




Improved Forest  
Management Projects:

# The Importance of Methodology to Reflect Quality



# A case study designed to help carbon project buyers understand the differences in removal versus reduction crediting categories, and considerations when assessing methodologies across registries.

Carbon removal represents measurable climate impact with tons of emissions removed from the atmosphere. True carbon removal methodologies and activities have rarely been questioned on the value or integrity of their impact. While Carbon Dioxide Removal (CDR) products are often associated with engineered solutions, nature-based alternatives have a sizable role to play in near-term meaningful offsets to carbon emissions.

However, carbon markets have long been flooded with carbon offsets labeled as “**avoidance**” or “**reduction**”. These are based on counterfactual claims of mass deforestation in the absence of carbon credit revenues. While reductions can be valuable, they can also misrepresent true climate impact. These projects have prompted questions to the integrity of carbon markets.

Savvy buyers should understand these nuances and the methodology differences between removal and avoidance in nature-based carbon projects. This paper lays out the case for removal-based credits and the value of conservative accounting methodologies such as Verra’s Verified Carbon Standard (VCS).

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## Introduction

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As 2030 approaches with many initial milestones towards corporate net zero commitments, it is critical that buyers seek those carbon offsets that objectively quantify the amount of carbon a project removes and ensure the true impact of the carbon removal they are purchasing. The time is now for buyers to understand the details behind the various product options and insist on credible carbon projects that adhere to the most stringent methodologies and deliver the environmental impact that they claim.

Improved Forest Management (IFM) projects, which result from sustainable forestry practices that increase carbon storage and are the focus of this analysis, issue two types of credits:

### Emissions reduction credits

This represents the tons of carbon emissions avoided by making a change in asset management. In the case of IFM, reduction credits represent the emissions that would have been generated had the forest been harvested.

### Carbon removal credits

This represents the removal of one ton of carbon emission from the atmosphere. In IFM projects, removals represent a true ton of carbon dioxide captured and sequestered. They are generated as trees grow.

Nature-based credits are registered under several different methodologies, with vastly different accounting approaches resulting in either carbon removal or avoidance credits. The projects that accurately measure carbon removals have value comparable to technology-based engineered solutions with a steep discount in price.

To shed light on how different IFM methodologies calculate credits, this case study provides comparative analyses between two popular

carbon crediting methodologies: the established IFM methodology VM0003 maintained by Verra, the governing body of the Verified Carbon Standard (VCS), and the *IFM Methodology on Non-Federal U.S. Forestlands* which is promoted by the American Carbon Registry (ACR). This comparative analysis provides buyers with a deeper understanding of these ratings systems and highlights the key nuances related to how credits are issued and assessed.

### Key findings from the comparison include:

- ACR issues a higher proportion of reduction credits, based on the counterfactual claim of clear-cut harvesting in absence of the carbon market
- VCS prioritizes measurable removal credits over time, with a smaller percentage of reduction credits
- On average, ACR projects tend to have a shorter duration than the VCS

Projects issuing primarily reduction credits of short duration can invite questions as to the certainty of the carbon impact. This underscores the importance that buyers source credits from projects that have been verified and highly rated.



## A Series of Analyses

### 01 IFM Rating Scale

Given our focus on informing buyers' understanding of different credits, Chestnut Carbon, in cooperation with our parent Kimmeridge Energy, developed a new rating scale for IFM carbon projects on key metrics, including volume, durability, and type of credit. The most conservative IFM projects receive credit for incremental carbon removal from tree growth and represent durable, long-term carbon storage, rather than for avoidance credits with claims to reduce emissions by avoiding deforestation and forest degradation, a counter-factual outcome.

### 02 Comparative Analyses

Further internal analysis exploring the quality and availability of credits in the market compared various IFM projects using different methodologies. This comparison clearly demonstrates the case for prioritizing carbon removals over reductions. The analysis shows that there is an increased potential for over-crediting by reductions-based methodologies. This poses serious risks of inflating climate benefits, with broader implications of risk to the overall integrity of the carbon market.

Both analyses conclude with a call for buyers to support market integrity in IFM projects by purchasing credits that demonstrate quality, integrity and environmental impact.

# The IFM Rating Scale: How can buyers determine what “good” is when trying to compare various ratings methodologies?

Given the number of methodologies to choose from when selecting IFM credits, we developed a rating system which assesses the quality of a project in terms of durability and additionality based on publicly available project data<sup>1</sup>.

