# WESTPHALEN FOREST CARBON PROJECT MONITORING REPORT

Document Prepared by Zimmfor Management Services Ltd.

| | |
|---|---|
| Project title | Westphalen Forest Carbon Project |
| Project ID | 3363 |
| Monitoring period | 01-January-2022 to 31-December-2024 |
| Original date of issue | 26-June-2025 |
| Most recent date of issue | 26-June-2025 |
| Version | 1.3 |
| *VCS Standard* Version | VCS Standard 4.7, 16-April-2024 |
| Prepared by | Zimmfor Management Services Ltd. |

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# 1 PROJECT DETAILS

## 1.1 Summary Description of the Implementation Status of the Project

Matthias Graf von Westphalen (Project Proponent) has developed a Logged to Protected Forest carbon offset project to achieve greenhouse gas (GHG) emission reductions and removals through the conservation of privately owned logged to protected (LtPF) forests. The Westphalen Forest Carbon Project (Westphalen) is implemented following the Verified Carbon Standard (VCS) VM0012 – Improved Forest Management in Temperate and Boreal Forests (LtPF), v1.2 methodology registered as Project ID 3363 in the VERRA Registry.

The Westphalen project was implemented in 2018, and the project area encompasses properties owned by Westphalen. Westphalen has the authority to implement project activities on these properties, such as a carbon crediting project, by directing forest planning within the current project activity instance (PAI). To date no new project activity instances have been added.

The geographic area of the project is composed of nine regions located in Germany and the present PAI occupies approximately 772 hectares (ha). These areas are non-contiguous and are comprised of a mosaic of freehold properties owned and operated by Westphalen in the states of Schleswig-Holstein and, North Rhine-Westphalia.. Properties were managed for timber harvest prior to the implementation of the carbon crediting project under forest management plans created in 2015.

Carbon emission offsets are calculated by comparing the project scenario which ceases all timber harvesting, to a baseline scenario which represents regular forest harvesting operations. Carbon pools are estimated utilizing the Operational-Scale Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3) – Version 1.2, allowing for the calculation of carbon emission offsets. The baseline scenario for the project is the continuation of legally permitted commercial harvesting for the duration of the 40-year project. The harvest schedule is implemented under the baseline scenario using selective thinning and final felling, which are regionally appropriate forest management practices.

The project scenario is designed to conserve current forest conditions where the carbon crediting project has been implemented by Westphalen. The project involves low levels of harvest activities to maintain forest health, enhance ecological conditions, and/or mitigate risks. It is estimated that the revised 40-year project will sequester ~ 280,000 tonnes of carbon dioxide equivalent ($tCO_2e$) from the atmosphere over the 40-year project period, averaging approximately 7,000 $tCO_2e$ per year.

The net ERs achieved in the project (ERy) in the monitoring period is approximately 17,897 $tCO_2e$.

Westphalen intends to maintain the project activities for 100 years.

## 1.2 Audit History

**Table 1: Audit History of Project**

| Audit type | Period | Program | Validation/verification body name | Number of years* |
|---|---|---|---|---|
| *Validation/ Verification* | 01-January-2018 - 31-December-2021 | VCS | RINA Services S.p.A (RINA) | 4 |
| *2nd Verification* | 01-January-2022 - 31-December-2024 | VCS | EPIC Sustainability Services | 3 |
| *Total* | | | | 7 |

Note: for the purpose of all subsequent reference to modelling the term timestep may be used. This verification period addresses modelling timesteps 5, 6 & 7.

## 1.3 Sectoral Scope and Project Type

**Table 2: Sectoral Scope and Project Type**

| | |
|---|---|
| Sectoral scope | Agriculture, Forestry, and Other Land Use (AFOLU), 14 |
| AFOLU project category[1] | Improved Forest Management (IFM) |
| Project activity type | Logged to Protected Forest (LtPF) |

## 1.4 Project Proponent

**Table 3: Project Proponent**

| | |
|---|---|
| Organization name | Matthias Graf von Westphalen |
| Contact person | Dr. Johannes Gerst |
| Title | Forest Manager |
| Address | CENTRALVERWALTUNG, LAER 3, MESCHEDE, GERMANY, 59872 |
| Telephone | +49 2953 8007 |
| Email | j.gerst@graf-von-westphalen.de |

[1] *See Appendix 1 of the* VCS Standard

## 1.5 Other Entities Involved in the Project

**Table 4: Other Entity Information**

| | |
|---|---|
| Organization name | Zimmfor Management Services Ltd. |
| Role in the project | Listing Representative, Authorized Representative, Implementation Partner, Project Developer |
| Contact person | Jason Zimmermann, RPF |
| Title | President |
| Address | 2218-D Airport Drive, Campbell River, BC, V9H E2, Canada |
| Telephone | +1 604 619 1585 |
| Email | jason@zimmfor.com |

## 1.6 Project Start Date

**Table 5: Project Start Date**

| | |
|---|---|
| Project start date | 01-January-2018 |
| Justification | This is the date that which Westphalen began harvest curtailments within the project area, representing the date at which the project begins generating GHG emission reductions or removals |

## 1.7 Project Crediting Period

**Table 6: Project Crediting Period**

| | |
|---|---|
| Crediting period | ☐ Seven years, twice renewable<br>☐ Ten years, fixed<br>☒ Other - 40 years (3.9.3 - the initial project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years.) |
| Start and end date of first or fixed crediting period | 01-January-2018 to 31-December-2057<br>(amended from original PDMR due to revision to Verra Standard 4.7) |

## 1.8 Project Location

The Westphalen PAI consists of multiple polygons (parcels) and occupies 772 ha of privately owned German forest land. The project geographic area is composed of nine regions, each containing non-contiguous parcels which make up the current PAI (see Appendices for completed list of project area polygon co-ordinates). Six of the project regions are in central Germany, and three regions border the Baltic Sea on the north coast of the country. The surrounding areas are a mixture of privately owned operational forest lands, towns and communities, residential areas, farmland, and federal and state-owned lands. The extent of the PAI is described by the geodetic coordinates below. The associated KML file is located within the Verra Registry, representing the geographic spatial location of polygons within the project.

**Table 7: PAI Extent Co-ordinates**

| | Extent Coordinates | | | |
|---|---|---|---|---|
| Coordinate System | North | South | East | West |
| GCS_WGS_84 | 55.058 | 47.270 | 15.037 | 5.866 |

## 1.9 Title and Reference of Methodology

**Table 8: Project Methodology and Tool Reference Table**

| Type (methodology, tool or module). | Reference ID, if applicable | Title | Version |
|---|---|---|---|
| Methodology | VM0012 | Improved Forest Management in Temperate and Boreal Forests (LtPF) | 1.2 |
| Tool | N/A | AFOLU – Non-Permanence Risk Report Calculation Tool | 4.2 |
| Tool | VT0001 | Tool for the Demonstration and Assessment of Additionality in VCS AFOLU Project Activities | V3.0 |
| Tool | N/A | The Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3) | V1.2 |
| Tool | Section 3.2.1 Methodology Deviations | MARketz Tool Market Leakage | V2.2 |

## 1.10 Double Counting and Participation under Other GHG Programs

### 1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

Westphalen is neither registered nor included in an emissions trading program or a binding emission limit program.

### 1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

## 1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

### 1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit?

☐ Yes ☒ No

### 1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system?

☐ Yes ☒ No

### 1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

Is the Project Proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

*If yes:*

Has the Project Proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through the Verified Carbon Standard project 3363 for the greenhouse gas emission reductions or removals associated with [Project Proponent or authorized representative organization name(s)] [name of the product(s) whose emissions footprint is changed by the project activities]."

☒ Yes ☐ No

*If yes to all:*

Westphalen supplies round wood and fuel wood to 31 manufacturing and sawmill companies. It is involved in all activities related to maintaining forest stand health and maintenance. Westphalen has made a public statement regarding Scope 3 emissions on the company website, and emails have been sent to current retailers describing the project and outlining the potential risk of double claiming. See Appendices and website link below[2] for substantiation.

## 1.12 Sustainable Development Contributions

Westphalen, through IFM via LtPF activities, contributes to sustainable development as defined by and tracked against the United Nations Sustainable Development Goals (SDGs). Westphalen's contribution to (at minimum) SDGs 12 (Responsible Consumption and Production), 13 (Climate Action), and 15 (Life on Land) is illustrated through mitigation actions and change activities. The initiatives support and further develop the project SDG goals and their associated targets.

Project activities implemented during the monitoring period that result in SD contributions includes continued third-party certification to Normative document German PEFC standard PEFC D 1002-1:2020 for sustainable forest management in Germany. Sections of the certification standard prevent deforestation. Lastly, continued registration with Verra ensures Climate Action is carried out with GHG emissions avoided or removed.

SD contributions described in the table below contribute to achieving any nationally stated sustainable development priorities[3]. Specifically, certification helps contribute to the goal of having 5000 sites focused on 12.2 for Sustainable production that steadily increases the proportion of sustainable production. For Indicator 13 greenhouse gas emissions the goal is for the achievement of greenhouse gas neutrality by 2050 (previously to be reduced by at least 70 % by 2040 and at least 80 to 95 % by 2050). This report largely targets National fuel emissions trading for heating/transport, the Coal Phase-Out, the Renewable Energy Sources, and Grant programmes to support decarbonising in industry and thus is not specific to project activities. Lastly, for 15.2 the focus is on eutrophication of ecosystems and reduction by 35 % by 2030 compared to 2005.

[2] Westphalen website: Search for 'Scope 3' https://www.graf-von-westphalen.de/news/kundeninformation-scope-3-emissionen/

[3] Germany's Sustainable Development Strategy 2021: Germany's Sustainable Development Strategy | Federal Government

Evidence of the project's SD contributions are provided as Appendices to this report.

**Table 9: Sustainable Development Contributions**

| Row number | SDG target | SDG indicator | Net impact on SDG indicator | Current project contributions | Contributions over project lifetime |
|---|---|---|---|---|---|
| 1) | 12.2 | Responsible Consumption + Production: Achieve the sustainable management and efficient use of natural resources. | Implemented activities to increase | 772 hectares of Westphalen forest lands are certified under PEFC Sustainable Forest Management certification. No further changes during this monitoring period | 100% (772 ha) of Westphalen forestlands accredited to a recognized third-party sustainable forest management standard |
| 2) | 13.0 | Climate Action: *Tonnes of greenhouse gas emissions avoided or removed* | Implemented activities to increase | Prevent the release of an estimated 17,897net ERs (ERy) into the atmosphere during this monitoring period. | Westphalen will have prevented the release of an estimated 29,871 net ERs (Ery) into the atmosphere during the project lifetime. |

| | | | | | |
|---|---|---|---|---|---|
| 3) | 15.2 | Life on Land: Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally | Implemented activities to increase | By conserving 772 ha of temperate forest, the Westphalen project has protected ecosystems and biodiversity for flora and wildlife. | Prevented the deforestation of 772 ha of private forestlands, contributing globally |

## 1.13 Commercially Sensitive Information

All stakeholder information, such as names, addresses, etc., are kept confidential. Details are not disclosed in the Monitoring Report.

No other commercially sensitive information is withheld from the public version of this monitoring report.

# 2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

## 2.1 Stakeholder Engagement and Consultation

### 2.1.1 Stakeholder Identification

**Table 10: Stakeholder Identification**

| | |
|---|---|
| Stakeholder Identification | The stakeholder composition has not changed since the project's initial validation/verification, and no new stakeholder groups have been identified.<br><br>Previous stakeholders were directly identified by the client and incorporated into the Zimmfor GHG Stakeholder Consultation and Engagement SOP process. All stakeholders were grouped into the following categories:<br><br>Economic<br><br>Environmental<br><br>Forest Agencies<br><br>Government<br><br>Research Institutes and Universities<br><br>Social<br><br>No indigenous people were identified. The United Nations defines indigenous people as people who “have retained social, cultural, economic, and political characteristics distinct from the those of dominant societies in which they live.” Germany is home to inhabitants with centuries of cohabitation and settlement history, resulting in an ethnic group majority with equal rights. Therefore, no such people are classified or identified as indigenous in Germany. |

| | |
|---|---|
| Legal or customary tenure/access rights | Legal ownership and land rights are designated to Westphalen and are referred to as “guaranteed” per Article 14 in the Constitution2F4, and section 903, Powers of the Owner, in the civil code3F5. These lands do not have any tenure or access rights disputes, and Westphalen maintains the legal right to project activities on their land. |
| Stakeholder diversity and changes over time | Interactions between the identified stakeholders are typical of those in the forest industry within Germany. Westphalen has relationships with adjacent neighbors, communities, and hunting officials as they maintain access for recreational purposes and manage and provide access for firewood collection and hunting on Westphalen lands. Economic relationships extend to stakeholders like wood buyers, forest contractors, and tree nurseries for harvesting wood products from land owned by Westphalen. Westphalen has additional relationships with environmental stakeholders to ensure their management practices on their forest lands are up to date with all current environmental standards and best practices.<br><br>Stakeholders within these groups vary in ethnicity, race, and gender.<br><br>There are no changes in the make-up of each group. |
| Expected changes in well-being | There have been no changes or expected changes in the well-being of stakeholders or their characteristics at this time. Under the baseline scenario, “Historical Practice”, the focus is on long-term sustainable timber production. The stakeholder groups come from diverse social, economic, and cultural backgrounds. Many groups are businesses, associations, or societies with environmental, cultural, social, or financial interests in forest lands. Interactions between stakeholders are minimal. |
| Location of stakeholders | No Stakeholders live within the PAI nor are there stakeholders whose property rights will be affected by the project activity. The project's geographic area is composed of nine regions in Germany, including Schleswig-Holstein and North Rhine-Westphalia. Project impacts were considered among communities and potential stakeholders that occurred within a 20 km buffer outside of the Westphalen PAI. |

[4] https://www.gesetze-im-internet.de/englisch_gg/englisch_gg.html#p0117

[5] See website: https://www.gesetze-im-internet.de/englisch_bgb/englisch_bgb.html#p4425, Civil Code in the version promulgated on 2 January 2002 (Federal Law Gazette [*Bundesgesetzblatt*] I page 42, 2909; 2003 I page 738), last amended by Article 1 of the Act of 10 August 2021 (Federal Law Gazette I p. 3515).

| | |
|---|---|
| Location of resources | Other private landowners and stakeholders are geographically located in Germany and own/operate on lands outside the project area. No stakeholders own or have customary access to resources located in the PAI. Stakeholders are not dependent on resources within the PAI and are unaffected by project activities. |

### 2.1.2 Stakeholder Consultation and Ongoing Communication

**Table 11: Stakeholder Consultation and Ongoing Communication**

| | |
|---|---|
| Ongoing consultation | Stakeholder consultation was conducted via electronic documents delivered by email, numerous in-person information sessions, and virtual webinar meetings (dates listed in the Appendices).<br><br>Online comment forms are available on the Zimmfor website[6], and links to the VERRA registry have also been provided. These will remain accessible to the public throughout the project's lifetime.<br><br>Stakeholders can find information about recent project news, educational materials, recreational activity opportunities, and contact details on Westphalen's website (https://www.graf-von-westphalen.de/). |
| Date(s) of stakeholder consultation | Numerous (refer to Appendices for a full list of stakeholder consultation activities) |
| Communication of monitored results | Updates to the project, including validation and verification events, as well as project documents, have been communicated to stakeholders through various multimedia modalities, posted on the Westphalen and Zimmfor project websites. After a certified third party and Verra have verified and reviewed the monitoring results for the 2022-2024 monitoring period, the monitoring documents will be publicly posted on the Verra Registry. |
| Consultation records | Online forms are available on the Zimmfor and Westphalen websites to collect stakeholder comments and feedback. Comments received by other means (e.g., presentations or direct emails) are collected within the Stakeholder consultation database.<br><br>Responses and any required updates to the project design relating to comments received from stakeholders are also |

[6] Stakeholder Consultation Feedback form available online here: https://form.jotform.com/221164311117239

| | |
|---|---|
| | tracked. All consultation information has been made available to the validation and verification body (VVB) during project verification. Refer to the Zimmfor SOP –Stakeholder Consultation + Engagement for additional details about Stakeholder consultation processes. |
| Stakeholder input | Due account was taken of all input received during the ongoing consultation and will continue throughout the project's lifetime. Comments received were documented within the Stakeholder Comments Database and have been addressed by Westphalen. This includes demonstrating stakeholder comment significance or irrelevance to the project design |

### 2.1.3 Free, Prior, and Informed Consent

**Table 12: Free, Prior, and Informed Consent**

| | |
|---|---|
| Consent | There is no unresolved land or general conflicts with any IPs, LCs, or customary rights holders. Legal rights to the land and benefits from the project activities are designated to Westphalen. |
| Outcome of FPIC | As no people live within the project activity instance, there are no affected individuals whose property rights will be affected by the project. |

### 2.1.4 Grievance Redress Procedure

**Table 13: Grievance Redress Procedure**

| Grievances received | Resolution and outcome |
|---|---|
| No grievances have been received since project implementation on 1 Jan 2018. | No grievances were raised during the monitoring period from 1 January 2022 to 31 December 2024.<br><br>Should concerns arise, the Zimmfor Stakeholder Consultation + Engagement SOP outlines a Grievance Redress procedure. This documented procedure and documentation of any disputes will be resolved through this process. The form and procedure are publicly available on the Zimmfor website (https://www.zimmfor.com/). The procedure is included in the Appendices for ease of reference. |

### 2.1.5 Public Comments

Refer to the Appendices for details on the stakeholder consultations that occurred during the monitoring period. During this process, three stakeholder comments were received, as presented in the table below. No remarks from stakeholders were received during this monitoring period via the

Verra or Zimmfor websites. The VVB will receive additional details on public comments during verification.

**Table 14: Public Comments**

| Summary of comments received | Summary of Response given | Date Comments Received | Stakeholder Category | Actions taken |
|---|---|---|---|---|
| Inquiry as to what will happen to the lands in the project when it ends. | The intent is for the project lands to be incorporated into a new carbon project. | 17-Dec-2024 | Environmental | No action is required, as there is no change to the project design. |
| Inquiry as to how the project is different from other climate protection projects. | The Westphalen Forest Carbon Project was developed using an improved forest management methodology. Other methodologies focus on reforestation. | 17-Dec-2024 | Social | No action is required, as there is no change to the project design. |
| Inquiry as to whether there is a minimum area requirement to develop a carbon project. | The project design has no area limitations, but the economics project implementation is a considerable factor. | 17-Dec-2024 | Environmental | No action is required, as there is no change to the project design. |

## 2.2 Risks to Stakeholders and the Environment

### 2.2.1 Management Experience

The management team, Zimmfor Management Services Ltd., has extensive experience in forest management, including certification systems, audits and inspections, due diligence and legality, and project management. The team is comprised of Registered Professional Foresters (RPFs), a Professional Accountant (CPA), Registered Professional Biologists (RPBio), and other resource professionals. See Corporate Resume in the Appendices for details of individual experience. Zimmfor is responsible for development of the carbon project, including carbon modelling and preparation of documentation.

Dr. Johannes Gerst, a German Professional Forester, currently manages Westphalen project lands, specifically under the direction of the owner and resource manager. Dr. Johannes Gerst is responsible for the development of estate management plans along with professional and technical review of the project documentation. Additionally, he facilitates stakeholder consultation, field monitoring and overall project monitoring (ensures cessation of harvesting and completed forest health monitoring).

