
SENATE COMMITTEE ON ENVIRONMENTAL QUALITY

Senator Allen, Chair

2021 - 2022 Regular

Bill No: AB 284
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Version: 4/14/2021
Urgency: No
Consultant: Rylie Ellison

Hearing Date: 6/28/2021
Fiscal: Yes

SUBJECT: California Global Warming Solutions Act of 2006: climate goal: natural and working lands

DIGEST: This bill requires the California Air Resources Board (ARB) to identify a 2045 climate goal, with interim milestones, for the states natural and working lands (NWL) to sequester carbon and reduce atmospheric greenhouse gas (GHG) emissions.

ANALYSIS:

Existing law:

- 1) Under the California Global Warming Solutions Act of 2006 (Health and Safety Code (HSC) §38500 et seq.):
 - a) Establishes ARB as the state agency responsible for monitoring and regulating sources emitting GHGs.
 - b) Requires ARB to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 (AB 32, 2006) and to ensure that statewide GHG emissions are reduced to at least 40% below the 1990 level by 2030. (SB 32, 2015)
 - c) Requires ARB to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions and to update the scoping plan at least once every 5 years.
 - d) Requires ARB when adopting regulations, to the extent feasible and in furtherance of achieving the statewide GHG emissions goal, to do the following:
 - i) Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

- ii) Ensure that activities pursuant to the regulations do not interfere with efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.
 - iii) Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.
 - iv) Consider cost-effectiveness of these regulations.
- 2) Restricts ARB to only adopting GHG rules and regulations that are consistent with the most recent scoping plan update. (HSC §38592.5)
- 3) States that it is the policy of the state that the protection and management of NWL is an important strategy in meeting the state’s GHG emissions reduction goals, and that the protection and management of those lands can result in the removal of carbon from the atmosphere and the sequestration of carbon in, above, and below the ground, using the following definitions (Public Resources Code (PRC) §9001 et seq.):
- a) “Natural lands” are lands consisting of forests, grasslands, deserts, freshwater and riparian systems, wetlands, coastal and estuarine areas, watersheds, wildlands, or wildlife habitat, or lands used for recreational purposes such as parks, urban and community forests, trails, greenbelts, and other similar open-space land.
 - b) “Working lands” are lands used for farming, grazing, or the production of forest products.
- 4) Tasks the California Environmental Protection Agency (CalEPA), working with the California Department of Food and Agriculture (CDFA), Department of Forestry and Fire Protection (CalFIRE), and the Forest Management Task Force, with promoting a goal of reducing at least five million metric tons of GHG emissions per year through the development and application of compost on working lands, which include, but are not limited to, agricultural land, land used for forestry, and rangeland. (PRC §42649.87)

This bill:

- 1) Makes findings and declarations about California’s stake and actions in global climate change.
- 2) Declares it is the intent of the Legislature that:

- a) All policies and programs undertaken to achieve carbon neutrality seek to improve air quality and support the health and economic resiliency of urban and rural communities, particularly low-income and disadvantaged communities.
 - b) All policies and programs undertaken to achieve carbon neutrality be implemented in a manner that supports climate adaptation and biodiversity, including the protection of the state's water supply, water quality, and native plants and animals.
 - c) State agencies engage the support, participation, and partnership of universities, businesses, investors, and communities, as appropriate, to achieve GHG emissions reductions goals.
- 3) Requires ARB, in collaboration with CNRA and other relevant state agencies, no later than January 1, 2023, as part of the next scoping plan update, to:
- a) Identify a 2045 climate goal, with interim milestones, for the state's NWL to sequester carbon and reduce atmospheric GHG emissions in a manner that complements other climate and resource goals.
 - b) Identify practices, policy and financial incentives, market needs, and potential reductions in barriers that would help achieve these climate goals.
 - c) Include recommendations developed by the CDFR and CNRA regarding technical assistance to landowners and local governments to facilitate implementation of activities that sequester carbon, reduce GHG emissions, and enable access to markets and incentives.
 - d) Identify opportunities to enhance co-benefits, including climate resilience, particularly for vulnerable communities; the enhancement of air and water quality, public health, jobs, species habitat; public access to recreation, and emissions reduction in other sectors.
- 4) Requires ARB, no later than January 1, 2024, to develop standard methods for state agencies to consistently track GHG emissions reduction, carbon sequestration, and, where feasible, additional benefits from NWL over time.
- 5) Requires ARB, CNRA, and other relevant state agencies to update subsequent scoping plans.

