



Overview on forest related climate change policy in Germany

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- 2 Climate change policy – state level
- 3 Guidelines and decision support
- 4 Questions and answers



Climate change policy – federal level

Legal framework



Federal climate change act:

- Article 1, purpose:
 - To protect against the effects of global climate change
 - Ensuring that national climate protection targets are met and that European targets are complied with
- Article 3, national climate protection targets:
 - Reduction of greenhouse gas emissions compared to 1990 levels:
 - By at least 65 percent by the year 2030; by at least 88 percent by 2040.
 - By 2045: greenhouse gas neutrality
- Article 3a, Contribution of LULUCF:
 - To at least minus 25 million tons of carbon dioxide equivalent by 2030
 - to at least minus 35 million tons of carbon dioxide equivalent by 2040
 - At least minus 40 million tons of carbon dioxide equivalent by 2045.



Climate change policy – federal level

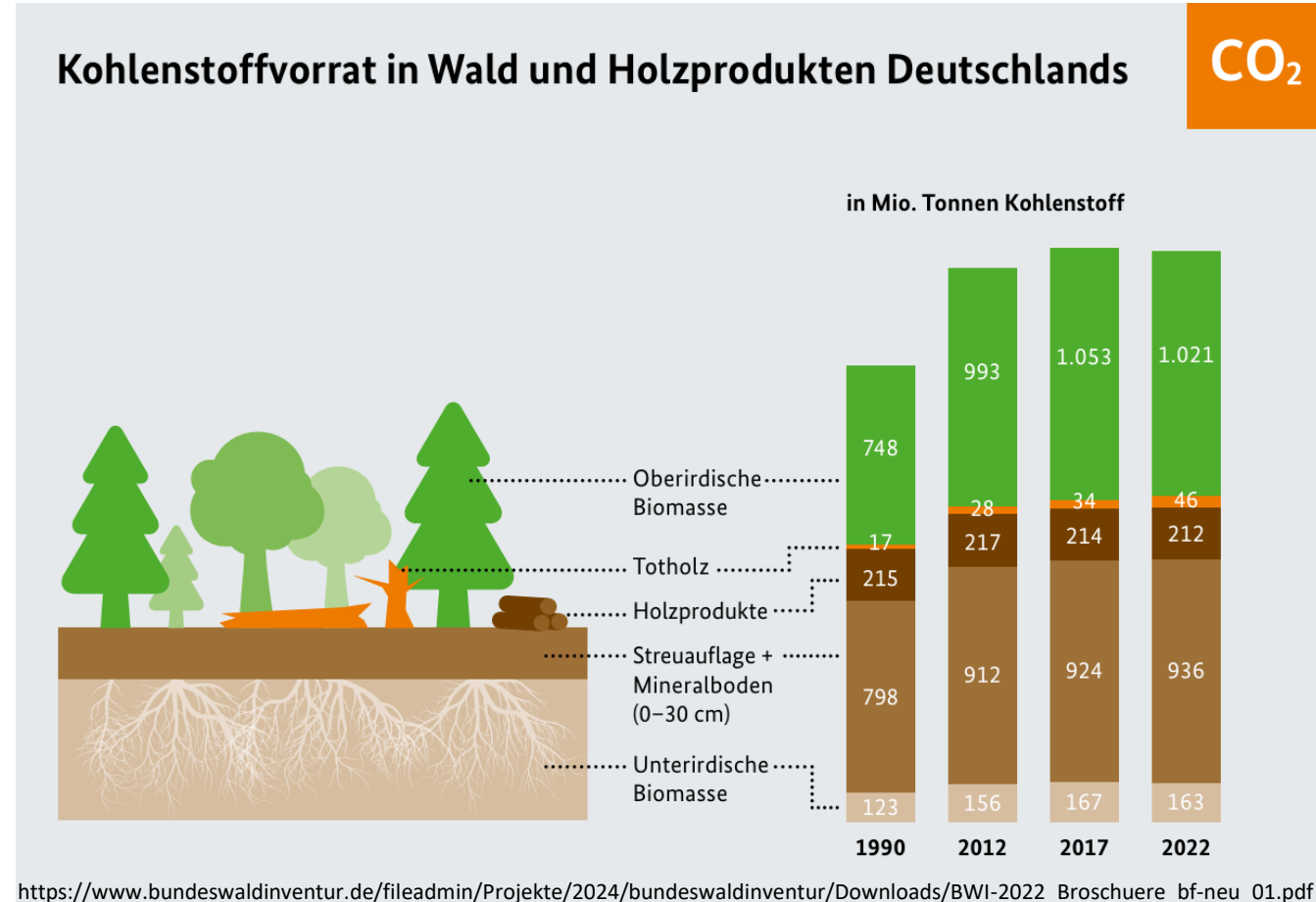
Legal framework



	1990	2012	2017	2022
Biomass above ground	748	993	1053	1021
Dead wood	17	28	34	46
Timber	215	217	214	212
Litter & soil	798	912	924	936
Biomass below ground	123	156	167	163
Sum	1901	2306	2392	2378
Difference to previous	NA	405	86	-14
			Unit: mil. tons of carbon	

Results of National Inventories:

- Until 2017: Carbon storage in German forests grew
- From 2017 to 2022 German forests emitted 14 mil. t of carbon



Climate change policy – federal level

Legal framework



Goal of the federal government (2021 – 2025):

- New federal forest act
 - Forests suffer from climate change
 - Forests contribute to climate change mitigation
 - Obligation of forest owners to change tree species composition to more climate change resilient **and** native species
- Debate:
 - Especially private forest owner are against it, but also wood industry
 - Restriction of property rights, being less flexible
 - Environmentalists very much welcome the idea
 - Want more and clearer restrictions

**Breaking News:
New forest act suspended!**



Climate change policy – federal level

Public funding programs – addressing forests



- Waldklimafonds (Forest climate fund):
 - Grants for research and innovation
 - Beneficiaries: enterprises, research institutes, universities, public offices, private individuals, associations
 - Goals:
 - Measures to maintain and expand the CO2 reduction potential of forests and wood
 - And to adapt forests to climate change
 - Projects: Vast thematic range (silviculture, calamity prediction, use of rare species, genetic analysis, influence of fungi, etc.)



Source: <https://www.waldklimafonds.de/>

Climate change policy – federal level

Public funding programs – addressing forests



- Climate adapted forest management (KLAWAM):
 - Grants for implementing a set of strict rules
 - Beneficiaries: private and communal forest owners
 - Goals:
 - To adapt forests on climate change
 - To enhance forests' function as carbon sink
 - To improve biodiversity
 - Projects:
 - Forest management must comply with 12 criteria (tree species composition, semi natural forestry, no clear cutting, dead wood, management free areas, no use of pesticides, water retention, etc.)