No changes to the management teams occurred during the monitoring period. The team gained continued experience with the Verra process and continued development of several registered projects.

### 2.2.2 Risk assessment

**Table 15: Risk assessment**

| | Risk identified | Mitigation or preventative measure(s) taken |
|---|---|---|
| Natural and human-induced risks to Stakeholders' wellbeing | No risk identified | Project activities (logged to protected) include regular monitoring and maintenance for forest health, as well as monitoring for fire, pest, or disease outbreaks. Stakeholders continue to have access to properties for recreational opportunities. |
| Risks to Stakeholder participation | Potential risk to stakeholder safety due to opposing opinions, cultural/ religious differences, landholder grievances or disputes, government, or local oppression of freedom of expression. | Throughout the project's lifetime, Westphalen will continue to communicate and consult with stakeholders.<br><br>All stakeholder information, such as names, addresses, etc., are kept confidential. Responses are recorded in public records as anonymous. |
| Working conditions | Risks associated with forestry work can include but are not limited to exposure to extreme weather (heat, cold, rain/snow), working close to moving equipment, working in remote locations, working alone, wildlife encounters, trips, and falls, scrapes, and bruises. | Westphalen follows all legal requirements under the Labour Law5F7 and Occupational Safety and Health Act6F8 Regulations that protect the worker's safety, health, and economic interests.<br><br>Westphalen is certified under the Programme for the Endorsement of Forest Certification (PEFC)7F9, Type B – Forest owners and managers, and demonstrates that employees are adequately equipped, trained, |

[7] Further details such as Anti-discrimination, dismissal protection, and employment details can be found here: https://www.bmas.de/EN/Labour/Labour-Law/labour-law.html

[8] https://www.bmas.de/EN/Labour/Occupational-Safety-and-Health/occupational-safety-and-health-art.html

[9] PEFC certification is valid for up to 5-years and obtained when individuals or organizations have demonstrated conformity with PEFC standards. PEFC General Assembly (2018). Sustainable Forest Management Requirements, PEFC ST 1003:2018 PEFC Council, https://cdn.pefc.org/pefc.org/media/2024-11/89abc90f-975f-4571-b456-0314a749f9fa/08907ebe-4c07-522c-9fab-8c1e8523853c.pdf

| | | |
|---|---|---|
| | | and insured for working in the forest[10]. |
| **Safety of women and girls** | No risk identified | Under PEFC certification, Westphalen has demonstrated compliance with national legislation regarding human rights and the International Labour Organization (ILO). Violence against women and children is a criminal offense and is punishable by German law[11]. |
| **Safety of minority and marginalized groups, including children** | No risk identified | The legal working age in Germany is 15. Westphalen has no current employees under the age of 15 and adheres to the ILO normative references and applicable national regulations regarding minorities, marginalized groups, and child safety[12]. |
| **Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)** | No risk identified | Westphalen will continue to maintain and comply with all applicable protective laws related to environmental and pollution regulations, as demonstrated by its PEFC certification under Section 1.10 Environmental Requirements, pp. 36. The project activities do not involve the generation of waste or hazardous materials, nor the discharge or release of these materials. |

## 2.3 Respect for Human Rights and Equity

### 2.3.1 Labor and Work

**Table 16: Labor and Work**

[10] As outlined in PEFC General Assembly (2018). Sustainable Forest Management Requirements, PEFC ST 1003, Section 6.3.4.2, pp.16

[11] Law on Civil Protection against Acts of Violence and Stalking website: https://www.gesetze-im-internet.de/gewschg/BJNR351310001.html and Domestic Violence: Your Rights Protection options by the police, criminal law, and civil law. https://www.big-berlin.info/sites/default/files/downloads/330_Ihr_Recht_Englisch.pdf

[12] See Sec 3.10-Fundamental ILO Conventions, pp.10, Sustainable Forest Management Requirements, PEFC ST 1003:2018

| | Risks identified[13] | Mitigation or preventative measure(s) taken |
|---|---|---|
| Discrimination and Sexual Harassment | The potential risks associated with discrimination in relation to project activities include, but may not be limited to, the following:<br>• Lack of job opportunities based on gender/race/culture<br>• Unequal pay<br>Hostile work environments in which employees experience harassment or threats of violence against them based on their race. | Westphalen is not involved in or complicit with any form of discrimination or sexual harassment related to the project and its activities.<br>Westphalen employs people of diverse genders, ethnicities, and those with different beliefs. Work opportunities provided by Westphalen are posted publicly on their website, along with the position description and the job requirements. The submission of applications for postings is not restricted in any manner besides by a pre-determined timeframe<br>Under the General Equal Treatment Act (Allgemeines Gleichbehandlungsgesetz), individuals are protected against discrimination at work due to race or ethnic origin, gender, religion or belief, disability, age, or sexual identity. Infringements are compensable through civil law.<br>Westphalen is audited to the PEFC certification standard Section 6.3.4.3[14]; Health, safety and working conditions whereby employees' and contractors' wages must be the same as or greater than industry standards. |
| Gender equity in labor and work | Potential risks associated with gender equity in labor and work include exclusion from employment opportunities, harassment, and inclusion in employee meetings. | Westphalen employs people of diverse genders, ethnicities, and those with different beliefs within a pre-determined timeframe. |

[13] The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

[14] Under PEFC, Section 6.3.4.3 it is stated "The standard requires that wages of local and migrant forest workers as well as of contractors and other operators operating in PEFC-certified areas shall meet or exceed at least legal, industry minimum standards or, where applicable, collective bargaining agreements. *Note:* Where wages are below the living wage of a country, steps should be taken to attain increased wages towards a living wage level over time in addition to increases for inflation. ."

| | | |
|---|---|---|
| | | Under PEFC certification, the standard in Section 6.3.4.4 requires that Westphalen is committed to equal opportunities, non-discrimination, and freedom from workplace harassment. Gender equality shall be promoted." |
| **Human trafficking-forced labor and child labor** | No risk identified | Human trafficking and forced or child labor is a federal offense in Germany, punishable under criminal law. The Federal Government adopted the National Action Plan for Business and Human Rights (NAP) on 21-December-2016 [15] and in 2019, ratified the Protocol of 2014 to the Forced Labour Convention of 1930[16]. Westphalen does not use forced, child, or trafficked labor in its workforce. |

### 2.3.2 Human Rights

**Table 17: Human Rights**

| Risks identified | Mitigation or preventative measure(s) taken |
|---|---|
| No risk identified | Westphalen follows all applicable international and local laws regarding human rights. In conformity with the PEFC standards and certification, Westphalen complies with the fundamental ILO conventions, specifically the United Nations, Universal Declaration of Human Rights, 1948, ILO No. 169, Indigenous and Tribal People Convention, ILO No 29, Forced Labour Convention, 1930, ILO N0. 182, Worst Forms of Child Labour Convention, and the Basic Law for the Federal Republic of Germany, Article 1 Basic Rights[17] |

[15] https://globalnaps.org/country/germany/

[16] https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:::NO:12100:P12100_ILO_CODE:P029

[17] Basic Law for the Federal Republic of Germany in the revised version published in the Federal Law Gazette Part III, classification number 100-1, as last amended by the Act of 20 December 2024 (Federal Law Gazette 2024 I, no. 439). Website: https://www.gesetze-im-internet.de/englisch_gg/englisch_gg.html

### 2.3.3 Indigenous Peoples and Cultural Heritage

**Table 18: Indigenous Peoples and Cultural Heritage**

| Risks identified | Mitigation(s) or preventative measures taken |
|---|---|
| No risk identified | As defined by the United Nations, Indigenous Peoples "have retained social, cultural, economic, and political characteristics that are distinct from the those of dominant societies in which they live." Germany is home to inhabitants with centuries of cohabitation and settlement history, resulting in an ethnical group majority with equal rights and no class or cultural distinction; therefore, no such people are classified or identified as indigenous in Germany. |

### 2.3.4 Property Rights

**Table 19: Property Rights**

| Risks identified | Mitigation or preventative measure(s) taken |
|---|---|
| No risk identified | As noted above, no Indigenous Peoples are identified within Germany. Additionally, there are no local communities or customary rights holders with legal or customary tenure and access rights to territories, property, and resources within the PAI. There is a clear and defined title on all project lands. |

### 2.3.5 Benefit Sharing

**Table 20: Benefit Sharing**

| | |
|---|---|
| Summary of the benefit sharing plan | NA<br><br>There are no disputes over rights to territories and resources, so no benefit-sharing agreements or plans have been implemented with any stakeholders. See Section 2.3.4 above. |
| Benefit sharing during the monitoring period | NA<br><br>There are no disputes over rights to territories and resources, so no benefit-sharing agreements or plans have been implemented with any stakeholders. See Section 2.3.4 above. |

## 2.4 Ecosystem Health

Germany is home to approximately 48,000 animal species, 10,300 plant species, and 14,400 mushroom varieties[18]. Biodiversity and wild fauna and flora are legally protected by the Federal Nature Conservation Act (1977) and the Federal Regulation for the Protection of Species (1986) at the state level. Both the Wild Birds Directive (1979) and the Fauna-Flora-Habitat Directive (FFH-Directive, 1992) have been adopted by the EU.

**Table 21: Ecosystem Health**

| | Risk identified | Mitigation or preventative measure(s) taken during the monitoring period |
|---|---|---|
| **Impacts on biodiversity and ecosystems** | Potential risks to biodiversity and ecosystems may occur due to the following:<br>• Loss of trees, ecosystem damage due to fire<br>• Loss of trees ecosystems due to insect damage<br>• Tree damage, ecosystem impact from windthrow events<br>• Unplanned harvest | The leading causes of species diversity loss are, to regionally varying degrees, intensive farming and forestry, landscape dissection and urban sprawl, soil sealing, and pollutants (e.g., acidifying chemicals and nutrients)[19].<br>Project activities do not negatively impact biodiversity or ecosystems, as the focus is on conserving mature forests (with an average age of 76 years.<br>Spatial and onsite monitoring is scheduled annually to identify any changes to carbon stocks. Mitigation measures are undertaken in accordance with German legislation requirements and PEFC certification criteria. This includes the protection of forests from fire by early reporting, having trained staff in suppression techniques, harvesting insect infestation areas to mitigate the spread of infestations, and harvesting windthrow trees to prevent fire fuels and insect attractants to adjacent standing forests and ecosystems.<br>Professional foresters annually inspect the project area for health conditions. See Section 4.3 Monitoring Plan for further details. |
| **Soil degradation and soil erosion** | Potential risks may include but are not limited to soil compaction or | Soil compaction or displacement may occur in the project scenario from forest health maintenance activities. |

[18] https://www.deutschland.de/en/topic/environment/species-protection-in-germany-nine-facts-about-biodiversity

[19] See conclusion (pg 10): https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Naturschutz/indikatorenbericht_2019_en_bf.pdf

| | | |
|---|---|---|
| | displacement due to equipment operations | Project activities focus on conserving forests. In some instances, disturbance may occur due to avoidable or unavoidable causes.<br><br>On Westphalen lands, the maintenance and appropriate enhancement of protective functions in forest management, notably soil, and water, are required in forest management plans and carried out as part of their PEFC certification (Section 8.1.1, Criterion 1, pp. 17; Section 8.3.5, Criterion 3, pp. 20). |
| **Water consumption and stress** | No risk identified | Project activities do not result in any water consumption or stress on ecosystems. Project activities focus on conserving forests. As noted above, water management is required as part of PEFC certification under Section 8.5, Criterion 5, pp21. |

### 2.4.1 Rare, Threatened, and Endangered Species

The following table has been completed for forest-dependent species only. A complete list of individual species can be found in the Appendices.

**Table 22: Rare, Threatened, and Endangered species**

| | |
|---|---|
| Species or habitat | The following is a summary of Species in Annexes II, IV, and V within the Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) occurring in the project area: 136 birds, 29 mammals, 5 amphibians, 3 fish, 5 beetles, and a crustacean.<br><br>As a logged-to-protected project, Westphalen did not adversely impact habitats or connectivity areas for rare, threatened, or endangered species during this monitoring period.<br><br>Limited calamity wood removal activities were carried out during the monitoring period, including the removal of Spruce beetle-infected trees and windthrow, to mitigate further impacts on habitats and areas required for habitat connectivity. Where unavoidable harvesting did occur in the PAI during the monitoring period, the species noted were managed per Forest Management Plan requirements and Forest certification—more specifically, via the German Forest Certification System endorsed by the Programme for the Endorsement of Forest Certification as required under Criterion 4: maintenance, conservation, and appropriate enhancement of biological diversity in forest ecosystems.<br><br>Forest management certification can effectively strengthen forest biodiversity conservation and ensure ecologically, socially, and economically sustainable forest management through the application of appropriate management methods[20]. |
| Areas needed for habitat connectivity | As a logged-to-protected project scenario, the project did not adversely impact habitats or connectivity for rare, threatened, or endangered species during this monitoring period.<br><br>Connectivity will be maintained or enhanced with project implementation as the project activities focus on forest health and conservation rather than harvesting operations. |

The table below is used to identify and summarize risks related to habitats for rare, threatened, and endangered species, as well as areas for habitat connectivity. It describes the commensurate mitigation or preventative measure(s) in place to prevent or mitigate the identified risk during the monitoring period.

[20] See section 2.3.7 Sustainable forestry: https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Naturschutz/indikatorenbericht_2019_en_bf.pdf

**Table 23: Risks related to habitats for rare, threatened, and endangered species**

| | Risks identified | Mitigation or preventative measure(s) taken |
|---|---|---|
| Habitats for rare, threatened, and endangered species | No risk identified | Loss of habitat, biodiversity, and endangered species can occur through uncontrollable or unavoidable events, such as flooding, drought, fire, disease, and illegal harvesting. No such events have occurred.<br><br>Species habitat has been identified as part of Westphalen's PEFC certification and is monitored annually. Mitigation measures are taken to protect and enhance these areas where appropriate, such as ensuring natural regeneration and leaving snags standing and rare trees in place to create biological biodiversity.<br><br>A review and discussion with knowledgeable stakeholders on native species (Herr Roland Schockemöhle, Head of Regional State Forest Service) confirmed that this logged to protected project is unlikely to have any negative impact.<br><br>Project activities do not have a negative impact on habitats for rare, threatened, and endangered species. |
| Areas for habitat connectivity | No risk identified | As mentioned above, the same unavoidable events can potentially affect areas for habitat connectivity.<br><br>Westphalen forest lands are managed in accordance with a forest management plan, government environmental regulations, and third-party certification (PEFC). This includes management, enhancements, and protective mitigation measurements for threatened and endangered species and their habitat. The project lands |

| | | |
|---|---|---|
| [redacted] | | are monitored on-site and spatially for area loss and stand health annually.<br><br>A review and discussion with knowledgeable stakeholders on native habitat (Herr Roland Schockemöhle, Head of Regional State Forest Service) confirmed that this logged to protected project is unlikely to have any negative impact.<br><br>Project activities do not have a negative impact on areas for habitat connectivity. |

### 2.4.2 Introduction of species

**Table 24: Introduced Species**

| Species introduced | Classification | Justification for use | Adverse effects and mitigation |
|---|---|---|---|
| N/A<br><br>No Species were introduced or planted in the project area. | | | |

**Table 25: Existing Invasive Species**

| Existing invasive species | Mitigation measures to prevent the spread or continued existence of invasive species |
|---|---|
| Alien species are a factor in endangering biological diversity. Currently, there are approximately 317 alien animal species (neozoans) and at least 452 alien plant species (neophytes) considered established in Germany, of which 10% pose a serious threat to biodiversity.[21] The project area does not contain any invasive species. | As part of Westphalen's due diligence and requirements for third-party certification, forest professionals annually monitor Westphalen lands for invasive species, including the Signal crayfish, Egyptian goose, Nutria (also known as a beaver rat), raccoon, Giant hogweed, and Himalayan Balsam. If discovered, invasive species are removed in accordance with proper protocols. |

**Table 26: Invasive Species**

| | Risks identified | Mitigation or preventative measure(s) taken |
|---|---|---|

[21] https://www.cbdint/countries/profile?country=de

| | | |
|---|---|---|
| Invasive species | The potential risks related to invasive species include but are not limited to the following:<br>• Nutrient and resource competition<br>• Predation on native species<br>• Disease transmissions | As part of Westphalen's due diligence and requirements for third-party certification, forest professionals annually monitor Westphalen lands for invasive species, including the Signal crayfish, Egyptian goose, Nutria (also known as a beaver rat), raccoon, Giant hogweed, and Himalayan Balsam. If discovered, invasive species are removed in accordance with proper protocols. |

### 2.4.3 Ecosystem Conversion

**Table 27: Ecosystem Conversion**

| | Risks identified | Mitigation or preventative measure(s) taken |
|---|---|---|
| Ecosystem conversion | No risk identified | The Westphalen Forest Carbon project is not an afforestation, reforestation, and revegetation (ARR), Improved Agricultural Land Management (IALM), Wetlands Restoration and Conservation (WRC), or Avoided Conversion of Grasslands and Shrublands (ACoGS) project. As such, no clearing has been completed, and this section does not apply. |

# 3 IMPLEMENTATION STATUS

## 3.1 Implementation Status of the Project Activity

Westphalen is a conservation-based IFM project that has generated GHG emission reductions by curtailing harvesting, road building, and other forestry-related operations. The Project Proponent has implemented the IFM project by converting commercial forests into conservation-based forests, thereby retaining and increasing carbon sequestration and avoiding future greenhouse gas (GHG) emissions from timber harvest operations.

There have been no changes to the Project Proponent and no new project activities have been implemented during the current monitoring period.

Spatial monitoring using Normalized Difference Vegetation Indices (NDVI) analysis demonstrated that previously implemented project activities continue to be implemented during the current monitoring period.

Events that impact the GHG emission reductions or carbon dioxide removals were noted during the monitoring period. All related events have been modelled to determine their impact. The events consist of incidental and/or calamity cutting that is legally required as part of forest health maintenance or for the purposes of maintaining public safety. These events did not meet the definition of a loss event.

No loss of carbon stock occurred during the monitoring period, although incidental harvesting was required for forest health and safety matters. The GHG benefit of the project for the verification period is positive.

## 3.2 Deviations

### 3.2.1 Methodology Deviations

A methodology deviation has been applied to the calculations for Market Leakage.

Refer to Section 5.3.2, Market Leakage, for the updated procedure regarding the calculation of a market leakage factor.

This alternative calculation method, utilizing the Zimmfor-developed MARketz Tool, is intended to achieve a higher level of accuracy in relation to project details (scope and scale) for market leakage quantification compared to the options within the VM0012 methodology. The deviation meets the suitability criteria as outlined in Section 3.20 of the VCS-Standard V4.7.

No other methodology deviations were applied.

### 3.2.2 Project Description Deviations

1. 30yr to 40yr project period

As per requirements of the revised Verra Standard V4.7 per section 3.2.11, which requires a 40-year project longevity, the Westphalen project longevity was extended from 30 years to 40 years. The baseline scenario is still valid; however, requires changes to the following:

- Project description & crediting period
- Test for Additionality - NPV analysis of the baseline for financial indicators
- Model Run length

The deviation does not impact the applicability of the methodology, additionality nor the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology. As such, the deviation may be described and justified in this monitoring report. The deviation will be described in all subsequent monitoring reports.

