

# Oaks 2040: Carbon Income Can Help Restore Oak Woodlands

By Tom Gaman

In the *Oaks 2040* series California Oaks established that statewide oak forests and woodlands could capture a billion tonnes of carbon dioxide (CO<sub>2</sub>) in this century<sup>1</sup>. On the other hand, the International Panel on Climate Change estimates that deforestation and forestry-related emissions account for 20% of total worldwide CO<sub>2</sub> emissions, and each lost oak tree contributes to that. This phase of California Oaks' *Oaks 2040* series explores the opportunities for landowners to sequester additional carbon, enhance oak woodlands through diversifying land uses and produce new carbon income streams.

The California Legislature, in efforts to combat climate change and emissions, created the California Climate Action Registry in 2001. That program has now evolved to become the Climate Action Reserve (CAR), a voluntary carbon exchange program available in the US, Canada and Mexico. CAR recognizes forests as being valuable and dynamic sinks for carbon dioxide. Unlike Kyoto Protocol and European carbon emissions reduction plans, CAR provides a voluntary system for forest and woodland owners to manage for carbon sequestration. Participating landowners can register and market carbon Climate Reserve Tonnes (CRTs or "Carrots") as they may be gained from oak woodland improvement, reforestation and avoided deforestation<sup>2</sup>.

It works like this. CAR has developed a carbon registration and verification program that is in conform-

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<sup>1</sup> For estimations on carbon in the various oak woodlands and forest types please see "*Oaks 2040 Carbon Resources in California Oak Woodlands*", available at [www.californiaoaks.org](http://www.californiaoaks.org)

<sup>2</sup> This article focuses on the CAR program, but potential project developers should know that other similar programs are also available such as those organized by the Regional Greenhouse Gas Initiative and the American Carbon Registry.

ance with International Standards Organization (ISO) and American National Standards Institute (ANSI) audit procedures. The core process is to define a project and, within its boundaries, to identify and measure carbon sources, sinks and reservoirs. Any public or private project developer reviews the woodland inventory and develops carbon sequestering management practices that create net climate benefits. These are calculated in terms of metric tonnes of CO<sub>2</sub>.

Each project requires "Attestation of Title" which is essentially a legal guarantee of ownership. It must also be demonstrated that the project is above and beyond legal requirements (e.g. it cannot be mitigation for some other project or otherwise required by law). Projects in forests and oak woodlands must assure that the committed lands within the project boundary will sequester measurable and verifiable carbon for a century, above and beyond baseline "business as usual" scenarios.

A team of third-party verifiers, each of whom is free of conflicts of interest and at least one of whom represents an insured ISO certified "verification body", follows the general forestry-specific project and verification protocols in a detailed review of the project developer's methodologies. At the conclusion of the process, the verification body provides an opinion on the project developer's emissions estimates. Verified emissions reductions are registered with CAR as CRTs which are deposited in project accounts, and are then available for sale, saving, or for use as carbon offsets. The process is completely transparent. Project development reports, verification opinions and annual monitoring documents for all projects are available for public review on the CAR website. All activities are subject to audit by ISO and ANSI as set forth for environmental programs in ISO 14064.

## TYPES OF PROJECTS & PROJECT DEVELOPER COMMITMENTS

Detailed protocols govern the process whereby CRTs are owned, measured, recorded, and tracked for permanence and retired. Industry-specific protocols have been developed for landfill and dairy organic waste and methane, ozone depleting chemicals, concrete production, forestry, urban forestry and electrical energy production. All of these processes have major potential to produce and reduce greenhouse gas emissions. A project developer “submits” a project for verification to CAR. CAR reviews the project and, if eligible, authorizes the project developer to proceed with the verification process and eventual registration of the CRTs.

Forest projects can be developed for reforestation (depleted forests and woodlands that have been disturbed and out of production for 10 years or longer), for “improved forest management” (a commercial sustainably managed forest or woodland which retains greater carbon inventory when measured against current regional common practice), or for “avoided conversion” (a conservation easement placed upon land that otherwise was slated for development). Urban forestry projects are restricted to public lands and may work well for parks,

municipal street trees or highway enhancement projects.

The required base carbon pools are standing live and dead trees, and are reported for all project types. Other significant and optional carbon pools include lying dead wood, shrubby and herbaceous layers, duff and litter, and soil carbon. Ground level and soil-borne carbon pools are very significant in oak woodlands and should be considered in any range or woodland project submittal.

