

RESONATE

Resilient forest value chains –enhancing resilience through
natural and socio-economic responses

Overview & midterm results

Valladolid - April 2024

Presenting: **Sara Uzquiano**

RESONATE Co-ordinator: **Marcus Lindner**

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Horizon 2020 RIA, project no.
101000574 (April 2021 -
March 2025)



What we aim for

RESONATE aims to generate the needed knowledge and practices for making European forests, the services they provide, and related economic activities more resilient to future climate change and disturbances.

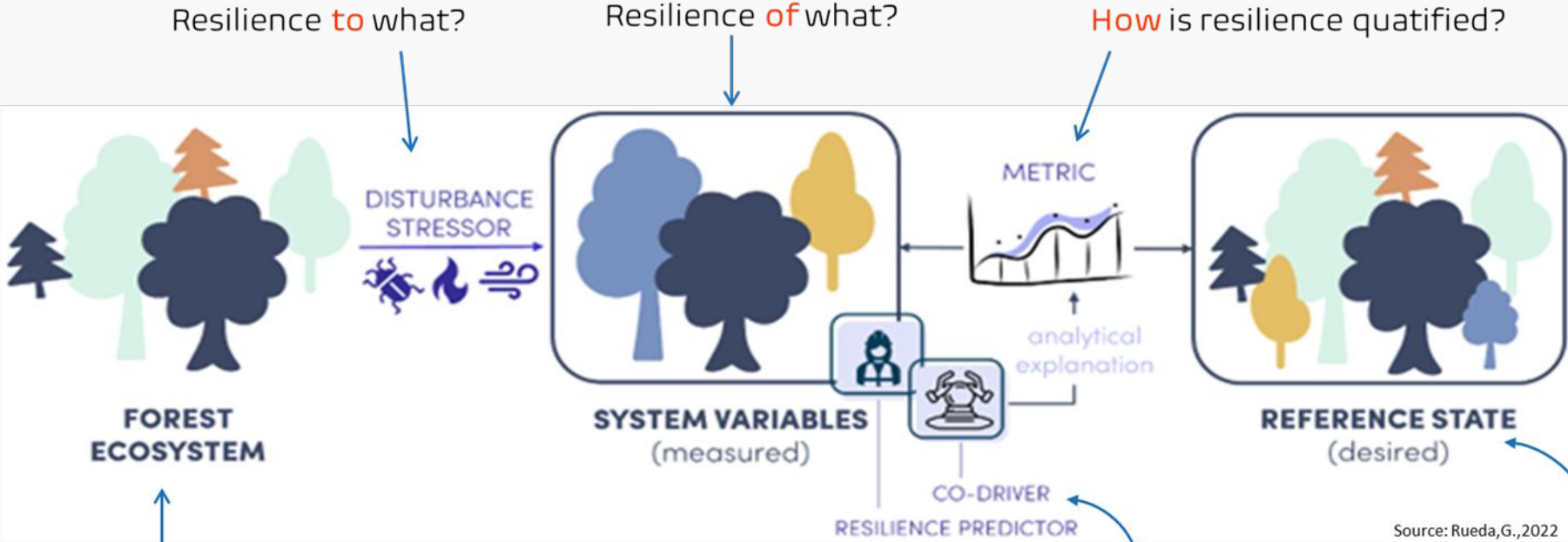


Development of the Operational Resilience Framework (ORF)



8 main resilience concepts

- Approach**
(Type of Resilience)
- Engineering
 - Ecological
 - **Socio-ecological**



Source: Rueda,G.,2022

Stability and production capacity

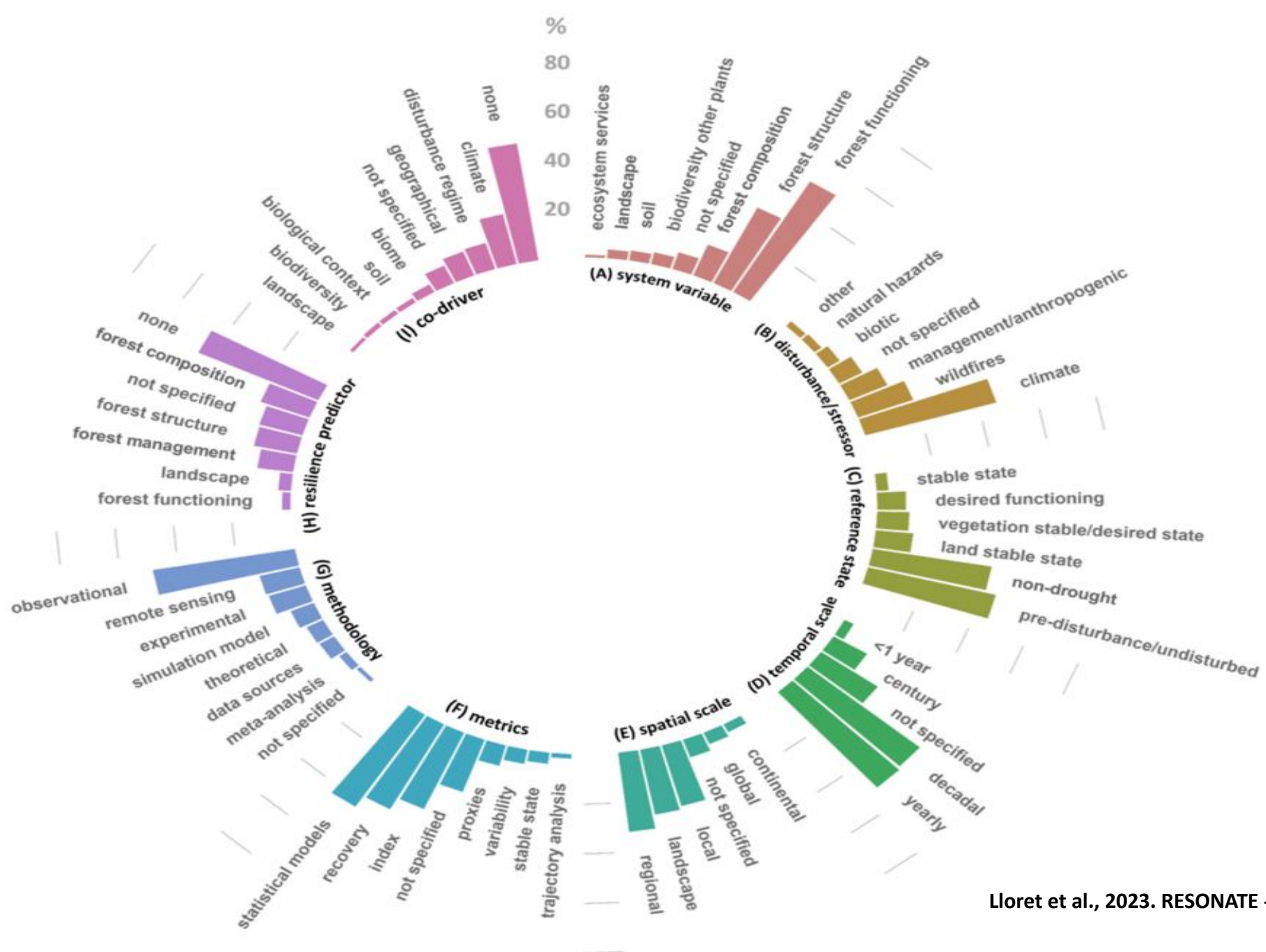
Does some factor **determine** the resilience of what to what?

