PROPOSED PROJECT ACTIVITY ALIGNMENT ASSESSMENT

Ecological restoration in Mespelbrunn, Bavière

LT-006-GER-062023 MESPELBRUNN, GERMANY

Stichting Life Terra

Type B Project

February 2, 2024

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ases

On-Chain Protocol

ALIGNMENT ASSESSMENT FOR THE PROJECT SUBMITTED BY LIFE TERRA FOUNDATION, "MESPELBRUNN, GERMANY ECOLOGICAL RESTORATION", WITH AOCP IDENTIFIER LT-006-GER-062023 MESPELBRUNN, GERMANY

CONTEXT

As part of the process for the certification of nature-positive projects and the consequent issuance of Verified Nature-Positive Credits (VNPCs) under the ASES on-chain protocol, the Project developer "Life Terra Foundation" submitted the project "Mespelbrunn, Germany Ecological restoration". This Project activity is in the onboarding stage with the aOPC identification code LT-006-GER-062023. A planting at a deforested area in Mespelbrunn, Germany, was concluded on May 2nd, 2022. Since Project activities have been implemented before the start of the onboarding process, it participates as a project of Modality B. According to the aOCP rules and procedures, Modality B projects shall go through the following process to be registered:

1. Application via the Project Submission Form (PSF), done by the Project proponent.
2. Documentation review and alignment assessment, done by aOCP Operations Team.
3. Payment of onboarding fee by the project proponent.
4. Project pre-registration is done by aOCP Operations Team.
5. On-site validation of the implemented Project activities, done by aOCP Operations Team.
6. Elaboration of Baseline report, Monitoring plan, and Contingency table of credits issuance, done by the aOCP Operations Team.
7. Project proponent agreement.
8. Project Verification by an external, independent, 3rd-party Verifier, delivering a Project Verification Report.
9. Project registration letter and first credits issuance, done by aOCP Operations Team.

This report corresponds to step 2, alignment assessment. The methodology and data gathered on-site are presented here.

ALIGNMENT ASSESSMENT

The aOCP is founded on robust principles aimed at ensuring that Project activities seeking registration and accreditation with Verified Nature Positive Credits (VNPCs) demonstrably and positively impact ecosystems in a real, measurable, permanent, and additional manner while avoiding any harm to ecosystems and/or society.

Conformity with the aOCP's principles, values, rules, and requirements is a fundamental prerequisite for participation in the program. This evaluation occurs during the onboarding phase, before the registration of Project activities. This mandate is stipulated in the aOCP Procedures document, which outlines all the stages a Project undergoes from its inception to the issuance, trading, and retirement of VNPCs.

A positive result of the alignment assessment with aOCP's principles, values, rules, and requirements confirms that the proposed Project activity:

1. Falls into one of the following project types:
   a. Forest management, including ARR
   b. Regenerative agriculture
   c. Silvopastoral management
   d. Urban forests / individual tree climate action
   e. Biochar
2. Adheres to the environmental and social no-harm prerequisites,
3. Is anticipated to yield positive impacts on biodiversity,
4. The Project was developed less than 24 months ago;
5. Conforms to the additionality criteria for the requested VNPCs,
6. Possesses documentation substantiating land ownership or an agreement for the project's duration,
7. The Project area has not been degraded, deforested, or burned in the last 24 months;

Certain circumstances may result in an unfavorable assessment and, if not rectified or clarified satisfactorily, could lead to the rejection of the Project activity's registration within the aOCP.

These circumstances include:

- Non-compliance with aOCP's principles, values, rules, and requirements,
- Issuance of contradictory and/or false declarations by the Project proponent or Project developer,
- Diminished confidence in the Project activity's ability to yield anticipated ecosystem and/or social benefits due to an inadequate risk management plan, which encompasses a comprehensive assessment of internal, external, and natural risks, as well as risk mitigation and contingency planning.

