

Sustainable and responsible management and re-use of degraded peatlands in Latvia



LIFE REstore

Five demonstration areas in the project – evaluation of impact on the GHG emissions



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Objectives

The primary objective of the study is to demonstrate climate change mitigation potential in managed wetlands by implementation of 5 different land management practices in former peat extraction sites. The secondary objective is elaboration of methodology for verifying of the impact of implemented climate change mitigation measures in comparison to the most probable land use scenario in case of no anthropogenic intervention.

The selected climate change mitigation measures includes two rewetting scenarios – increase of groundwater level in Lauga mire and planting of Sphagnum in Ķemeri nature reservation, two conversion to cropland scenarios – establishment of plantation of blueberry plantation in Kaigu mire and establishment of cranberry plantation in Kaudzīšu mire.

Rewetting - increase of groundwater level in Lauga mire (affected area 309 ha)

Rewetting and planting Sphagnum sp. (affected area 0.5 ha)

Conversion to cropland – establishment of blueberry plantation (affected area 4.2 ha)

Conversion to cropland – establishment of cranberry plantation (affected area 3.4 ha)

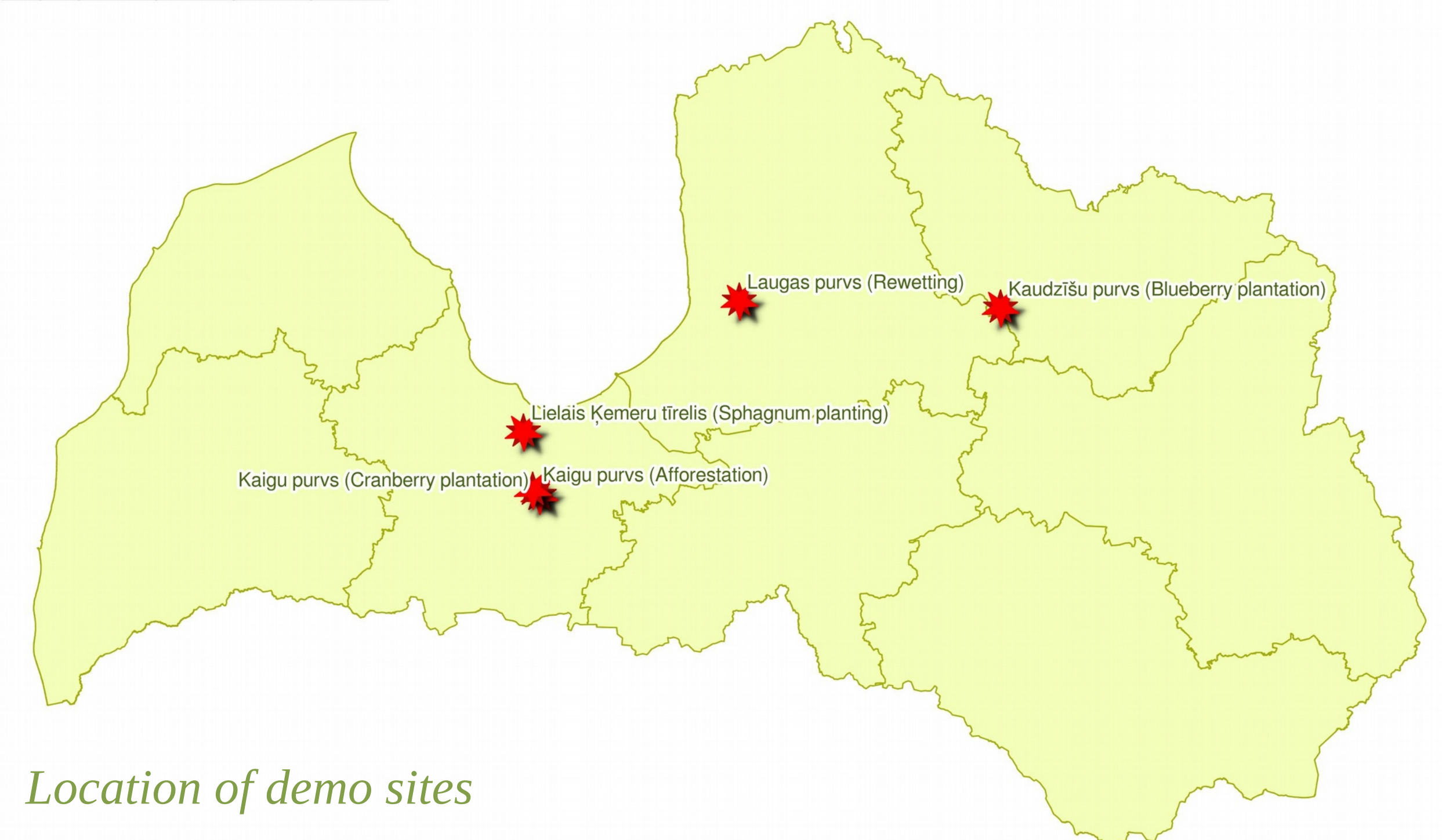
Afforestation and recycling of wood ash – fast growing and conventional tree species (affected area 9.5 ha)