Resilience **compared** to what?

Applied to all activities in RESONATE

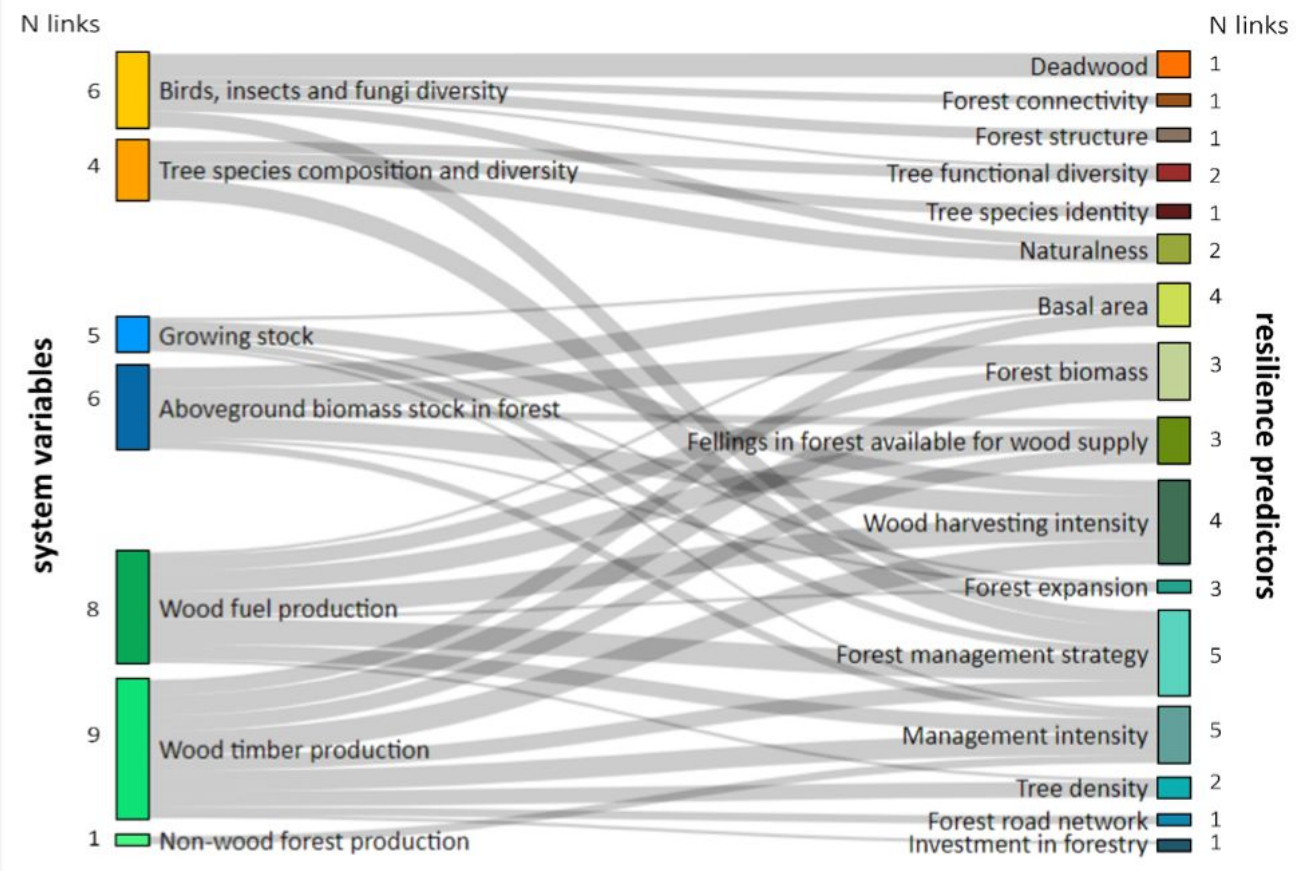
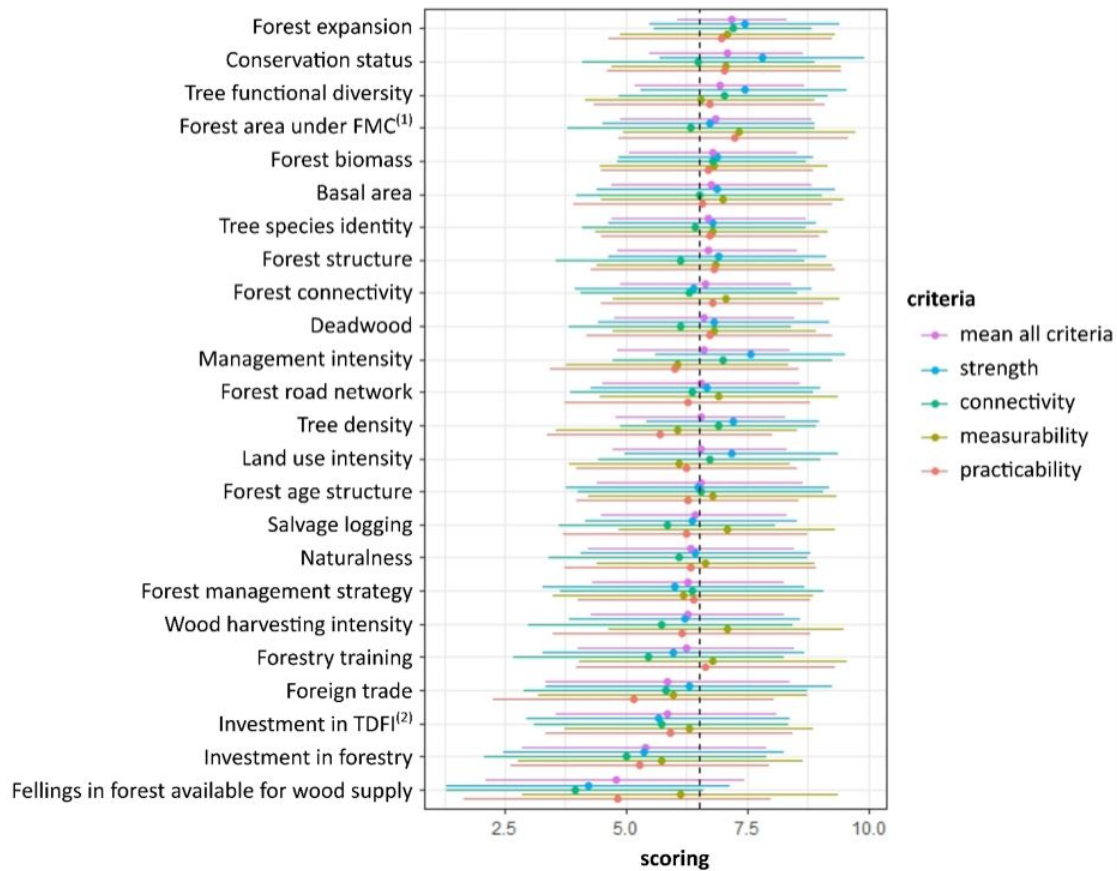
Lloret et al., 2023. RESONATE - Deliverable 1.4.