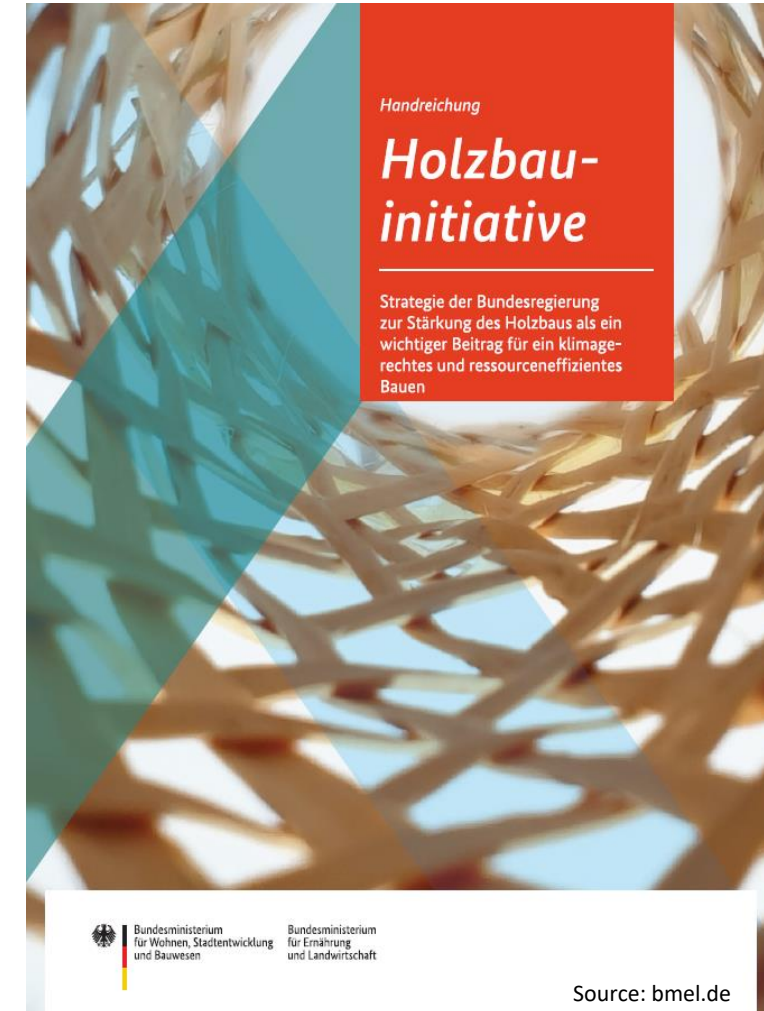


Climate change policy – federal level

National strategies – addressing value chain

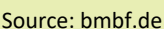


- Timber construction initiative (Holzbauinitiative):
 - Common strategy of federal ministry of building and ministry of agriculture
 - Relates to different German strategies on **climate protection**, **sustainability**, resources efficiency, bio economy, **biodiversity**, biomass, circular economy and affordable housing
 - Goals:
 - To consider wood and other renewable raw materials more than before
 - To increase the quantity of timber construction and to promote innovation (e.g. use of broad leaved species in construction)
 - To exploit the circularity of timber
 - To take (lightweight) timber construction in urban densification
 - To increase serial timber construction and serial refurbishment
 - Effects on forests:
 - Increased demand for timber of different species



Source: bmel.de

National strategies – addressing value chain



Climate change policy – state level (Hesse)

Integrated Climate Protection Plan Hesse



- Integrated Climate Protection Plan Hesse
 - Based on EU and federal goals
 - Describes the implementation in Hesse
- 9 action areas
 - Energy, industry, traffic and mobility, buildings and cities, circular economy, education and research, health and civil protection, land use, superordinate
- Common plan of 8 ministries
- Supported by 6 scientific institutes



Climate change policy – state level (Hesse)

Integrated Climate Protection Plan Hesse



- Forest related actions:
 - Wood construction campaign
 - Advice on and establishment of new agroforestry systems
 - Optimized climate protection in a designated forest management unit
 - Promotion of sustainable, multifunctional forestry
 - Improvement of water retention in the forest
 - Establishment of climate-resilient forests
 - Climate-sensitive forestry with broad impact
 - Forest climate risk maps - improved advisory basis for new challenges to Hessian forest owners
 - Subproject 1: “Climate risk maps for forests - improved advisory basis for new challenges for Hessian forest owners”
 - Subproject 2: “Cultivability and ecological compatibility of alternative tree species in Hesse”



Climate change policy – state level (Hesse)

Integrated Climate Protection Plan Hesse



- Wood construction campaign
 - Measures to facilitate and to promote wood construction
 - E.g. simplification of building regulations
- Advice on and establishment of new agroforestry systems
 - Establishment of at least 100 ha of agroforestry systems in Hesse
 - Strengthening existing promotion networks
- Optimized climate protection in a designated forest management unit
 - Research on optimization of carbon storage in forests
 - Public promotion of results



Climate change policy – state level (Hesse)

Integrated Climate Protection Plan Hesse



- Promotion of sustainable, multifunctional forestry
 - Stabilization of carbon storage in Hessian forest soils
 - Increase of carbon sequestration through silvicultural measures with explicit consideration of biodiversity
- Improvement of water retention in forests
 - Considering water retention in forest road construction
 - Creation of fire extinguishing ponds
 - Restoration of flowing and standing waters as well as forest bogs
- Establishment of climate-resilient forests
 - Reforestation of calamity induced clearings
 - Use of multiple species



Climate change policy – state level (Hesse)

Integrated Climate Protection Plan Hesse



- Climate-sensitive forestry
 - Risk analysis for forests in Hesse to give forest owners a decision support tool
- Forest climate risk maps - improved advisory basis for new challenges to Hessian forest owners
 - Subproject 1: “Climate risk maps for forests - improved advisory basis for new challenges for Hessian forest owners”
 - Decision support tool for forest owners
 - Subproject 2: “Cultivability and ecological compatibility of alternative tree species in Hesse”
 - Study on tree species from the Mediterranean, Caucasian or Near East Asia



Climate change policy – state level (Hesse)