Demo sites

Emission factors & other assumptions

| Demo site | Greenhouse gas (GHG) | Measurement unit | IPCC defaults | + LIFE REstore results |
|---|------------------------------|--|---------------|------------------------|
| Afforested site | CO ₂ | tons CO ₂ -C ha ⁻¹ | 2.60 | 0.96 |
| | DOC | tons C ha ⁻¹ | 0.31 | 0.31 |
| | CH ₄ | kg CH ₄ ha ⁻¹ | 2.50 | 22.39 |
| | CH ₄ from ditches | kg CH ₄ ha ⁻¹ | 217.00 | 217.00 |
| | Share of ditches | - | 3% | 3% |
| | N ₂ O | kg N ₂ O-N ha ⁻¹ | 2.8 | -0.05 |
| Cranberry plantation | CO ₂ | tons CO ₂ -C ha ⁻¹ | 2.80 | 0.75 |
| | DOC | tons C ha ⁻¹ | 0.24 | 0.24 |
| | CH ₄ | kg CH ₄ ha ⁻¹ | 6.10 | 5.72 |
| | CH ₄ from ditches | kg CH ₄ ha ⁻¹ | 542.00 | 542.00 |
| | Share of ditches | - | 5% | 5% |
| | N ₂ O | kg N ₂ O-N ha ⁻¹ | 4.3 | 0.22 |
| Blueberry plantation | CO ₂ | tons CO ₂ -C ha ⁻¹ | 5.30 | 1.13 |
| | DOC | tons C ha ⁻¹ | 0.31 | 0.31 |
| | CH ₄ | kg CH ₄ ha ⁻¹ | 1.80 | 25.87 |
| | CH ₄ from ditches | kg CH ₄ ha ⁻¹ | 1165.00 | 1165.00 |
| | Share of ditches | - | 5% | 5% |
| | N ₂ O | kg N ₂ O-N ha ⁻¹ | 4.3 | 0.90 |
| Rewetted areas (Sphagnum sp. plantation and Lauga mire) | CO ₂ | tons CO ₂ -C ha ⁻¹ | -0.23 | 1.31 |
| | DOC | tons C ha ⁻¹ | 0.24 | 0.24 |
| | CH ₄ | kg CH ₄ ha ⁻¹ | 122.67 | 122.67 |
| | CH ₄ from ditches | kg CH ₄ ha ⁻¹ | - | - |
| | Share of ditches | - | - | - |
| | N ₂ O | kg N ₂ O-N ha ⁻¹ | - | 0.21 |