Evidence of C application in literature



Lloret et al., 2023. RESONATE - Deliverable 1.4.

Assessment of resilience indicators based on stakeholder perception

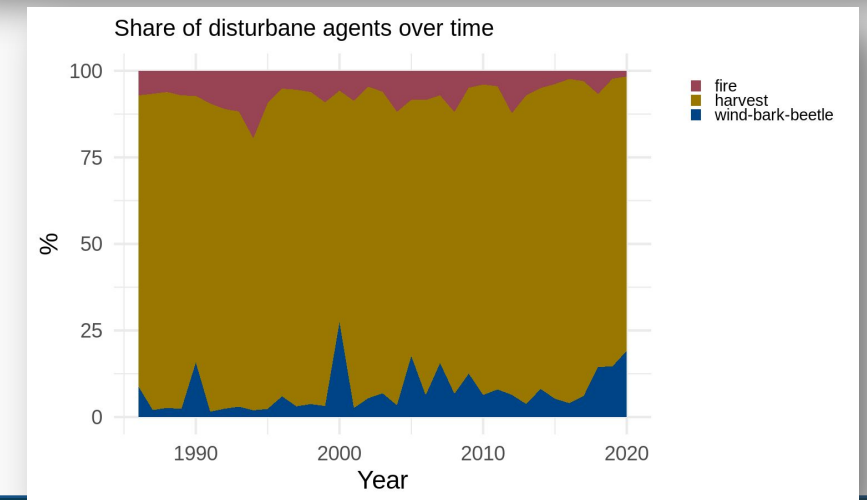
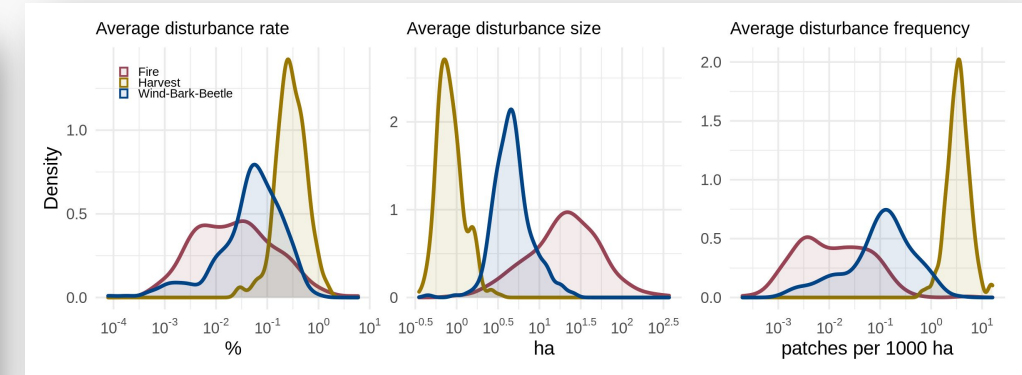
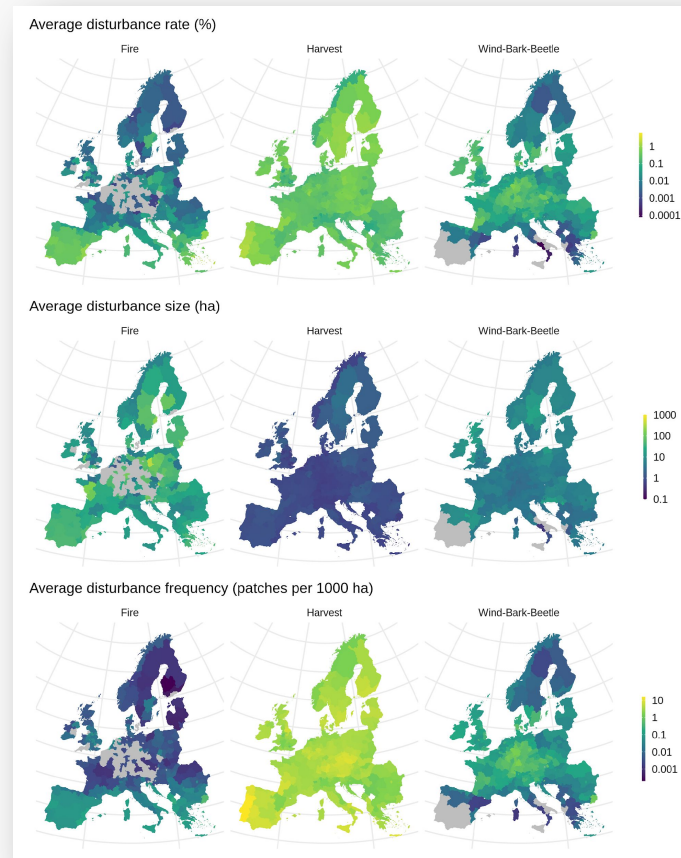
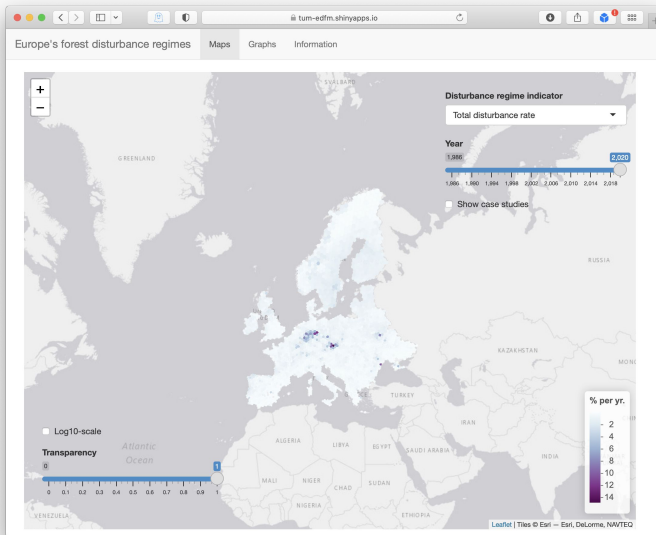


Setting the scene

