

Sequestering Carbon Case Study I:

The Dowty Property in Humboldt County, California

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This article features Steve and Valerie Dowty's rehabilitation work on their Humboldt property. Rich Wade provided the carbon sequestration estimate.

El Dorado Chapter's Carbon Neutral Pledge

In 2019, the El Dorado Chapter of the California Native Plant Society adopted a pledge to decarbonize its activities, meaning that the Chapter's activities will, in net, add no greenhouse gases to the atmosphere. We are doing this in phases: For the time being we are focusing on just our transportation carbon footprint ("Scope 1 emissions"), that is, the fuel we use to attend meetings, events, plant sales, etc.

At the beginning of last year we estimated the chapter's annual transportation carbon footprint to be 20 tons per year (CO₂). Because of the various restrictions and social distancing during 2020, the Chapter's carbon footprint was re-estimated to be 7 tons (CO₂). To put these 7 tons in perspective, the average carbon footprint per person in the U.S. is 15 tons per year (CO₂).

For those who have not yet met the Downtys...

Steve and Valerie Dowty bought their Humboldt property in the early 1970s after they finished attending school there. After that, they lived in Texas for a couple years and then in the San Francisco Bay Area. They moved to a 10 acre parcel south of Placerville in 1986, rehabilitating it and encouraging California native plants to reestablish there.

The Downtys are founding members of the El Dorado Chapter. Members of this chapter may know them because they regularly sell local plants at the chapter's plant sales, specializing in local native grasses, sedges and rushes.

Steve presented slides on their land rehabilitation methods at a chapter meeting a couple of years ago. A summary of the techniques he favors would include lots of thinning and weed whipping, taking care of water flows, planting some California natives, but mostly nurturing the natives that grow back on their own.

Humboldt Property Details

The Dowty's Humboldt property is 20 acres and is located between Arcata and Eureka in the Jacoby Creek drainage. It is a high quality redwood forest with a little over 75% redwood. Other conifer species present are Douglas fir, grand fir, western hemlock, Sitka spruce and western red cedar. Since the property is up slope and inland from the

immediate coast, it is above a lot of the fog and gets more sun. It has a lot of shrub species with salal and evergreen huckleberry being the most dominant and very invasive along the logging roads and other disturbed areas. There are many herbaceous species including native grasses, sedges and rushes. These are remnants of the prairie vegetation native to the inland ridge tops. There are many flowering herbaceous species including rhododendron, red Clintonia, Kellogg lily, redwood violet, and trillium.



Sky View of Dowty Property
(Photo: S. and V. Dowty)

The original clear cut was in the early 1900s by steam donkey. A prior owner selectively logged in the 1960s.

The Downtys only visited the property a few times in the first decades after purchasing it, but in 1997 they decided to have a registered forester evaluate the property. The forester ran a timber cruise and developed a Non Industrial Timber Management Plan (NTMP) for the property. A second timber cruise was completed by registered foresters in 2007. Steve personally participated in both timber cruises.

(A timber cruise is a survey involving sampling the forest in a grid and at each point recording the height and basal diameter of the trees. The trees are cored a few inches to obtain the growth rate. After running the sampling numbers in a program, the result



Rhododendron occidentale (Western Azalea)
on Dowty property (Photo: S. and V. Dowty)

is an estimate of merchantable forest products by species and volume, and growth rate. The purpose of the NTMP is to allow California “nonindustrial” landowners; that is, owners with small acreage and are not primarily engaged in the manufacture of forest products, to have a forest management plan for their property that is more flexible than an “industrial strength” Timber Harvest Plan.)

The Downtys have made two selective timber harvests, one in 1997 and one in 2005. Timber volume before both cuts was in the 650,000 to 750,000 board foot range. Steve remembers, “Loggers tear around pretty good, but that the land does recover well in a few years.” They have more timber on the place now than any time since the original clear cut. Current timber volume should be in

the million board foot range with annual growth of more than 36,000 board feet per year. Depending upon the price of timber, they may selectively cut again in the near future.

Steve summarizes his continuing management activities as based on cutting plants he wants to reduce so as to minimize competition and increase the prairie vegetation. “Initially the main focus was removing salal and evergreen huckleberry from along the roads. After doing that, I noticed the prairie vegetation increasing in the cleared areas, so I expanded my efforts to other areas.”

Estimate of Annual CO₂ Sequestered on Humboldt Property

The timber cruise calculation results are in units of board feet which are problematic with respect to estimating carbon sequestration. This is because board feet are a timber industry measurement that is designed to be an estimate of yield of lumber and not a total trunk volume. In addition, there is the unmeasured increase in branches, foliage, and root structures which also sequester carbon. Nevertheless, it has been estimated that just based upon 36,000 board feet increase in merchantable forest products per year, the property in sequestering in the range of 30-60 tons of carbon (C) each year.



Lilium kelloggii (Kellogg Lily) busily being beautiful and sequestering carbon on the Dowty property (Photo: S. and V. Dowty)

Converting this carbon (C) that the trees are sequestering to carbon dioxide (CO₂) is a chemistry calculation. Carbon footprints are calculated as carbon dioxide (CO₂) in the air, that is, they are calculated after the carbon is burned and has combined with two oxygen atoms from the air. So the Dowty Property is currently estimated to be sequestering very roughly 100-200 tons of carbon dioxide (CO₂) per year.

Cherishing the Dowty Donation & Buying Carbon Credits

In 2020 (and again in 2021) the Downtys have donated the carbon sequestered on their Humboldt property to our chapter. Even though the carbon sequestered on the Dowty property is a very rough estimate, it is well in excess of the chapter’s transportation carbon footprint estimate of 7 tons (CO₂) last year and likely around 14 tons in a non-pandemic year.

In January 2021, the Board set in motion a purchase of 7 tons of carbon offsets for the chapter’s 2020-2021 activity year. This was done even though we had received the donation from the Downtys. This is because carbon credits purchased are from programs following protocols which rigorously document and monitor to assure that the

estimated carbon sequestered actually occurs over a long period of time, up to 100 years in some programs. A full protocol is not something the chapter wants to invest in at this time.

Nevertheless, we still acknowledge (for the short-term and without a lot of documentation) this generous donation from the Downtys. We hope that it will inspire others to tend the land they have ties to carefully and also to reduce carbon emissions both at club events and at home. We can be a part of the solution.