The following credit rating system designed by Chestnut Carbon in conjunction with Kimmeridge Energy provides a standardized metric to assess quality which enables buyers to identify credits that offer genuine, long-term environmental benefits, and which in turn, incentivize high standards among other IFM project developers.

The rating system assesses the quality of the credits based on the ratio of emission reductions (lower rating) to carbon removals (higher rating) and durability of carbon storage. For additionality, a scale from A to E reflects the percentage of removal credits to reduction credits. For example, a project that is 100% removal credits would score an A, whereas a project that is 60% or more reductions would score an E. For durability, the rating reflects the length of the project term ranging from 1 year to 100 years.

Table A

Letter Score	Percent Removal Credits
A	100%
B	80% to <100%
C	60% to <79%
D	40% to <59%
E	Less than 40%



<sup>1</sup>ACR Public Reports Project Registry.  
VCS Project Registry.

## Analysis 01: Objectively Rating IFM Projects

To compare the durability and emissions removal of projects registered under different methodologies, Figure 1 presents the results of the ratings analysis for IFM projects registered under ACR (gray) and VCS (green), plotted on a graph. The horizontal axis represents the **durability** of the credits generated by these projects, while the vertical axis reflects the **ratio of removals to reductions**, using letter grades from A to E, where A indicates the highest rating for pure removals (see Table A, prior page). The size of the bubbles represents **projected lifetime credit volume by project** as sourced from publicly available registry documents.

The bubble with the light green halo represents the rating of the Chestnut Carbon IFM project which scores highly in both durability and proportion of removal. The large size of the bubble represents projected growth of the project, with the goal of 500,000 acres by 2030.

For more information on this analysis, please refer to our white paper [“Accelerating the Carbon Market: A Standardized Rating System for Removal and Avoidance Credits.”](#)

The analysis shows that most credits projected to be issued for ACR projects fall to the bottom left when plotted on the graph, representing a project rating based on the volume of reduction credits and a shorter project term. The VCS projects that have a lower durability score maintain a higher project rating score due to the proportion of removal credits.