According to the information provided by the Project proponent in the Project Submission Form (PSF), the proposed Project activity belongs to the aOCP category of *Forest management.* The plot at Mespelbrunn was reforested after severe damage from years of drought, bark beetle infestation, and storms. Thus, the planting aims to restore the forest land and create more resiliency through increased biodiversity while providing some valuable woods for ongoing local sustainable timber production. Project activities consists of the planting of 8950 trees of 4 species: *Quercus petraea* (6250), *Acer pseudplatanus* (2200), *Acer platanoides* (300) and *Alnus glutinosa* (200). The Project area and sampling points used for the present analysis are shown in figure 1.
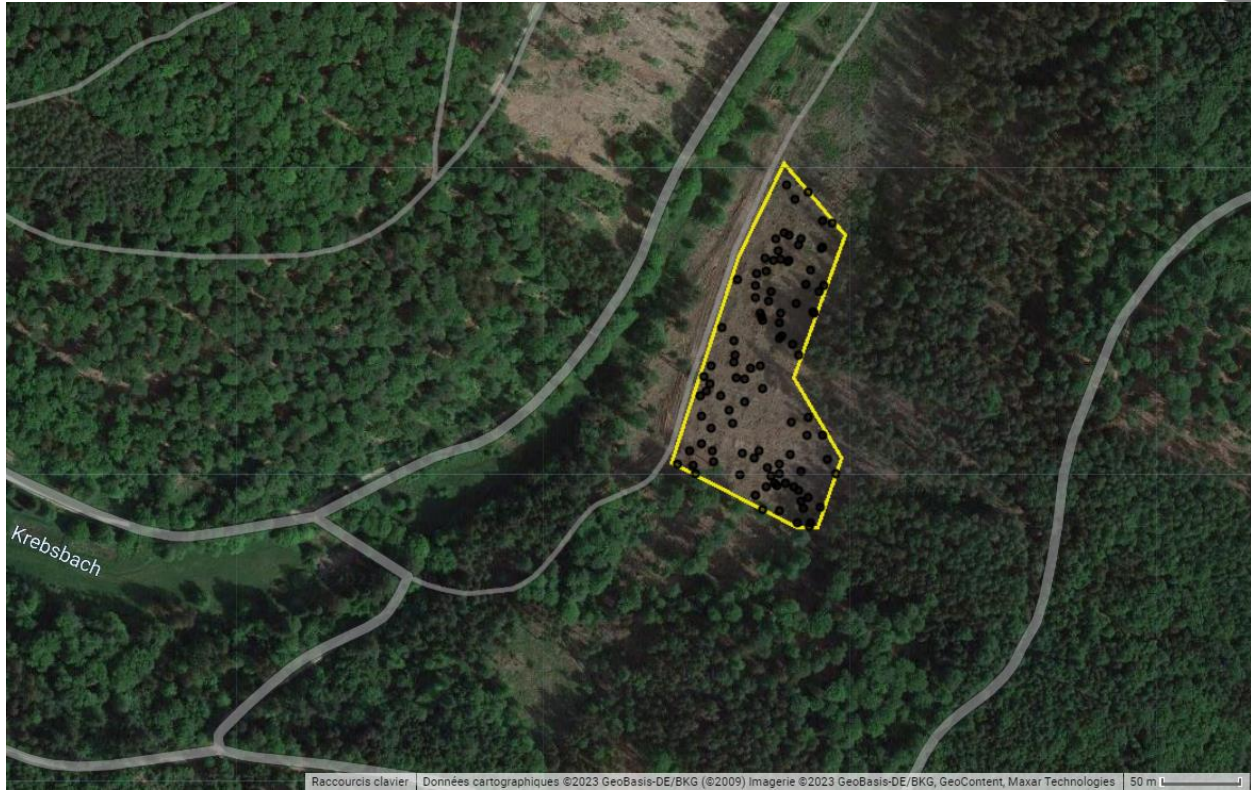
Figure 1. Project area and sampling points used for the NDVI analysis.