Given these changes, Westphalen estimates generating approximately 280,000 tonnes of CO2e over the project's lifetime. The estimated annual GHG emission reduction/removals of the project in Table 6 of the Westphalen Forest Carbon Project, Project Description and Monitoring Report V4.4 (issue date15-February-2024) are revised as follows:

**Table 28: Updated Estimated GHG Emission Reductions and Removals**

| Year | Estimated GHG emission reductions or removals (tCO2e) |
|---|---|
| 01-January-2018 - 31-December-2018 | 3,247 |
| 01-January-2019 - 31-December-2019 | 4,101 |
| 01-January-2020 - 31-December-2020 | 5,144 |
| 01-January-2021 - 31-December-2021 | 2,475 |
| 01-January-2022 - 31-December-2022 | 7,576 |
| 01-January-2023 - 31-December-2023 | 7,272 |
| 01-January-2024 - 31-December-2024 | 7,523 |
| 01-January-2025 - 31-December-2025 | 7,279 |
| 01-January-2026 - 31-December-2026 | 6,658 |
| 01-January-2027 - 31-December-2027 | 6,880 |
| 01-January-2028 - 31-December-2028 | 7,022 |
| 01-January-2029 - 31-December-2029 | 7,150 |
| 01-January-2030 - 31-December-2030 | 7,246 |
| 01-January-2031 - 31-December-2031 | 7,351 |
| 01-January-2032 - 31-December-2032 | 7,524 |
| 01-January-2033 - 31-December-2033 | 7,567 |
| 01-January-2034 - 31-December-2034 | 7,598 |
| 01-January-2035 - 31-December-2035 | 7,641 |
| 01-January-2036 - 31-December-2036 | 7,491 |
| 01-January-2037 - 31-December-2037 | 7,671 |
| 01-January-2038 - 31-December-2038 | 7,616 |
| 01-January-2039 - 31-December-2039 | 7,710 |
| 01-January-2040 - 31-December-2040 | 7,693 |
| 01-January-2041 - 31-December-2041 | 7,558 |
| 01-January-2042 - 31-December-2042 | 7,616 |
| 01-January-2043 - 31-December-2043 | 7,700 |

| | |
|---|---|
| 01-January-2044 - 31-December-2044 | 8,179 |
| 01-January-2045 - 31-December-2045 | 8,208 |
| 01-January-2046 - 31-December-2046 | 8,062 |
| 01-January-2047 - 31-December-2047 | 7,831 |
| 01-January-2048 - 31-December-2048 | 7,664 |
| 01-January-2049 - 31-December-2049 | 7,445 |
| 01-January-2050 - 31-December-2050 | 7,284 |
| 01-January-2051 - 31-December-2051 | 7,071 |
| 01-January-2052 - 31-December-2052 | 6,863 |
| 01-January-2053 - 31-December-2053 | 6,835 |
| 01-January-2054 - 31-December-2054 | 6,740 |
| 01-January-2055 - 31-December-2055 | 6,654 |
| 01-January-2056 - 31-December-2056 | 6,592 |
| 01-January-2057 - 31-December-2057 | 6,557 |
| **Total Estimated ERs** | **280,296** |
| **Total Number of crediting years** | **40** |
| **Average Annual ERs** | **7,007** |

## 3.3 Grouped Projects

Although developed as a grouped project there are no new project activity instances introduced during the monitoring period.

## 3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

Note: as per requirements of the revised Verra Standard V4.7, changes were made as per section 3.2.11, which requires a 40-year project longevity. The baseline scenario is still valid.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

| | |
|---|---|
| **Data / Parameter** | Spatial Inventory data ($A_{BSL,i}$, $A_{PRJ,i}$),i |
| **Data unit** | Hectares (Ha) |
| **Description** | Respective areas of baseline and project polygon, i for all project instances |
| **Source of data** | GPS Coordinates, inventory records, spatial data using a Geographic Information System (GIS) |
| **Value applied:** | Each polygon has an area |
| **Justification of choice of data or description of measurement methods and procedures applied** | GIS spatial delineation of project areas and tabular forest inventory classes. An ESRI GIS software program is used to integrate data from various sources and its derivatives (areas, perimeters etc.) |
| **Purpose of Data** | Required for baseline and project calculations |
| **Comments** | Includes delineation of project areas and polygons |

| | |
|---|---|
| **Data/Parameter** | CF |
| **Data unit** | t C t-1 d.m |
| **Description** | Carbon fraction of dry matter |
| **Source of data** | IPCC 2006 default value |
| **Value applied:** | 0.50 |
| **Justification of choice of data or description of measurement methods and procedures applied** | Best available data |
| **Purpose of Data** | Required for baseline carbon and project calculations |

| | |
|---|---|
| Comments | Embedded in CBM CFS3 EU-AIDB SPU 3 |

| | |
|---|---|
| Data / Parameter | BEF |
| Data unit | Unitless |
| Description | Biomass expansion factors (BEF) for conversion of productivity metrics to biomass, |
| Source of data | CBM-CFS3 default values. |
| Value applied: | CBM-CFS3 calculates the Biomass Expansion Factor as a function of jurisdiction, ecozone and tree species. |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 data is widely reviewed and accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | Calculation of baseline and project emissions. |

| | |
|---|---|
| Data / Parameter | $R_i$ |
| Data unit | Unitless |
| Description | Root to shoot ratio in polygon, i |
| Source of data | CBM-CFS3 default values. |
| Value applied: | CBM-CFS3 variants calculate belowground biomass as a function of tree species and tree size. |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 data is widely reviewed and accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |

| | |
|---|---|
| Comments | Root allocation can vary by site productivity. |

| | |
|---|---|
| Data / Parameter | $f_{BSL,NATURAL,i,t}$, $f_{PRJ,NATURAL,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,NATURALi}$, $f_{PRJ,NATURAL,i,t} < 1$) |
| Description | The proportion of biomass that dies from natural mortality in polygon, i, year, t, in the baseline and project cases, respectively. |
| Source of data | Modeled by CBM-CFS3. |
| Value applied: | Default settings in CBM-CFS3. |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for baseline and project calculations. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,DAMAGE,i,t,}$ $f_{PRJ,DAMAGE,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,DAMAGEi,t}$ $f_{PRJ,DAMAGE,i,t} < 1$) |
| Description | The proportion of additional biomass removed for road and landing construction in polygon, i, year, t, in the baseline and project cases, respectively. |
| Source of data | As described in the management plan for road development. Monitoring data on an *ex-post* basis in the project scenario. |
| Value applied: | Variable on an *ex-post* basis in the project scenario - digitized in the project scenario on an *ex-post* basis if visible in remote sensing or captured by standing stocking estimates. Captured within the clearing component of the baseline scenarios. |

| | |
|---|---|
| Justification of choice of data or description of measurement methods and procedures applied | Estimated based on expert opinion based on regional experience. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,BLOWDOWN,i,t}$, $f_{PRJ,BLOWDOWN,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,BLOWDOWNi,t}$, $f_{PRJ,BLOWDOWN,i,t} < 1$) |
| Description | The proportion of live aboveground tree biomass subject to blowdown in polygon, i, year, t, in the baseline and project cases, respectively. |
| Source of data | Included within the natural mortality factors calculated in $f_{BSL,NATURAL,i,t}$, $f_{PRJ,NATURAL,i,t}$ by CBM-CFS3.<br>Also captured by spatial monitoring if >4ha, which would be incorporated as a new polygon on an *ex-post* basis. |
| Value applied: | Zero for the baseline and project *ex-ante* calculations (part of the natural mortality modeling in CBM-CFS3). |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,BRANCH,i,t}$, $f_{PRJ,BRANCH,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,BRANCHi,t}$, $f_{PRJ,BRANCH,i,t} < 1$) |
| Description | The proportion of aboveground tree biomass comprised of branches > 2 in diameter in polygon, i, year, t, in the baseline and project cases, respectively. |

| | |
|---|---|
| Source of data | Calculated within CBM-CFS3. |
| Value applied: | Variable, see source data. |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,BUCKINGLOSS,i,t}$, $f_{PRJ,BUCKINGLOSS,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,BUCKINGLOSSi,t}$ $f_{PRJ,BUCKINGLOSS,i,t} < 1$) |
| Description | The proportion of the log bole biomass left on site after assessing and/or merchandizing the log bole for quality, in polygon, i, year, t, in the baseline and project cases, respectively. |
| Source of data | CBM-CFS3 EU-AIDB default values for SPU 3 |
| Value applied: | CBM-CFS3 EU-AIDB default values for SPU 3 |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,SNAGFALLDOWN,i,t}$, $f_{PRJ,SNAGFALLDOWN,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,SNAGFALLDOWNi,t}$ $f_{PRJ,SNAGFALLDOWN,i,t} < 1$) |
| Description | The proportion of snag biomass in polygon, i, year, t, that falls over, in the baseline and project cases, respectively. |

| | |
|---|---|
| Source of data | Modeled by CBM-CFS3-EU-AIDB. |
| Value applied: | Variable, depending on species and dbh. Modeled by species and age class within CBM-CFS3 EU-AIDB |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,LWDECAY,i,t}$, $f_{PRJ,LWDECAY,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,LWDECAYi,t}\ f_{PRJ,LWDECAY,i,t} < 1$) |
| Description | The annual proportional loss of lying dead biomass due to decay, in polygon i, year, t in the baseline and project cases, respectively. |
| Source of data | Modeled by CBM-CFS3-EU-AIDB. |
| Value applied: | CBM-CFS3 default values for SPU 3 |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,SWDECAY,i,t}$, $f_{PRJ,SWDECAY,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,SWDECAYi,t}\ f_{PRJ,SWDECAY,i,t} < 1$) |
| Description | The proportional loss of snag biomass due to decay, in polygon, i, year, t, in the baseline and project cases, respectively. |

| | |
|---|---|
| Source of data | Modeled by CBM-CFS3-EU-AIDB. |
| Value applied: | CBM-CFS3 default values for SPU 3 |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{BSL,DBGDECAY,i,t}$, $f_{PRJ,DBGDECAY,i,t}$ |
| Data unit | unitless ($0 < f_{BSL,DGBDECAYi,t}$ $f_{PRJ,DBGDECAY,i,t} < 1$) |
| Description | The proportional loss of dead belowground biomass due to decay, in polygon i, year, t, in the baseline and project cases, respectively. |
| Source of data | Modeled by CBM-CFS3-EU-AIDB. |
| Value applied: | CBM-CFS3 default values SPU 3 |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $P_{3\text{-}year}$ and $P_{100\text{-}year}$ |
| Data unit | unitless |
| Description | The proportion of total carbon stored in wood products after 3 years ($P_{3\text{-}year}$); and the proportion of harvested wood stored for 100 years ($P_{100\text{-}year}$), for product type, *k*. |

| | |
|---|---|
| Source of data | Calculated for the baseline and project case |
| Value applied: | $P_{3\text{-year}}$ = 0.495 (softwood saw log)<br>$P_{100\text{-year}}$ = 0.095 (softwood saw log)<br>$P_{3\text{-year}}$ = 0.317 (softwood pulpwood)<br>$P_{100\text{-year}}$ = 0.006 (softwood pulpwood)<br>$P_{3\text{-year}}$ = 0.500 (hardwood saw log)<br>$P_{100\text{-year}}$ = 0.035 (hardwood saw log)<br>$P_{3\text{-year}}$ = 0.496 (hardwood pulpwood)<br>$P_{100\text{-year}}$ = 0.103 (hardwood pulpwood) |
| Justification of choice of data or description of measurement methods and procedures applied | Smith, et al (2006) Table 6 – the Northeast Softwoods, Saw Logs and Pulpwood; along with the Northeast Hardwood tables were applied. |
| Purpose of Data | Calculation of harvested wood products |
| Comments | HWP excel spread sheets |

| | |
|---|---|
| Data / Parameter | $P_{BSL,SLF}$, $P_{BSL,MLF}$, $P_{BSL,LLF}$ |
| Data unit | unitless |
| Description | The short-lived fraction ($P_{SLF}$), medium-lived fraction ($P_{MLF}$), and long-lived fraction ($P_{LLF}$), respectively, for product type, *k* |
| Source of data | Calculated as per equations 22a-c (baseline) and equations 50a-c (project) |
| Value applied: | $P_{BSL,SLF}$ = 0.505 (softwood saw log), 0.683 (softwood pulp), 0.5 (hardwood saw log), 0.504 (softwood pulp)<br>$P_{BSL,MLF}$ = 0.410 (softwood saw log), 0.677 (softwood pulp), 0.465 (hardwood saw log), 0.401 (softwood pulp)<br>$P_{BSL,LLF}$ = 0.095 (softwood saw log), 0.006 (softwood pulp), 0.035 (hardwood saw log), 0.103 (softwood pulp) |

| | |
|---|---|
| Justification of choice of data or description of measurement methods and procedures applied | Smith, et al (2006) Table 6 – the Northeast Softwoods, Saw Logs and Pulpwood; along with the Northeast Hardwood tables were applied. |
| Purpose of Data | Calculation of harvested wood products |
| Comments | HWP excel spread sheets |

| | |
|---|---|
| Data / Parameter | $f_{TRANSPORTk}$ |
| Data unit | (unitless; $0 \leq f_{BSL,TRANSPORTk} < 1$). |
| Description | The fraction of raw material transported by transportation type, *k*. |
| Source of data | Buyer/ Log sale history (2016-2021). Harvest history (all material is transported by truck) |
| Value applied: | 1 |
| Justification of choice of data or description of measurement methods and procedures applied | Buyer/ Log sale history (2016-2021). Harvest history (all material is transported by truck) |
| Purpose of Data | |
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $C_{HARVEST}$ |
| Data unit | t C emitted/t C raw material |
| Description | The carbon emission intensity factor associated with harvesting |
| Source of data | Default values in VM0012 Table 4 have been used |
| Value applied: | 0.016 |
| Justification of choice of data or description of measurement methods and procedures applied | Default values in VM0012 |

| | |
|---|---|
| Purpose of Data | |
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $C_{MANUFACTUREk}$ |
| Data unit | t C emitted/t C raw material |
| Description | The carbon emission intensity factor associated with manufacture of product, k |
| Source of data | Default values in VM0012 Table 4 have been used |
| Value applied: | 0.04 |
| Justification of choice of data or description of measurement methods and procedures applied | Buyer/Log sale history (2016-2021). Harvest history (all material is manufactured as sawnwood) |
| Purpose of Data | |
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $C_{TRANSPORTk}$ |
| Data unit | t C emitted/t C raw material ● km |
| Description | The carbon emission intensity factor associated with the transport of raw material by transportation type of product, k |
| Source of data | Default values in VM0012 Table 4 have been used |
| Value applied: | 0.00007 |
| Justification of choice of data or description of measurement methods and procedures applied | Default values in VM0012 |
| Purpose of Data | |

| | |
|---|---|
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $d_{TRANSPORTk}$ |
| Data unit | km |
| Description | The distance transported by transportation type, *k*. |
| Source of data | Buyer/ Log sale history (2016-2021) |
| Value applied: | 68.8km |
| Justification of choice of data or description of measurement methods and procedures applied | Weighted average haul distance based on Buyer/ Log sale history (2016-2021) |
| Purpose of Data | |
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $C_{EMITTRANSPORT,t}$ |
| Data unit | t C $yr^{-1}$ |
| Description | The annual fossil fuel emissions associated with the transport of raw material |
| Source of data | |
| Value applied: | Changes annually see spreadsheet |
| Justification of choice of data or description of measurement methods and procedures applied | |
| Purpose of Data | *Equation 26* |
| Comments | Emissions Estimate spreadsheets |

| | |
|---|---|
| Data / Parameter | $\Delta C_{HWP,t}$ |
| Data unit | t C $yr^{-1}$ |
| Description | The annual change in carbon stocks in harvested wood products for year, *t* |
| Source of data | Calculated in equation 18 (Section 8.1); equation 46 (Section 8.2) |
| Value applied: | Changes annually see spreadsheet |
| Justification of choice of data or description of measurement methods and procedures applied | |
| Purpose of Data | |
| Comments | Westphalen Final GHG Estimate Spreadsheet |
| Data / Parameter | $E_M$ |
| Data unit | % |
| Description | An estimate of model error based on the relative area-weighted difference between model-predicted values of carbon storage and those values measured in field plots. |
| Source of data | Model output and field data (see Equation 60a). |
| Value applied: | Percent Calculated |
| Justification of choice of data or description of measurement methods and procedures applied | Value determined using approach described in the VM0012 Methodology. |
| Purpose of Data | Calculation of Uncertainty. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_I$ |
| Data unit | % |

| | |
|---|---|
| Description | An estimate of Inventory sampling error calculated as the 90% confidence limit of the area-weighted differences between the model-predicted values of carbon storage and those values measured in field plots. |
| Source of data | Model output and field data (see Equation 60c). |
| Value applied: | Percent Calculated |
| Justification of choice of data or description of measurement methods and procedures applied | Value determined using approach described in the VM0012 Methodology. |
| Purpose of Data | Calculation of Uncertainty. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_P$ |
| Data unit | % |
| Description | An estimate of the total project error used to determine the uncertainty factor. |
| Source of data | Model output and field data (see Equation 60f). |
| Value applied: | Percent Calculated |
| Justification of choice of data or description of measurement methods and procedures applied | Value determined using approach described in the VM0012 Methodology. |
| Purpose of Data | Calculation of Uncertainty. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_{Ry,ERR}$, |
| Data unit | % |

| | |
|---|---|
| Description | The uncertainty factor calculated for year 'y' (See Section 5.4). |
| Source of data | Model output and field data (see Equation 60f). |
| Value applied: | % |
| Justification of choice of data or description of measurement methods and procedures applied | Value determined using approach described in the VM0012 Methodology. |
| Purpose of Data | Calculation of baseline and project emissions and calculations of $VCU_y$. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $MLF_y$ |
| Data unit | % |
| Description | The market leakage factor determined for year 'y' |
| Source of data | Determined based upon the approach defined in Section 5.3 |
| Value applied: | Percent Calculated |
| Justification of choice of data or description of measurement methods and procedures applied | The value determined using the MARketz Tool as detailed in the appendices. |
| Purpose of Data | Calculation of leakage. |
| Comments | |

| | |
|---|---|
| Data / Parameter | Component Ratio Method (Biomass Expansion Factors). |
| Data unit | Unitless |
| Description | Used to convert height and DBH into biomass of component pools. Utilized to calculate biomass measured in field plots. |

| | |
|---|---|
| Source of data | Modeled by CBM-CFS3. |
| Value applied: | CBM-CFS3 default settings for SPU 3 |
| Justification of choice of data or description of measurement methods and procedures applied | CBM-CFS3 is widely accepted. |
| Purpose of Data | Required for calculation of baseline and project emissions. |
| Comments | |

