

TEG Forestry – Annex - recommendations

Table 10: Annex to the Forest mitigation taxonomy and SFM requirements: in addition to the SFM requirements, these are indicative and recommended forest management practices that maintain and/or increase carbon stores or carbon sinks of above and below ground carbon.

| Category | Indicative examples of types of practices that could be considered for all the relevant carbon pools ¹ . Applicability per activity ² (AF, RE, FR, MF), if not specifically mentioned, practice applies to all. |
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| <p>A. Practices that maintain existing carbon stocks above and below ground, considering relevant carbon pools³, while maintaining or improving the soil quality, soil carbon and biodiversity.</p> | <p>In above-ground biomass</p> <p>Rationale: Enhance structural stability against disturbances due to optimal crown and stem architecture that minimizes the impact of disturbances (storms, pest outbreaks) and associated carbon losses.</p> <ul style="list-style-type: none"> • Ensure long-term balance between increment and harvesting in each management unit⁴ (MF). <p>In soil</p> <p>Rationale: Minimize carbon losses in soil due to management and maintain the natural carbon stock in soils. Minimize or no nitrogen release.</p> <ul style="list-style-type: none"> • Use harvesting methods that minimise impacts on soils; • Maintain soil organic carbon pool and soil health through continuous cover that contribute to soil moisture and biodiversity. Leave appropriate vegetation and other non-productive species. <p>In deadwood⁵</p> <p>Rationale: Maintain quantity of deadwood.</p> <ul style="list-style-type: none"> • Maintain standing and on the ground deadwood (RE, RF, MF) in adequate quantities⁶; |

¹ This is a non-exhaustive list of practices that could be used, keeping in mind that all carbon pools identified here need to be addressed. Applicants can develop further practices, if meeting the requirements of the Category. Types of practices always have to be understood depending on the local conditions (temperature, rainfall, soil, altitude, species, etc.).

² AF – Afforestation, RE – Restoration, RF – Reforestation, MF – Management of existing forest

³ According to LULUCF Regulation Annex I, part B, the carbon pools are: above-ground biomass, below-ground biomass, litter, dead wood, soil organic carbon.

⁴ Whole area or a compartment, depending on existing classifications of the forests in the country.

⁵ Subject to the local conditions and limitation in wildfires prone areas and outbreaks of pests and disease and other natural disturbances.

⁶ i.e. taking into account potential effect on health and stability of ecosystems, risks of forest fires, etc.

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| | <ul style="list-style-type: none"> Retains trees with microhabitat, distribution and arrangement, tree species, size of retained wood, stage of decay⁷ (RE, RF, MF). <p>In litter</p> <p>Rationale: Maintain the amount of litter.</p> <ul style="list-style-type: none"> Release forest residues on the ground when the ecological conditions are suitable in order not to increase inflammable material in forest fires prone sites. |
| <p>B. Practices that increase carbon sinks and potentially subsequent existing carbon stocks above and below ground.</p> | <p>In above ground biomass⁸</p> <p>Rationale: Enhance structural stability against disturbances due to optimal crown and stem architecture that minimize the impact of disturbances (storms, pest outbreaks) disturbances damage and associated carbon losses. Support carbon stock and/or carbon sequestration increase, alone or in combination with forest resilience.</p> <ul style="list-style-type: none"> Promote natural regeneration when in line with ecological conditions and stands requirements⁹ and adopt artificial regeneration only in cases of proved unsuccessful site spread on natural regeneration (MF); Reduce risk of bark beetles or other pest outbreaks through species diversification, support more spatially diverse management that increases tree regeneration speed enhancing of structure complexity; Undertake continuous regeneration as an integral part of forest tending in even and uneven aged forests (RF, MF); Enhance of the natural productivity and supporting forest species' composition similar to original or re-establishing the productivity; Release / maintain mature old trees (incl. "crop tree") as part of ecosystems structure and complexity (MF); Adjust the length of rotation age of stands when in line with trees and stands vitality (RF, MF); Select native species or in exceptional circumstances, species, varieties, ecotypes of trees that adequately provide the best adaption to the site and resilience to climate change, natural disasters and the biotic, pedologic and hydrologic condition of the area concerned, as well as to the potential invasive character of the species under local conditions, current and projected climate change. <p>In deadwood</p> |

⁷ On deadwood management in Europe. Vitková L. et al (2018) Deadwood management in Central European forests: Key considerations for practical implementation. Forest Ecology and Management.