METHOD OF ANALYSIS

The proposed Project activity was assessed for its alignment with the aOCP rules and requirements, using the following checklist.

Alignment criteria	Yes	No
Does the project belong to one of the following types: • Forest management, including ARR • Regenerative agriculture • Silvopastoral management • Urban forests / individual climate action • Biochar	**Y**	
Does the project comply with the environmental and social no-harm requirement?	**?**	
Is the project expected to have positive impacts on biodiversity?	**Y**	
If the project has already started, is it less than 5 years old?	**Y**	
Do the requested VNPCs comply with the additionality criteria?	**Y**	
Has documentation establishing land ownership or an agreement for the project's duration been provided?	**Y**	
Have any trees or shrubs been cleared in the project area in the last 2 years?	**Y**	

Historical land cover dynamics was analyzed using Google Earth high-resolution images as well as NDVI (Normalized Difference Vegetation Index) analysis. The NDVI is a widely used remote sensing metric that provides information about the density and health of vegetation in a specific area. It is calculated from the difference between near-infrared and red light reflectance from the Earth's surface.

When analyzing historic land cover, NDVI can be used to track changes in vegetation over time. By examining archived NDVI data, it is possible to observe trends in vegetation density, identify shifts in land use patterns, and monitor the effects of factors like urbanization, deforestation, or natural disasters.

NDVI provides information on the quantity and quality of vegetation in a given area. It varies from -1 to +1, where values closer to +1 indicate dense and healthy vegetation, while values close to -1 suggest a lack of vegetation or presence of artificial surfaces.

In Google Earth Engine, the maximum monthly NDVI from January 2019 to October 2023 was calculated using Sentinel-2 satellite imagery. Random control points were then plotted in each property (Figure 1) and the monthly NDVI value at each point was extracted.

Google Colab was used to generate a box plot showing the distribution of NDVI values at the control points. A box plot is a standardized way of displaying the distribution of a data set based on its summary of five numbers of data points: the "minimum", the first quartile [Q1], the median, the third quartile [Q3], and the "maximum". Box plots provide information on outliers, symmetry of the data, degree of clustering, and whether and how the data are skewed[1].

RESULTS

Google Earth images (figure 2) show that all the trees in the Project area have been removed between May 2020 and May 2022. According to the information provided by the Project proponent in the PSF, the Project area has been severely damaged from years of drought, bark beetle infestation, and storms. This situation led to logging of the trees to prevent further spreading of the bark beetle.

Figure 2. Google Earth images of the Project area from 2020 and 2022.

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[1] Galarnyk, M. Understanding Boxplots. https://builtin.com/data-science/boxplot

NDVI analysis (figures 4) shows that in 2019, the Project area had a mean monthly NDVI around 0.75, which started declining since the second quarter of 2020, reaching 0.38 in June 2021. Since October 2010, the yearly average NDVI remained below 0.6, reflecting the vegetation cover loss before May 2022.
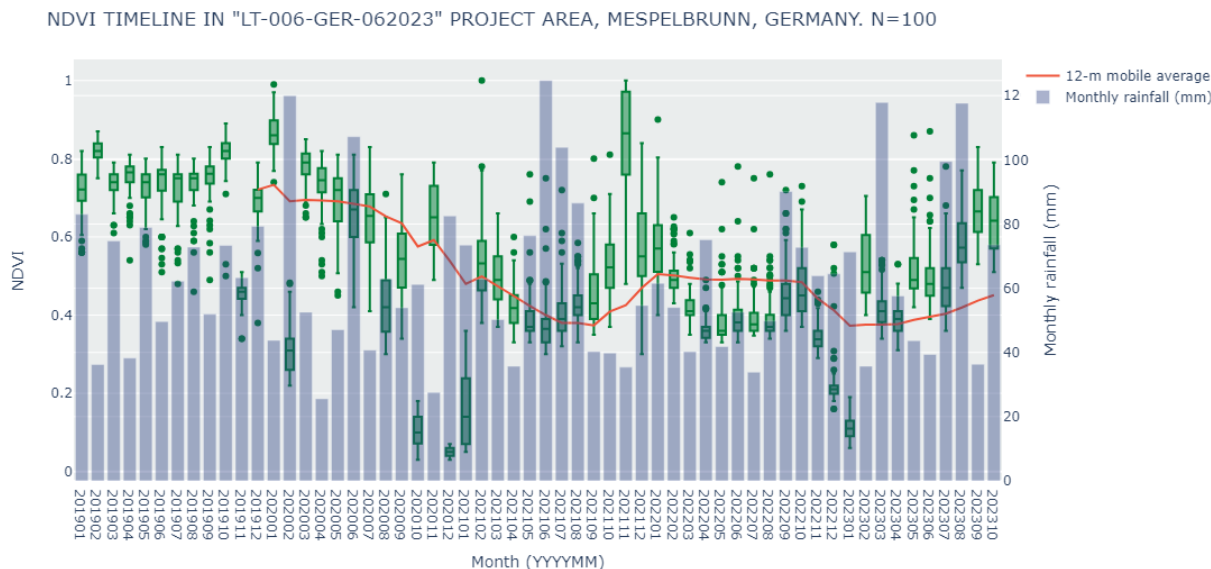