## 4.2 Data and Parameters Monitored

| | |
|---|---|
| Data / Parameter | $A_{PRJ,i}$ |
| Data unit | Hectares (ha) |
| Description | Area of forest land in polygon, i |
| Source of data | Latest version of the spatial inventory data. |
| Description of measurement methods and procedures applied | GIS inventory data updated annually from Remote Sensing data, GPS data, combined with Westphalen forest inventory spreadsheets. Updated yearly by Project Proponent, monitored by the Project Developer. |
| Frequency of monitoring/recording | Prior to every verification period. Yearly for spatial change monitoring. |
| Value applied: | Inventory data, hectares. |
| Monitoring equipment | Visual, satellite, aerial photos, GPS survey data. |
| QA/QC procedures applied | Standard GIS QA/QC procedures. Zimmfor Management Services Ltd. – Greenhouse Gas Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Calculation of project emissions in project area instances. |

| | |
|---|---|
| Calculation method | GIS software processes calculate areas. |
| Comments | Includes delineation of project areas and polygons |

| | |
|---|---|
| Data / Parameter | APSP,i, |
| Data unit | Hectares (ha) |
| Description | Area of permanent sample plot in polygon, i |
| Source of data | Field measurement. |
| Description of measurement methods and procedures applied | Fixed radius permanent sample plot design. See Zimmfor Management Services Ltd Greenhouse Gas Monitoring SOP for procedures applied for plot sampling procedures. Completed by Project Developer. |
| Frequency of monitoring/recording | Plot measurements are repeated on 5-year intervals. |
| Value applied: | See compiled plot data MS Excel File. Plot area is recorded in m2 and converted to hectares. |
| Monitoring equipment | GPS, measuring tape. ZEB GeoSLAM Horizon LiDAR Scanner |
| QA/QC procedures applied | GPS of plot center. Zimmfor Management Services Ltd. Standard Operating Procedures (SOP) followed, including QC/QA plot check processes. |
| Purpose of data | Required for calculations of mean aboveground biomass and in determination of Uncertainty Factor. |
| Calculation method | Measured |
| Comments | |

| | |
|---|---|
| Data / Parameter | $DBH_{i,t}$ |

| | |
|---|---|
| Data unit | Centimeters (cm) |
| Description | Diameter at breast height measured for each tree in the sample plot at time, t |
| Source of data | Field measurements in sample plots. |
| Description of measurement methods and procedures applied | Field measurements in permanent sample plots. Measurement with ZEB GeoSLAM Horizon LiDAR Scanner trees ≥ 5cm in DBH at 1.3m height above ground. Completed by Project Developer. |
| Frequency of monitoring/recording | Individual plot tree re-measurements are repeated on 5-year intervals. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | ZEB GeoSLAM Horizon LiDAR Scanner, DBH tape, data logger |
| QA/QC procedures applied | Zimmfor Service Management Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for calculations in aboveground biomass and in determination of Uncertainty Factor. |
| Calculation method | Measured. |
| Comments | |

| | |
|---|---|
| Data / Parameter | Height $_{i,t}$ |
| Data unit | Meters (m) |
| Description | Tree height measured for each tree in the sample plots at time, t |
| Source of data | Field measure in sample plots. |
| Description of measurement methods and procedures applied | Field measurements in permanent sample plots. Measurement with ZEB GeoSLAM Horizon LiDAR Scanner to for trees ≥ 5cm DBH. Completed by Project Developer. |

| | |
|---|---|
| Frequency of monitoring/recording | Individual plot tree re-measurements are repeated on 5-year intervals. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | ZEB GeoSLAM Horizon LiDAR Scanner, or other instrument designed for measuring height. |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for calculations of mean aboveground biomass and in determination of Uncertainty Factor. |
| Calculation method | Measured |
| Comments | |

| | |
|---|---|
| Data / Parameter | $B_{AG\ i,t}$ |
| Data unit | t d.m. ha-1 (d.m. = dry matter) |
| Description | Aboveground live tree biomass in polygon, i, year, t, in the project. |
| Source of data | Permanent sample plots (PSP). |
| Description of measurement methods and procedures applied | Calculated from $Height_{i,t}$, $DBH_{i,t}$, and $APSP_{i,}$ Completed by Project Developer. |
| Frequency of monitoring/recording | Upon establishment of the PSP. Every 5 years, thereafter. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |

| | |
|---|---|
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Above ground biomass for each permanent sample plot will be calculated using $m^3$/ha and supporting CBM-CFS3 data (Boudewyn 2007 equations). |
| Comments | Calculated |

| | |
|---|---|
| Data / Parameter | $B_{BG\ i,t}$ |
| Data unit | t d.m. ha-1 (d.m. = dry matter) |
| Description | Average belowground live tree biomass in polygon, i, year, t, in the project. |
| Source of data | Estimated using info from above ground biomass calculations within permanent sample plots from $BAG_{i,t}$. |
| Description of measurement methods and procedures applied | Calculated using plot data in CBM-CFS3 EU-AIDB. Completed by Project Developer. |
| Frequency of monitoring/recording | Upon establishment of the PSP. Every 5 years, thereafter. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Below ground biomass for each permanent sample plot will be calculated using $m^3$/ha and supporting CBM-CFS3 data (Boudewyn 2007 equations). |
| Comments | |

| | |
|---|---|
| Data / Parameter | $B_{TOTAL\ i,t}$ |
| Data unit | t d.m. ha$^{-1}$ (d.m. = dry matter) |
| Description | Average total live biomass in polygon, i, for year, t. |
| Source of data | Derived from average above and below ground biomass calculations within permanent sample plots. |
| Description of measurement methods and procedures applied | Sum of $B_{AGi,t}$ and $B_{BGi,t.}$ Completed by Project Developer. |
| Frequency of monitoring/recording | Upon establishment of the PSP. Every 5 years, thereafter. |
| Value applied: | Calculated using plot data and supporting CBM-CFS3 data (Boudewyn 2007 equations and 2014 updates). |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for above and below ground living tree biomass and in the determination of Uncertainty Factor. |
| Calculation method | Sum of $B_{AGi,t}$ and $B_{BGi,t}$ values. |
| Comments | Calculated |

| | |
|---|---|
| Data / Parameter | $CLB_{i,t}$ |
| Data unit | t d.m. ha$^{-1}$ (d.m. = dry matter) |
| Description | Total carbon storage in live tree biomass in polygon, i, year, t, tC in the project case. |
| Source of data | Permanent sample plots. |

| | |
|---|---|
| Description of measurement methods and procedures applied | Calculated from $B_{TOTALi,t}$ and CF, sum of $B_{AG\ i,t}$ and $B_{BG,\ i,\ t.}$ Completed by Project Developer. |
| Frequency of monitoring/recording | Upon establishment of the PSP. Every 5 years, thereafter. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | As calculated by supporting CBM-CFS3 data (Boudewyn 2007 equations and 2014 updates) and plot data, or $B_{TOTALi,t}$ * CF |
| Comments | |

| | |
|---|---|
| Data / Parameter | $CDOM_{i,t}$ |
| Data unit | t d.m. $ha^{-1}$ (d.m. = dry matter) |
| Description | Total carbon storage in dead organic matter in polygon, i, year, t, |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Calculated from $DOM_{SNAGi,t}$ and $DOM_{LDWi,t}$ and CF. Completed by Project Developer. |
| Frequency of monitoring/recording | Upon establishment of the PSP. Every 5 years, thereafter. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |

| | |
|---|---|
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | As calculated from plot data, decay rate constraints and supporting CBM-CFS3 data (Boudewyn 2007 equations and 2014 updates). Or $(DOM_{SNAGi,t} + DOM_{LDWi,t})* CF$ |
| Comments | Calculated |

| | |
|---|---|
| Data / Parameter | $f_{PRJ,NATURAL,i,t}$ |
| Data unit | unitless ($0 < f_{PRJ,NATURAL,i,t} < 1$) |
| Description | The proportion of biomass that dies from natural mortality in polygon, i, year, t, in the project scenario. |
| Source of data | Permanent sample plots, remote sensing. |
| Description of measurement methods and procedures applied | The height and DBH of dead trees in permanent sample plots will be recorded. Areas of stand replacing natural disturbance events will be delineated if >1.0 hectares. Completed by Project Developer. |
| Frequency of monitoring/recording | Annually in the case of natural disturbance events, every 5 years in the case of individual plot trees |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | Observation |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for project calculations |

| | |
|---|---|
| Calculation method | Observation in plot, and/or calculated by supporting CBM-CFS3 data (Boudewyn 2007 equations and 2014 updates) and/or GIS/GPS delineation. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{PRJ,HARVEST,i,t}$ |
| Data unit | unitless ($0 < f_{PRJ,HARVEST,i,t} < 1$) |
| Description | The proportion of biomass removed by harvesting from polygon, i, in year, t, in the project scenario. |
| Source of data | Project Proponent harvesting records, inventory data. |
| Description of measurement methods and procedures applied | Volume derived from harvesting records. Modeled estimates of total biomass in polygon, i, used to derive parameter. Completed by Project Proponent. |
| Frequency of monitoring/recording | Annually |
| Value applied: | See harvest area. |
| Monitoring equipment | GPS, remote sensing |
| QA/QC procedures applied | Data will be verified by ground-truthing and comparison with remote sensing information. |
| Purpose of data | Required for project calculations. |
| Calculation method | Modeled by CBM-CFS3 based on actual removals. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $f_{PRJ,DAMAGE,i,t}$ |
| Data unit | unitless ($0 < f_{PRJ,DAMAGE,i,t} < 1$) |

| | |
|---|---|
| Description | The proportion of additional biomass removed for road and landing construction in polygon, i, year, t, in the project case. |
| Source of data | Remote sensing, inventory data. |
| Description of measurement methods and procedures applied | Removals derived from remote sensing data and construction records. Completed by Project Proponent yearly. |
| Frequency of monitoring/recording | Annually |
| Value applied: | See GIS delineations construction records. |
| Monitoring equipment | GPS, satellite imagery, aerial photos, |
| QA/QC procedures applied | Data will be verified by ground-truthing and comparison with remote sensing information. |
| Purpose of data | Required for project calculations. |
| Calculation method | Areal estimate of removals is multiplied by average carbon density within a polygon. |
| Comments | |

| | |
|---|---|
| Data / Parameter | $DOM_{SNAG,i,t}$ |
| Data unit | t d.m. $ha^{-1}$ (d.m. = dry matter) |
| Description | Total mass of dead organic matter contained in standing dead wood in polygon, i, year, t in the project case. |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Calculated from Height, $_{i,t}$, $DBH_{i,t}$, and $APSP_{,i}$ of dead trees measured in permanent sample plots. Completed by Project Developer. |
| Frequency of monitoring/recording | Every 5 years. |

| | |
|---|---|
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Calculated by supporting CBM-CFS3 data (Boudewyn 2007 equations and 2014 updates) from plot data. |
| Comments | Calculated |

| | |
|---|---|
| Data / Parameter | $DOM_{LDW,i,t}$ |
| Data unit | t d.m. $ha^{-1}$ (d.m. = dry matter) |
| Description | Total mass of dead organic matter contained in lying dead wood in polygon, i, year, t in the project case. |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Calculated from the line intersect method (Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP)). Completed by Project Developer. |
| Frequency of monitoring/recording | Every 5 years. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | |
| QA/QC procedures applied | Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |

| | |
|---|---|
| Calculation method | Calculated using the following field- measured parameters Li,t, dni,t, DLDWc,i,t , and N,t |
| Comments | Calculated |

| | |
|---|---|
| Data / Parameter | VLDW,i,t |
| Data unit | m3 ha-1 |
| Description | Total volume of dead organic matter contained in lying dead wood in the polygon, i, year, t in the project case. |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Calculated from the line intersect method (Zimmfor Management Services Ltd. Greenhouse Gas – Monitoring SOP). Completed by the Project Developer. |
| Frequency of monitoring/recording | Every 5 years. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | Tape and visual inspection. |
| QA/QC procedures applied | Zimmfor Management Services Ltd Greenhouse Gas – Monitoring SOP. |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Calculated using the following field- measured parameters $L_{i,t}$, $d_{ni,t}$, $D_{LDWc,i,t}$ , and $N_t$ |
| Comments | |

| | |
|---|---|
| Data / Parameter | $L_{i,t}$ |
| Data unit | Meters (m) |

| | |
|---|---|
| Description | Calculation of lying dead wood: Length of the transect used to determine volume of lying dead wood in the sample plot, at time, t (4*25m=100m). Completed by Project Developer. |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Field measurements |
| Frequency of monitoring/recording | Every 5 years. |
| Value applied: | 100 meter transect |
| Monitoring equipment | Metric measuring tape. |
| QA/QC procedures applied | Zimmfor Management Services Ltd Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of carbon stocks and Uncertainty Factor. |
| Calculation method | |
| Comments | |

| | |
|---|---|
| Data / Parameter | $D_{n,i,t}$ |
| Data unit | Centimeters (cm) |
| Description | Calculation of lying dead wood volume: Diameter of each piece n of dead wood inside the sample plot at time, t). |
| Source of data | Permanent sample plots. |
| Description of measurement methods and procedures applied | Lying dead wood to be sampled as described in the Zimmfor Management Services Ltd Monitoring SOP. Four 25-m lines are established bisecting each plot on cardinal bearings (N,S,E,W) and specific diameters of the lying wood within three radius sizes intersecting the lines are measured. The minimum diameter must not be less than 5 cm. Completed by Project Developer |

| | |
|---|---|
| Frequency of monitoring/recording | Every 5 years. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | Caliper, diameter tape |
| QA/QC procedures applied | Zimmfor Management Services Ltd Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | |
| Comments | |

| | |
|---|---|
| Data / Parameter | $N_{,t}$ |
| Data unit | unitless |
| Description | Calculation of lying dead wood: Diameter of each piece n of dead wood along the in the sample plot at time, t). |
| Source of data | Permanent sample plots field measurement. |
| Description of measurement methods and procedures applied | Total number of wood pieces in the sample plot, in time t, Completed by Project Developer. |
| Frequency of monitoring/recording | Every 5 years. |
| Value applied: | See compiled plot data MS Excel File. |
| Monitoring equipment | Visual observation. |
| QA/QC procedures applied | Zimmfor Management Services Ltd Greenhouse Gas – Monitoring Standard Operating Procedures (SOP). |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | |

| | |
|---|---|
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_M$ / Mean model error for the project |
| Data unit | % |
| Description | An estimate of model error. |
| Source of data | Model output and field data. |
| Description of measurement methods and procedures applied | Calculated value determined difference between of model-predicted values of carbon storage and those values measured in field plots (see Equation 60a). Completed by Project Developer. |
| Frequency of monitoring/recording | At each verification. |
| Value applied: | -18.38% |
| Monitoring equipment | |
| QA/QC procedures applied | |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Equation (60a). |
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_I$ / Inventory error for the project |
| Data unit | % |
| Description | An estimate of inventory sampling error. |
| Source of data | Model output and field data. |

| | |
|---|---|
| Description of measurement methods and procedures applied | Calculated as the 90% confidence limit of the area-weighted differences between the model-predicted values of carbon storage and those values measured in field plots. Completed by Project Developer. |
| Frequency of monitoring/recording | At each verification. |
| Value applied: | 17.61% |
| Monitoring equipment | |
| QA/QC procedures applied | |
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Equation (60c). |
| Comments | |

| | |
|---|---|
| Data / Parameter | $E_P$ / Estimated project error |
| Data unit | % |
| Description | An estimate of total project error calculated as the sum of the model and inventory error terms. |
| Source of data | Model output and field data. |
| Description of measurement methods and procedures applied | Calculated as the sum of EM and EI (Equation 60e). Completed by Project Developer. |
| Frequency of monitoring/recording | At each verification. |
| Value applied: | -0.78% |
| Monitoring equipment | |
| QA/QC procedures applied | |

| | |
|---|---|
| Purpose of data | Required for determination of Uncertainty Factor. |
| Calculation method | Equation (60f). |
| Comments | |

| | |
|---|---|
| Data / Parameter | $ER_{y,ERR}$ / Uncertainty Factor |
| Data unit | % |
| Description | The uncertainty factor calculated for year 'y' |
| Source of data | Model output and field data. |
| Description of measurement methods and procedures applied | Calculated value. Completed by Project Developer. |
| Frequency of monitoring/recording | At each verification and applied annually until the next verification. |
| Value applied: | 1.5 % |
| Monitoring equipment | |
| QA/QC procedures applied | |
| Purpose of data | Required for project calculations. |
| Calculation method | |
| Comments | |

| | |
|---|---|
| Data / Parameter | $MLF_y$ |
| Data unit | Percent |
| Description | The market leakage factor determined for year 'y' |

| | |
|---|---|
| Source of data | Model output and field data. |
| Description of measurement methods and procedures applied | Determined based upon the approach defined in Section 3. Completed by Project Developer. |
| Frequency of monitoring/recording | At each verification |
| Value applied: | 20% |
| Monitoring equipment | |
| QA/QC procedures applied | |
| Purpose of data | Required for calculation of leakage. |
| Calculation method | Value determined using the MARketz Tool as detailed in the appendices. |
| Comments | |

## 4.3 Monitoring Plan

The objective of the Westphalen Forest Carbon Project monitoring plan is to reliably monitor changes in carbon stocks related to the calculation of VCU's prior to each verification. In particular, the program will reliably monitor changes in spatial forest inventory conditions and collect field data on carbon stocks (as per Zimmfor Management Services Ltd. Monitoring Standard Operating Procedures (SOP)) to compare against modeled carbon stocks and to calculate the uncertainty factor.

Ongoing monitoring is the primary operational task for the project, which will be completed by the Project Proponent and supported by the Project Developer and Implementation Partner. Additional field monitoring may require the hiring of external field crews, all of which will be experienced in forest mensuration. Westphalen's onsite supervisor, Project Developer and Implementation Partner will be responsible for the adequate training of these external contractors, ensuring that all individuals involved are familiar with the sampling standard operating procedures.

Monitoring carried out during the reporting period included several separate processes, spatial change monitoring, establishment and/or re-measure of monitoring plots and leakage monitoring.

### 4.3.1 Spatial monitoring

Spatial change monitoring is completed annually through the monitoring period and as such an assessment was completed for the 2022/2023 and the 2023/2024. The NDVI Spatial Monitoring Report for both 2023 and 2024 are included within the Appendices. The reports include information on the process including data acquisition, classification, and results.

In 2023 no inventory change was observed during the monitoring period in the Schleswig-Holstein geographic region. Spatial change detection results in North Rhine-Westphalia show an inventory change of 0.76 hectares. This was attributed to unavoidable harvesting due to a Spruce beetle kill and was the reason for harvesting in 2022. This has been addressed in the Project GHG update.

In 2024 no inventory change was observed during the monitoring period in the North Rhine-Westphalen or Schleswig-Holstein geographic region.

### 4.3.2 Sample Plots

Building upon the initial sample design and to ensure representation across the project area, additional plots were measured during the monitoring period. Additional plots were completed during the week of 2024-09-12. The project initially installed 31 permanent carbon plots in 2022 and established an additional set of 46 plots in 2024.

**Table 29: Plot allocation by Analysis Unit**

| Analysis Unit | Number of Plots |
|---|---|
| BZ1 | 17 |
| BZ2 | 23 |

| Analysis Unit | Number of Plots |
|---|---|
| BZ3 | 13 |
| OZ1 | 4 |
| OZ2 | 7 |
| OZ3 | 4 |
| SZ1 | 5 |
| SZ2 | 4 |
| **Grand Total** | **77** |

- The methods used for measuring, recording, storing, aggregating, collating and reporting on monitored data and parameters were completed as they were during validation
- Plots were completed by Forest Design[22] utilizing the same field crew and equipment
- Plot centers were identified in the field utilizing GPS units and the sampling plot is 400m$^2$ circle.
- Tree measurements were completed using a Light Detection and Ranging (LiDAR) unit, the GeoSlam Horizon or FJDynamics. The LiDAR unit sends a laser light from a transmitter and the surrounding forests and ground beneath it reflect the laser energy back, which is then detected and measured in time and distance by sensors.
- Standing Deadwood within the plot was measured using the same method as live trees.
- Lying Deadwood was measured using four 25m transects which run at 90-degree angles to each other across the plot center at cardinal bearings (or if available more current technologies such as LiDAR).
- Tree data was compiled using excel and volume related to merchantable volume used allometric formals common to Germany [23]
- Quality control was carried out on 10% of sample plots. All variables within the plot were remeasured to ensure that the submitted data meets the required measurement accuracy for that variable. Data collected did not exceed error thresholds.
- Data entry quality control measures were undertaken for data entered to databases operated by Westphalen. Minor anomalies were noted and corrections made via resubmittal of the data. Communication records on file (RE_ Westphalen Monitor Plot (corrections)).