(Senf and Seidl 2022. RESONATE- Deliverable 2.1.)



- Online map of disturbance hotspots
- Report on Europe's forest disturbance regimes and their changes over time



RESONATE Resilience challenges







Operational guidance → “Resilience to what?”

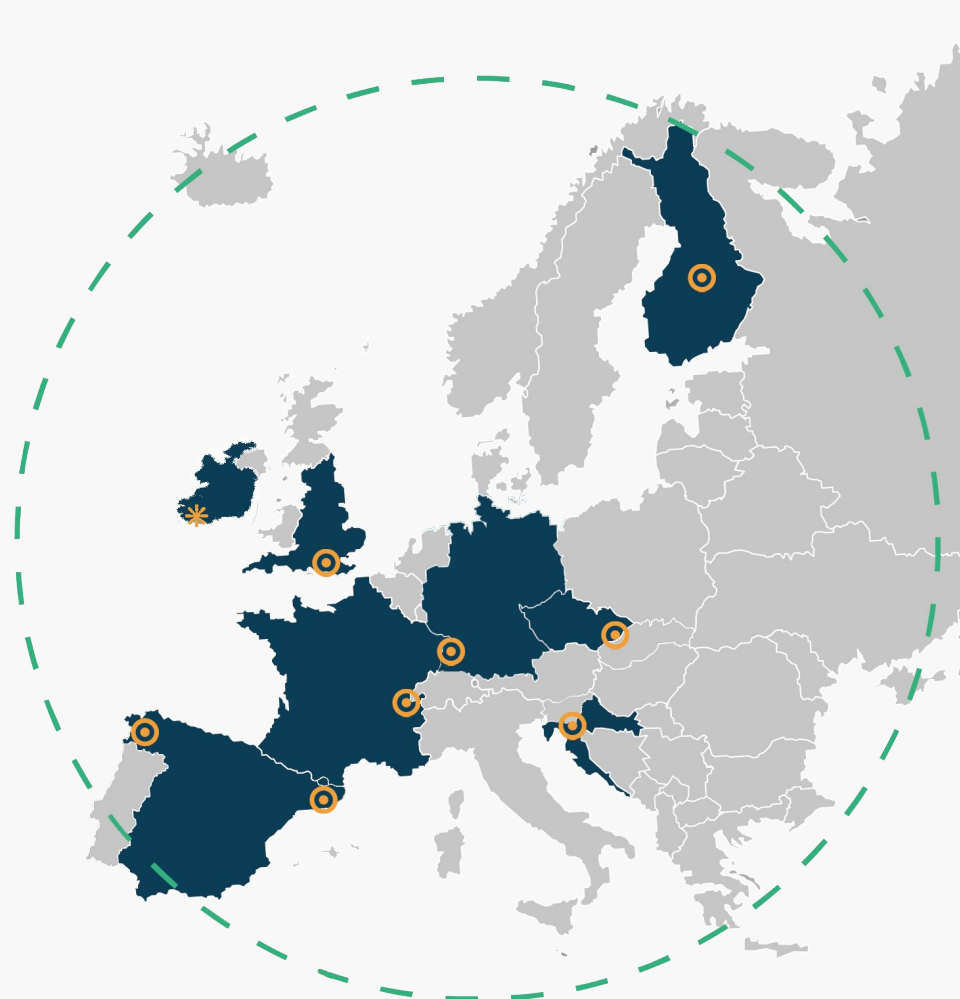
RESONATE addresses four major challenges of current forest systems management