Background

- 1) *Natural and Working Lands (NWL)*. California's NWL include rangelands, forests, woodlands, wetlands, grasslands, shrubland, farmland, riparian areas, and urban green space. They cover more than 90 percent of the State and supply life-sustaining resources including clean water, air, food, and fiber. With their potential to sequester carbon, reduce GHG emissions, and increase the capacity for California to withstand inevitable climate impacts, these lands are a critical component of California's integrated climate change strategy. However, some sources show that California's NWL are a net GHG source, losing more carbon than they are sequestering, with wildfire being the largest cause of carbon loss. A number of entities in California's executive branch are developing policy and implementing programs to mitigate disturbances on natural and working lands and protect these lands from conversion to more intensive land uses.

- 2) *Nature-Based Climate Solutions*. Last year, The Nature Conservancy (TNC) of California released a report titled *Nature-Based Climate Solutions: A Roadmap to Accelerate Action in California* outlining 12 nature-based solutions and associated strategies suitable for implementation across 28 million acres of California's NWL. These solutions include: urban reforestation, reducing wildfire severity, post-wildfire restoration, wetland restoration, avoided conversion of natural land, and sustainable agricultural practices. They claim that, if enacted now, under the most ambitious scenarios these strategies could reduce GHG emissions by more than 500 million metric tons (MMT) cumulatively and save over \$24 billion in damages by the year 2050. For comparison, California's total economy-wide GHG emissions in 2018 were 425.3 MMT.

However, GHG mitigation estimates come with a high degree of uncertainty. The declining health and net GHG emissions of the State's lands are expected to increase through a negative feedback loop as climate change further stresses these systems. With more frequent and intense drought, wildfire, pest outbreaks, and other impacts, it will only become more challenging to achieve climate change mitigation goals. In addition to climate factors, it is extremely challenging to parse out the complex interactions between natural carbon cycles and human activity. In a recent study on GHG emissions from the Amazon rainforest, one co-author stated "[I]t's made up of moving parts: multiple climate forcers, not just carbon but also methane, nitrous oxide, particulates and biophysical effects, each being acted on by human stressors that range from dam building and hunting to climate change...Synthesizing these changes is a huge challenge."

While there is some uncertainty around the scale of GHG mitigation potential of NWL under a changing climate, nature-based mitigation projects can provide substantial co-benefits to ecosystems and communities. The TNC report identifies several co-benefits that nature-based solutions can provide, including habitat resilience, groundwater recharge, flood risk reduction, and creating open space for communities. Of the 28 million acres of land identified in the report, more than 60 percent fall within disadvantaged and low-income communities, meaning these projects and how they are prioritized have sizable equity impacts as well.