Public funding programs



- Hesse is funding private and communal forest owners
 - General funding
 - Supports forest owners in their forest management (e.g. afforestation, tree species change, pre-commercial thinnings, forest road construction, etc.)
 - Calamity funding
 - Supports forest owners to cope with calamities
- In a changing environment funding is constantly further developed
 - E.g. discussions on funding foreign, climate resilient tree species



Climate change policy – state level (Hesse)

Guidelines and decision support



- State forest administration develops guidelines
 - Binding for state forests
 - Orientation for private and communal forests
 - Some guidelines are binding when applying for funding
- Guidelines
 - Forest development goals
 - Cultivation recommendation of native and non-native tree species
 - Silviculture manual (Waldbaufibel)



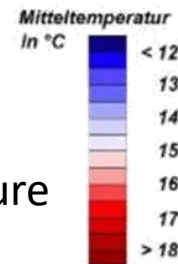
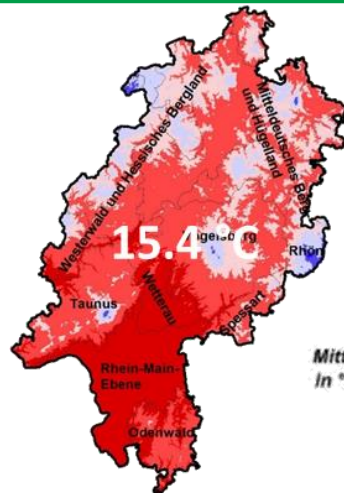
Guidelines and decision support

Forest development goals

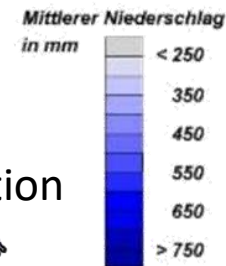
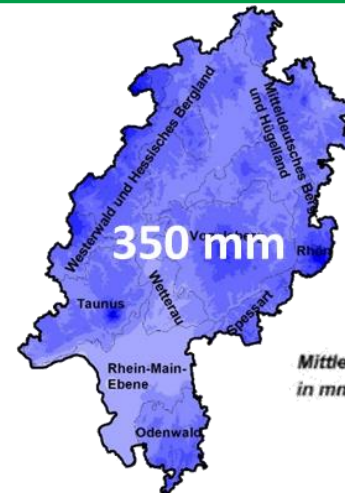


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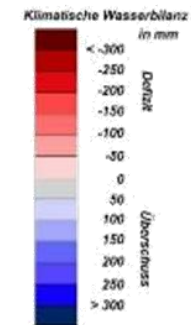
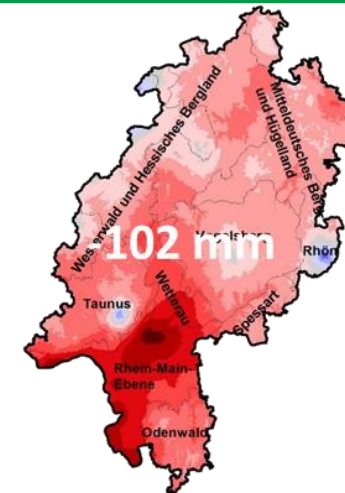
Heute (1981 – 2010)



Mean temperature



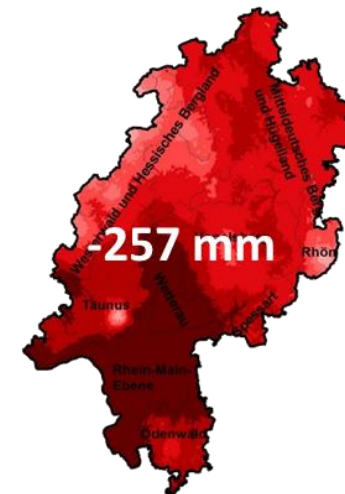
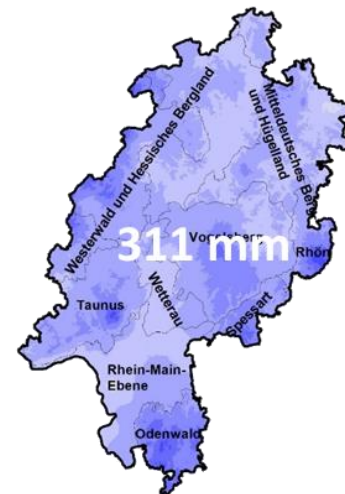
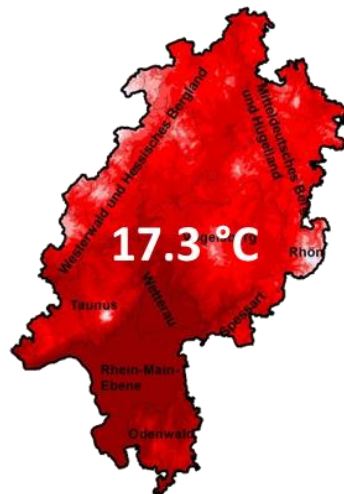
Mean precipitation