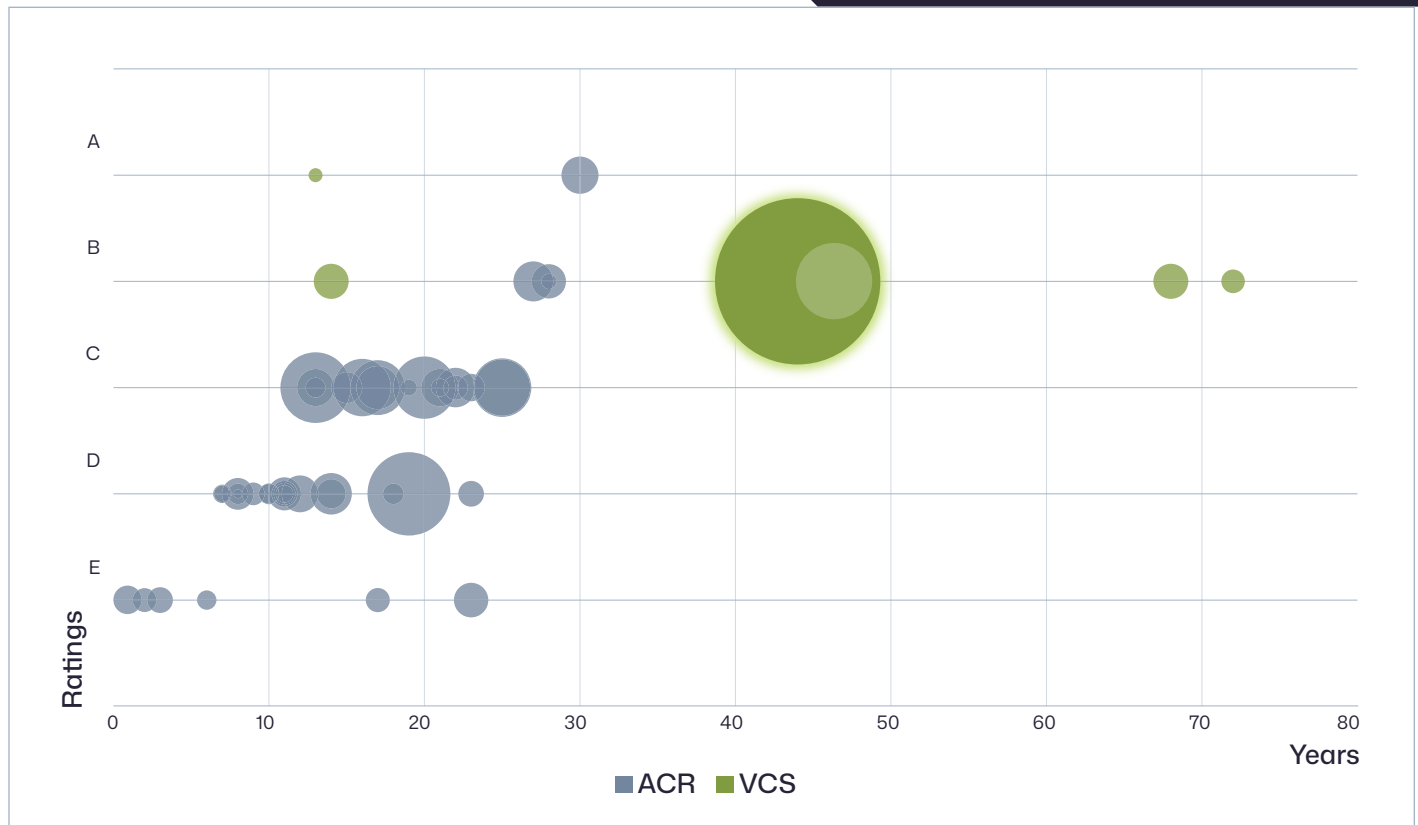


Figure 1. Projects' ratings by durability (horizontal axis), size (graduation of bubble size), and removals versus reductions (vertical axis). The bubble with the halo represents the rating of Chestnut Carbon's IFM program. The size of the Chestnut Carbon IFM bubble reflects a grouped project design where new acreage will be continuously conserved and enrolled into the project over the next two decades.

Complete data for each project can be found in Appendix A.

## Analysis 02: Given Reduction or Earned Removal?

### Why are most credits in the market reduction-based?

Currently, carbon markets are flooded with reduction-based credits based on a counterfactual, versus removal credits which represent realized, measurable climate benefits. To determine why this is the case, we plotted projections of cumulative credit issuance over time for projects applying IFM methodologies maintained by VCS and ACR in Figures 2 and 3, respectively, using publicly available projections validated by independent auditors at the time of each project registration.