⁸ Practices that increase carbon sequestration are linked only to above-ground and deadwood carbon pools where it is technically feasible to enhance, measure and monitor carbon sequestration

⁹ Subject to local conditions and legal obligations to control pest outbreaks

⁹ Subject to the local conditions and limitation in wildfires prone areas and outbreaks of pests and disease

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| | <ul style="list-style-type: none"> • Increase the quantity and distribution of standing and ground deadwood (RE, RF, MF); • Retain trees with microhabitat, position and arrangement, tree species, size of retained wood, stage of decay¹⁰ (RE, RF, MF). |
| <p>C. Practices that are associated with forest management approaches that target conservation or other non-productive functions of forests</p> | <ul style="list-style-type: none"> • Reduce harvest, e.g. as part of non-intervention forest management approaches (where harvest is only possible for safety or phytosanitary reasons); • Maintain high carbon stocks in multiple pools while optimizing other non-productive ecosystems benefits (RE, MF); • Support species diversity, including ancillary species (AF, RE, RF, MF); • (Re-)establish the structure of forests, enhance the natural productivity and native species diversity (RE, RF, MF); • Enhance forest species' composition similar to original or re-establish the productivity and some or all of the species originally present/native species. <p>In deadwood</p> <p>Rationale: Increase the amount of standing and ground deadwood. Approaches such as limited or non-intervention management and conservation forestry are associated with high carbon stocks given that more biomass is left in the forest, rotation lengths are typically increased compared to conventional approaches while non-productive ecosystem services are optimized.</p> <ul style="list-style-type: none"> • Increase the quantity and distribution of standing and ground deadwood (RE, RF, MF); • Retain trees with microhabitat, position and arrangement, tree species, size of retained wood, stage of decay¹¹ (RE, RF, MF); • No or minimal use of pesticides to control pest outbreaks¹² and instead favour alternative approaches or techniques, such as non-chemical alternatives to pesticides, in line with the Directive 2009/128/EC on the sustainable use of pesticide. |

10 On deadwood management in Europe. Vitková L. et al(2018) Deadwood management in Central European forests: Key considerations for practical implementation

11 On deadwood management in Europe. Vitková L. et al(2018) Deadwood management in Central European forests: Key considerations for practical implementation

12 Subject to local conditions and legal obligations to control pest and disease outbreaks

Indicative glossary of terms

- **Forest:** Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. Source: FAO, Global Forest Resources Assessment, 2020, Terms and Definitions <http://www.fao.org/3/I8661EN/i8661en.pdf>
- **Afforestation:** Establishment of forest through planting and/or deliberate seeding on land that, until then, was under a different land use, implies a transformation of land use from non-forest to forest. Source: FAO, Global Forest Resources Assessment, 2020, Terms and Definitions <http://www.fao.org/3/I8661EN/i8661en.pdf>
- **Rehabilitation / restoration:** Any intentional activity that initiates or accelerates the recovery of an ecosystem from a degraded state (referencing the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES). Source: FAO, Unasylva, Forest and landscape restoration, <http://www.fao.org/3/a-i5212e.pdf>
- **Reforestation:** Re-establishment of forest through planting and/or deliberate seeding on land classified as forest. Source: FAO, Global Forest Resources Assessment, 2020, Terms and Definitions <http://www.fao.org/3/I8661EN/i8661en.pdf>
- **Carbon pool:** The whole or part of a biogeochemical feature or system within the territory of a Member State and within which carbon, any precursor to a greenhouse gas containing carbon or any greenhouse gas containing carbon is stored. (Article 3(1)). Source: Guidance on developing and reporting the Forest Reference Levels in accordance with Regulation (EU) 2018/841.
- **Harvested wood product (HWP):** Any product of wood harvesting that has left a site where wood is harvested. (Article 3(1)). Source: Guidance on developing and reporting the Forest Reference Levels in accordance with Regulation (EU) 2018/841.
- **Sustainable forest management (practice):** The Helsinki Resolution H1 (1993) of Forest Europe defines “sustainable management” as: “the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”. Furthermore, Annex IV A.(f) of the LULUCF Regulation states that “the reference level should be consistent with the objective of contributing to the conservation of biodiversity and the sustainable use of natural resources, as set out in the EU forest strategy, Member States’ national forest policies, and the EU biodiversity strategy”. The proposed taxonomy Regulation refers to sustainable forest management in Art. 2(1)(n), following the EU Forest Strategy (COM(2013) 659 final) definition, which is almost identical to the Helsinki Resolution H1 (1993) of Forest Europe. Source: IPCC Good Practice Guidance for LULUCF (2003).
- **Carbon sink:** Any process, activity or mechanism that removes greenhouse gas (GHG), an aerosol or a precursor of a GHG or aerosol from the atmosphere. Source: IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton and C. von Stechow (eds.)]. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130.
- **Carbon stock:** The quantity of carbon in a pool.
- **Conversion:** Conversion (often also referred to as land-use change) refers to a change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land-use change may have an impact on the surface albedo, evapotranspiration, sources and sinks of greenhouse gases (GHGs), or other properties of the climate system and may thus give rise to radiative forcing and/or other impacts on climate, locally or globally. Source: IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton and C. von Stechow (eds.)]. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130.
 - o Used in this context to refer to the change of one land use to another (e.g. grassland to forest).
- **Grasslands:** Ground covered by vegetation dominated by grasses, with little or no tree cover. Source: FAO (2005), Grasslands of the World In this context, this category includes rangelands and pasture land that is