1.	Changing suitability of tree species in response to climate change and extreme events	A simple line-art icon of a tree with a trunk and several branches.
2.	Increased risks of forests disturbances , e.g. wildfires, windstorms, insect pests	Three icons arranged horizontally: a flame, a lightning bolt, and a beetle.
3.	Changing societal demand on forest products and ecosystem services and their impacts on social-ecological resilience	An icon showing two stylized human figures with speech bubbles above them, representing communication or societal interaction.
4.	Biodiversity decline, threatening ecosystem functioning	A stylized line-art icon of an owl, representing biodiversity.



10 Case studies across 9 European countries

				
Galicia	Light Green	Red	Orange	Light Blue
Catalonia	Green	Light Pink	Light Orange	Blue
France	Green	Red	Light Orange	Blue
Germany	Green	Red	Orange	Light Blue
Czech Republic	Green	Red	Orange	Blue
Finland	Light Green	Light Pink	Light Orange	Blue
United Kingdom	Light Green	Light Pink	Orange	Light Blue
Ireland	Light Green	Red	Light Orange	Light Blue
Croatia	Green	Light Pink	Light Orange	Light Blue



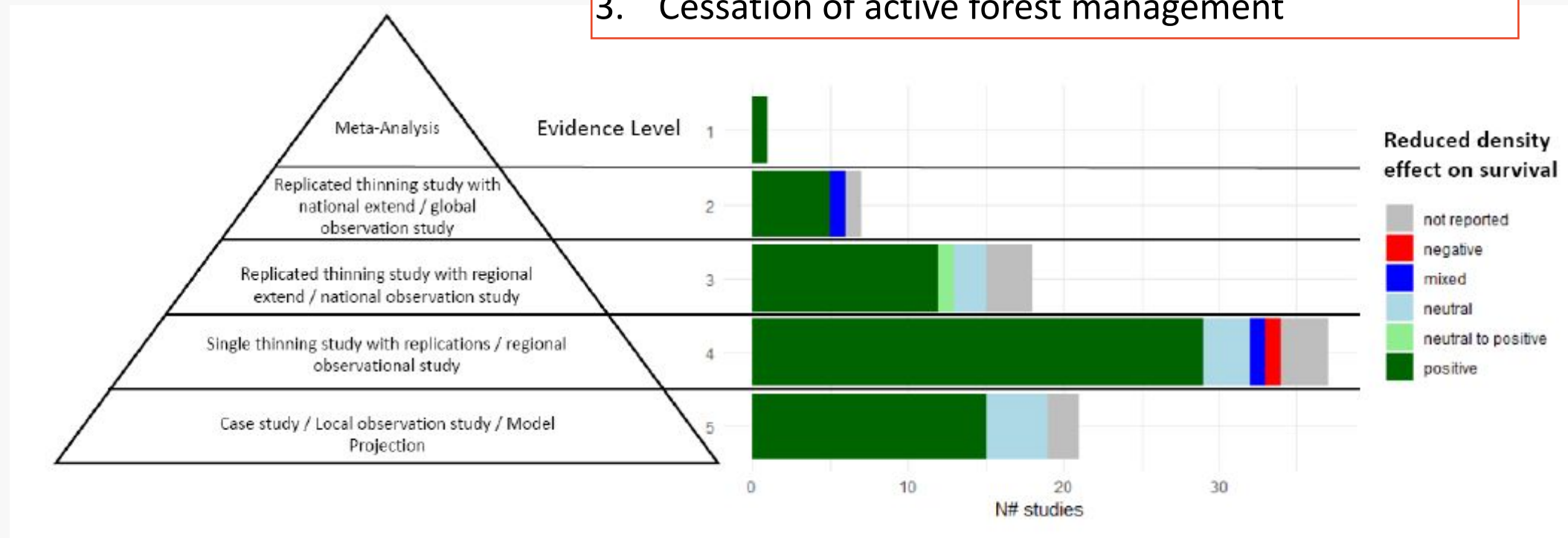
Silvicultural options to enhance resilience



- Report on the potential management options to mitigate disturbances (Willig and Bauhus 2023. Deliverable 2.4.)

- Focus on 3 management options

1. Reducing stand density
2. Maintenance or promotion of species diversity.
3. Cessation of active forest management



Evaluation of evidence base on thinning

Resilience assessment of ecosystem services



- Assessment of **ecosystem services** in different biogeographical contexts and **management regimes** during **1986-2020** (BU, CREAM).