Figure 2 shows that cumulatively, most IFM credits issued by VCS are projected to be removal-based. While the VCS-registered projects do include reduction credits, the vast majority are removal credits calculated as the carbon sequestered in the tree growth over the duration of the project. By contrast, Figure 3 shows that a majority of ACR projects issue frontloaded reduction-based credits, representing the avoided emissions from the presumed immediate release of carbon stored in trees prior to the start of the IFM project.

This comparison demonstrates how reduction-based ACR projects aggressively credit for the entire carbon stock in the forest, versus only crediting for the incremental carbon sequestered in new tree growth, driving a significantly higher volume of credits for the developer.

It is almost impossible to confirm whether the trees in the ACR projects would have been clear cut in the first year or two as most suppose, introducing questions as to the quality and integrity of the associated credits. The preference by developers for the ACR methodology could be driven, for some, by the motivation to maximize the volume of sellable credits early in the project's crediting period.

#### VCS IFM Cumulative Removals and Reductions by Year

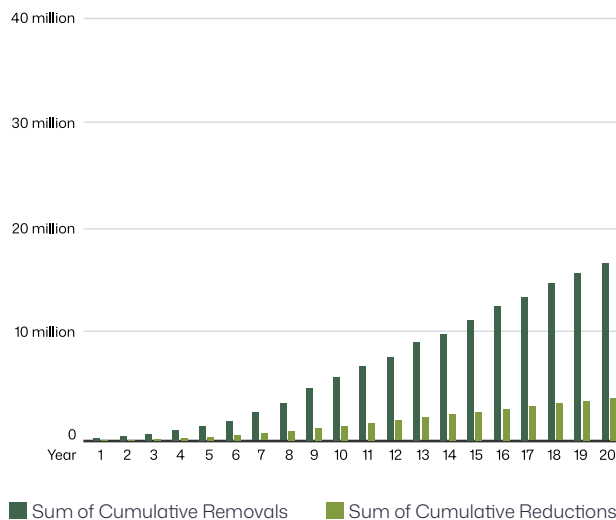


Figure 2. Six projects registered under VCS VM0003 methodology; cumulative removals vs reductions over time. Complete data for each project can be found in Appendix A.