- 3) *Natural and Working Lands Climate Smart Strategy*. Last October, Governor Gavin Newsom signed Executive Order (EO) N-82-20, which is a call to action on the biodiversity and the climate change crises through nature-based solutions. In EO N-82-20, Governor Newsom sets the goal of 30% conservation of California's land and coastal waters by 2030 and directs CNRA to develop a strategy to achieve that goal by February 2022. It also directs an interagency working group, led by CNRA, to develop a Natural and Working Lands Climate Smart Strategy that serves as a framework to advance the state's carbon neutrality goal and build climate resilience.
- 4) *ARB's NWL Inventory*. The NWL Inventory is a quantitative estimate of the existing state of ecosystem carbon stored in the State's land base (separate from the California GHG Emissions Inventory). It provides estimates of carbon stocks, stock change, and resulting GHG flux associated with changes in California's landscape, and attributes those changes to disturbances. The data from the 2018 estimates that in 2014, there was 5,340 MMT of carbon (19,600 MMT CO₂-equivalents) in California's ecosystems, but that they have had a net loss of an estimated 630 MMT of CO₂-equivalents from 2001 to 2014, primarily due to wildfires. The historic 2020 wildfire season alone is estimated to have released 112 MMT of CO₂. To put this in perspective, the 1990 annual emission level enshrined as AB 32's 2020 goal was roughly 431 MMT. Notably, the CO₂-equivalent emission contribution of wildfires is not included in ARB's calculations used to evaluate statewide emission levels. ARB has stated they are still working to understand and project both human- and naturally-caused wildfire GHG emissions, building on the work done for the NWL inventory.
- 5) *Counting Carbon*. CNRA, in collaboration with ARB, CDFA, CalEPA, and the Governor's Office of Planning and Research (OPR), are engaged in development of the California Natural and Working Lands Carbon and Greenhouse Gas (CALAND) model. The model is being developed by Lawrence Berkeley National Laboratory (LBNL) under contract to CNRA, and

began development in August 2016. CALAND is a data-driven, empirical model of the California landscape carbon budget and associated GHG emissions. It considers ecosystem carbon exchange, wildfire, land use based cover change, and a suite of management practices. Annual emissions of carbon dioxide, methane, and black carbon are calculated based on the respective carbon pathways within the overall carbon budget. The utilization of forest biomass for wood products and bioenergy is also included, and their respective emissions are also quantified. A first iteration of the model was used for the 2017 Scoping Plan Update, and an updated model will likely be used as part of the 2022 Scoping Plan Update as well. Most of the State planning and goal-setting is based on this model, as well as others like COMET-Planner for agricultural land management practices.

- 6) *NWL in ARB's 2017 Scoping Plan.* Pursuant to the AB 32 requirement that ARB prepare (and update every five years) a Scoping Plan to achieve the maximum technologically feasible and cost-effective reduction of GHG emissions, ARB released the latest update of the Scoping Plan in 2017. Among other topics and GHG emission sources, the 2017 Scoping Plan discussed NWL in some depth. Briefly, the 2017 Scoping Plan proposes the following preliminary objectives for NWL in California:
- Ensure that NWL become a net carbon sink over the long-term and avoid at least 15-20 MMT of GHG emissions by 2030;
 - Measure and monitor progress by completing ARB's NWL Inventory and implement tracking and performance monitoring systems; and,
 - Unleash opportunity in the agricultural sector by improving manure management, boosting soil health, generating renewable power, electrifying operations, utilizing waste biomass, and increasing water, fertilizer, and energy use efficiency to reduce super pollutants.

These objectives are non-binding and non-regulatory, however AB 398 (E. Garcia, Chapter 135, Statutes of 2017) requires ARB to ensure all GHG rules and regulations adopted are consistent with the updated scoping plan. To accomplish these objectives and others, the Scoping Plan called for the participation of CNRA, the CDFG, CalEPA, and ARB to produce a draft 2030 Natural and Working Lands Climate Change Implementation Scoping Plan.

- 7) *The Draft 2030 NWL Climate Change Implementation Plan.* As directed by ARB's 2017 Scoping Plan Update, the 2030 NWL Climate Change Implementation Plan (Plan) is designed to reduce GHG emissions and to cultivate net carbon sequestration potential for California's natural and working lands. The 2019 draft for the Plan proposes that the State will strive to increase

fivefold the acres of cultivated lands and rangelands under State-funded soil conservation practices, double the rate of State-funded forest management or restoration efforts, triple the rate of State-funded oak woodland and riparian restoration, and double the rate of State-funded wetland and seagrass restoration through 2030. The projected climate outcomes of this level of effort is cumulative emissions of 12.4 to 35.9 MMT CO₂-equivalents by 2030 and cumulative emission reductions of around -84 MMT CO₂-equivalents by 2045, with the benefits of these actions expected to grow substantially over time, through 2100 and beyond. That means that the scientific assessment supporting this Plan found that activities such as forest fuel reduction will likely still result in near-term GHG losses, but long-term GHG reductions.