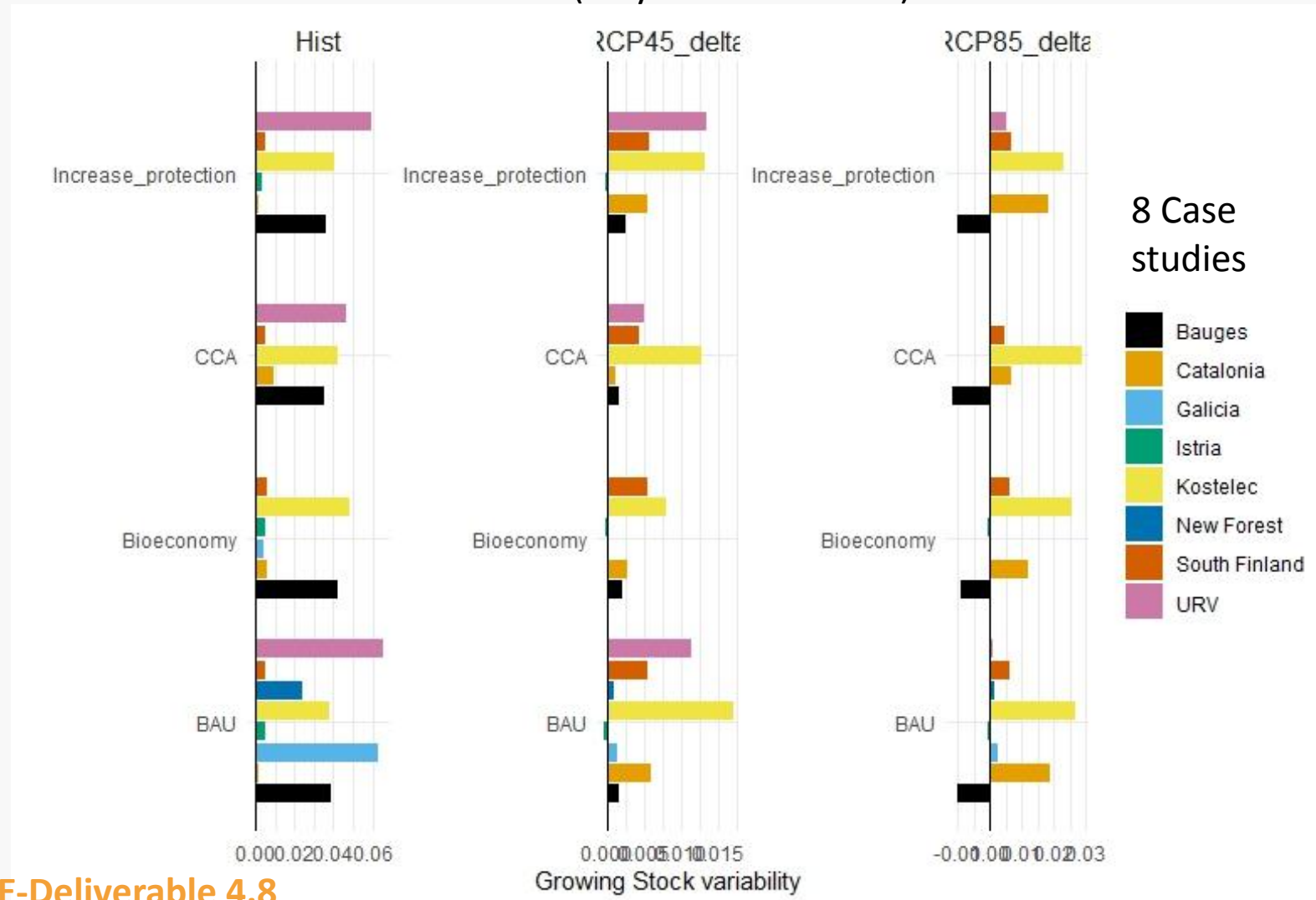
Icons by Gabriela Rueda

Projection of Growing stock resilience



- Projection of the resilience of growing stock under three climate scenarios and four management regimes

2021 – 2100 (80 years simulation)



