opportunities, especially over a longer time horizon. Areas of opportunity include conifer forests not reforested after severe fire and fallow agricultural lands, as well as riparian hardwood reforestation at lower elevations. Reforestation opportunities are present on both private and public forestlands.

The co-benefits of reforestation include:

- Increased forest canopy shading could seasonally slow melting of snowpack and lead to slower release of runoff water. A more persistent snowpack would reduce needs for downstream water storage in reservoirs, and would reduce the potential and intensity of floods and their associated flood management activities.

- Erosion control and improved soil conditions would reduce sediment and dissolved material content of runoff, leading to improved water quality and reduced municipal water treatment costs and energy use.
- Improved forest habitats for species directly affected by climate change or species indirectly affected by existing stressors such as lost, degraded or fragmented habitats which can be exacerbated by climate change.
- Providing an opportunity to replant sites with native species and seed sources that are better adapted to changing climate conditions.
- Significant employment opportunities.

While less common, afforestation (planting trees where they have not been present historically) also can contribute to increased carbon storage. Water availability, changes in habitat types and other ecological considerations must be addressed in the development and implementation of these projects. Species and seed source selection must be done carefully, with full evaluation of site conditions and changing climate. Invasive tree species must be avoided.

Implementation: Implementing agencies for this program would be similar to the Forest Stand Improvement program, described above. CAL FIRE's reforestation seed bank and the Forest Service's reforestation nursery and seed bank, along with several commercial reforestation nurseries, are important resources for this effort.

URBAN FORESTRY

More than 95% of Californians live in an urban area and depend on the multiple ecosystem services, social, and economic benefits of urban forestry. Maintaining existing urban forests sustains current carbon sequestration benefits estimated at 4.5 MMTCO2E annually, while planting more trees offers significant new GHG reduction opportunities that will increase over time. Urban forests also improve the aesthetic and emotional connection between people and nature, provide local jobs, reduce residential energy consumption, and benefit disadvantaged communities.

The co-benefits of urban forestry include:

- Increasing shade that reduces heat island effect, protecting public health, lowering cooling bills, and saving energy;
- Strengthening property values and tax base;
- Improving air and water quality;
- Reducing urban runoff from impervious surfaces and associated non-point source urban runoff pollution, leading to reduced municipal water treatment costs and energy use.
- Providing fish and wildlife habitat and the connection of urban dwellers to nature.
- Creating jobs planting and maintaining trees.

Implementation: Evaluation of potential urban forestry opportunities could be performed by CAL FIRE through the existing Urban and Community Forestry Program. Important collaborators include a range of state and nonprofit urban forestry organizations, local governments, and the US Forest Service.