Comments

- 1) *Purpose of Bill.* According to the author, “Global carbon emissions have already passed the limit beyond which catastrophic climate change is possible. To prevent the worst impacts of climate change, a sizable amount of atmospheric carbon will need to put back into the ground. In preparation for the next California Air Resources Board (CARB) scoping plan update in 2022, Assembly Bill 284 directs CARB to incorporate and set an overall climate goal for carbon sequestration for the state’s natural and working lands. This legislation will ensure that the next scoping plan fully considers and leverages the huge power of California’s natural and working lands in achieving our ambitious greenhouse gas emission goals. The scoping plan is strictly a planning document that outlines how the state can meet our ambitious climate goals – it is not a land-use mandate for farmers or other private landowners. Through AB 284, the state will be able to establish relevant policy frameworks and set a climate goal for our natural and working lands, both of which will ultimately be critical to achieving California’s ambitious greenhouse gas reduction goals.”
- 2) *Efforts Already Underway.* AB 284 compliments and bolsters EO N-82-20, which directs ARB, as part of the next scoping plan process, to take into consideration the Natural and Working Lands Climate Smart Strategy and science-based data to update the target for the natural and working lands sector in achieving the state's 2045 carbon neutrality goal.

Several of the provisions of this bill are already underway across the state agencies. The 2017 scoping plan already included NWL, and according to the 2019 draft of the NWL Climate Change Implementation Plan, future updates of the scoping plan will “reflect this pivotal role for natural and working lands to

improve public health, contribute to climate goals, and sustain many ecosystem benefits.”

- 3) *Carbon and GHG Emissions Accounting on NWL*. Quantifying carbon and GHG flows in and out of a source is challenging in any real-world circumstance, and it becomes particularly difficult with natural sources because there is no clear baseline for carbon stored in NWL. Developing a system to account for changes in carbon in NWL is further complicated by a variety of factors (e.g. spatial and temporal heterogeneity, lack of granularity in models, climate factors, limitations on real-world measurements for verification, future policy changes, etc.). However, there are some fundamental questions that should be considered when accounting for carbon and GHG flows on NWL:
- a) *Positive Emissions*. As indicated in the NWL Inventory, NWL are currently a source of GHG emissions, and it is likely they will continue to be a source over the next decade, with or without state intervention. While certain actions have the potential to mitigate some of those emissions, it could be problematic to only track negative GHG emissions. This is particularly true if the carbon that is counted as removed is subsequently lost. For example, if a forest resiliency project gets credit for sequestering carbon but that forest still burns down, then that forest would still be counted as a carbon sink when it is in fact a carbon source. For the most accurate accounting, both reduction of GHGs and emissions of GHGs of NWL should be considered to ensure that the carbon accounting is balanced and reflective of reality.
 - b) *Permanence and Risk*. Depending on how and where carbon in NWL is stored, the permanence of CO₂ removal differs ranging from temporary (e.g. forests, soil) to effectively permanent (e.g. mineralization, geological). It is important to account for the length of time carbon is likely to be stored, the risks of increasing GHG emissions from NWL, and to reevaluate often, as those factors change over time. This is particularly true as the climate gets hotter and drier, reducing the amount of carbon that is stored naturally in NWL and increasing the risk of significant GHG emissions, i.e. from wildfires.