The field data was calculated and reported correctly and transparently for the project calculations. These values were used to determine the uncertainty deduction factor, and not for directly calculating project emission reductions or removals.

[22] Forest Design's website: https://forestdesign.ro/index.php/ro/

[23] Forest growth software systems based on TreeGrOSS: https://univerlag.uni-goettingen.de/handle/3/isbn-978-3-86395-149-8

Under the VM0012 methodology, Section 8.2, Project Emissions, the net emissions calculated for both the project and baseline should be determined using the same modelling methods and inventory inputs. The inventory data from approved forest management plans were used to model the baseline and project ERRs.

Following the steps outlined in Section 8.2.2, Determining Actual Onsite Carbon Stocks, field plot measurements were collected to compare biomass estimates from monitoring activities against current year-modeled values in the project scenario to determine an uncertainty factor. They were not used to create a forest inventory dataset.

The parameter DBHi,t , and the corresponding MS Excel file holds all the data retrieved during the monitoring plot activities. This Excel file is used as a direct input for the calculation of uncertainty (a separate Excel file). Due to the complexity of the data required and the calculations for determining an uncertainty factor, the calculation steps have been kept separate from the GHG calculator.

The project has updated the inventory, uncertainty calculations, and carbon calculations from both spatial analysis and field plot measurement data as outlined above.

As a result of monitoring none of the following actions were required:

1. Refine the project analysis units based on new forest inventory data or to meet the needs of future project instances. No PAI were added nor was inventory data revised
2. Refine or calibrate carbon models based on updated inventory data, as appropriate. Not required given the results of the uncertainty calculation.
3. Update or modify inventory polygons based on updated remote sensing, forest inventory data, or field truthing, or as a result of project activities or disturbances. As the disturbance noted was small in nature (0.76ha) no modification was made at this time.

### 4.3.3 Other Monitoring Requirements:

Westphalen has also documented the following:

1. Activity shifting leakage (monitored annually, reported at each verification) – the project has assessed the activity shifting leakage based on the timber harvest levels on lands owned or controlled by Westphalen that are outside the project area.
2. Market leakage calculations (at each verification, applied annually) - market leakage calculations have been confirmed using the latest plot inventory data and best available regional leakage area analysis.
3. Unplanned timber harvest occurred within the project monitoring period to address calamity events (insect attacks and windthrow) which required a response from Westphalen. Further quantification has demonstrated that the GHG benefit of the project for the verification period is positive (i.e., all losses have been made-up over the verification period taking into account project GHG emissions, removals, and leakage).

# 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

## 5.1 Baseline Emissions

### 5.1.1 Baseline Scenario GHG Emissions Calculation Summary

There are no changes to the baseline as presented in the initial Joint Project Description & Monitoring Report (PDMR). The methodology does not provide procedures or equations to determine reductions and removals separately.

The CBM-CFS3 model and supporting spreadsheets were used based on spatial forest inventory data to calculate and track all annual changes in both the live biomass ($\Delta C_{BSL,LB,t}$) and dead organic matter pools (($\Delta C_{BSL,DOM,t}$) for the baseline scenario in a method consistent with the formulas in VM0012. Carbon storage changes in harvested wood products ($\Delta C_{BSl,HWP,t}$) and fossil fuel emissions ($\Delta C_{BSL,EMITFOSSIL,t}$) summarized net carbon balances in the supporting calculation spreadsheets.

All relevant equations are provided and referenced with sufficient information to reproduce calculations.

The total annual carbon balance in year, t, for the baseline scenario (ΔCBSL,t, in t C yr-1) was calculated as:

$$\Delta C_{BSL,t} = \Delta C_{BSL,P,t} \quad (1)$$

where:

$\Delta C_{BSL,P,t}$ is the annual change in carbon stocks in all pools in the baseline across the project activity area (including all project instances); t C yr-1.

The annual change in carbon stocks in all pools in the baseline across the project activity area ($\Delta C_{BSL,P,t}$; t C $yr^{-1}$) was calculated as:

$$\Delta C_{BSL,P,t} = \Delta C_{BSL,LB,t} + \Delta C_{BSL,DOM,t} + \Delta C_{BSl,HWP,t} \quad (2)$$

where:

$\Delta C_{BSL,LB,t}$ = annual change in carbon stocks in living tree biomass (above- and belowground); t C $yr^{-1}$

$\Delta C_{BSL,DOM,t}$ = annual change in carbon stocks in dead organic matter; t C $yr^{-1}$

$\Delta C_{BSl,HWP,t}$ is the annual change in carbon stocks associated with harvested wood products, t C $yr^{-1}$.

The annual change in carbon stocks in living tree biomass (above- and belowground) in the baseline scenario ($\Delta C_{BSL,LB,t}$; t C $yr^{-1}$) was calculated as:

$$\Delta C_{BSL,LB,t} = \Delta C_{BSL,G,t} - \Delta C_{BSL,i,t} \quad (3)$$

where:

$\Delta C_{BSL,G,t}$ = annual increase in tree carbon stock from growth; t C $yr^{-1}$

$\Delta C_{BSL,L,t}$ = annual decrease in tree carbon stock from a reduction in live biomass; t C $yr^{-1}$.

Live Biomass Gains and Loss (Eq 4- 9) are calculated within CBM-CFS3 using appropriate inputs derived from forest inventory data. All efforts have been made to data suited to the project area and are forest-type specific.

The annual change in carbon stocks in dead organic matter (DOM) ($\Delta C_{BSL,DOM}$; t C $yr^{-1}$) in the baseline scenario was calculated as:

$$\Delta C_{BSL,DOM,t} = \Delta C_{BSL,LDW,t} + \Delta C_{BSL,SNAG,t} + \Delta C_{BSL,DBG,t} \quad (10)$$

where:

$\Delta C_{BSL,LDW,t}$ = change in lying dead wood (LDW) carbon stocks in year, t; t C $yr^{-1}$

$\Delta C_{BSL,SNAG,t}$ = change in snag carbon stock in year, t; t C $yr^{-1}$

$\Delta C_{BSL,DBG,t}$ = change in dead below-ground biomass carbon stock in year, t; t C $yr^{-1}$.

The annual change in emissions associated with the production of harvested wood products (HWP), $\Delta C_{BSI,HWP,t}$, is calculated as:

$$\Delta C_{BSI,HWP,t} = \Delta C_{BSL,STORHWP,t} - \Delta C_{BSL,EMITFOSSIL,t,} \quad (18)$$

$\Delta C_{BSL,STORHWP,t}$ = the annual change in harvested carbon that remains in storage after conversion to wood products (t C $yr^{-1}$)

$\Delta C_{BSL,EMITFOSSIL,t}$ = the annual change in fossil fuel emissions from harvesting (logging and log transport) and processing of the various wood products.

## 5.2 Project Emissions

### 5.2.1 Project Scenario GHG Emissions Calculation Summary

The CBM-CFS3 and supporting spreadsheets were used in combination with the spatial forest inventory data to calculate and track annual changes in both the biomass ($\Delta C_{PRJ,LB,t}$) and dead organic matter pools ($\Delta C_{PRJ,DOM,t}$) for the project scenario. Changes in carbon storage in harvested wood products ($\Delta C_{PRJ,HWP,t}$) and fossil fuel emissions ($\Delta_{PRJ,EMITFOSSIL,t}$) and summarized net carbon balances and buffer discounts were determined within the applicable spreadsheets.

The total annual carbon balance in year, t, for the project scenario ($\Delta C_{PRJ,t}$, in t C $yr^{-1}$) was calculated as:

$$\Delta C_{PRJ,t} = \Delta C_{PRJ,P,t} \quad (29)$$

where:

$\Delta C_{PRJ,P,t}$ is the annual change in carbon stocks in all pools in the baseline across the project activity area; t C $yr^{-1}$.

The annual change in carbon stocks in all pools in the project scenario across the project activity area ($\Delta C_{PRJ,P,t}$; t C $yr^{-1}$) was calculated as:

$$\Delta C_{PRJ,P,t} = \Delta C_{PRJ,LB,t} + \Delta C_{PRJ,DOM,t} + \Delta C_{PRJ,HWP,t} \quad (30)$$

where:

$\Delta C_{PRJ,LB,t}$ = annual change in carbon stocks in living tree biomass (above- and belowground); t C $yr^{1}$

$\Delta C_{PRJ,DOM,t}$ = annual change in carbon stocks in dead organic matter; t C $yr^{-1}$

$\Delta C_{PRJ,HWP,t}$ is the annual change in carbon stocks associated with harvested wood products, t C $yr^{1}$.

The annual change in carbon stocks in living tree biomass (above- and belowground) in the project scenario ($\Delta C_{PRJ,LB,t}$; t C $yr^{-1}$) was calculated as:

$$\Delta C_{PRJ,LB,t} = \Delta C_{PRJ,G,t} - \Delta C_{PRJ,L,t} \quad (31)$$

where:

$\Delta C_{PRJ,G,t}$ = annual increase in tree carbon stock from growth; t C $yr^{-1}$

$\Delta C_{PRJ,L,t}$ = annual decrease in tree carbon stock from a reduction in live biomass; t C $yr^{-1}$.

The annual decrease in carbon from live biomass loss (ΔCPRJ,L,t; t C yr-1) is the sum of losses from: Natural mortality (i.e. insects, disease, competition, wind, etc.); Commercial round wood felling and ; Incidental sources. Losses are specific to a given polygon and each polygon must be summed to calculate the total annual loss across the project activity area. The live biomass losses are not emitted directly but rather are transferred to specific carbon pools.
The annual change in carbon stocks in dead organic matter (DOM) ($\Delta C_{PRJ,DOM}$; t C $yr^{-1}$) in the project scenario was calculated as:

$$\Delta C_{PRJ,DOM,t} = \Delta C_{PRJ,LDW,t} + \Delta C_{PRJ,SNAG,t} + \Delta C_{PRJ,DBG,t} \quad (38)$$

where:

$\Delta C_{PRJ,LDW,t}$ = change in lying dead wood (LDW) carbon stocks in year, t; t C $yr^{-1}$

$\Delta C_{PRJ,SNAG,t}$ = change in snag carbon stock in year, t; t C $yr^{-1}$

$\Delta C_{PRJ,DBG,t}$ = change in below-ground carbon stock in year, t; t C $yr^{-1}$.

The annual change in the carbon stored in harvested wood products (HWP), ($\Delta C_{PRJ,HWP,t}$; t C $yr^{-1}$) in the project scenario was calculated as:

$$\Delta C_{PRJ,HWP,t} = \Delta C_{PRJ,STORHWP,t} - \Delta C_{PRJ,EMITFOSSIL,t,} \quad (46)$$

## 5.3 Leakage Emissions

### 5.3.1 Activity Shifting Leakage

It has been determined that no activity-shifting leakage occurred within the monitoring period of 01 January 2022 to 31 December 2024.

The analysis of activity shifting leakage for the monitoring period was completed by comparing the variance between annual harvest objectives from the forest management plans to the cumulative actual harvest volumes of the same year for all forest lands owned and operated by Westphalen (7,076 ha) at the project start date. Within the 10-year forest management plan schedule (2015-2025), the allowable amount of timber harvest removal must not exceed the activity shifting threshold volume amount, or activity shifting would be considered as occurring.

Under the German Forest Conservation and Forestry Promotion Act (Federal Forest Act), private landowners are legally obligated to sanitary harvest damaged timber related to calamities (natural disturbances which could impact long-term forest health) to ensure sustainable forests for future use. This volume removal is considered regulatory and outside of the FMP parameters, so it was not included in this evaluation. Before initiating harvest operations in calamity areas, landowners are required to contact the forest tax authorities for harvest approval and, at the year's end, submit tax documents detailing logged volumes removed following the Forest Compensation Act and Section 34b of the Income Tax Act[24] (EstG).

The figure below demonstrates that the cumulative harvest volumes (dark blue) are below the activity-shifting threshold (red line), showing that no activity-shifting leakage occurred.

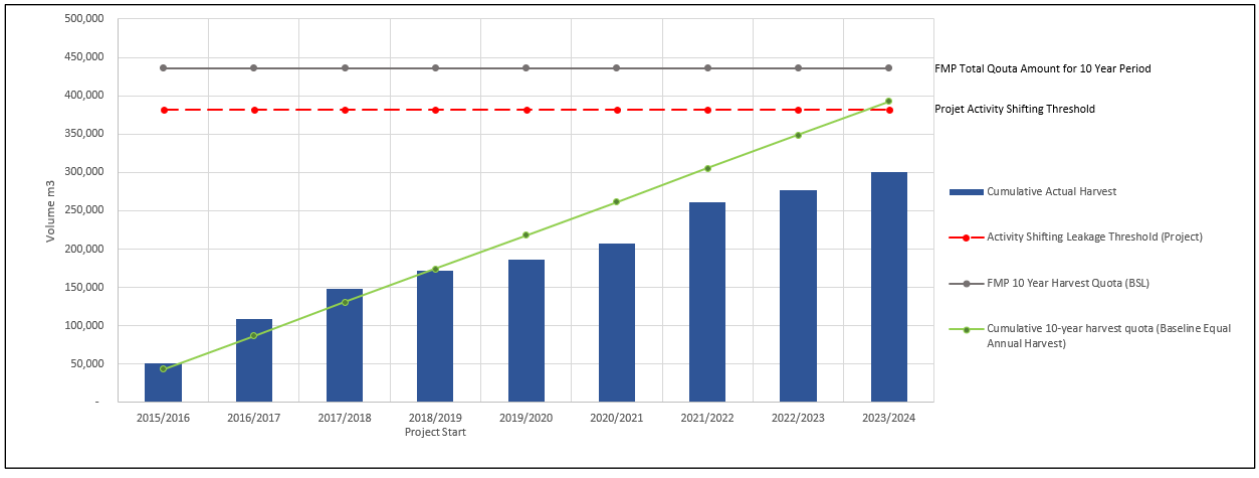


**Figure 1: Comparison of harvest volumes during the monitoring period (all values in m³).**

[24] For more information on Tax rates for income from extraordinary wood uses, see weblink: § 34b EStG - individual standard (www-gesetze--im--internet-de.translate.goog)

### 5.3.2 Market Shifting Leakage

The VM0012 LtPF methodology provides the following market leakage definition (Section 8.3.2): market leakage risk occurs when a project significantly reduces the production of a commodity, causing a change in the supply and market demand equilibrium that results in a shift in output elsewhere to make up for the lost supply.

A methodology deviation, as noted in section 3.2.1, has been utilized for the calculation of market leakage. In this regard, the MARketz tool has been used for the Westphalen Project. Full details supporting the development and use of the MARketz tool are provided in the initial PDMR. The intent is to rank each assessment as a low, moderate, or high risk of market leakage.

Below is a summary of results for each of the market leakage assessments comprising the tool:

1. Market Determination: the market determination assessment and quantification of a Domestic Leakage Factor seeks to define the proportion of potential leakage that will occur in domestic markets versus international markets. Data is sourced from the BMEL-Statistik.de website, specifically file 'SJT-8070300-0000.xlsx Supply balance for round wood'[25]. The international Leakage Factor applied is 14.4%.
2. Market Equilibrium: this assessment seeks to determine the project's effects on production and consumption within the host country while considering a comprehensive set of global economic factors. The Global Forest Products Model (GFPM, v2020[26]) developed by Buongiorno et al. is utilized. For the project run of the model, 1000ha (770ha rounded up) was removed from the total timber harvesting land base. The first year of disturbance to market equilibrium in the amount of total production or consumption was 2065 (47 years from the project start date). As this is greater than 40 years from the project start date, the assessment results in a low risk of market leakage.
3. Barriers - A. Distribution Barrier – Cost of Transportation: the assessment is conducted to determine the potential spatial extent of market leakage effects as determined by the cost of transporting wood products. Where the cost of transportation increases by 15% or more, this represents a market barrier. No barriers were identified at the local or regional level but were identified at the national level, making the project a moderate risk of market leakage[27]. This is adequately reflected in historical market sales records before project implementation.
3. Barriers - B. Regulatory Barrier – Jurisdiction: this assessment is conducted to determine the potential legal extent of market leakage effects as determined by ownership type within the project country. Information regarding laws and regulations impacting cut control was sourced from the FSC CW Risk Assessment for Germany[28]. Data is sourced from the BMEL-Statistik.de website, specifically file 'SJT-7010200-2012.xlsx Forest area by property type and forest

[25] https://www.bmel-statistik.de/forst-holz/tabellen-zu-forst-und-holzwirtschaft

[26] https://buongiorno.russell.wisc.edu/gfpm/

[27] Source: Dr. Johannes Gerst personal communication September 13, 2023

[28] https://connect.fsc.org/document-centre/documents/resource/201

category'[29]. Given the split between ownership with quota-based legislation and those without similar restrictions, the project has a moderate risk of market leakage for this aspect.

4. Product Substitutability: the purpose of assessing product substitutability is to determine if a different product can be used in place of the ones generated in the baseline scenario. If there is high substitutability, there is a higher risk of market leakage due to the product being easily replaced with another product. Substitutability Factors are sourced from BC FCOP 2.0 (currently under consultation) and notes that the substitutability of wood products has a significant effect on the ultimate leakage estimate[30]. Given that a high proportion of the project contains moderately substitutable products (e.g., European beech (Fagus sylvatica L.)), the project has a moderate risk of market leakage for this assessment.
5. Land/Carbon Impact - A. Percent of National Inventory: the assessment is conducted to determine the scale of the carbon project compared to the national inventory of the host country. This assessment provides a scaled or proportional analysis of the implementation of the project scenario as it relates to national resources. Data is sourced from the BMEL-Statistik.de website, specifically file "SJT-7010400-2012.xlsx Forest area by property type and forest category" along with the most current national inventory[31]. Given the project's small size in relation to the national inventory, there is a low risk of market leakage.
6. Land/Carbon Impact - B. Biomass Ratio of Project (compared to national inventory): the assessment of the biomass ratio of the project compared to the national inventory (or leakage area) follows the biomass ratio assessment commonly used within several AFOLU methodologies. Data is sourced from the BMEL-Statistik.de website, specifically file "SJT-7010400-2012.xlsx Forest area by property type and forest category" along with the most current national inventory32. The variable biomass ratio of stand types in relation to the potential leakage area creates a moderate risk of market leakage.

Market leakage risk occurs when a project significantly reduces the production of a commodity causing a change in the supply and market demand equilibrium that results in a shift of production elsewhere to make up for the lost supply. The MARketz tool calculates a score for each assessment which is gathered on the Market Score Card within the excel workbook. The MARketz tool excel file has been provided for the verification assessment. The market score card calculates the overall weighted score of all the assessments, produces the resulting assessment score as a percentage, and the corresponding Market Leakage Factor.