Forest and woodland carbon volumes are measured through a sampling process called “forest inventory”. Statistical confidence deductions are subtracted from the inventory to provide CRT purchasers with absolute assurance that the tonnes of carbon are real and identifiable. Future forest growth, based on the management plan, is estimated 100 years into the future using science-based and peer reviewed forest stand modeling software (see Figure 1). The baseline is averaged over a century and is constant for the life of the project. The carbon tonnes available (CRTs) are those that are additional or above business as usual. They are shown above the red baseline in the chart below.

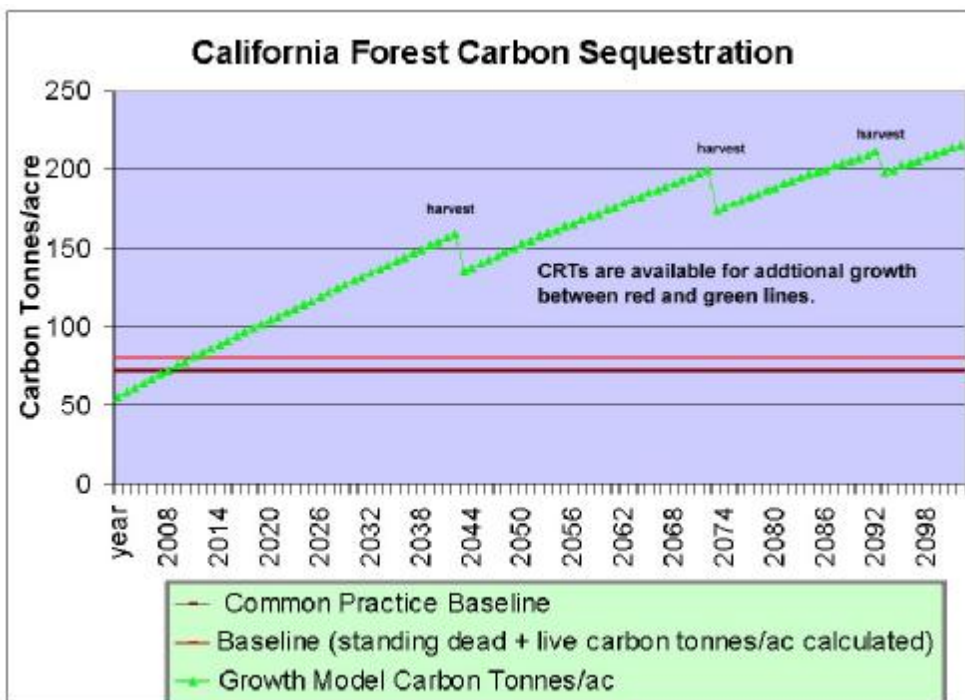


Figure 1. CRTs are available for carbon sequestration above the baseline. This redwood landowner gets no credit in the early years as the inventory is below the common practice baseline (shown in purple). CRTs are available for the “additional” growth above the baseline between the purple and green lines.

Projects are monitored regularly and a new third-party verifier assumes oversight of the audit process every six (6) years. Forms and reports are submitted to CAR annually. Every six years a site visit to the forest or woodland project is scheduled. Each site is audited by comparing the forest project inventory and continuing conformance to the principles of sustainable forestry. Every 12 years every forest inventory is updated. By accepting registered CRTs from CAR and placing them in their account, project developers are in turn committing to retain CRTs as additional for 100 years from the date of issuance. The carbon commitment is recorded on the property deed. In the case of family forests, this commitment will last for generations.

If a reversal occurs, the forest project is cancelled. If it is an unavoidable reversal such as windstorm or fire, the CRTs are compensated for by deduction of CRTs from the program mandatory reserve buffer. If a voluntary cancellation takes place, then the project developer must replace the cancelled CRTs with valid CRTs from another project, which could be expensive! Forest project owners can remove forest products if such harvesting was planned in advance, is sustainable, and the inventory is above and beyond the tonnes of carbon CRTs claimed.

## **OAK WOODLAND PROJECTS**

“Business as usual in oak woodlands” means cattle grazing. The problem with grazing in oak woodlands is that the young oak trees are also chewed, browsed and trampled. If not killed outright, years of continued grazing assures that young hardwood trees never grow to more than a few inches in height. Many ranchers, range managers and oak restorationists will be quick to tell you that removal of grazing is not the solution, as the result is usually a huge influx of invasive plants such as goat grass, medusa head and yellow star thistle. Such plants are not only unpalatable to cattle but they dry out the upper soil horizons and are very persistent.