AB 284 requires ARB to develop standard methods for state agencies to consistently track GHG emissions reduction, carbon sequestration, and, where feasible, additional benefits from NWL over time. However, it does not provide direction on the how GHG emissions reduction or sequestration should be defined, or that positive GHG emissions should be tracked as well.

The author may wish to consider requiring ARB to:

- *Develop standard methods for tracking both positive and negative GHG emissions on NWL; and,*
- *Include the impacts of increasing fire risk, warming temperatures, decreasing precipitation, and other climate change impacts on the ability of the state to reduce GHG emissions and sequester carbon on NWL when developing climate goals.*

- 4) *Maximizing Co-benefits.* One strength of carbon sequestration projects on NWL are the co-benefits to air and water quality, biodiversity, and overall resilience to climate change.

As the projected climate outcomes from the 2030 NWL Climate Change Implementation Plan indicate, it may take longer than 2030 to begin to achieve negative emissions, even with substantial NWL conservation efforts. While relying on NWL to mitigate and offset emissions can be precarious based on the uncertainty of future outcomes, taking action on NWL to minimize wildfire risk, protect natural resources, and improve resilience of vulnerable communities from the worst impacts of climate change is essential.

AB 284 has provisions dictating that all policies and programs undertaken to achieve carbon neutrality should also seek to support the health and economic resiliency of urban and rural communities, particularly low-income and disadvantaged communities. These communities face the greatest risk from the worst impacts of climate change, such as flooding, extreme heat, water scarcity, wildfire, and more. Targeted projects on NWL have the potential to greatly improve resilience to these risks.

Managing primarily for carbon sequestration may not always be congruent with projects that maximize these co-benefits, and in some cases could have unintended effects. For example, reliance on forests for GHG mitigation raises several concerns if policy is not grounded on sound ecosystem and biodiversity science. Parties risk investing in fast-growing monocultures which may not maximize carbon storage long-term or are vulnerable to pests, disease, climate extremes.

A holistic approach to NWL, so that carbon sequestration, improving resilience, and protecting natural resources are considered simultaneously will help to ensure that there are no unintended consequences.

- 5) *Who Dictates Best Practices on NWL?* Historically, CNRA and CDFA have been the agencies that implement NWL policy and work with landowners and

other stakeholders in doing so. CNRA oversees and supports multiple departments that manage NWL and implement projects that yield climate benefits like the Sustainable Agricultural Conservation Program, the Forest Health Grant Program, the Wetlands Restoration for Greenhouse Gas Reduction Program, and the Urban Greening Grant Program. CDFA also oversees the Healthy Soils Program. While AB 284 requires ARB to consult with these two agencies and incorporate their recommendations for technical assistance to landowners and local governments, this bill would make ARB the lead agency in determining practices, policy and financial incentives, market needs, and potential reduction in barriers to meet the climate goals for NWL that ARB will also set.

Given ARB's primary expertise in quantifying GHG flows and the clear need for NWL to be regulated not just as GHG sinks/sources but as complex ecosystems providing myriad services, the author may wish to require ARB integrate recommendations from CNRA and CDFA into the scoping plan on:

- *Practices, policy and financial incentives, market needs, and potential reduction in barriers; and*
- *Opportunities to enhance co-benefits practices on NWL should be integrated in the scoping plan.*

6) *Interaction with other Bills.* SB 27 (Skinner) was introduced this year and overlaps with AB 284 by requiring the state to set carbon sequestration goals on NWL. That bill would have the CNRA, in coordination with the Cal EPA, ARB, and CDFA, establish carbon sequestration goals for natural and working lands to help the state meet its long-term climate goals to reduce atmospheric carbon and build resilience to climate impacts, no later than July 1, 2022. It would also require ARB, as part of its scoping plan, to consider a range of CO₂ removal targets, including those in line with the 2018 IPCC United Nations' Intergovernmental Panel on Climate Change (IPCC) report entitled *Global Warming of 1.5 degrees Celsius* as well as emerging research on CO₂ removal potential in California and market and technology conditions. This is similar, but slightly different to how AB 284 approaches carbon sequestration goals on NWL.