#### ACR IFM Cumulative Removals and Reductions by Year

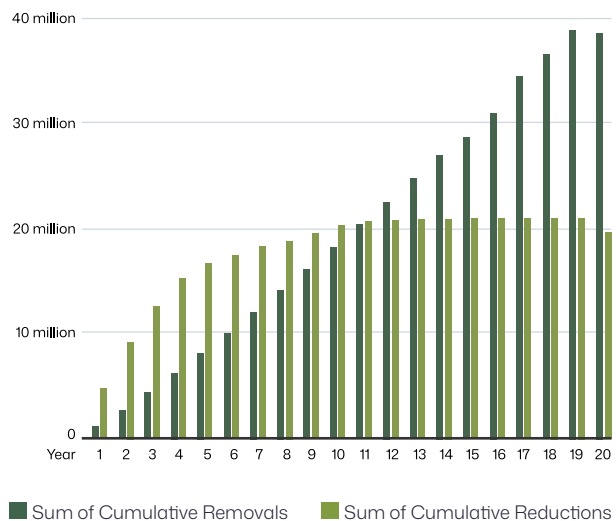


Figure 3. Forty-six projects registered under ACR methodology; cumulative removals vs reductions over time. Complete data for each project can be found in Appendix A.

<sup>2</sup>Carbon Credits: Offsets Vs Removals. Carbon removals vs avoidance: A dangerous distraction. November 8, 2023.

<sup>3</sup>Carbon Direct. Removal, reduction, and avoidance credits explained. November 8, 2023.

## How do credit volumes compare across different methodologies?

To determine whether ACR results in a comparatively high volume of credits per project, we looked at 46 ACR projects currently listed on the registry and 6 projects registered with Verra under the VM0003 methodology. We represented the comparisons here, demonstrating projects registered with ACR consistently issue a higher number of credits, and a higher percentage of reductions credits, per project. The chart shows that the ACR methodology issues significantly more credits than VCS, with a much higher volume and ratio of carbon emissions reductions.

Based on Figure 4, most IFM project developers use the ACR methodology. As described above, the ACR IFM methodology generates a higher proportion of reductions versus removals credits. Developers seeking to maximize credit volume are more likely to choose the ACR methodology to generate large volumes of reduction-based credits.

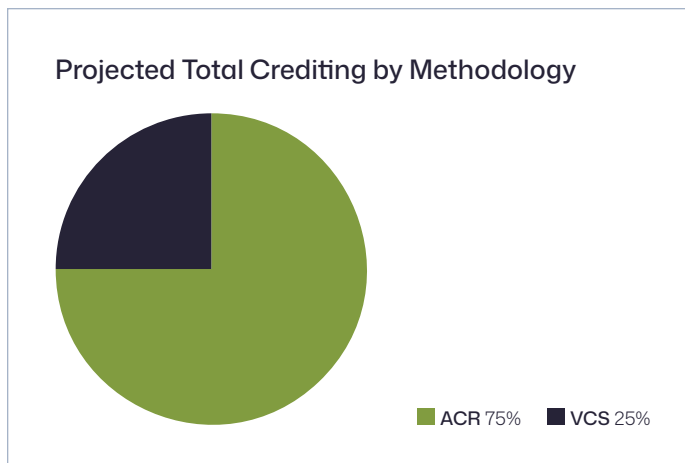
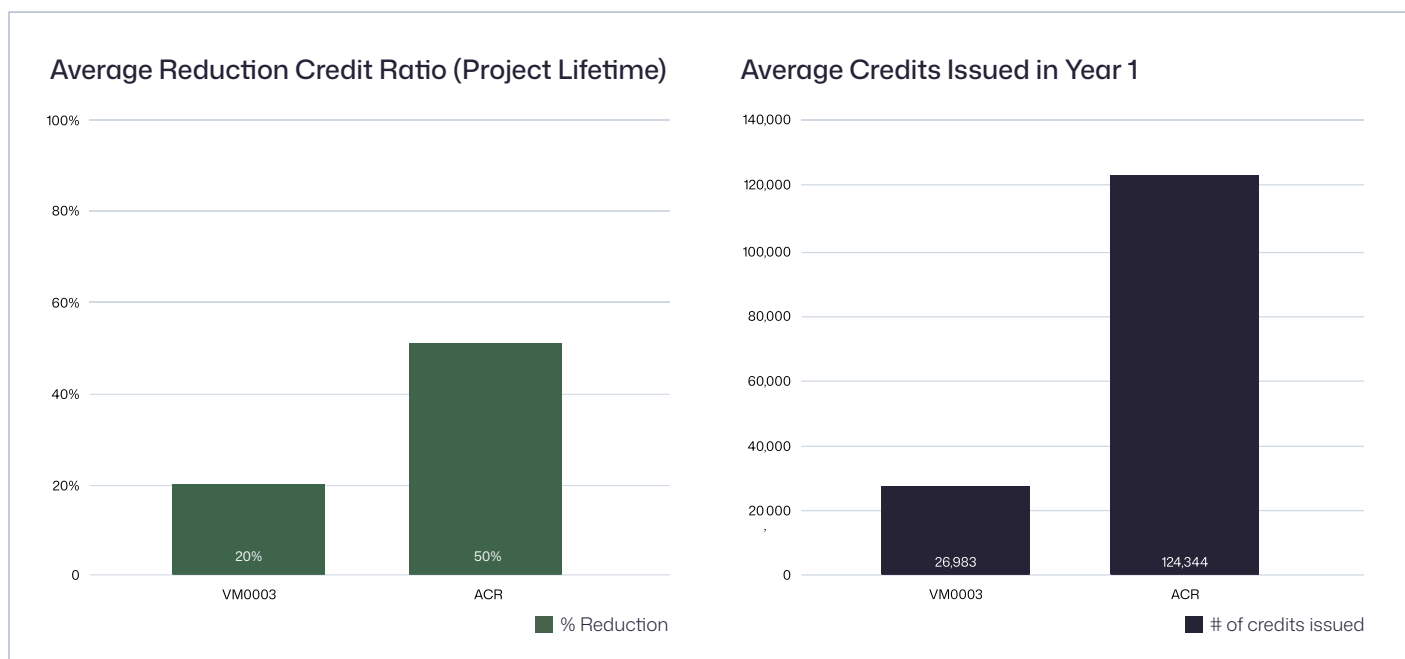