[29] https://www.bmel-statistik.de/forst-holz/tabellen-zu-forst-und-holzwirtschaft

[30] https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/offset-projects/consultation

[31] https://www.bmel-statistik.de/fileadmin/daten/7010400-2012.xlsx and the https://www.thuenen.de/en/thuenen-topics/forests/the-german-national-forest-inventory

[32] https://www.bmel-statistik.de/fileadmin/daten/7010400-2012.xlsx and the https://www.thuenen.de/en/thuenen-topics/forests/the-german-national-forest-inventory

The market leakage assessment described above was completed for the monitoring period. The resulting market leakage factor ($MLF_y$) of 20% was applied within the net GHG Emission Reductions and Removals calculations. The below table outlines the

## 5.4 GHG Emission Reductions and Carbon Dioxide Removals

### 5.4.1 Calculation of the Uncertainty Factor

Per the methodology monitoring section, the project has installed at least one field plot in each Analysis Unit. The project initially installed 31 permanent carbon plots in 2022 with an additional set of 46 plots established in 2024.

The project-level uncertainty factor is calculated by a function within the Westphalen Uncertainty Calculator Excel spreadsheet, following the formulas below:

Step 1 – the project calculated the average percent model error ($E_M$) for the project based on the average area-weighted difference between measured values in monitored plot observations and model-predicted values using Equations 60a, b.

$$E_M = 100 \bullet (\sum y_{d,h,i} / \sum(A_{PRJ,h} \bullet y_{m,h,i})) \qquad (60a)$$

where:

The summation is across all plot observations, i, and across all analysis units, h;

$$y_{d,h,i} = A_{PRJ,h} \bullet (y_{p,h,i} - y_{m,h,i}) \qquad (60b)*$$

* Corrected via VM0012 Improved Forest Management in Temperate and Boreal Forests (LtPF), v1.2 Errata and Clarifications (17 DEC. 2014)

$E_M$ = Mean model error for the project (%)

$y_{d,h,i}$ = the area-weighted difference between measured and predicted carbon storage in analysis unit, h, plot observation, i (t C)

$y_{m,h,i}$ = carbon storage measured in analysis unit, h, plot observation, i (t C $ac^{-1}$)

$y_{p,h,i}$ = carbon storage predicted by model for analysis unit , h, plot observation, i (t C $ac^{-1}$) $A_{PRJ,h}$ = area of project analysis unit, h (ac)

Step 2 – The project calculated the inventory error ($E_I$) at a 90 percent confidence interval expressed as a percentage of the mean area-weighted inventory estimate from the measured plots. Inventory error is estimated based upon the difference between modeled and measured values for monitoring plots established in polygons grouped within analysis units.

Inventory error, $E_I$, is estimated by first calculating the standard error of the area-weighted differences between the plot observation measurement and the associated model-predicted carbon storage (both on a per hectare basis) for analysis units. The standard error is then multiplied by the *t*- value for the 90 percent confidence interval. Finally, $E_I$ is expressed in relative terms (in Equation 60c) by dividing

the 90% confidence interval of the area-weighted differences between predicted and measured values in all plots by the area-weighted average of the measured values in all monitoring plots.

$$E_I = 100 \bullet [SE * 1.654 / ((1/N) \bullet \sum(A_{PRJ,h} \bullet y_{m,h,i}))] \quad (60c)$$

where:

$E_I$ = Inventory error for the project (%)

SE = the project level standard error of the area weighted differences between measured plot observation and predicted values of carbon storage.

N = total number of plot observations in all analysis units 1.654 = the 90% confidence interval t-value

All other terms as defined in equation 60a.

$$SE = S/\sqrt{N} \quad (60d)$$

where:

N = total number of plot observations in all analysis units

S = the standard deviation of the area weighted differences between measured and predicted values of carbon storage across all analysis units.

$$S = \sqrt{[(1/N - 1) \bullet \sum(y_{d,h,i} - \bar{y}bar_d)^2]} \quad (60e)$$

where:

$ybar_d$ = the project-level mean of the area weighted differences between measured plot observation and predicted values of carbon storage. See equation 60b for the calculation of $y_{d,h,i}$

All other terms as defined in equation 60b and 60c.

Step 3 - The total error for the project ($E_P$; %) is calculated by adding the model and inventory error terms, as calculated in Steps 1 and 2.

$$E_P = E_M + E_I \quad (60f)$$

Step 4 – Compare the result of Step 3 against the table below to determine the uncertainty factor.

**Table 30: Uncertainty Factor calculation**

| Estimated Project Error, $E_P$ (%) | Uncertainty Factor (= $ER_{Y,ERR}$) |
|---|---|
| 0 – 10% | = 1.5% |
| >10% | = 1.5% + EP – 10% |

### 5.4.2 Initial Estimate of Uncertainty

Carbon plot volumes were compared against CBM-CFS3 model values. The inventory error term ($E_I$) was calculated to be 17.61% while the model error term ($E_M$) was -18.38%. As shown in Equation 60f, the project error term ($E_P$) was calculated as the sum of $E_M$ and $E_I$ (-0.78%). Thus, the uncertainty factor ($ER_{Y,ERR}$) was calculated to be 1.5%.

This uncertainty factor will be re-assessed at subsequent verifications and adjusted to reflect improved field data from the project monitoring plot network.

### 5.4.3 Calculation Net Emissions Reductions

Gross carbon emissions reductions ($ER_{y,GROSS}$; t $CO_2e$ $yr^{-1}$) created by the Westphalen Forest Carbon Project were calculated annually as the difference between the baseline and project scenario emission reductions/emissions:

$$ER_{y,GROSS} = (\Delta C_{BSL,t} - \Delta C_{PRJ,t}) \bullet 44/12 \quad (57)$$

Where:

$\Delta C_{BSL,t}$ = total baseline scenario emissions calculated from equation 1 (t C $yr^{-1}$).

$\Delta C_{PRJ,t}$ = total project scenario emissions calculated from equation 29 (t C $yr^{-1}$).

44/12 = factor to convert C to $CO_2e$

The annual net GHG emissions reductions are calculated each year using Equation 58.

$$ER_y = ER_{y,GROSS} - LE_y \quad (58)$$

where:

$ER_y$ = the net GHG emissions reductions and/or removals in year y (the overall annual carbon change between the baseline and project scenarios, net all discount factors except the permanence buffer) (t $CO_2e$ $yr^{-1}$).

$ER_{y,GROSS}$ = the difference in the overall annual carbon change between the baseline and project scenarios (t $CO_2e$ $yr^{-1}$).

$LE_y$ = Leakage in year y (t $CO_2e$ $yr^{-1}$), as calculated in equation 56b below.

$$LE_y = MLF_y \bullet ER_{yGROSS} \quad (56b)$$

### 5.4.4 Calculation of Voluntary Credit Units (VCUs)

The number of VCU's the Westphalen Forest Carbon Project generates as available for issuance and sale in year, *y* ($VCU_y$; t $CO_2e$ $yr^{-1}$), is calculated as:

$$VCU_y = ER_y \bullet (1 - ER_{y,ERR}) - BR_y \quad (59)$$

where:

$ER_y$ = the net GHG emissions reductions and/or removals in year (t $CO_2e$ $yr^{-1}$), as calculated in equation 58.

$ER_{y,ERR}$ = the uncertainty factor for year, y, (calculated in Section 5.4.2), expressed as a proportion.

$BR_y$ = estimated VCU-equivalent $tCO_2e$ issued to the VCS Buffer Pool in year, *y*, calculated using the latest version of the VCS Tool for AFOLU Non-Permanence Risk Report Excel Calculation Tool, v4.2

BRy is calculated by multiplying the most current verified permanence risk Buffer Withholding Percentage for the project by the change in carbon stocks (difference between baseline and project scenario) for the project area.

The project VCS Buffer Discount Factor ($BR_Y$) was calculated as 19%, as per the non-permanence risk assessment. The BR factor will be re-assessed at each verification, as necessary.

The uncertainty factor was determined to be 1.5%, as calculated above. The uncertainty factor will be re-calculated from field plot data at each verification.

The annual VCUs projected for Westphalen for the verification period of 01-January-2022 to 31-December-2024 are calculated in the table below.

**Table 31: Expected total GHG benefit to date and assessment of permanence risk.**

| | |
|---|---|
| State the non-permanence risk rating (%) | 19% |
| Has the non-permanence risk report been attached as either an appendix or a separate document? | ☒ Yes ☐ No |
| For ARR and IFM projects with harvesting, state, in $tCO_2e$, the Long-term Average (LTA). | N/A |
| Has the LTA been updated based on monitored data, if applicable? | ☐ Yes ☒ No<br>The project does not meet or exceed the harvesting activity definition, being, the harvest of trees, vegetation, or other biomass, which results in a reduction by more than 20% of carbon stocks over a five-year period. |
| State, in $tCO_2e$, the expected total GHG benefit to date. | 29,871 net GHG emissions reductions and/or removals values - ERy (Eq 58) |
| If a loss occurred (including a loss event or reversal), state the amount of $tCO_2e$ lost: | 0 |

**Table 32: Total VCU issuance by vintage**

| Vintage period | Baseline emissions (tCO2e) | Project emissions (tCO2e) | Leakage emissions (tCO2e) | Buffer pool allocation (tCO2e) | Net emissions reductions and/or Removals VCUs (tCO2e) | Total VCU issuance (tCO2e) |
|---|---|---|---|---|---|---|
| 01-Jan-2022 to 31-Dec-2022 | (5,424) | 2,152 | 1,515 | 1,152 | 6,061 | 4,818 |
| 01-Jan-2023 to 31-Dec-2023 | (5,660) | 1,612 | 1,454 | 1,105 | 5,818 | 4,625 |
| 01-Jan-2024 to 31-Dec-2024 | (4,542) | 2,982 | 1,505 | 1,144 | 6,018 | 4,785 |
| **Total** | **(15,626)** | **6,746** | **4,474** | **3,401** | **17,897** | **14,228** |

- Currently, the VM0012 methodology does not provide specific formulas for calculating emissions as a reduction or a removal separately, so they cannot be provided in the above table.

**Table 33: Ex-ante GHG vs. achieved reductions and removals for the monitoring period.**

| Vintage period | Ex-ante estimated reductions/ removals | Achieved reductions/ removals | Percent difference | Explanation for the difference |
|---|---|---|---|---|
| 01-Jan-2022 to 31-Dec-2022 | (5,835) | 6,061 | +203.87% | Changes made to the calculation of Harvested Wood Products and accounting. Correction made to a calculation error in equation 51 (PRJ -HWP). With this error cessation of incidental harvesting in the project scenario resulted in a negative emission (i.e. all carbon stored in wood products was immediately released). |
| 01-Jan-2023 to 31-Dec-2023 | 6,523 | 5,818 | -10.8% | Minor unavoidable harvest in project area / increase in non-permanence reduction with introduction of revised tools V.4.2 |

| | | | | |
|---|---|---|---|---|
| 01-Jan-2024 to 31-Dec-2024 | 7,231 | 6,018 | -16.77% | Minor unavoidable harvest in project area / increase in non-permanence reduction with introduction of revised tools V.4.2 |
| Total | 7,919 | 17,897 | +126% | The difference of +126% is due to calculation error during first monitoring period which resulted in negative emissions. See rational provided above. |

# APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

| Section | Information | Justification |
|---|---|---|
| 2.2.2 | Stakeholder details | All stakeholder information, such as names, addresses, etc., are kept confidential |
| | | |

# APPENDIX 2 – SUPPORTING DATA FILES

The following table identifies the key data files used for calculating all aspects of the Project Development Document. All additional files not submitted here will be provided to the Auditors upon request.

**Table 34: List of reporting document files used in the formation of the Westphalen Monitoring Report**

| Description | Filename | Format | Date |
|---|---|---|---|
| Spatial Inventory | WP_CarbonProjectArea_2022 | KML | 2022-12-02 |
| Project inventory dataset | MonitorPlot_Inventory_Dec'22' | | 2022-12-09 |
| CBM-CFS Stores result and run assumptions along with all carbon pools and fluxes related to the BSL model run | WP-BSL_2025 | Access Datafile (large) | 2025-02-21 |
| CBM-CFS Stores result and run assumptions along with all carbon pools and fluxes related to the PRJ model run | WP-PRJ_2025_Final | Access Datafile (large) | 2025-02-21 |
| Total Delta Ecosystem provides summary of carbon dynamics in both the baseline and project | DeltaEco-BSL_PRJ (Feb '25) | Excel | 2025-02-21 |
| Baseline HWP calculations | BSL_HWP(Feb '25) t0 | Excel | 2025-02-21 |
| Project HWP calculations | PRJ_HWP(Feb '25) t0 | Excel | 2025-02-21 |
| Baseline Emission calculations | Emissions_BSL_Estimate (Feb '25) | Excel | 2025-02-21 |

| | | | |
|---|---|---|---|
| Project Emission calculations | Emissions_PRJ_Estimate (Feb '25) | Excel | 2025-02-21 |
| Final GHG calculations | Westphalen MR-1 GHG Estimate (Feb '25) | Excel | 2025-02-21 |
| Calculation for Activity Shifting Leakage | WP Activity Leakage Confidential(Jan22'25) | Excel | 2025-01-27 |
| Calculation for Market Leakage | MARketz Tool_Westphalen(Oct'24) | Excel | 2024-11-18 |
| Plot inventory Information | MonitorPlots2024_AU_Intersect(Oct10'24) | Excel | 2024-10-18 |
| Calculation of Uncertainty | Westphalen - Uncertainty Calculator M2 (Oct '24) - Final | Excel | 2024-10-28 |
| Spatial location of monitoring plots | WP_MonitorPlots_20241008 | KML | 2024-10-08 |
| Monitoring Plot Compilation 2024 | DOM fix- Trees_Carbon_Sept2024 | Excel | 2024-11-04 |
| Monitoring Plot Compilation 2022 | All_LiveTreePlot_Data_19.09.2022 | Excel | 2024-10-17 |
| Conversion of plot volumes to biomass | Westphalen_NFI_Biomass_Calc_(Oct'24) | Excel | 2025-01-27 |
| Annual monitoring | NDVI Spatial Monitoring Report 2023 | PDF | 2024-11-04 |
| Annual monitoring | NDVI Spatial Monitoring Report 2024 | PDF | 2024-10-31 |

# APPENDIX 3 – NON-PERMANENCE RISK REPORT

Final version is to be accessed via the Verra Hub ( https://projecthub.verra.org/ ). For convenience during the audit a PDF has been provided in the auditor share folder.

# APPENDIX 4 – GRIEVANCE REDRESS PROCEDURE

This Grievance Redress Procedure is intended as a supplement to the Zimmfor Standard Operating Procedures – Stakeholder Consultation + Engagement under the Verified Carbon Standard (VCS) and the Sustainable Development Verified Impact Standard (SD VISta) of the same date as indicated on this document.

As it relates to project developed under the VCS and SD VISta, the following Grievance Redress Procedure outlines methods that will be implemented to address disputes that may arise between stakeholders and Project Proponents during project planning, implementation and maintenance.

The following processes are intended to facilitate receiving, hearing, responding to and attempting to resolve grievances, within a reasonable time period related to VCS and SD VISta projects developed by Zimmfor.

These procedures are to be applied to all Zimmfor VCS and SD VISta projects, however where appropriate, these procedures will be amended to consider culturally appropriate conflict resolution methods.

These documented procedures, and documentation of disputes resolved through this procedure will be made publicly available on the Zimmfor website (https://www.zimmfor.com/).

## CONTACT INFORMATION

All grievances are requested to be submitted through the Grievance Submission form located on the Zimmfor website. Where local customs or circumstances do not allow for electronic submission, a paper version of the Grievance Submission Form can be provided. Please contact Zimmfor using the information provided on contact page of our website if you or someone you are representing requires an alternate form of submission.

## GRIEVANCE PROCESS

### *Stage 1 – Receive, Respond, and Resolve*

When Zimmfor receives a grievance related to a VCS Project, either directly or via a Project Proponent, Zimmfor will:

1. Acknowledge the grievance to the griever, if not already done so by the Project Proponent and provide an initial response to the griever within two weeks of the original grievance. Zimmfor will request the griever complete the Zimmfor Grievance Submission Form if they have not already and including relevant evidence to support their concern. General information grievances received will be tracked within the Zimmfor Grievance Record Database and made publicly available.
2. Conduct a preliminary assessment to determine whether evidence provided in a grievance is or is not substantial, by assessing the evidence provided.

3. Dialogue with griever with the aim to solve grievances assessed as substantial before further actions are taken.
4. While substantial grievances are pending, a precautionary approach towards the continued implementation of the project will be taken, which may include:
    - Temporarily halting the sale of VCUs generated by the project, or
    - Developing interim mitigation measures to effectively mitigate the grievance, until the grievance is resolved.
5. Where further investigation is required to resolve a substantial grievance, a desk or field review (as applicable) will be conducted within two months of the initial grievance.
6. Where a grievance is assessed as being substantial, mitigation measures will be developed, as applicable (e.g., mitigation measure revision or development, changes to project design or implementation). Mitigation measures may include steps to be taken by stakeholders, as well as the Project Proponent, to resolve the issue.
7. If a mitigation measure cannot be determined and/or enforced, Stage 2 – Mediation, shall be considered and managed accordingly.
8. Upon conclusion of the grievance review and mitigation process, the Grievance Record Database will be updated with relevant results of the grievance and any actions taken towards its resolution.
9. A separate grievance file will be maintained by Zimmfor to record detailed records of grievances received, correspondence, and actions taken.

## *Stage 2 – Mediation*

If a grievance cannot be resolved by utilizing the procedure outlined within Stage 1, the grievance will be referred for a neutral third-party[33] for mediation.

Procedures for mediation will be developed and outlined by the neutral third-party.

## *Stage 3 – Arbitration or Adjudication*

Any grievances that are not resolved through mediation will:

1. Be referred to arbitration, to the extent allowed by the laws of the relevant jurisdiction, or,
2. Be referred to competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

[33] The neutral third-party will be contracted by Zimmfor, however will be required to be agreed upon by both the Project Proponent and the griever.

# APPENDIX 5 – ZIMMFOR CORPORATE RESUME

# Corporate Resume

**Zimmfor Management Services Ltd.**

2218-D Airport Drive •
Campbell River, BC •
V9H 0E2
Canada
info@zimmfor.com
www.zimmfor.com

Consulting companies uniquely comprised of resource sector operators focused on managing, servicing and supporting the resource industry.
Dedicated professionals with impeccable analytical and writing skills to investigate and analyze complex issues who are driven to contribute to sound resource stewardship.

For more than 20 years, our multi-lingual personnel have provided a range of services in the resource industry throughout North America, South America, Europe and Asia:

## Services

- **Carbon Projects + Marketing/Sales** – Development, implementation and maintenance of nature-based carbon solutions (improved forest management) including marketing and sales services and feasibility assessments. Standards/methodologies include: Verra Verified Carbon Standard (VM0003, VM0010, VM0012); American Carbon Registry (ACR); Sustainable Development Verified Impact Standard (SDVISta).
- **Certification** – Environment and Sustainability (ISO, FSC®, CSA, SFI); Chain of Custody (FSC, PEFC, SFI); FSC Controlled Wood; Health and Safety (OSHAS, SAFE), Towards Sustainable Mining (TSM); Progressive Aboriginal Recognition (PAR); Verified Carbon Standard (Verra VCS); Sustainable Development Verified Impact Standard (SDVISta)
- **Resource Tenure Management** - Resource management services in the forest and mining industry from site level plans to high level plans and permits, tenure acquisition, etc. relating to +500,000 m3 of annual harvest.
- **Management Systems** – Develop, implement and maintain operational systems and procedures to support commitments to Safety, Environment, Sustainability, Quality, Sustainable Mining and Health / Safety. US Lacey Act and European Union Timber Regulation.
- **Supply Chain Compliance** – Supply chain due care (Lacey Act, TSCA, Uyghur Forced Labor, PFAS, etc.) system development, implementation and maintenance. Internal and external audits and inspections support to fulfil third party certification and legal compliance requirements, relating resource management, chain of custody, Controlled Wood and ISO 9000/14001.
- **Project Management** - Coordinate and manage your resource projects efficiently including, but not limited to corporate integration/ restructuring, asset acquisitions, training programs, etc.