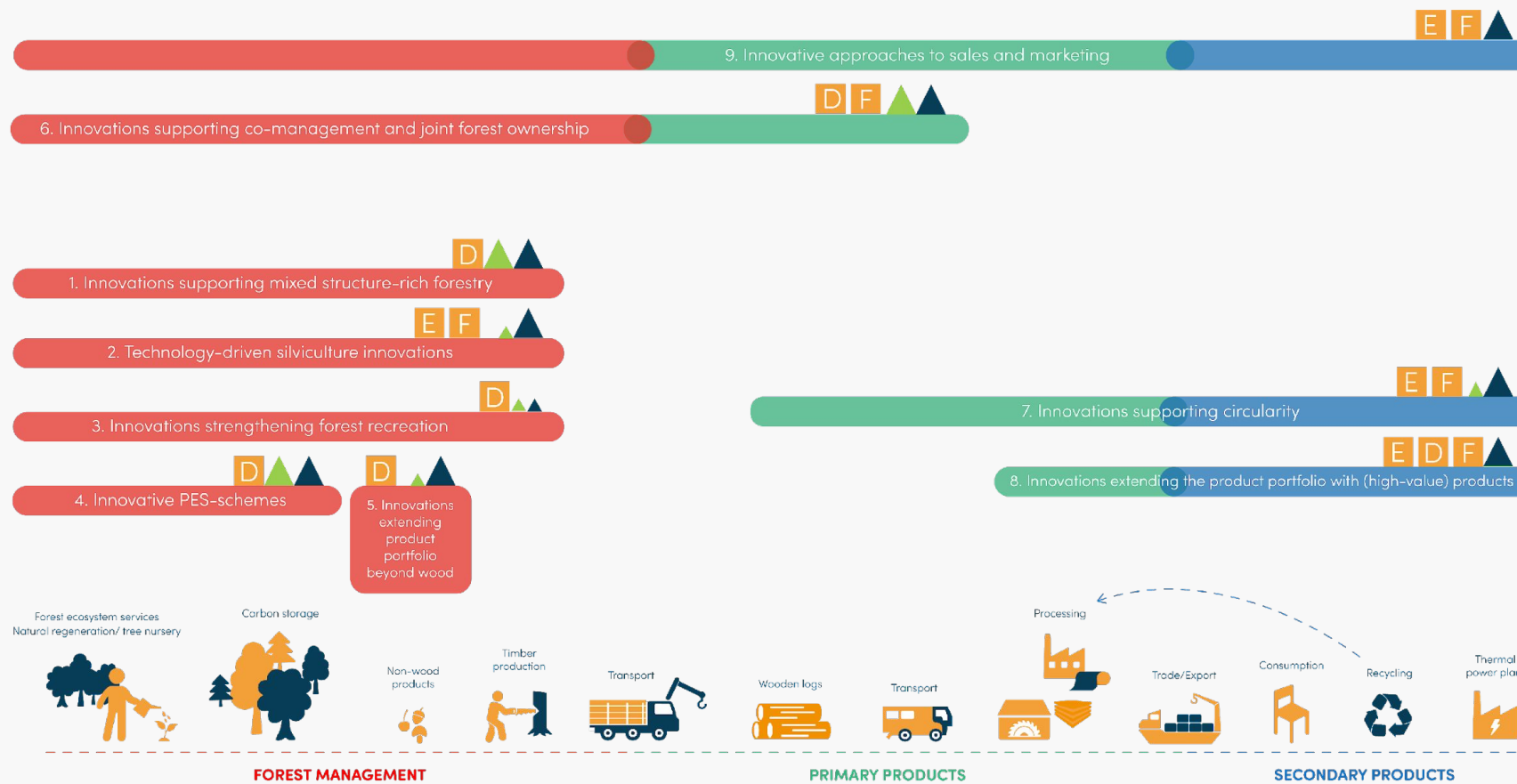
8 Case studies

- Bauges
- Catalonia
- Galicia
- Istria
- Kostelec
- New Forest
- South Finland
- URV

Patacca et al., 2024. RESONATE-Deliverable 4.8



Resilient Forest Value Chains under changing conditions



-  Strengthens value chain resilience
-  Strengthens forest resilience
-  Evidence is mixed
-  Innovations that stimulate diversification
-  Innovations that stimulate efficiency
-  Innovations that stimulate flexibility

Hoeben and Stern, 2023. RESONATE - Deliverable 3.5.



Hoeben, A. D., Stern, T., & Lloret, F. (2023). **A Review of Potential Innovation Pathways to Enhance Resilience in Wood-Based Value Chains.** Current Forestry Reports, 9(5), 301-318.



Resilient Forest Value Chains under changing conditions

9. Innovative approaches to sales and marketing



6. Innovations supporting co-management and joint forest ownership



1. Innovations supporting mixed structure-rich forestry



2. Technology-driven silviculture innovations



3. Innovations strengthening forest recreation



7. Innovations supporting circularity



8. Innovations extending the product portfolio with (high-value) products



4. Innovative PES-schemes



5. Innovations extending product portfolio beyond wood



5. Innovations extending product portfolio beyond wood



- Strengthens value chain resilience
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Hoeben and Stern, 2023. RESONATE - Deliverable 3.5.



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How flexible is societal demand under fast-changing circumstances?



Framework for systematically assessing and quantifying demand resilience, based on **qualitative data from an expert survey** in 8 RESONATE case studies.

- Forest recreation and carbon sequestration appear to be the most resilient ecosystem services.
- Timber production and non-wood forest products are assessed to be resilient due to the number and quality of substitutes.



Lautrup et al., 2024. RESONATE - Deliverable 4.6.



How can you be aware of what we do?

- *Social Media:* EFI's 'Resilience Blog', RESONATE twitter account
- *Use of partners' Social Media accounts:* twitter, Facebook, LinkedIn, YouTube;
- *Networking* at events

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Research & advice to improve the [#resilience](#) of [#European #forests](#) and associated [#valuechains](#)

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RESONATE @RESONATE_forest · Aug 9

#Knowledge exchange across Europe and thorough assessment of good-practice & shortcomings of #forest #disturbance management is essential for preparing anticipatory crisis plans & gaining support across sectors. #barkbeetle

Read our #PolicyBrief bit.ly/44KhNjO

POLICY BRIEF
MANAGING BARK BEETLE OUTBREAKS IN THE 21ST CENTURY

Policy Recommendation #1

LEARN AND ANTICIPATE, NOT ONLY RESPOND

Forest Europe growing life
MINISTRY OF AGRICULTURE OF THE CZECH REPUBLIC
RESONATE Resilient Forests for Society

European Forest Institute (EFI) and 9 others

1 12 19 1,745



RESONATE @RESONATE_forest · Aug 18

Combine silviculture and forest protection in an integrated #risk management strategy. Under #climatechange, risk reduction and #resilience matter more than maximized productivity. Read the #PolicyBrief bit.ly/44KhNjO

POLICY BRIEF
MANAGING BARK BEETLE OUTBREAKS IN THE 21ST CENTURY

Policy Recommendation #3

RECONCILE SILVICULTURE AND FOREST PROTECTION

Forest Europe growing life
MINISTRY OF AGRICULTURE OF THE CZECH REPUBLIC
RESONATE Resilient Forests for Society

European Forest Institute (EFI) and 9 others

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RESONATE @RESONATE_forest · Aug 24

Replying to @RESONATE_forest @europeanforest and 9 others
Forests can recover without or with limited human intervention. Given the expanding bark beetle outbreak areas, it becomes crucial to incorporate the promotion of natural dynamics and active adaptation & restoration. Read the #PolicyBrief bit.ly/44KhNjO @FORESTEUROPE

POLICY BRIEF
MANAGING BARK BEETLE OUTBREAKS IN THE 21ST CENTURY

Policy Recommendation #5

MAKE USE OF NATURAL FOREST DYNAMICS

Forest Europe growing life
MINISTRY OF AGRICULTURE OF THE CZECH REPUBLIC
RESONATE Resilient Forests for Society

6 6 516

Videos



RESONATE
Resilient Forests for Society

HOME ABOUT FOCAL AUDIENCE NEWS

Our RESONATE team visited the Wienerwald Biosphere Reserve as part of our RESONATE project meeting in September 2022. It was fascinating to learn about the diverse recreational activities offered, and how the Biosphere Reserve manages to protect biodiversity and deals with forest disturbances. Watch this interview with Harald Brenner of the Wienerwald Biosphere Reserve and Dr. Alexandra Wieshaider of the Austrian Federal Forest and be inspired!