Restoration of native perennial grasses and woodlands in California’s rangelands requires intensive landowner commitment, managed grazing, and time. The good news is that the oak trees will, if microclimates are managed with due consideration, reproduce naturally from acorns or planting of seedlings, often in a light nurse cover of native grasses and shrubbery. Trees can be planted with gopher protection, sun protection and browse protection from tree shelters. Greater success will be gained by planting in the fall so that acorns and seedlings gain from winter rainfall. Monthly watering of seedlings for two to three years during the dry months also produces better results.

Many open grassy spaces within oak woodlands were once woodlands themselves. Such areas are plentiful in California and these open areas are excellent locations for woodland restoration. Landowners can receive CRTs for their efforts under the reforestation and improved forest management project types. CAR registration essentially can provide an ongoing woodland management subsidy that helps to diversify ranch income, while the landowner benefits from the increased value of long-term conservation stewardship.

Land use practices, harvests, planting, habitat enhancement, range management projects, and other details can be spelled out in a property specific management plan. For oak woodland management plans, the strategic key is to manage microclimates that re-establish ecological processes. Any gardener can tell you that it is necessary to create the proper conditions for each plant to grow. Trees are no different. Trees must be matched with their planting sites, but they need more space and time. To manage ecological interactions in native ecosystems, it is wise to have a well-considered adaptive plan and long-term time frame to provide a context and backdrop for day-to-day and future strategic management activities. Management plans also help landowners become eligible for cost share and technical assistance available through a variety of federal and state conservation programs.

Some wild lands are threatened by urbanization, vineyard development and other conversion activities. Unless conservation action is taken, they soon may not exist at all. Such forests and woodlands are eligible under CAR for CRTs which result from “avoided conversion”. A conservation easement is required. Tax benefits, cost-share programs, income from sales of conservation easements, and the sale of CRTs are all permissible. Combined with recreational rights, viewshed protection benefits, woodland restoration, carefully managed forestry, grazing and farming, such projects can make the difference between future sustainable rural communities and suburban sprawl.

Atmospheric carbon levels crossed 390 parts per million in April 2010. Landowner considering conservation programs will want to know the external future impacts of climate change. According to current climate models, California oak woodlands will become more warm and wet. Reduced snow pack in the Sierra-Nevada, a longer fire season, and, in some places, drier summers will result in migrating species. The trees themselves will probably endure, and conditions may even develop where there are opportunities for iconic California oak trees to grow in places where they do not grow today.

### **ECONOMICS AND THE MARKET FOR CRTs**

Offsetting carbon emissions is not free and increasing regulations leave no doubt that the future costs, for good reason, will be borne by the consumers of emissions-laden products and services. It is necessary to reduce carbon emissions and it is costly to bring CRTs to market. Offsetting methane and ozone emissions require major investments in flares, dairy waste digesters, green energy power cogeneration facilities, and a wide variety of new green technologies now under

development. Likewise forest and oak woodland owners are committing their valuable lands to conservation programs. Inventorying, reporting, verifying, registering and managing forest carbon stocks requires money and a long-term commitment. The cost of developing projects is usually in the range of \$25,000. Third party verification is a further expense before CRTs can be sold. Depending on the type, the average acre of oak woodland in California, for instance, can sequester 100 tonnes or more CO<sub>2</sub> equivalent over its 100-year lifetime, or about 1 CRT per acre per year. For an oak woodland project, the minimum acreage that makes sense for economic purposes is about 2000 acres or more. CAR has now developed an “aggregation policy” which will enable smaller landowners, or project development companies like Blue Source (which cover up front project development expenses in exchange for CRTs), to group separate properties into a single application and thereby reduce expenses for property owners.

As trees grow, additional verified CRTs are registered and then can be marketed each year. There is a ready market for verified CRTs. PG&E’s Climate Smart, and the TerraPass voluntary carbon offset programs are just two, among many, consumers of CRTs. Presently CRTs are listed on the CAR website and are available for sale for \$6-\$11, arranged by private sale or negotiation. Most analysts feel that the price must rise to \$18-\$25/CRT in order for the market to function properly, and some feel that is inevitable.

California Oaks believes that oak woodland CRTs, produced through the Climate Action Reserve and other carbon sequestration programs, will become valuable assets adding another cash income stream and incentives for advancing conservation and perpetuation of oak woodlands throughout California.

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