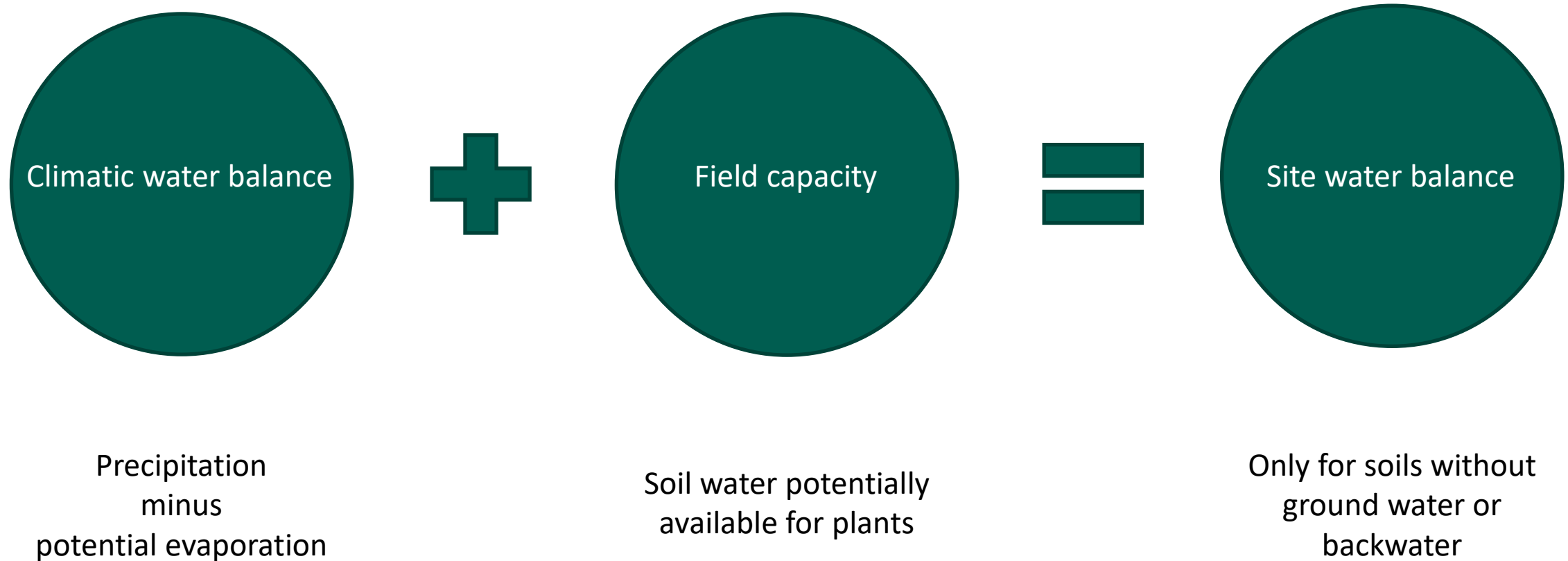


Climatic water balance

future

Zukunft (2041 – 2070)