As the bill moves forward, the author should monitor each bill to ensure that they complement each other.

Related/Prior Legislation

SB 27 (Skinner, 2021) would create the California Carbon Sequestration and Climate Resilience Project Registry in order to maintain a list of eligible but

unfunded projects to mitigate California's GHG emissions and improve climate resilience. SB 27 is before the Assembly Committee on Natural Resources.

SB 582 (Stern, 2021) would, amongst other things, require CNRA, CalEPA, and ARB to develop a Climate Restoration Plan that specifies carbon removal targets before 2035. SB 582 was moved to the Senate inactive file.

AB 1395 (Muratsuchi, 2021) would declare that it is the policy of the state to achieve "carbon neutrality" as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. AB 1395 is before the Senate Environmental Quality Committee.

AB 2954 (Robert Rivas, 2019) was nearly identical to this bill. AB 2954 was held in the Senate Appropriations suspense file.

DOUBLE REFERRAL:

If this measure is approved by the Senate Environmental Quality Committee, the do pass motion must include the action to re-refer the bill to the Senate Natural Resources and Water Committee.

SOURCE: The Nature Conservancy (sponsor)
California Climate and Agriculture Network (sponsor)

SUPPORT:

350 Bay Area Action
350 Sacramento
350 Silicon Valley
Agriculture and Land-based Training
American Farmland Trust
Audobon California
California Association of Resource Conservation Districts
California Climate & Agricultural Network (CALCAN)
California Climate & Agriculture Network (CALCAN)
California Habitat Conservation Planning Coalition
California League of Conservation Voters
California Native Plant Society
Californians Against Waste
Californians for Pesticide Reform
Carbon Cycle Institute
Ccof
Ceres Community Project

Climate Center; the
Community Environmental Council
Defenders of Wildlife
Elders Climate Action, Norcal and Social Chapters
Environmental Defense Fund
Fibershed
Greenbelt Alliance
Marin Interfaith Climate Action
Mono Lake Committee
Nature Conservancy; the
Peninsula Open Space Trust
Pesticide Action Network
Pesticide Action Network North America
Planning and Conservation League
Roots of Change
Santa Clara Valley Open Space Authority
Save Mount Diablo
Sequoia Riverlands Trust
The Trust for Public Land

OPPOSITION:

Agricultural Council of California
American Pistachio Growers
California Association of Wheat Growers
California Bean Shippers Association
California Chamber of Commerce
California Cotton Ginners & Growers Association
California Farm Bureau Federation
California Fresh Fruit Association
California Grain and Feed Association
California Pear Growers Association
California Seed Association
California Walnuts
Western Agricultural Processors Association
Western Growers Association
Western Plant Health Association

ARGUMENTS IN SUPPORT: A joint letter from one of the sponsors, The Nature Conservancy, and three other conservation organizations argues, “The health of California’s natural and working lands is linked directly to the health of our climate and communities. The priority California places on stewarding and conserving these lands will determine how well we fight climate

change and prepare for climate impacts that will take a dramatic toll on our environment and our communities. California's lands can play a critical role in capturing and storing carbon emissions that contribute to climate change and its impacts."

ARGUMENTS IN OPPOSITION: A joint letter from 15 organizations representing the agriculture industry argues, "Simply setting an audacious climate goal, as proposed in the bill, will not suffice, unless it is built on a fully vetted strategy and matched with unambiguously consistent funding. Without these additional items addressed, we fear that the actions required in AB 284 will not help to meet the State's overall climate goals.

"We are also concerned about the practicality of developing statewide carbon sequestration and greenhouse gas emission reduction goals for natural and working lands. The inevitable impacts of future state policies and extreme weather events, such as drought and wildfire, will likely complicate the achievement of a statewide goal established at single point in time."

-- END --