NDVI TIMELINE IN "LT-006-GER-062023" PROJECT AREA, MESPELBRUNN, GERMANY. N=100

Figure 4. Monthly NDVI and rainfall since January 2019.

The plantation was settled accordingly with the site's restoration and economic needs. The implemented Project activities are, therefore, an important contribution to increasing forest cover in the Project area at the same time it keeps providing important economic and social benefits to the local community.

CONCLUSIONS

- The Project activities, consisting in the plantation of 8950 trees from 4 species, are compatible with the aOCP's principles and criteria. Furthermore, in addition to capturing carbon dioxide from the atmosphere, by increasing vegetation cover, the project is likely to positively impact biodiversity, protect the soil from erosion and sustain rainfall water infiltration. However, the aOCP rules and requirements establish that at least 5 plant species should be included to further enhance biodiversity. Therefore, we require additional information regarding the selection of these 4 species to justify the ecological relevance of the choice, and if future planting with more species is planned.
- Additionally, there is a discrepancy with the aOCP rules and requirements, which state that the project area should not have been deforested within two years prior to the start of the project. We understand your assertion that logging was a necessary response to severe damage caused by drought, bark beetle infestation, and storms, particularly affecting the spruce trees. However, in the interest of transparency and to ensure

alignment with the aOCP, we kindly request further details regarding the conditions that led to the decision to cut the trees.

- In this sense, we require you to provide additional information on the specific events related to drought, bark beetle infestation, and storms. All information that helps to increase the understanding of the severity and extent of the damage caused by these factors, as well as the efforts taken to mitigate the impact on the trees. Additionally, any documentation or evidence supporting the need for tree cutting, such as studies or assessments conducted during or after the events, would be valuable in validating the necessity of logging. Our commitment is to ensure that the project aligns with the highest standards of ecological integrity, and your cooperation in providing comprehensive details will contribute to a thorough assessment.

UPDATES IN VERSION 2 OF THE ALIGNMENT ASSESSMENT

The Project proponent provided the requested information on January 24th, 2024, in the document "Reforestation criteria used in Mespelbrunn Plot (Germany)". The project area's phytosanitary condition, regarding insect infestation and drought, which lead to prescribed logging was clearly and satisfactorily explained and documented, including information about Germany's phytosanitary regulations. Tree species selection was also adequately justified with considerations regarding natural regeneration stimulation as consequence of project activities, consistent with ecological succession principles.

Based on the information provided, the proposed Project activity is deemed eligible to be registered as a Modality B, Forest management project.