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not considered as cropland. It also includes systems without human intervention, the thresholds used in the forest land category. This category also includes all grassland from wild lands to recreational areas as well as agricultural and silvo-pastoral systems, subdivided into managed and unmanaged, consistent with national definitions.

- **Wetlands:** This category includes land that is covered or saturated by water for all or part of the year (e.g., peatland) and that does not fall into the forest land, cropland, grassland or settlements categories. This category can be subdivided into managed and unmanaged according to national definitions. It includes reservoirs as a managed sub-division and natural rivers and lakes as unmanaged sub-divisions. Source: FAO.
- **Biodiversity:** Biological diversity or biodiversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. Diversity indices are measures of richness (the number of species in a system); and to some extent, evenness (variances of species' local abundance). They are therefore indifferent to species substitutions which may, however, reflect ecosystem stresses (such as those due to high fishing intensity). Source: Convention on Biological Diversity.
- **Native Species:** one which naturally exists at a given location or in a particular ecosystem, i.e. it has not been moved there by humans. Source: FAO
- **Peatlands:** Peatlands are wetlands with a thick layer of organic soil. Source: European Forestry Institute
- **Abiotic:** not biotic. Nonliving. The criteria refer to abiotic risks to forests, this would include e.g. fires, wind throws, droughts.
- **Biotic:** Of or relating to life; especially: caused or produced by living beings. Living. Living organisms make up the biotic parts of ecosystems. The criteria refer to biotic risks to forests, which would include pests.
- **Monoculture:** Growing only one crop that is of an even age
- **Soil carbon / soil organic carbon:** Soil carbon or soil organic carbon is the carbon stored in soils. Source: FAO 2017.
- **Soil quality:** Soil quality is the capacity of a soil to function within ecosystem and land-use boundaries to sustain biological productivity, maintain environmental quality and promote plant and animal health. Source: Bunemann et. al. (2018), Soil quality – a critical review.
- **Ecotypes:** A distinct form of a plant species occupying a particular habitat.
- **Close-to-nature:** 'Close-to-nature forest management' is a forest management approach characterised by practices which build on, or emulate, natural processes and which aim to combine the economic use of forests with nature conservation. The results are actively managed but multi-storeyed and rich mixed forests which are relatively close to natural forests. The concept includes active forest management with timber harvest and thus should not be mistaken for approaches explicitly intending to preserve natural processes e.g. in wilderness areas. Close-to-nature forest management practices typically used vary slightly from one country to another but would be expected to include the following elements: use of native or site-adapted tree species, natural regeneration, limited machine operation, inclusion of nature conservation measures, exclusion of fertilisation or pesticide use, long rotation length, and single stem or group harvesting. Source: LIFE 2018-20 work programme.
Which again is building on: Duncker, P. S., S. M. Barreiro, G. M. Hengeveld, T. Lind, W. L. Mason, S. Ambrozy, and H. Spiecker. 2012. Classification of forest management approaches: a new conceptual framework and its applicability to European forestry. *Ecology and Society* 17(4): 51.
- **Pedologic conditions:** Soil related conditions.
- **Hydrologic conditions:** Water related conditions.