Figure 4. Relative percentage of annual credits issued between the two methodologies for the first 20 years of a project, based on all projects currently listed on ACR registry and with Verra under the VM0003 methodology. See Appendix A for data sets.



Complete data for each project can be found in Appendix A.



## What if Chestnut Carbon had elected to use the ACR methodology instead of VCS?

To illustrate how the differences in methodology impact the quantity of credits issued, we contrasted two different crediting scenarios using Chestnut Carbon's IFM credits: our selected approach using VCS and the alternative approach using ACR. The contrast is shown between Figures 5 and 6.

Figure 5 shows the cumulative quantity of credits issued per acre of forest over the first 20 years using VM0003, the selected VCS methodology. It shows that the project generates 94% removal-based credits from incremental forest growth in the upper quadrant of the plot, seen steadily increasing over time commensurate with increasing tree size and carbon storage.

The orange line on the graph represents the starting point of improved forest management, zero credit at year zero. A small quantity (<7%) of reduction-based credits are issued reflecting the avoided harvesting of the trees over our 100-year analysis period, as shown below the zero line in gray. The difference between the gray and dark blue lines represents the total credits issued to the project. These plots illustrate a conservative and removal-oriented project design when compared to Figure 6.

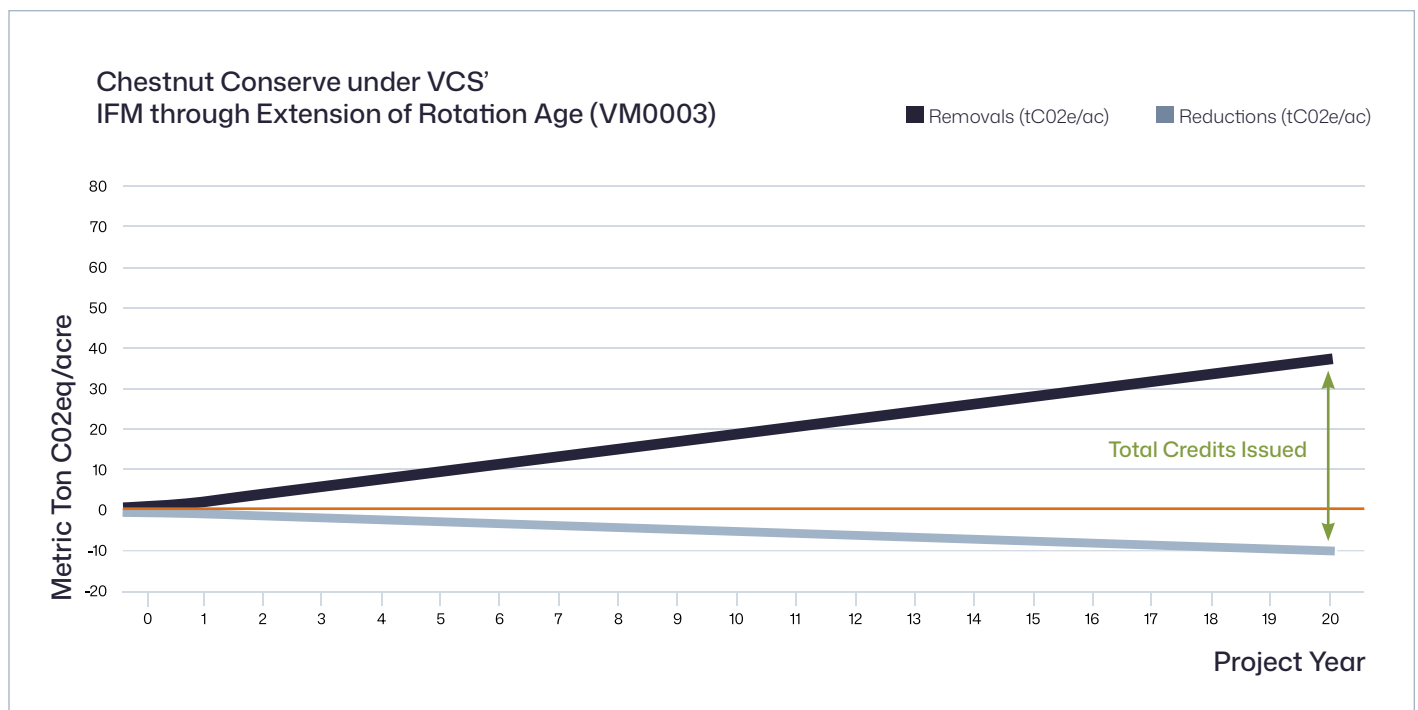


Figure 5 Chestnut IFM- VM0003 Credit Profile: reduction vs removal credits per acre by project year for Verra Project ID 3814

## A Different Result: Had We Applied the ACR Methodology

Figure 6 depicts the reduction-forward crediting scenario promoted by ACR, which was not selected by Chestnut Carbon. Over the same 20-year period, the project would have issued nearly twice the quantity of credits. However, they would primarily be reduction-based credits based on a counter-factual with less certainty of climate impact. It also shows that most credits would have been issued in the first year.

This rate of reduction crediting implies that, in the absence of an IFM project, the entire forest would have been harvested immediately. This initial flush of credits in many reductions-based projects may be enticing to project developers as a way to generate revenue from standing trees but has in the past been, in some cases, misleading as to the true climate impact.

While the VCS methodology is more conservative, Chestnut Carbon has made the decision to use this carbon measurement and to forgo the use of the widely popular ACR methodology. This allows us to deliver credits that meet the most rigorous standards and

scrutiny, even if that means we bring fewer credits to market. While it is almost certain that the forests in these projects would be harvested in the absence of the IFM intervention over our 100-year analysis period, Chestnut Carbon's project gives very little credit (<7%) for the avoided harvesting of the already standing trees, and these reduction-based credits are gradually issued over a very long period of time as the forest grows.

Had Chestnut applied the ACR IFM methodology instead of the VCS IFM methodology, we would have issued double the credits from the same forest.