Reforestation criteria used in Mespelbrunn Plot (Germany)

Background

A record 3-year drought occurred in Germany between 2018 and 2020 which caused immense tree stress. It left the forests vulnerable to insect attacks, storms, fires, or a combination of these threats. Our reforestation project was on a calamity area with previously bark-beetle-infested trees that had to be removed.

Necessity of logging prior to reforestation

Every forest owner in Germany is obliged to combat pests. The obligation for our project's landowner to detect and remove beetle-infested trees results in particular from regional legislation, i.e. the Bavarian Forest Act Art. 14 (stating that the forest has to be properly managed and protected from damage), the Bavarian Forest Pest Insect Ordinance [German: Waldschadinsektenverordnung (WaldSchadInV)], and the Plant Protection Act. According to the WaldSchadInV every forest owner must check his forest for insect pests, especially for infestation characteristics of spruce bark beetles (*Ips typographus*) [German: "Buchdrucker"] and the spruce wood engraver/six-dentate bark beetle (*Pityogenes chalcographus*) [German: "Kupferstecher"], the two most important bark beetles on spruce.

Interim deforestation to curtail pests & forest conversion through reforestation

Forest owners are requested to take care of the processing of affected trees in a way that is effective in protecting the forest. Preventing the bark beetles from infesting any other trees means cutting down the diseased stands and removing the timber from areas with healthy trees, leaving as little as possible behind to reduce the risk of further spreading. Through deforestation, the bark beetles are deprived of food, thus preventing their ability to spread. It is important to reforest with more resilient tree species to create a "forest conversion" [German: "Waldumbau"] long-term.
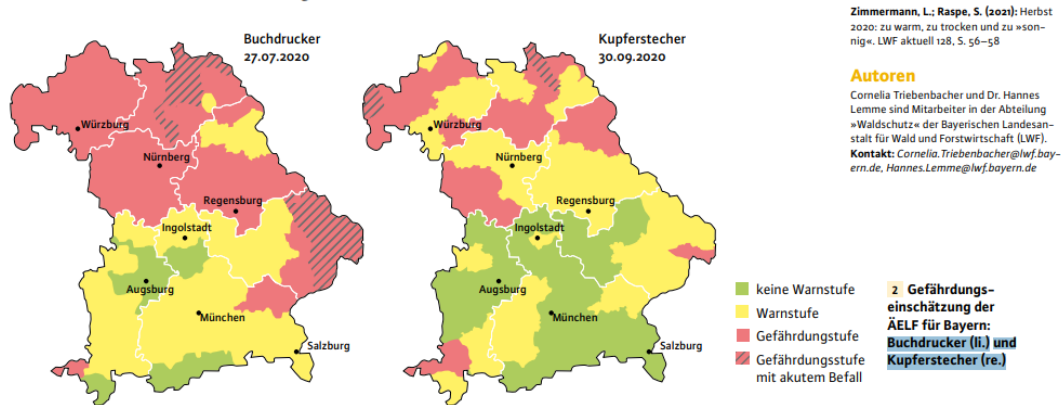
Emergency loggings (VS scheduled harvesting of wood) are often the last measure taken in the event of a massive pest infestation. They cause random, unscheduled major volumes of timber which result in considerable revenue shortfalls for the forestry industry. State orders to log infested timber force landowners to deal with corresponding loss of income (from low timber prices due to oversupply on the market) and high restoration costs. The enormous damage caused by bark beetles is both ecologically and economically.

The Bavarian State Institute of Forestry [German: "Bayerische Landesanstalt für Wald und Forstwirtschaft (LWF)"] provides an information portal which presents some legislation for forest owners on the obligation to control bark beetles as well as announcements of the Bavarian administrative districts, which regulate the monitoring and control of bark beetles.

Severity in Mespelbrunn

The severity and extent of the damage in 2020 caused by climatic factors (drought, storms) and a subsequent bark beetle infestation in the region - in northern Bavaria, Lower Franconia [German: "Unterfranken"] - is also highlighted e.g. in this publication of LWF [in German] titled "Bark beetle year 2020". It shows that Mespelbrunn was one of the infestation hotspots where

bark beetles - both the European spruce bark beetle (*Ips typographus*) and the spruce wood engraver/six-dentate bark beetle (*Pityogenes chalcographus*) caused considerable damaged areas.