Guidelines and decision support

Forest development goals



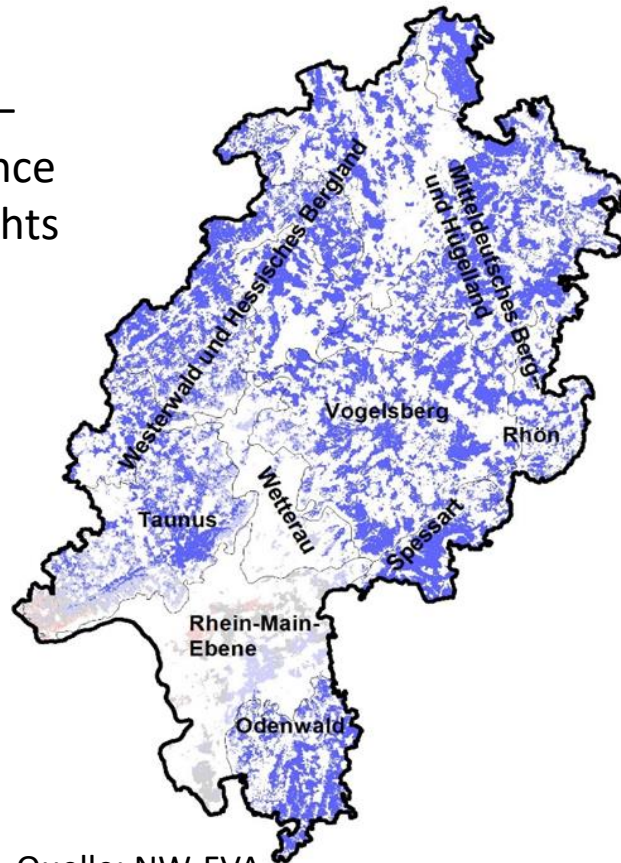
Periode 1981 bis 2010

Dt. Wetterdienst: +34 mm

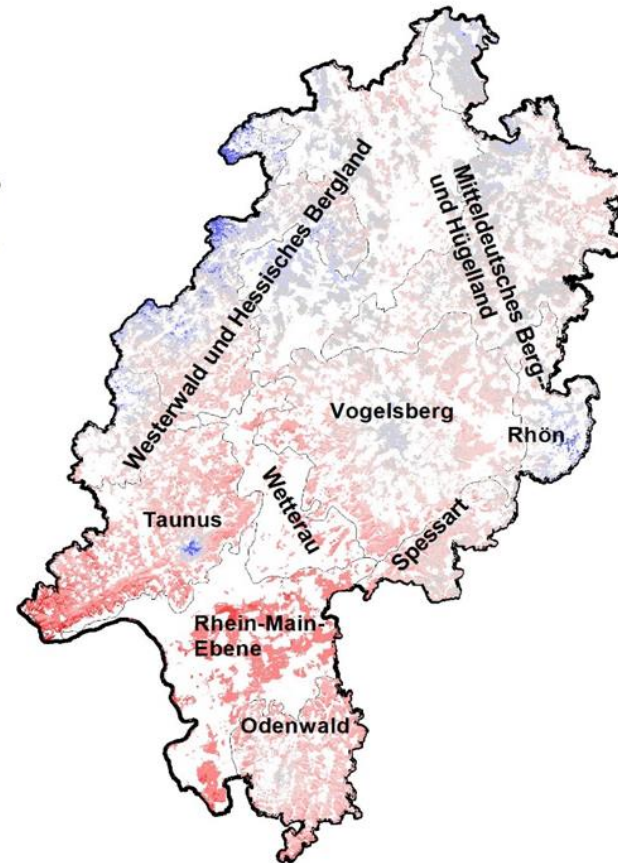
Periode 2041 bis 2070

Modell STARS: -124 mm

Change of site characteristics – site water balance indicates droughts



Quelle: NW-FVA

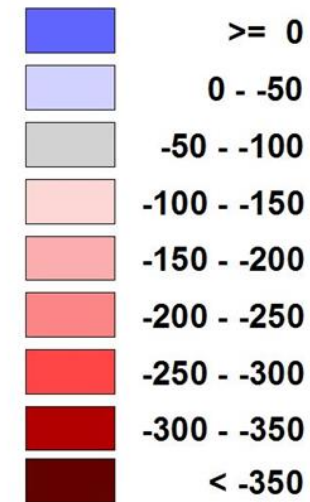


NW-FVA

Nordwestdeutsche
Forstliche Versuchsanstalt

Standortswasserbilanz

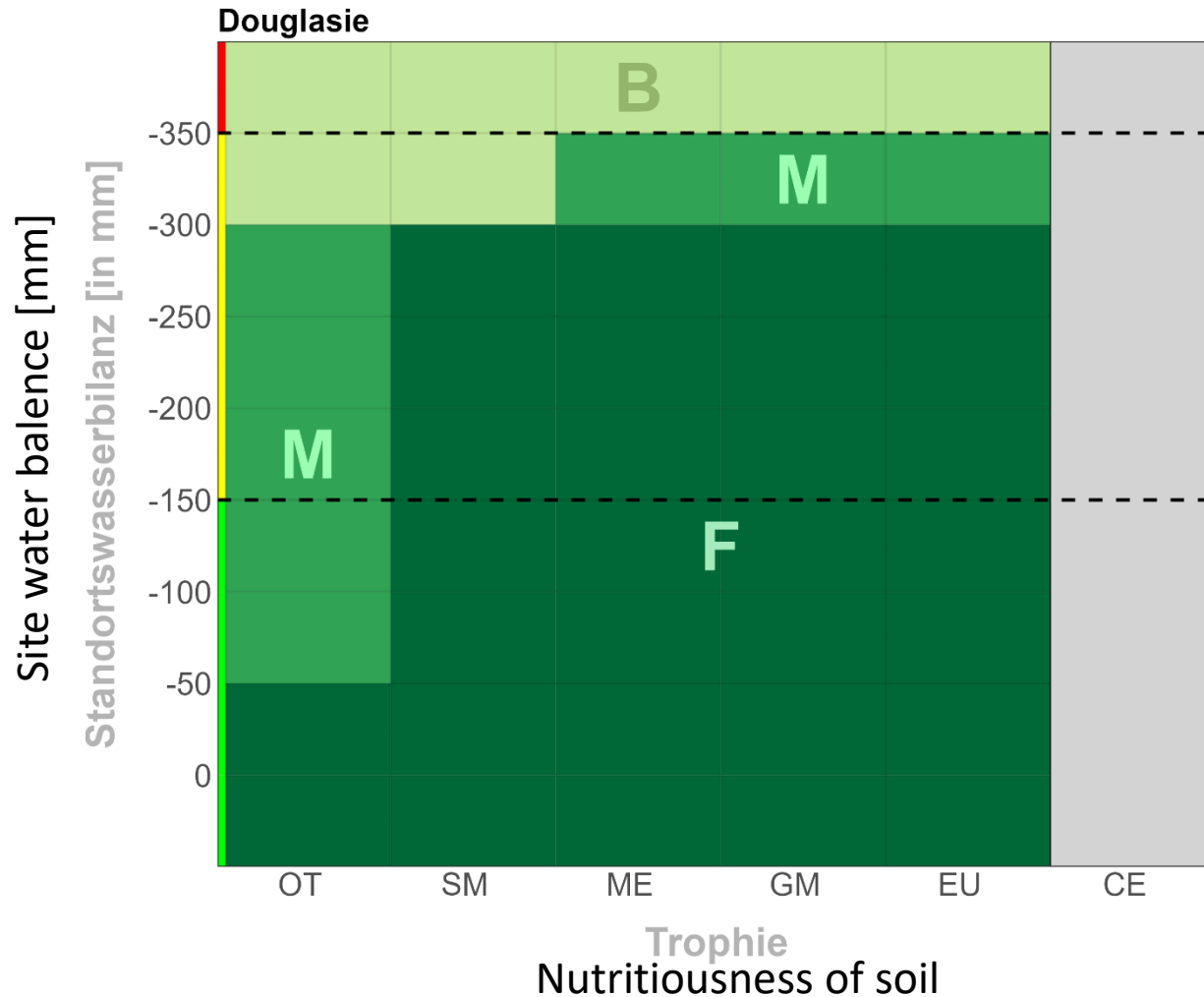
in mm



Site water
balance in
mm

Guidelines and decision support

Forest development goals



Ecogram of douglas fir
(*Pseudotsuga menziesii*)

Legend:

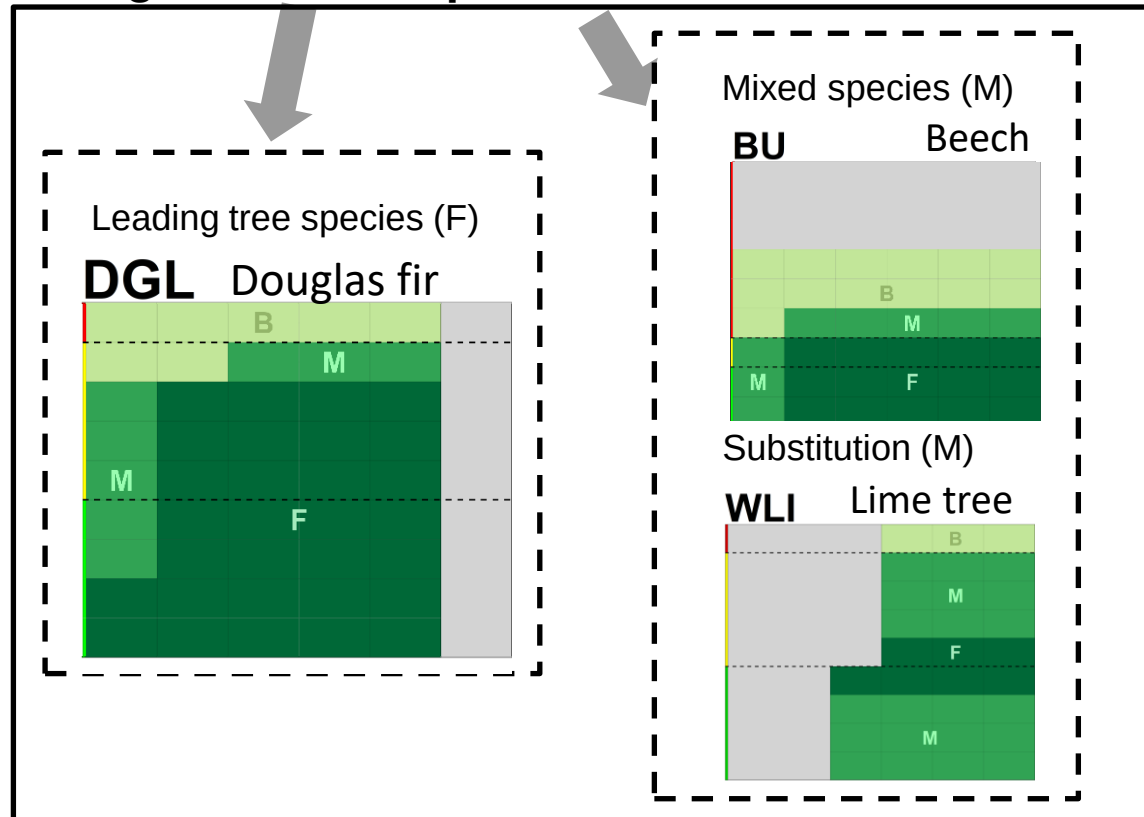
- excluded
- rare (B)
- mixed (M)
- leading (F)