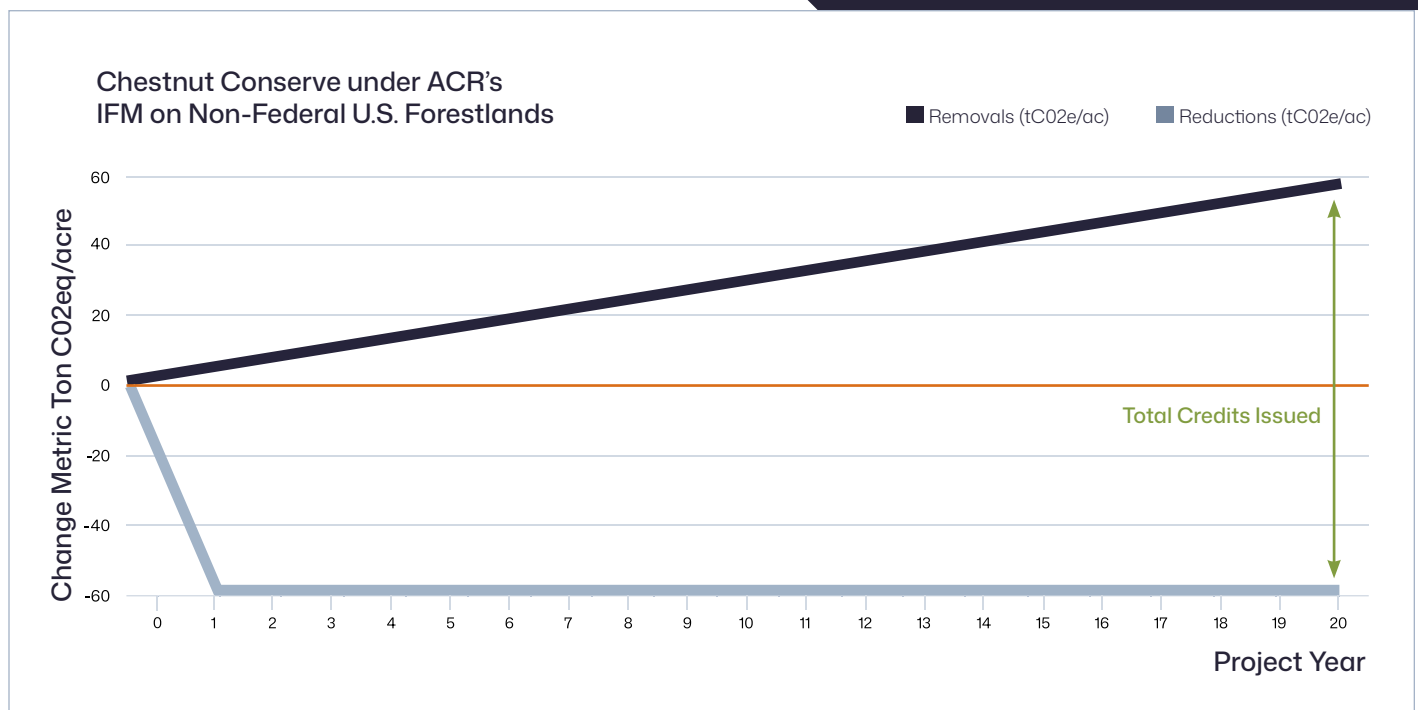


Figure 6 Chestnut IFM- ACR Credit Profile: reduction vs removal credits per acre by project year as comparison issuance to Verra Project ID 3814.

## Conclusion

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These analyses of the VCS and ACR methodologies reveal significant differences and implications for credit buyers. The majority of IFM credits originate from ACR and are reduction-based. In contrast, the VCS VM0003 IFM methodology yields lower volumes and promotes additional, realistic and incremental carbon removal measurements that are reflective of tree growth and demonstrate a conservative measure of climate benefit.

Given media attention and criticism leveled largely at projects employing reduction methodologies, relying on reduction-based credits can be a risk for buyers given historical standards for assessing their real impact. When selecting carbon credits, buyers should be informed and make purchase decisions that amplify their brand's sustainability efforts. Purchasing credits from projects that emphasize removals over reductions helps to ensure alignment of corporate intention with the purchase of high-quality, long-duration credits that represent real climate outcomes.



## Why Chestnut Carbon?

Chestnut Carbon surpasses industry norms for quality in nature-based removal credits by designing carbon projects that are truly removal-oriented and promote extended permanence of carbon stored in trees.

We seek to raise the bar on quality in Improved Forest Management (IFM) projects by leading the market in project design, choosing to use a conservative methodology for crediting that recognizes the real value of incremental carbon removal from new tree growth. The project sets the benchmark for excellence across domestic and international carbon markets due to the conservative methodology it employs and its commitment to only selling removal-based credits.

Chestnut Carbon offers high-quality, US-based carbon removal credits through enrollment of private landowners and rigorous third-party audits. The project features long-term conservation contracts, extending for 60 years via conservation easements that promote climate-smart forestry and prohibit harvesting except for forest health improvements.

Utilizing Improved Forest Management techniques and Extension of Rotation Age (VCS VM0003), Chestnut Carbon ensures increased carbon storage relative to baseline conditions. Additionally, the project provides co-benefits such as biodiversity protection, enhanced water quality, and improved resilience to climate change, further highlighting its commitment to sustainable and effective climate action which considerably surpass industry standards.