Zimmermann, L.; Raspe, S. (2021): Herbst 2020: zu warm, zu trocken und zu »sonnig«. LWF aktuell 128, S. 56–58

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Buchdrucker
27.07.2020

Kupferstecher
30.09.2020

keine Warnstufe
Warnstufe
Gefährdungstufe
Gefährdungsstufe mit akutem Befall

2 **Gefährdungs-einschätzung der ÄELF für Bayern: Buchdrucker (li.) und Kupferstecher (re.)**

[Another publication](#) of the municipality of Mespelbrunn (in cooperation with neighbouring municipalities) explicitly states the following:

a.   Spruce stands were again, like in previous years, attacked by the bark beetle, causing a considerable amount of damaged wood. The affected trees had to be felled and removed from the forest.

b.   At the municipal council in July 2020, it was confirmed that for 2020 no regular logging was planned, but exclusively emergency logging to take out bark-beetle-infested damaged wood.

c.   In this context, all private forest owners were constantly requested to check their forest areas regularly and cut down and remove infested trees from the forest immediately.

d.   The open spaces created by storms and bark beetle measures should be reforested as quickly as possible as large open spaces make the forest more susceptible to storms.

Tree species

We planted 4 species:
- *Acer pseudoplatanus* (Sycamore maple)
- *Quercus petraea* (Sessile oak)
- *Acer platanoides* (Norway maple)
- *Alnus glutinosa* (Common alder)

Th plantation of these species allows for the natural regeneration of at least 4 other species (incl. 3 of the most dominant species in Germany and in Bavaria).
- *Picea abies* (Norway Spruce)
- *Pine* (Pinus sylvestris)
- *Fagus sylvatica* (European beech)
- *Pseudotsuga menziesii* (Douglas fir)

So, the resulting mixed stand will be more biodiverse, comprising more than 5 species. This project had a dominance of beech and spruce before the infestation-related timber logging.

Emergency loggings happen significantly more for coniferous species - especially spruce - and less with deciduous trees. The general advice around the "forest conversion" in Germany is to

increase biodiversity with more deciduous woods. The selection of introduced species to be planted on the project area are all deciduous trees, to balance out the natural regeneration from mostly conifers, besides the naturally growing deciduous beech. The planted species are intended to grow well in combination with the pre-existing competitive European beech. Depending on different soil conditions, this species is commonly mixed in stands with sessile oak (on nutrient-poor, rather dry sites) and maples (better on wet soils). Three different types of maple are common in Germany, and this planting includes two of them: the Norway maple and Sycamore maple. Both are recommended species to mix into a species composition with the aim to adapt to climate change.

Despite long periods of drought, Mespelbrunn had also been affected by storms and heavy rainfalls. On May 11th 2020, for example, it rained 77,2 l/m² according to a storm documentation by Deutsche Rück, p.19, which is on one day the amount typically expected for the whole month. Including alder diversifies the resilience spectrum of the plants in the area in terms of tolerating waterlogging and flooding like no other native tree species.

Sources:
- https://www.biologie-seite.de/Biologie/Rotbuche
- https://www.deutscherueck.de/fileadmin/user_upload/Sturmdoku_2020_web.pdf
- https://www.lwf.bayern.de/waldschutz/monitoring/065609/index.php
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- https://www.vgem-mespelbrunn.de/Portals/1/Mespelbrunn/Mespelbrunn%20B%FCrgerbrosch%FCre%202020_digital.pdf
- https://www.bundeswaldinventur.de/fileadmin/SITE_MASTER/content/Downloads/BMEL_The_Forests_in_Germany.pdf

Signed at Barcelona, on 24th of January of 2024.

By **FOUNDATION**

Sven Kallen

(Secretary and Founder)