## Clients*

Adohi Partners, LLC
AHF Products
Ahlstrom [-Munksjo NA]
Arauco North America
Chinook Forest Partners
PotlatchDeltic Corporation
Metrie Inc.
Forstbetrieb MG von Westphalen
LP Building Solutions [Louisiana Pacific]
Frankfurt Zoological Society
Perimeter Forest LP
Nippon Paper Industries
Northwest Hardwoods Inc.
Oji Forest & Products
JAF International
PaperExcellence/Domtar
Mosiac Forest Management Corp.
Western Forest Products Inc.
Dasos Capital
Liechtenstein Investment
GreenFirst Forest Products
Silvador Company/Forest Capital SRL

** - selection only*

# Professional Experience **

| | |
|---|---|
| **Jason Zimmermann, RPF**<br><br>President + Owner | • Registered Professional Forester.<br>• +20 years of natural resource sector experience.<br>• Develop, implement and maintain management systems designed to be consistent with environment, health & safety, quality, sustainability requirements (e.g., ISO 14001, ISO 9001, FSC Forest Management, FSC Controlled Wood and CoC, Sustainable Forestry Initiative Forest Management and CoC, Canadian Standards Association Z809, PEFC CoC, Food SAFE, BC Forest Safety Council SAFE and OHSAS).<br>• Conduct and lead internal inspections, audits and investigations for conformance with management systems and third-party certification standards (noted above) as well as evaluation of legal compliance for over 20 years and facilitation/ management of third-party external audits to the same standards.<br>• Evaluation of legal compliance (Brazil, Chile, Indonesia, Malaysia, China, Russia, etc.)<br>• Extensive operational and management experience in Timber Harvesting, Road Construction, Sawmill, Remanufacturing and Pulp mill operations.<br>• Forest Engineering (harvesting and road layout for conventional and helicopter). Road layout/design and bridge design.<br>• Forest carbon project development, implementation; feasibility assessment reports; marketing and sales services for projects in Romania, Germany, Spain, Portugal, Ireland, Brazil, Canada, USA, Austria, Ukraine, Slovakia, Columbia, Bolivia, etc. |
| **Marika Forge, RP.Bio**<br><br>Manager, Forest Carbon + Management Services | • Registered Professional Biologist<br>• +10 year of natural resource sector experience<br>• Develop, implement and maintain management systems designed to be consistent with environment, health & safety, quality, sustainability requirements (e.g., ISO 14001, ISO 9001, FSC Controlled Wood and CoC, Sustainable Forestry Initiative Small Scale, and PEFC CoC).<br>• Conduct and lead internal inspections, audits and investigations for conformance with management systems and third-party certification standards (noted above) and facilitation/ management of third-party external audits to the same standards.<br>• Development of annual monitoring reports related to sustainable resource management<br>• As a Qualified Environmental Professional (QEP) experience in developing and implementing environmental management strategies and plans for projects involving environmentally sensitive areas, which include but are not limited to erosion and sediment control plans, environmental monitoring, fisheries habitat assessments and monitoring and environmental management plans for regulatory compliance, including the Riparian Areas Protection Regulation.<br>• Forest carbon project development, implementation; feasibility assessment reports; marketing and sales services for projects in Romania, Germany, Brazil, Canada, USA, Austria, Ukraine, Colombia, Bolivia, etc.<br>• Forest carbon modelling: Carbon Budget Model, Canadian Natural Resources Canada. |
| **Dave Brown, RPF**<br><br>Specialist, Operational Services | • Registered Professional Forester.<br>• +20 years of natural resource sector experience<br>• Legality, Environment and Sustainability Auditor (FSC, PEFC, EUTR and Lacey Act); Experienced in Chain of Custody, Controlled Wood/ Controlled Sources Risk Assessment verification, Health and Safety (OSHAS, SAFE) compliance. International experience in Australia, China, Indonesia, Mexico, Russia and the Ukraine.<br>• Develop strategic and operational plans for clients (e.g., Forest Stewardship Plan), including required consultation (government, public and First Nations).<br>• Prepare and Supervise silviculture and forestry contracts. Coordinate personnel, prepare budgets and completion reports.<br>• Develop, implement and maintain management systems designed to be consistent with environment and health + safety requirements (e.g., PEFC, ISO, SAFE).<br>• Road inspection, road maintenance & deactivation planning, road construction supervision<br>• Forest carbon project development, implementation; feasibility assessment reports; marketing and sales services for projects in Romania, Germany, Spain, Portugal, Ireland, Brazil, Canada, USA, Austria, Ukraine, Slovakia, Colombia, Bolivia, etc. |

| | |
|---|---|
| | • Forest carbon modelling: Carbon Budget Model, Canadian Natural Resources Canada. |
| **Alexandra Shaw, B.Sc.** [Earth and Ocean Sciences]<br><br>Specialist, Management Services [GIS] | • Bachelor of Science (Earth and Ocean Sciences [Honours with Distinction]<br>• +15 years of natural resources experience<br>• Data management, acquisition and processing<br>• Geomatics and GIS services via ArcGIS<br>• Preparation of legislative summaries [resource sector specific]<br>• Management of MS Access based land databases<br>• Generation of 3D models<br>• LiDAR and ortho imagery management<br>• Forest carbon project development, implementation; feasibility assessment reports; marketing and sales services for projects in Romania, Germany, Portugal, Ireland, Brazil, Canada, USA, Austria, Ukraine, Slovakia, Colombia, Bolivia, etc. |
| **Zoie Richards, AdDiplGIS**<br><br>Specialists, Forest Carbon & Management Services | • Advanced Diploma Geographic Information Applications; Forest Technologist Diploma<br>• +20 years of natural resources experience<br>• Implementation of Remotely Piloted Unmanned Aircraft System (RPAS) programs<br>• Inventory quality assurance process management Forest carbon project development, implementation and feasibility assessment reports for projects in Romania, Germany, Portugal, Ireland, Brazil, Canada, USA and Austria. |
| **Trevor de Zeeuw, RPF**<br><br>Specialist, Forest Carbon | • Registered Professional Forester<br>• Master of Science in Land Reclamation; Bachelor of Science with Honors in Natural Resource Management<br>• Inventory quality assurance process management Forest carbon project development, implementation and feasibility assessment reports for projects in Ukraine, Slovakia, Romania, Germany, Ireland, Brazil, Canada, USA and Austria. |
| **Marlo Zimmermann, CPA** [RPF]<br><br>Chief Financial Officer | • Certified Professional Accountant<br>• Registered Professional Forester (retired)<br>• +10 years of natural resources experience<br>• +10 years of accounting experience.<br>• Forest carbon project development, implementation and feasibility assessment reports for projects in Romania, Germany, Canada and USA. |
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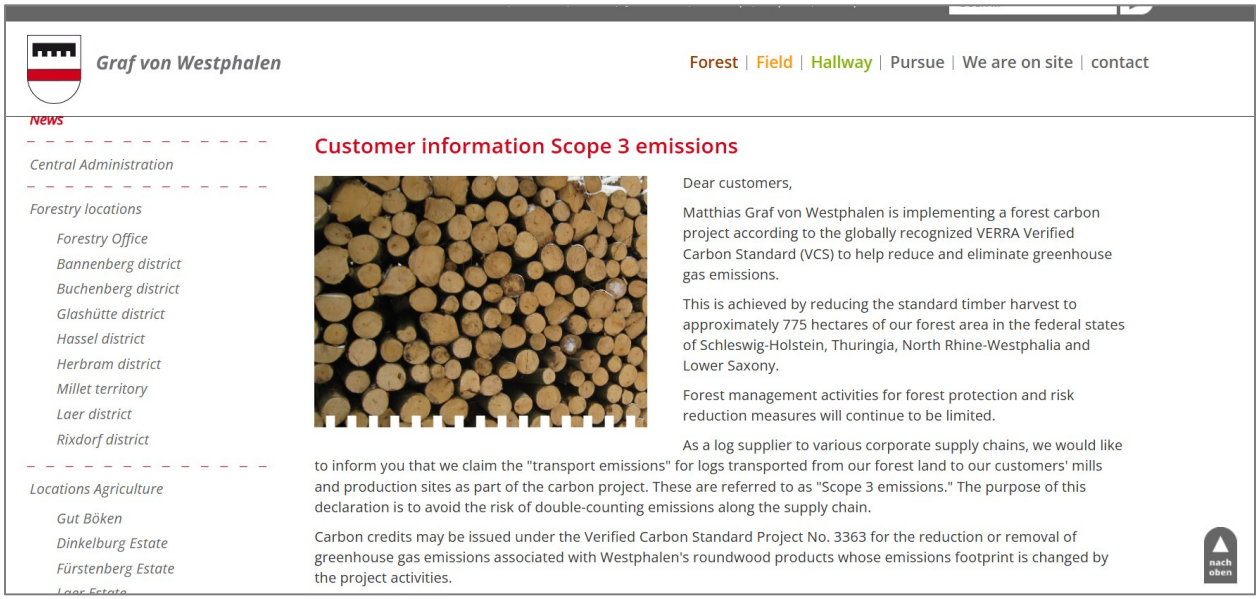
| | |

***- selection only*

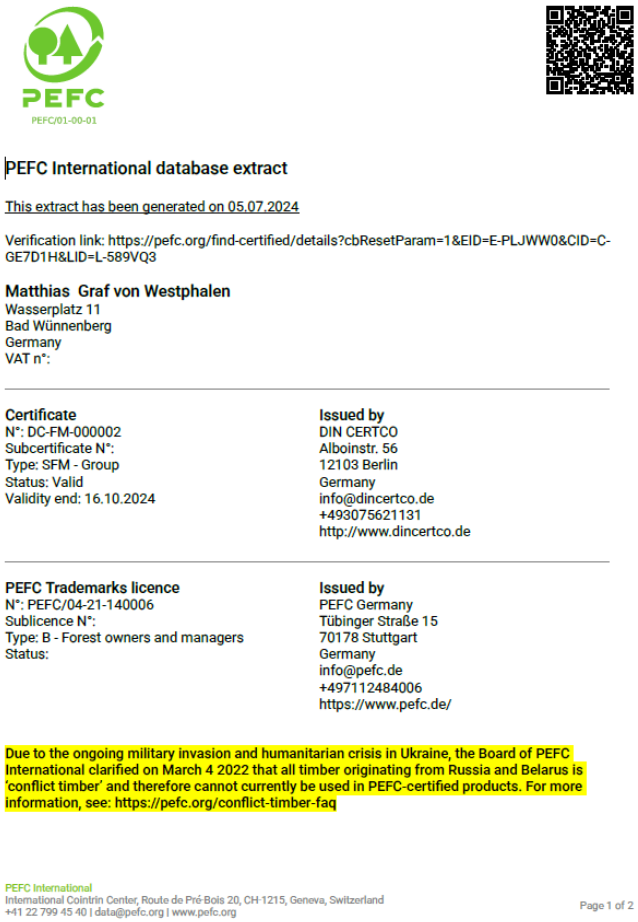
# APPENDIX 6 – SCOPE 3 EMISSIONS NOTIFICATION




As per VCS Standard v4.7 Section 3.24.7 Supply Chain (Scope) 3) Emissions wording:

*"Carbon credits may be issued through Verified Carbon Standard project #3363 for the greenhouse gas emission reductions or removals associated with Westphalen's roundwood products whose emissions footprint is changed by the project activities."*

# APPENDIX 7 – SUPPORTING INFORMATION FOR SDG CONTRIBUTIONS



PEFC
PEFC/01-00-01

**PEFC International database extract**

This extract has been generated on 05.07.2024

Verification link: https://pefc.org/find-certified/details?cbResetParam=1&EID=E-PLJWW0&CID=C-GE7D1H&LID=L-589VQ3

**Matthias Graf von Westphalen**
Wasserplatz 11
Bad Wünnenberg
Germany
VAT n°:

**Certificate**
N°: DC-FM-000002
Subcertificate N°:
Type: SFM - Group
Status: Valid
Validity end: 16.10.2024

**Issued by**
DIN CERTCO
Alboinstr. 56
12103 Berlin
Germany
info@dincertco.de
+493075621131
http://www.dincertco.de

**PEFC Trademarks licence**
N°: PEFC/04-21-140006
Sublicence N°:
Type: B - Forest owners and managers
Status:

**Issued by**
PEFC Germany
Tübinger Straße 15
70178 Stuttgart
Germany
info@pefc.de
+497112484006
https://www.pefc.de/

Due to the ongoing military invasion and humanitarian crisis in Ukraine, the Board of PEFC International clarified on March 4 2022 that all timber originating from Russia and Belarus is 'conflict timber' and therefore cannot currently be used in PEFC-certified products. For more information, see: https://pefc.org/conflict-timber-faq

PEFC International
International Cointrin Center, Route de Pré-Bois 20, CH-1215, Geneva, Switzerland
+41 22 799 45 40 | data@pefc.org | www.pefc.org

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**Figure 2: Certificate of third-party certification to the PEFC standard**

- For SDG 13.1 refer to Table Updated Estimated GHG Emission Reductions and Removals within Section 3.2 of this Monitoring Report. Note: the value presented in this MR is updated as a result to a transition to a 40-year project period.
- For SDG 15.2 as part of the PEFC certification under Criterion 2: Maintenance of forest ecosystem health and vitality. The standard requires that appropriate forest management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions or the use of tending, harvesting and transport techniques that minimize tree and/or soil damages shall be applied. Where harvesting was noted during the monitoring period planting records are available.

# APPENDIX 8 – STAKEHOLDER CONSULTATION

**In-person presentations to stakeholders occurred on:**

- 2023-06-26 at the 17th Conference of Commercial Forestry Managers (https://privatwaldbetriebe.de/blaetter-wald/)
- 2024-06-25 at the 18th Conference of Managers of Commercial Forestry Enterprises (https://privatwaldbetriebe.de/blaetter-wald/)
- 2024-08-28 at the Meeting of the Committee for Business Administration of the German Forestry Council (https://www.dfwr.de/ueber-uns/fachausschuesse/fachausschuss-fuer-betriebswirtschaft/)
- 2024-10-10 at the AGDW Forest Symposium "Europe after the election: Reorientating EU forest policy"[34] (https://www.waldeigentuemer.de/rueckblick-waldsymposium-2024/)

**Virtual stakeholder consultation meetings**

- 2024-12-04
- 2024-12-17

**Published article in the German Forestry Magazine, AFZ-Der Wald (Dr. Johannes Gerst)**

Forest-based climate protection according to Verra Standard, AFZ DerWALD, 23/2024, Johannes Gerst, Josef Nagel, Harm Tho Seeth, Matthias Graf Von Westphalen, pp36,37

[34] https://www.waldeigentuemer.de/termin/agdw-waldsymposium24/

# APPENDIX 9– LIST OF RARE, ENDANGERED, THREATENED SPECIES

Complete list of Species in Annexes II, IV, V of the Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) occurring in the project area

| Birds (Latin Name) | German Name | English Name |
|---|---|---|
| Podiceps auritus | Ohrentaucher | Great crested grebe |
| Tachybaptus ruficollis | Zwergtaucher | Little grebe |
| Podiceps cristatus | Haubentaucher | Great crested grebe |
| Podiceps girsegena | Rothalstaucher | Red-necked grebe |
| Podiceps nigricollis | Schwarzhalstaucher | Black-necked grebe |
| Phalacrocorax carbo | Kormoran | Cormorant |
| Botaurus stellaris | Rohrdommel | Bitter bittern |
| Ixobrychus minutus | Zwergdommel | Little bittern |
| Egretta alba (Ardea alba) | Silberreiher | Great egret |
| Ardea cinerea | Graureiher | Grey heron |
| Ciconia nigra | Schwarzstorch | Black stork |
| Cygnus bewickii (Cygnus columbianus bewickii) | Zwergschwan | Bewick's swan |
| Cygnus cygnus | Singschwan | Wooper swan |
| Cygnus olor | Höckerschwan | Mute swan |
| Anser albifrons flavirostris | Blässgans | Great white-fronted goose |
| Anser erythropus | Zwerggans | Little goose |
| Anser fabalis | Saatgans | Bean goose |
| Anser brachyrhynchus | Kurzschnabelgans | Pink-footed goose |
| Anser anser | Graugans | Greylag goose |
| Alopochen aegyptiaca | Nilgans | Egyptian goose |
| Branta leucopsis | Weißwangengans (Nonnengans) | Barnacle goose (Barnacle goose) |
| Branta bernicla | Ringelgans | Brent goose |
| Branta canadensis | Kanadagans | Canadian goose |
| Tadorna tadorna | Brandgans | Shelduck |

| | | |
|---|---|---|
| Mergus albellus (Mergellus albellus) | Zwergsäger | Red-breasted merganser |
| Anas strepera | Schnatterente | Gadget |
| Anas penelope | Pfeifente | Wigeon |
| Anas crecca crecca | Krickente | Teal |
| Anas platyrhynchos | Stockente | Mallard |
| Anas actua | Spießente | Pintail |
| Anas querquedula | Knäkente | Gaiter |
| Anas clypeata | Löffelente | Shoveler |
| Netta rufina | Kolbenente | Red-crested pochard |
| Aythya ferina | Tafelente | Tufted duck |
| Aythya fuligula | Reiherente | Goldeneye |
| Bucephala clangula | Schellente | Red-breasted merganser |
| Mergus albellus | Zwergsäger | Goosander |
| Mergus merganser | Gänsesäger | Red-breasted merganser |
| Mergus serrator | Mittelsäger | Honey buzzard |
| Pernis apivorus | Wespenbussard | Red kite |
| Milvus milvus | Rotmilan | White-tailed eagle |
| Haliaeetus albicilla | Seeadler | Marsh harrier |
| Circus aeruginosus | Rohrweihe | Sparrowhawk |
| Accipiter nisus granti | Sperber | Goshawk |
| Accipiter gentilis | Habicht | Rough-legged buzzard |
| Buteo lagopus | Raufußbussard | Common buzzard |
| Buteo buteo | Mäusebussard | Kestrel |
| Falco tinnunculus | Turmfalke | Pheasant |
| Phasianus colchicus | Jagdfasan | Crane |
| Grus grus | Kranich | Water rail |
| Rallus aquaticus | Wasserralle | Moorhen |
| Gallinula chloropus | Teichhuhn | Coot |
| Fulica atra | Blässhuhn | Oystercatcher |
| Haematopus ostralegus | Austernfischer | Lapwing |
| Vanellus vanellus | Kiebitz | Snipe |
| Gallinago gallinago | Bekassine | Greater Curlew |