Learn more at  
[chestnutcarbon.com](https://chestnutcarbon.com)

# All ACR and VCS VM0003 Projects: Source Data

Additional information  
can be found on the [ACR](#)  
and [VCS](#) registry websites.

Project ID	Acreage	Lifetime Reductions (credits/acre)	Lifetime Removals (credits/acre)	Lifetime Credits	Percent Reductions	Crediting Period Length (yr)	Letter Component
ACR212	173,386	8	15	3,817,372	37%	19	C
ACR272	3,423	134	14	505,568	91%	20	E
ACR368	2,673	46	41	232,067	53%	20	D
ACR374	3,111	75	28	320,668	73%	20	D
ACR376	13,536	17	5	288,662	78%	20	E
ACR386	3,174	59	23	259,446	72%	20	D
ACR389	10,088	80	5	853,572	94%	20	E
ACR394	1,281	31	14	58,168	68%	20	D
ACR398	8,486	66	25	770,541	73%	20	D
ACR422	6,144	8	24	199,475	25%	20	C
ACR424	4,439	35	12	209,213	75%	20	D
ACR441	5,556	79	0	437,728	100%	20	E
ACR483	5,242	29	29	302,622	50%	20	C
ACR483	3,913	29	29	302,622	50%	20	C
ACR505	22,210	27	36	247,960	43%	20	C
ACR506	3,819	33	26	1,319,688	56%	20	D
ACR507	4,511	55	31	329,106	64%	20	D
ACR508	5,274	49	33	367,370	60%	20	D
ACR509	5,317	54	44	515,084	55%	20	D
ACR518	8,543	35	23	308,634	61%	20	D
ACR519	8,892	40	12	443,435	77%	20	E
ACR534	2,721	41	33	654,347	56%	20	D

# All ACR and VCS VM0003 Projects: Source Data

Additional information  
can be found on the [ACR](#)  
and [VCS](#) registry websites.

Project ID	Acreage	Lifetime Reductions (credits/ac)	Lifetime Removals (credits/ac)	Lifetime Credits	Percent Reductions	Crediting Period Length (yr)	Letter Component
ACR539	13,295	99	46	394,873	68%	20	D
ACR558	29,331	25	31	743,078	44%	20	C
ACR562	12,983	17	31	1,418,834	36%	20	C
ACR566	3,822	9	26	455,847	25%	20	C
ACR569	38,221	57	29	326,610	67%	20	D
ACR571	21,471	24	36	2,306,909	41%	20	C
ACR574	3,326	0	50	1,062,886	0%	20	A
ACR576	11,364	1	53	178,756	1%	20	B
ACR579	8,961	71	10	917,572	88%	20	E
ACR586	86,221	55	39	842,952	59%	20	D
ACR587	22,068	11	23	2,977,264	32%	20	C
ACR588	5,795	22	27	1,078,862	45%	20	C
ACR590	172,737	53	35	507,837	60%	20	D
ACR592	14,230	5	10	2,630,868	34%	20	C
ACR595	38,272	35	39	1,056,025	47%	20	C
ACR596	23,147	30	36	2,527,927	46%	20	C
ACR604	101,272	24	28	1,194,133	46%	20	C
ACR614	36,634	10	14	2,426,124	41%	20	C
ACR617	8,326	4	30	1,229,934	11%	20	B
ACR637	15,356	36	32	1,041,401	53%	20	D
ACR672	2,955	103	69	508,023	60%	20	D
ACR701	63,980	43	40	5,320,579	52%	20	D

# All ACR and VCS VM0003 Projects: Source Data

Additional information can be found on the [ACR](#) and [VCS](#) registry websites.

Project ID	Acreage	Lifetime Reductions (credits/ac)	Lifetime Removals (credits/ac)	Lifetime Credits	Percent Reductions	Crediting Period Length (yr)	Letter Component
ACR732	12,364	16	57	903,012	21%	20	B
ACR735	8,568	24	43	579,394	36%	20	C
VCS1060	17,591	4	52	943,371	8%	100	B
VCS1367	982	0	153	150,030	0%	30	A
VCS1377	4,906	7	81	427,654	8%	100	B
VCS3814	100,000	11	44	4,514,120	20%	25	B
VCS4090	17,591	4	52	943,371	8%	29	B
VCS4268	500,000	12	47	21,149,794	20%	25	B