Guidelines and decision support

Forest development goals



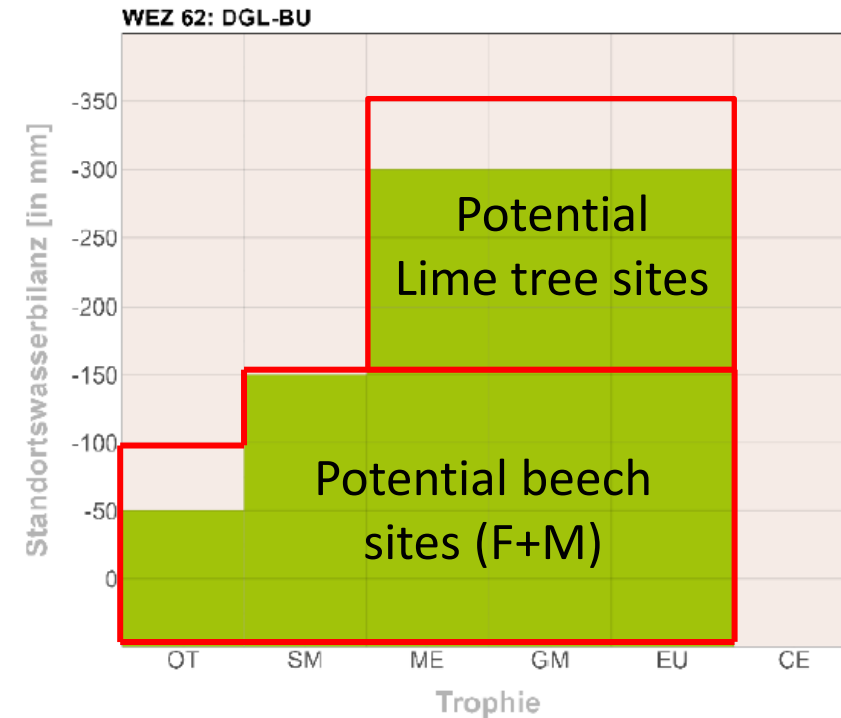
Forest Development Goal (WEZ) 62: Douglas fir – European Beech



 Potential sites of a tree species

WEZ 62: DGL-BU

Douglas fir: up to 70 %
Beech (or Lime tree): 20 - 30 %
Other rare species: up to 10 %



Site water balance [mm]

WEZ-Zuordnung

Trophiestufe

Oligotroph

Schwach Mesotroph

Mesotroph

Gut Mesotroph

Eutroph

Kalkeutroph

Kl. 9 < -350 mm

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Kl. 8
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Standortswasserbilanz [in mm]

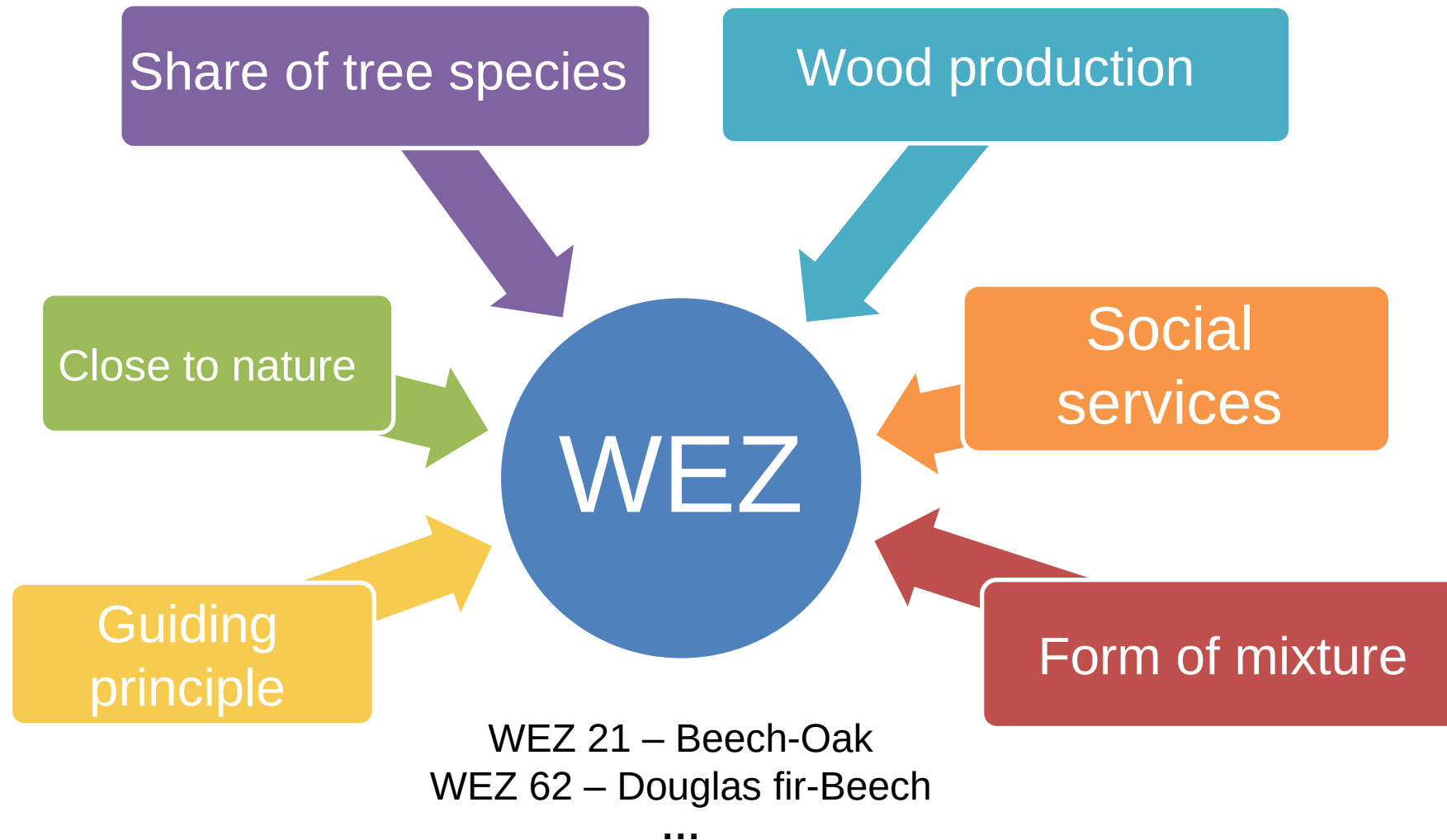
WEZ mit erhöhtem Trockenstressrisiko und verminderter Ertragsersparung: Aufgrund mangel

Nutritiousness of soil

uation (z. B. Buche vorhanden aus NV) im Einzelfall möglich. Nur im Staatswald.