| | | |
|---|---|---|
| Numenius arquata | Großer Brachvogel | Woodcock |
| Scolopax rusticola | Waldschnepfe | Black-headed gull |
| Larus ridibundus | Lachmöwe | Common gull |
| Larus canus | Sturmmöwe | Herring gull |
| Larus argentatus | Silbermöwe | Common tern |
| Sterna hirundo | Fluss-Seeschwalbe | Black tern |
| Chlidonias niger | Trauerseeschwalbe | Stock dove |
| Columba oenas | Hohltaube | Wood pigeon |
| Columba palumbus | Ringeltaube | Turtle dove |
| Streptopelia decaocto | Türkentaube | Eagle owl |
| Bubo bubo | Uhu | Pygmy owl |
| Glaucidium passerinum | Sperlingskauz | Tawny owl |
| Strix aluco | Waldkauz | Long-eared owl |
| Asio otus | Waldohreule | Boar's owl |
| Aegolius funereus | Raufußkauz | Nightjar |
| Caprimulgus europaeus | Ziegenmelker | Cuckoo |
| Cuculus canorus | Kuckuck | Kingfisher |
| Alcedo atthis | Eisvogel | Grey-headed woodpecker |
| Picus canus | Grauspecht | Green woodpecker |
| Picus viridis | Grünspecht | Black woodpecker |
| Dryocopus martius | Schwarzspecht | Middle spotted woodpecker |
| Dendrocopos medius | Mittelspecht | Great spotted woodpecker |
| Dendrocopos major | Buntspecht | Lesser spotted woodpecker |
| Dendrocopos minor | Kleinspecht | Skylark |
| Alauda arvensis | Feldlerche | Tree pipit |
| Anthus trivialis | Baumpieper | Yellow-headed wagtail |
| Motacilla flavissima | Gelbkopf-Schafstelze | White wagtail |
| Motacilla alba | Bachstelze | Sand martin |
| Riparia riparia | Uferschwalbe | Barn swallow |
| Hirundo rustica | Rauchschwalbe | House martin |
| Delichon urbicum | Mehlschwalbe | Wren |
| Troglodytes troglodytes | Zaunkönig | Starling |
| Sturnus vulgaris | Star | Robin |

| | | |
|---|---|---|
| Erithacus rubecula | Rotkehlchen | Blackbird |
| Luscinia luscinia | Sprosser | Nightingale |
| Luscinia megarhynchos | Nachtigall | Black redstart |
| Phoenicurus ochruros | Hausrotschwanz | Common redstart |
| Phoenicurus phoenicurus | Gartenrotschwanz | Mistle thrush |
| Turdus viscivorus | Misteldrossel | Blackbird |
| Turdus merula | Amsel | Wacho lderthrush |
| Turdus pilaris | Wacholderdrossel | Song thrush |
| Turdus philomelos | Singdrossel | Dunnock |
| Prunella modularis | Heckenbraunelle | Blackcap |
| Sylvia atricapilla | Mönchsgrasmücke | Garden warbler |
| Sylvia borin | Gartengrasmücke | Pygmy flycatcher |
| Ficedula parva | Zwergschnäpper | Pied flycatcher |
| Ficedula hypoleuca | Trauerschnäpper | Coal tit |
| Parus ater cypriotes | Tannenmeise | Blue tit |
| Parus caeruleus | Blaumeise | Great tit |
| Parus major | Kohlmeise | Crested tit |
| Parus cristatus | Haubenmeise | Marsh tit |
| Parus palustris | Sumpfmeise | Nuthatch |
| Sitta europaea | Kleiber | Treecreeper |
| Certhia familiaris | Waldbaumläufer | House sparrow |
| Passer domesticus | Haussperling | Tree sparrow |
| Passer montanus | Feldsperling | Red-backed shrike |
| Lanius collurio | Neuntöter | Great grey shrike |
| Lanius excubitor | Raubwürger | Magpie |
| Pica pica | Elster | Jay |
| Garrullus glandarius | Eichelhäher | Nuthatch |
| Nucifraga caryocatactes | Tannenhäher | Jackdaw |
| Coloeus monedula | Dohle | Rook |
| Corvus frugilegus | Saatkrähe | Carrion crow/Carrion crow |
| Corvus corone | Rabenkrähe/Aaskrähe | Hooded crow |
| Corvus cornix | Nebelkrähe | Raven |
| Corvus corax | Kolkrabe | Long-tailed tit |

| | | |
|---|---|---|
| Aegithalos caudatus | Schwanzmeise | Wood warbler |
| Phylloscopus sibilatrix | Waldlaubsänger | Witis |
| Phylloscopus trochilus | Fitis | Ground warbler |
| Locustella naevia | Feldschwirl | Wood warbler |
| Locustella fluviatilis | Schlagschwirl | Chaffinch |
| Fringilla coelebs | Buchfink | Branching finch |
| Fringilla montifringilla | Bergfink | Goldfinch |
| Bombycilla garrulus | Seidenschwanz | Goldcrest |
| Regulus ignicapilla | Sommergoldhähnchen | Greencrest |
| Carduelis chloris | Grünfink | Goldfinch |
| Carduelis carduelis | Stieglitz | Lintfinch |
| Carduelis cannabina | Bluthänfling | Bullfinch |
| Pyrrhula pyrrhula | Gimpel | Yellowhammer |
| Emberiza citrinella | Goldammer | Goldhammer |
| **Vertabraes, Mammals** | | |
| Myotis dasycneme | Teichfledermaus | Pond bat |
| Myotis myotis | Großes Mausohr | Greater mouse-eared bat |
| Plecotus auritus | Braunes Langohr | Brown long-eared bat |
| Nyctalus noctula | Großer Abendsegler | Greater noctule bat |
| Pipistrellus pipistrellus | Zwergfledermaus | Pippi Longstocking bat |
| Pipistrellus pygmaeus | Mückenfledermaus | Natterjack bat |
| Pipistrellus nathusii | Rauhautfledermaus | Natterjack bat |
| Myotis natterei | Fransenfledermaus | Daubenton's bat |
| Myotis daubentonii | Wasserfledermaus | Squirrel |
| Sciurus vulgaris | Eichhörnchen | Hazel dormouse |
| Muscardinus avellanarius | Haselmaus | Edible dormouse |
| Glis glis | Siebenschläfer | Bank vole |
| Myodes glareolus | Rötelmaus | Field mouse |
| Microtus agrestis | Erdmaus | Black rat |
| Microtus arvalis | Feldmaus | Wood mouse |
| Rattus rattus | Hausratte | Western house mouse |
| Apodemus sylvaticus | Waldmaus | Coypu/nutria (as a neozoon) |
| Mus domesticus | Westliche Hausmaus | Hare |

| | | |
|---|---|---|
| Myocastor coypus | Biberratte/Nutria (als Neozoon) | Forest shrew |
| Lepus europaeus | Feldhase | Brown hare |
| Sorex araneus | Waldspitzmaus | Forest shrew |
| Barbastella barbastellus | Mopsfledermaus | Barbastelle bat |
| Canis lupus | Wolf | Wolf |
| Felis silvestris | Wildkatze | Wild cat |
| Lutra lutra | Fischotter | Otter |
| Lynx lynx | Luchs | Lynx |
| Martes martes | Baummarder | Pine marten |
| Mustela putorius | Iltis, Waldiltis | Polecat, forest polecat |
| Myotis bechsteinii | Bechsteinfledermaus | Bechstein's bat |
| **Amphibians and Reptiles** | | |
| Alytes obstetricans | Geburtshelferkröte | Midwife toad |
| Bombina variegata | Gelbbauchunke, Bergunke | Yellow-bellied toad, mountain toad |
| Coronella austriaca | Schlingnatter | Smooth snake |
| Lacerta agilis | Zauneidechse | Sand lizard |
| Rana temporaria | Gras-, Taufrosch | Grass frog |
| **Fish and Roundmouths** | | |
| Barbus barbus | Barbe | Barbel |
| Cottus gobio | Groppe | Bullhead |
| Lampetra planeri | Bachneunauge | Brook lamprey |
| **Beetle** | | |
| Carabus variolosus ssp. nodulosus | Gruben-Großlaufkäfer | Ground beetle |
| Cerambyx cerdo | Heldbock | Heroic beetle |
| Limoniscus violaceus | Veilchenblauer Wurzelhalsschnellkäfer | Violet-necked click beetle |
| Lucanus cervus | Hirschkäfer | Stag beetle |
| Osmoderma eremita | Eremit, Juchtenkäfer | Hermit beetle |
| **Other** | | |
| Astacus astacus | Edelkrebs | Noble crayfish |

# APPENDIX 10 – NDVI SPATIAL ANALYSIS REPORTS

## Spatial Monitoring 2022/2023

Under the VM0012 methodology requirements, the spatial monitoring program was implemented to identify natural disturbance events, planned project activities such as harvests, road construction, and reforestation, and unplanned anthropogenic ("human-caused") disturbances such as illegal or unplanned harvests, to forest cover inventories within the project activity instance (PAI).

Changes in vegetation cover were monitored by comparing temporally distinct satellite images and their respective Normalized Difference Vegetation Indices (NDVI). The resulting analysis calculates either an increase or decrease in vegetation cover which can be classified and symbolized according to the magnitude of change. Changes are measured at the pixel scale of the imagery (20m x 20m for *Sentinel-2 2LA* imagery).

Inventory losses of >0.1ha were assigned a unique Polygon ID and further examined using additional data sources (e.g. Google Earth, additional satellite imagery) to categorize the change/ loss as cloud cover-water reflection, natural disturbance, planned project activities or unplanned harvests.

## Data Acquisition:

To account for the seasonality of vegetation cover, satellite imagery from 2022 and 2023 within a close seasonal range was selected for comparison analysis. Cloud cover was limited to between 0 and 3%, but not entirely avoidable due to the large project area coverage, the variability of timing for satellite flight paths, and days of data availability.

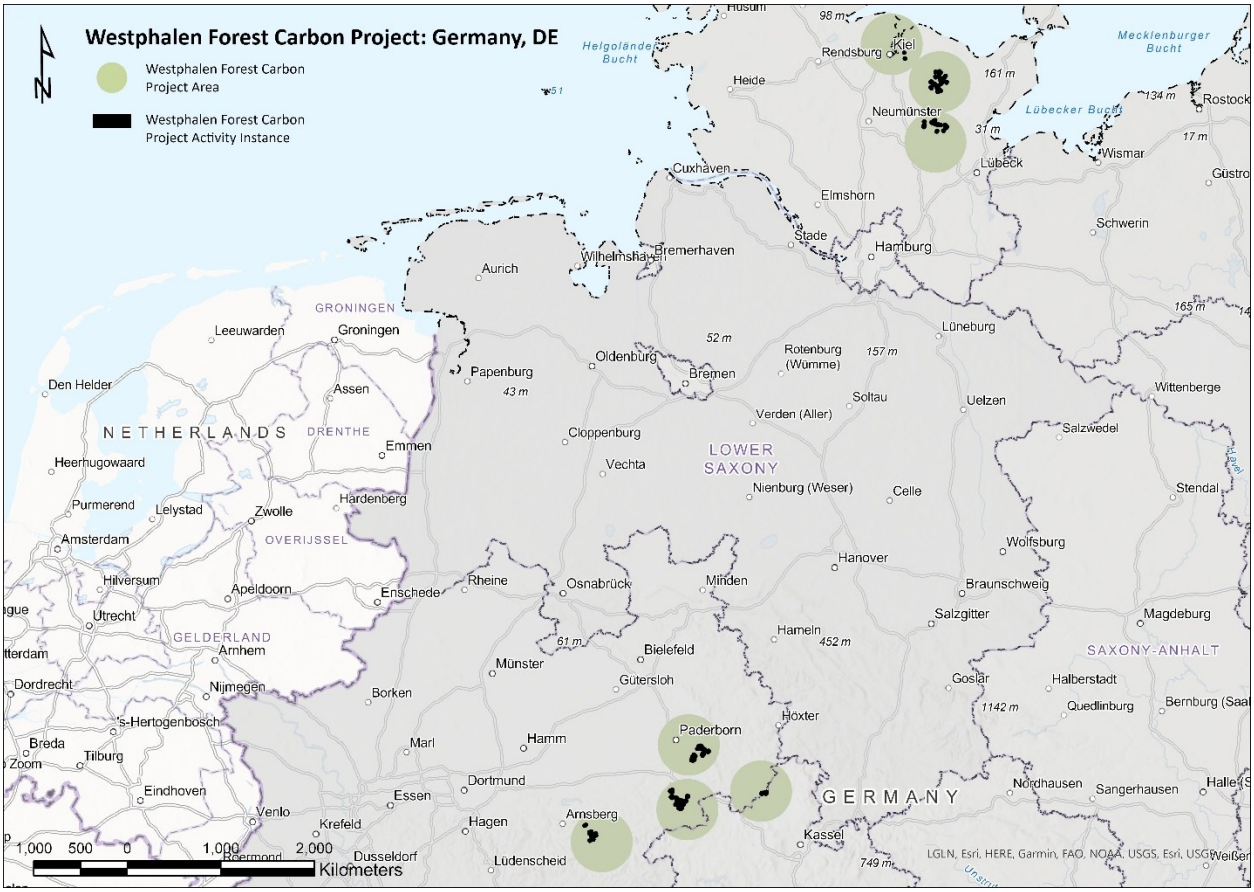


**Figure 3: Project Area Geographic Overview**

Data Classification:

Representative ranges were established for the change in NDVI over the designated time.

**The classification ranges for initial project comparison changes in NDVI**

| NDVI change | Qualitative Classification |
|---|---|
| > 0.2 | Significant vegetation gain |
| 0.1 to 0.2 | Vegetation gain |
| 0.05 to 0.1 | Minor vegetation gain |
| 0 to 0.05 | Minimal positive vegetation change |
| 0 to -0.05 | Minimal negative vegetation change |
| -0.05 to -0.1 | Minor vegetation loss |
| -0.1 to -0.2 | Vegetation loss |
| < -0.2 | Significant vegetation loss |

## Results

The project's geographic area is non-contiguous and encompasses freehold properties owned and operated by Westphalen in the states of Schleswig-Holstein and North Rhine-Westphalia.

No inventory change was observed during the monitoring period in Schleswig-Holstein geographic region.

Spatial change detection results in North Rhine-Westphalen show an inventory change of 0.76 hectares. This was attributed to unavoidable harvesting due to a Spruce beetle kill and was the reason for harvesting in 2021_2022. See below for more details.

February 2021:

April 2021:

**Figure 4: Damage to spruce trees becoming evident in 2021(circled red area).**

October 2021:

September 2022:

**Figure 5: Harvesting Occurred in 2021-2022 to remove Spruce Beetle Kill**

Spatial change detected in the PAI

| Change Poly (Unique ID) | Area(ha) | Disturbance Type | Project Analysis Unit Affected |
|---|---|---|---|
| {D92FBF8C-1262-4EFA-AE82-22123A2781B2} | 0.24 | Unavoidable I | SZ1 |
| {F5FA1243-F89E-4AB4-AF0A-8C0A82C03287} | 0.51 | Unavoidable | SZ1 |

Areas were summed according to which analysis unit they belonged to. In total, 1 analysis unit, SZ1, Spruce, was affected by unavoidable harvest.

The resulting area effects on the analysis units in the PAI inventory are summarized in the table below:

**Analysis Unit area and area % change in vegetative loss**

| PAI Analysis Units | Initial PAI AU Area (ha) | Total Area (ha) Disturbed in PAI 2022 | Total Area (ha) Disturbed in PAI 2023 | % Area Change in AU(ha) 2022 | % Area Change in AU(ha) 2023 |
|---|---|---|---|---|---|
| **BZ1** | 185 | 0.0 | 0.0 | 0% | 0% |
| **BZ2** | 254 | 0.0 | 0.0 | 0% | 0% |
| **BZ3** | 197 | 0.0 | 0.0 | 0% | 0% |
| **OZ1** | 18 | 0.0 | 0.0 | 0% | 0% |
| **OZ2** | 68 | 0.0 | 0.0 | 0% | 0% |
| **OZ3** | 22 | 0.0 | 0.0 | 0% | 0% |
| **SZ1** | 25 | 0.76 | 0.0 | 3% | 0% |
| **SZ2** | 3 | 0.0 | 0.0 | 0% | 0% |

Conclusion

The Westphalen Forest Carbon Project consists of one PAI totaling 772 ha of private forest lands in Germany, EU. Each area identified through the analysis as having any vegetative change was given a unique polygon ID, reviewed against current Sentinel-2LA or Google Earth satellite imagery, and harvested data from the client to confirm its validity.

The analysis resulted in the identification of 0.76 hectares of unavoidable harvest attributed to spruce beetle damage.

The overall change in tCO2 does not create a negative net GHG benefit. This inventory change is considered neither a reversal nor a loss event, as it has not affected more than 5% of previously verified GHG ERRs.

This inventory change was updated in the Project Proponent's 2023 forest inventory, and adjustments were made to the project GHG emissions, reductions, and removals in the project scenario to account for the project emissions as a result of the identified disturbance ex-post.

### Spatial Monitoring 2023/2024

Under the VM0012 methodology requirements, the spatial monitoring program was implemented to identify natural disturbance events, planned project activities such as harvests, road construction, and reforestation, and unplanned anthropogenic ("human-caused") disturbances such as illegal or unplanned harvests. If deemed necessary, this will result in an update to forest cover inventories within the project activity instance (PAI).

Changes in vegetation cover were monitored by comparing temporally distinct satellite images and their respective Normalized Difference Vegetation Indices (NDVI). The resulting analysis calculates either an increase or decrease in vegetation cover which can be classified and symbolized according to the magnitude of change. Changes are measured at the pixel scale of the imagery (20m x 20m for *Sentinel-2 2LA* imagery).

Inventory losses of >0.1ha were assigned a unique Polygon ID and further examined using additional data sources (e.g. Google Earth, additional satellite imagery) to categorize the change/ loss as cloud cover-water reflection, natural disturbance, planned project activities or unplanned harvests.

### Data Acquisition:

To account for the seasonality of vegetation cover, satellite imagery from 2023 and 2024 within a close seasonal range was selected for comparison analysis. Cloud cover was limited to between 0 and 3%, but not entirely avoidable due to the large project area coverage, the variability of timing for satellite flight paths, and days of data availability.

### Results

The project's geographic area is non-contiguous and encompasses freehold properties owned and operated by Westphalen in the states of Schleswig-Holstein and, North Rhine-Westphalia.

No inventory changes were observed during the monitoring period in these geographic region.

The resulting area effects on the analysis units in the PAI inventory are detailed below:

**Analysis Unit area and area % change in vegetative loss**

| PAI Analysis Units | Initial PAI AU Area (ha) | Total Area (ha) Disturbed in PAI 2022 | % Area Change in AU(ha) 2022 | Total Area (ha) Disturbed in PAI 2023 | % Area Change in AU(ha) 2023 | Total Area (ha) Disturbed in PAI 2024 | % Area Change in AU(ha) 2024 |
|---|---|---|---|---|---|---|---|
| BZ1 | 185 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| BZ2 | 254 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| BZ3 | 197 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| OZ1 | 18 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| OZ2 | 68 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| OZ3 | 22 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |
| SZ1 | 25 | 0.76 | 3% | 0.0 | 0% | 0.0 | 0% |
| SZ2 | 3 | 0.0 | 0% | 0.0 | 0% | 0.0 | 0% |

## Conclusion

The Westphalen Forest Carbon Project consists of one PAI totaling 772ha of private forest lands located in Germany, Europe.

The annual NDVI spatial monitoring for 2024 revealed no significant changes in vegetation occurred during the monitor period. Each area analyzed was given a unique polygon ID and reviewed against current satellite imagery, Google Earth imagery, and harvesting data from the client, to confirm its validity.