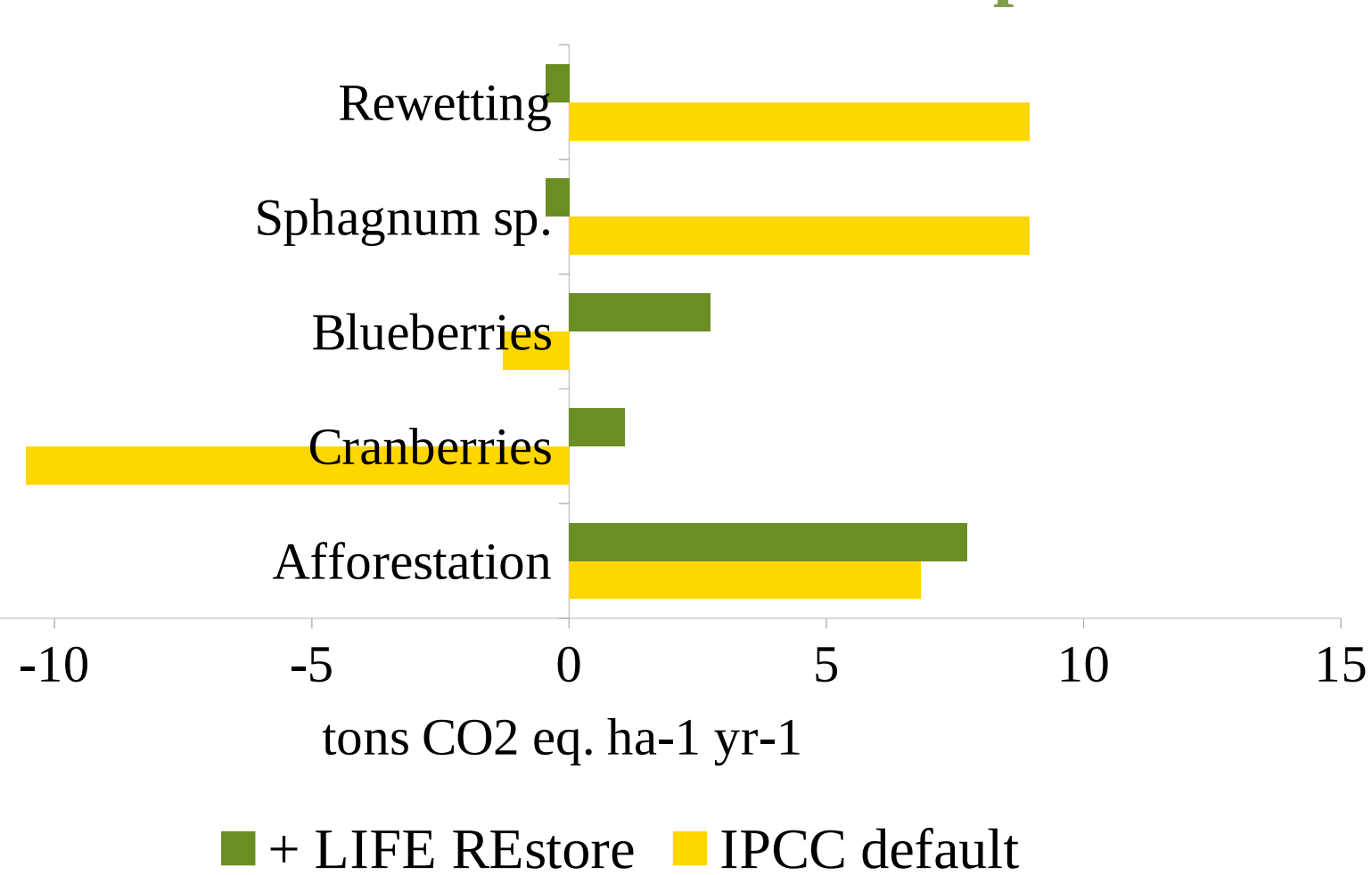
25 0 25 50 75 100 km



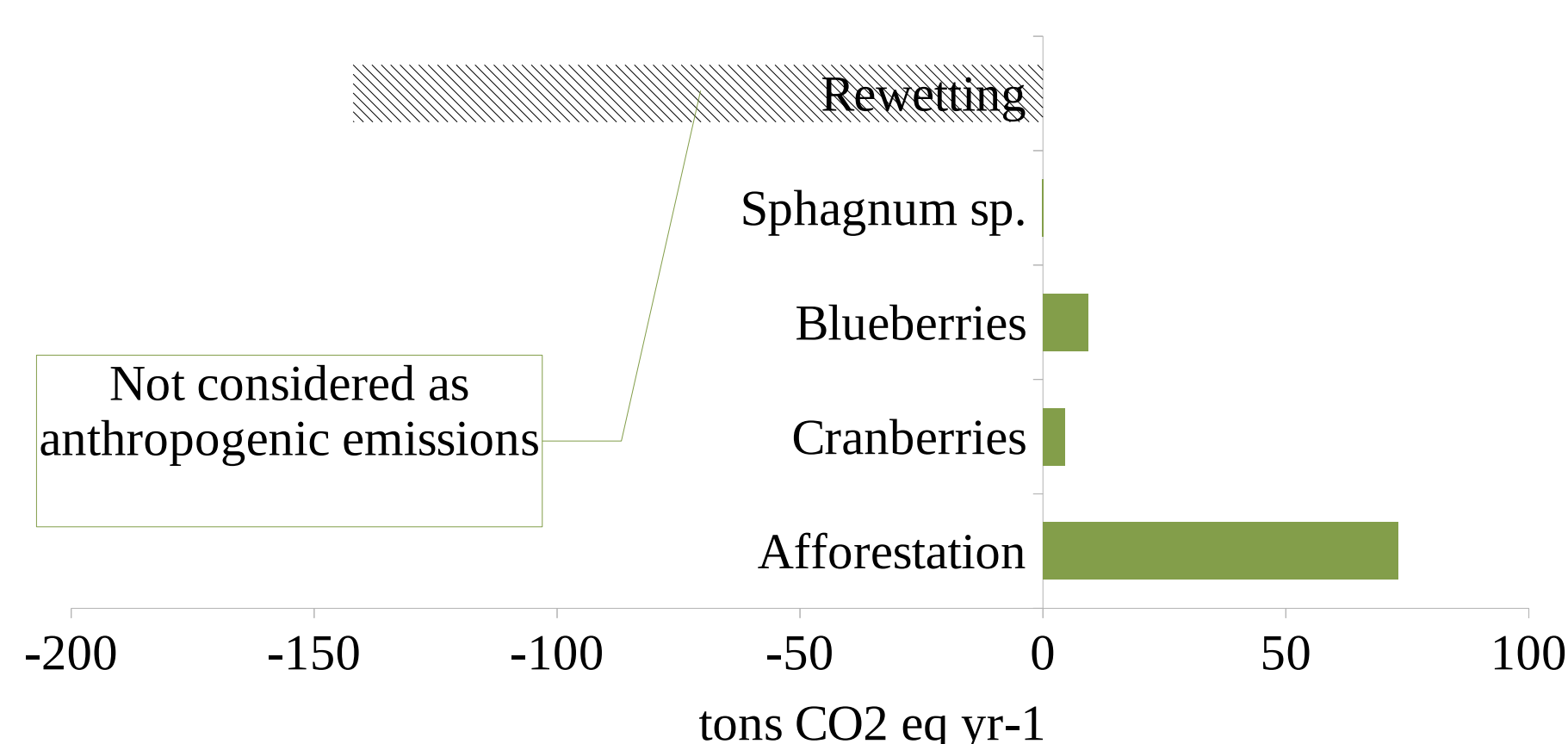
Changes in other carbon pools

| Carbon pool | Measurement unit | Afforested land | Blueberry plantation | Cranberry plantation | Rewetted areas |
|---|---------------------------------------|-----------------|----------------------|----------------------|----------------|
| Woody biomass | tons C ha ⁻¹ | 93.15 | - | - | - |
| Dead wood | tons C ha ⁻¹ | 4.50 | - | - | - |
| Ground vegetation | tons C ha ⁻¹ | 2.00 | 25.00 | 13.60 | - |
| Total | tons C ha⁻¹ | 99.65 | 25 | 13.6 | - |
| Average stock changes (50 years period) | tons C yr ⁻¹ | 1.99 | 0.5 | 0.27 | - |
| | tons CO ₂ yr ⁻¹ | 7.31 | 1.83 | 1 | - |

GHG emission reduction potential



Annual GHG emissions reduction



Assuming GHG emissions from rewetted areas as non-anthropogenic the net GHG emission reduction from the demo sites equals to sum of the emissions reduction from afforested areas, blueberry and cranberry plantations (87.0 tons CO₂ eq. yr⁻¹) and GHG emissions from rewetted areas before implementation of the LIFE REstore project (2676.5 tons CO₂ eq. yr⁻¹), in total **2763.5 tons CO₂ eq. yr⁻¹**.

LIFE 2014 – 2020 Climate change mitigation sub-program project, LIFE14 CCM/LV/001103

Project period: 01/09/2015 – 30/08/2019. Total budget 1 828 318 EUR, EU contribution 1 096 990 EUR.

Partners: Nature Conservation Agency of Latvia, Latvian State Forest Research institute Silava, Latvian Peat Producers Association, NGO Baltic Coasts

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