Guidelines and decision support

Forest development goals





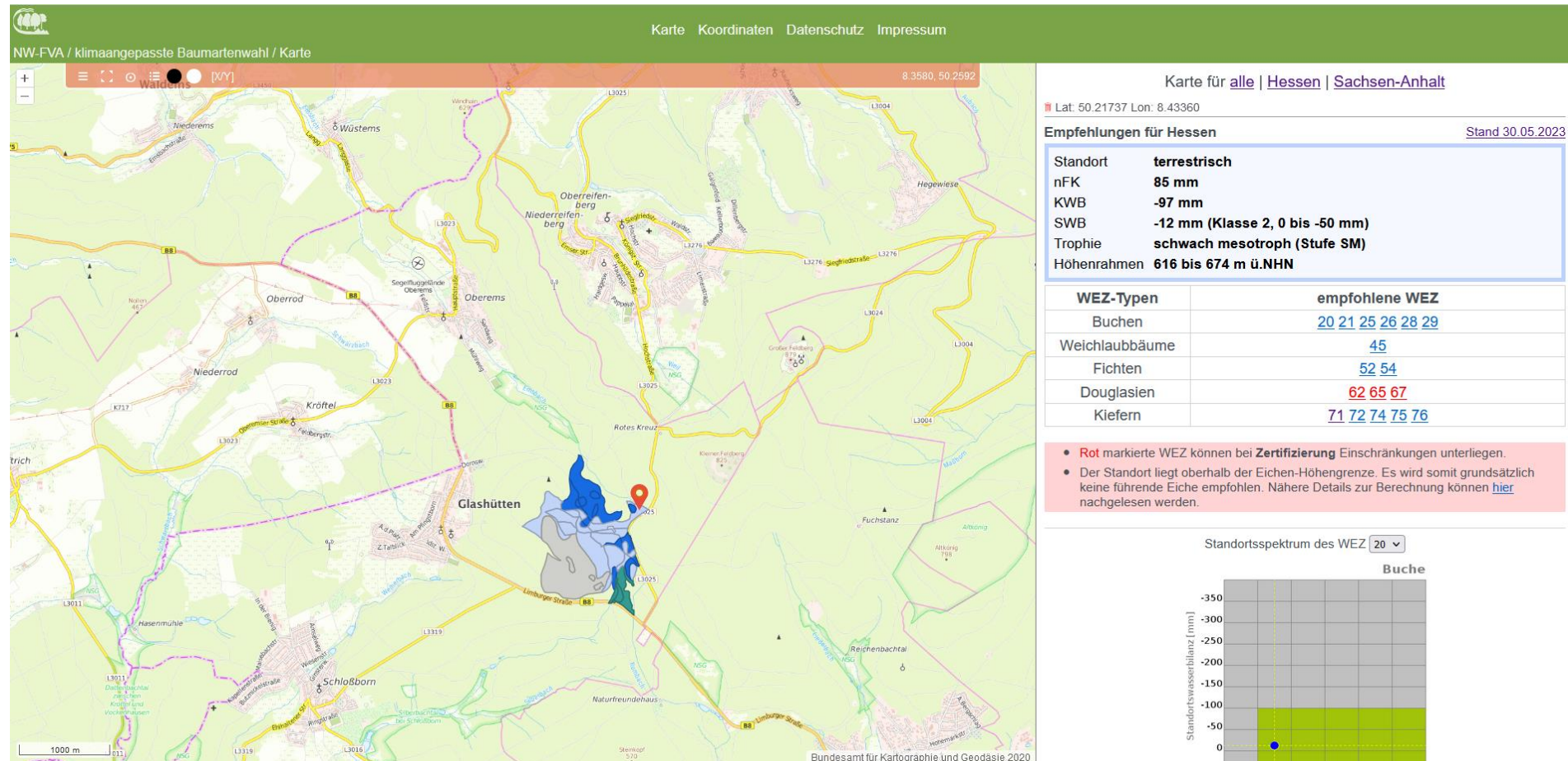
Forest development Goals:

- Available as brochure
- Binding for state forests
- Voluntary in private and communal forests
 - But binding, when applying for funding



Guidelines and decision support

Forest development goals



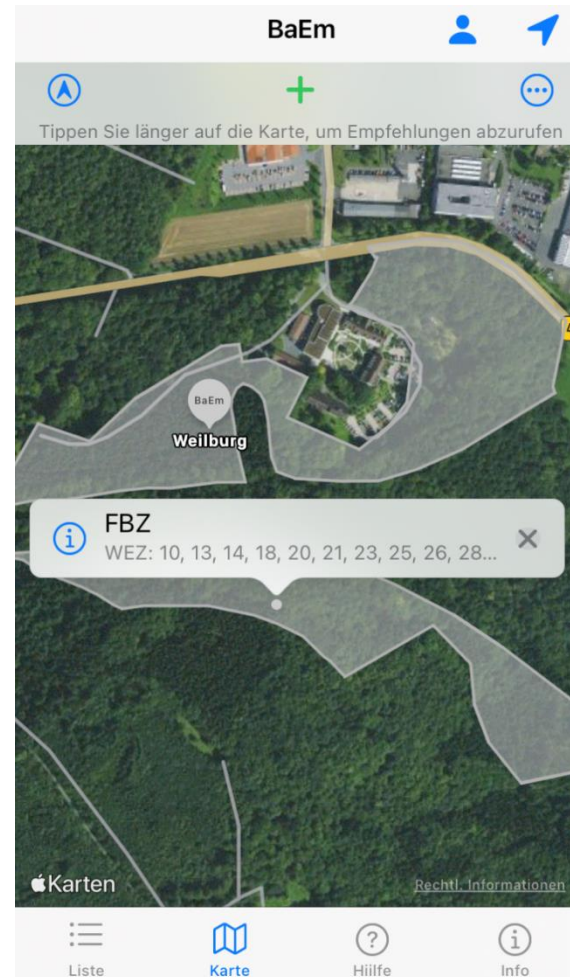
Web-Service of North Western German Research Institute (NW-FVA) / Freely accessible: <https://www.nw-fva.de/BaEm>

Guidelines and decision support

Forest development goals



- App for forest owners in Hesse
 - „BaEm mobile“
 - For Android and iOS
 - Localization either directly by GPS-function or manual



Schließen

Details

Standort

Land

Hessen

Standort

terrestrisch

nFK

172 mm

KWB

-244 mm

SWB

-72 mm (Klasse 3)

Trophie

eutroph (Stufe EU)

Höhenrahmen

224 bis 296 m ü.NHN

empfohlene Eichen-WEZ

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empfohlene Buchen-WEZ

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empfohlene Edellaubbaum-WEZ

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empfohlene Tannen-WEZ

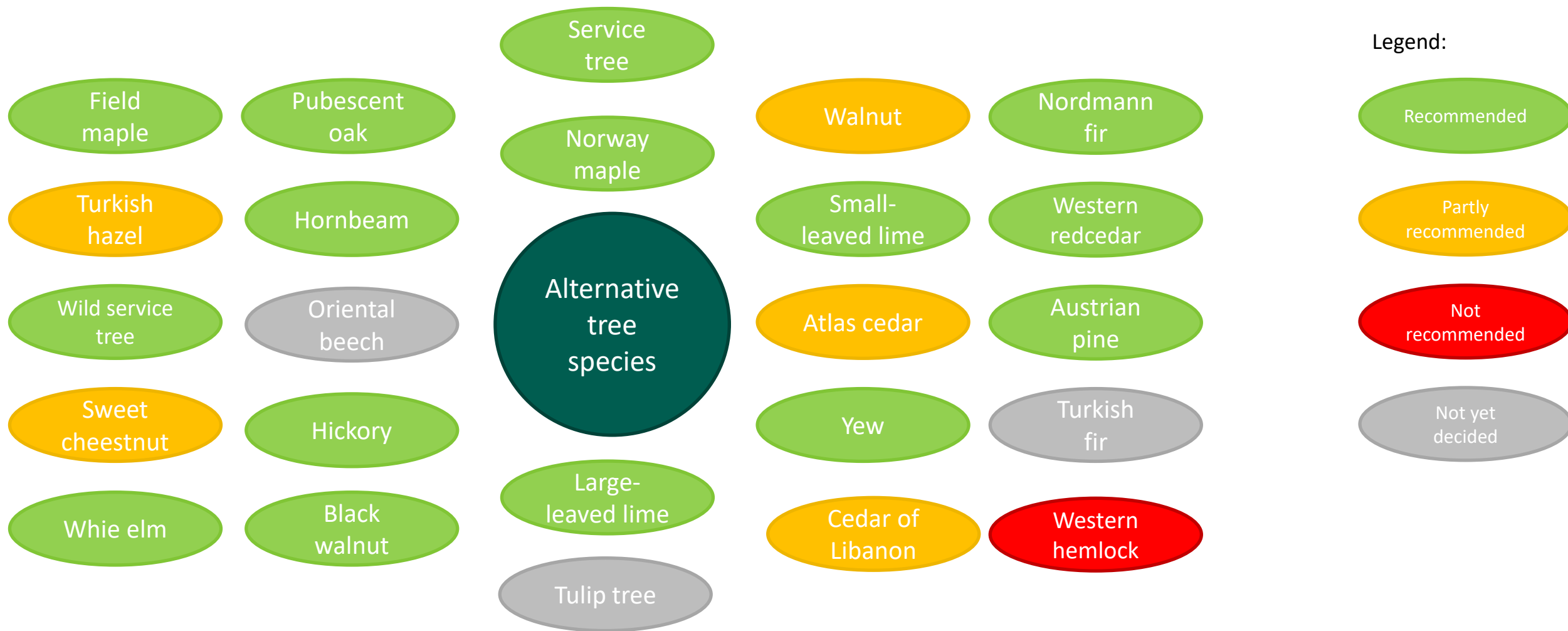
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empfohlene Douglasien-WEZ

Guidelines and decision support

Cultivation recommendation of native and non-native tree species



Guidelines and decision support

Adaptation of Hessian Silviculture Manual



- Principle of semi-natural silviculture remains with some exceptions
- Connections to forest development goals (WEZ) – tree species mixture
- More emphasis on climate change risks
 - Species mixture, volume per ha, target diameter
- Thinnings of Norway spruce and European beech with regards to site and risk
- Regeneration starts earlier
- Changes in harvesting patterns (from single tree to tree groups)
- Integration of nature protection guideline 2022
- Training of foresters starts 2025

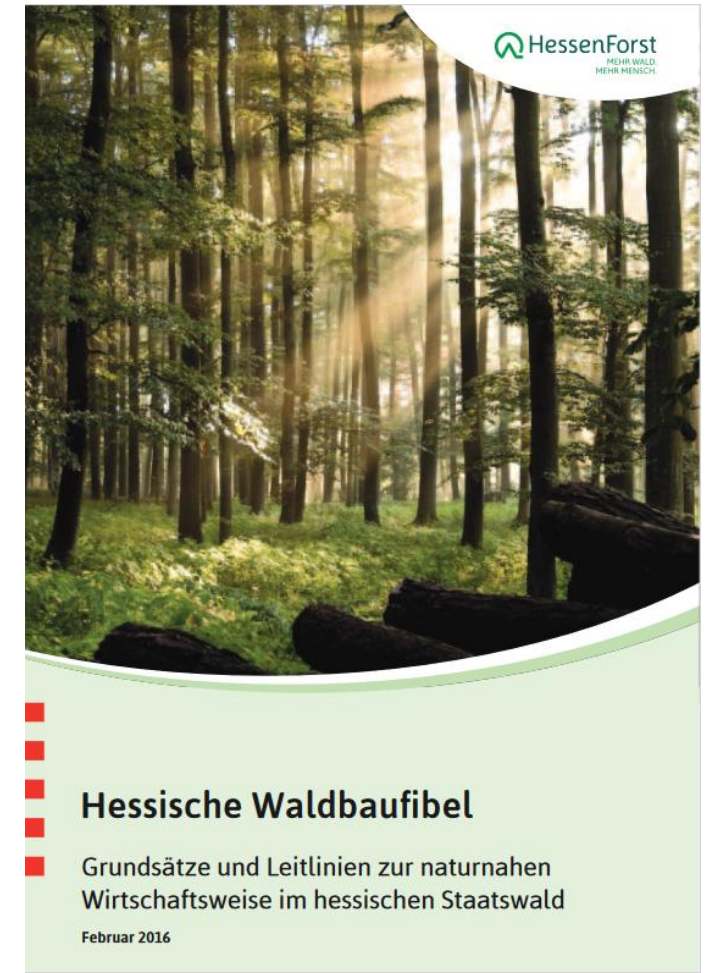




Photo: Reinbold