Activities and forest management of the Wienerwald Biosphere Reserve

Später ansehen Teilen

WIENERWALD BIOSPHERE RESERVE

ACTIVITIES AND FOREST MANAGEMENT

Ansehen auf YouTube

How forest management and disturbances affect biodiversity and carbon in Southern Finland

European Forest In...
2110 Abonnenten

Abonnieren

4 4 Teilen ...

Example of dissemination (& communication activity): LIGNA 2023



Panel discussion at LIGNA Fair



High level panel at LIGNA fair
explored better collaboration
between wood value chain actors

RESONATE policy briefs in collaboration with Forest Europe



Managing bark beetle outbreaks in the 21st century

POLICY BRIEF

Tomáš Hlásný | Czech University of Life Sciences in Prague, Faculty of Forestry and Wood Science
Julia Haas | FOREST EUROPE Liaison Unit Bonn

Bark beetles and other biotic agents have devastated European forests with unexpected severity. The worst is likely still ahead of us. It is crucial to devise strategies to mitigate disturbance impacts across the entire forest value chain and increase the preparedness of all actors and institutions. However, every crisis presents an opportunity. Let's seize this one and use it to create resilient forestry sectors and forests fit for the future.



Photo: Forest Management Institute of the Czech Republic.

Context

Huge forest areas have been affected by bark beetles across Europe during the past few years, with damages exceeding pre-2000 levels by nearly tenfold. The unprecedented scale of the damage turned the outbreaks into a pressing socio-economic issue. It concerns not only the forest-based sector and international timber markets but also the overall life quality of people, and raises questions about our ability to achieve climatic targets. These developments have prompted us to question the suitability of current management planning, silviculture, and forest protection practices, which were not designed to be implemented in such high-risk conditions. Accelerating climate change will intensify the outbreaks, cause their synchronous occurrence over large areas, and force them to expand to northern regions. These developments cannot only be addressed at the forest management level but require cross-sectoral and international cooperation with strong and clear policy support.



FOREST EUROPE
High-Level Talks

POLICY BRIEF

Forests for the future: How can forest resilience support Sustainable Forest Management?

Prepared by Marcus Lindner & Bernhard Wolfslehner (European Forest Institute) with contributions of Julia Haas & Silvia Abruscato (FOREST EUROPE - Liaison Unit Bonn)

CONTEXT

European forests and news about their condition are gaining increasing attention. Extreme climatic events and more frequent large-scale disturbances challenge sustainable forest management (SFM) in policy and practice (Fig. 1). One consequence is a strong call for more resilient forests, that is, forests that are able to cope better with disturbances and adapted to a rapidly changing climate. But what does this mean and how does this affect our understanding of SFM across Europe?



Figure 1: Interlinkages between disturbance risks are important as often storm damage is followed by bark beetle outbreaks or wildfires can trigger land erosion. The Bătrâștio Brânzile reserve in Bulgaria was affected by a sequence of disturbances, starting with a windstorm in 2001, subsequent bark beetle damage between 2002 and 2007, followed by wildfire in 2012. Photos: Alexander Douchnev

Forest health (especially the impacts of disturbances) and ecosystem protection have always been core elements of SFM, enabling us to maintain and enhance the provision of different ecosystem services such as forest products, biodiversity, carbon sequestration and protective functions.

The current wave of forest disturbances requires more than ever proactive risk management and resilient forest systems. The FOREST EUROPE process plans the implementation of a forest risk facility (FoRISK), i.e., a pan-European cooperation platform on risk management and prevention, with the aim of supporting SFM and help making pan-European forests fit for the future.

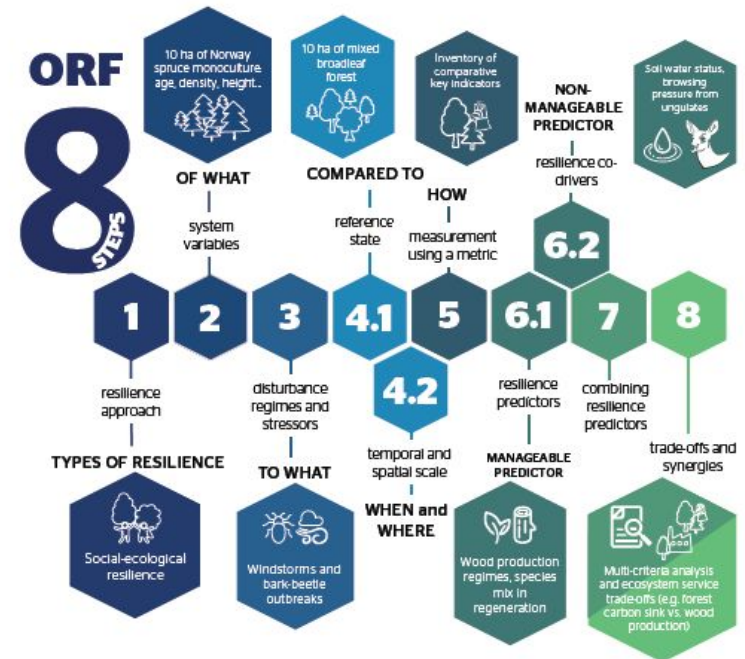


Figure 2: The eight steps of the operational forest resilience assessment framework (ORF) illustrated by the example of a Norway spruce forest in Central Europe. The social-ecological forest resilience assessment is applied to analyse resilience to windstorms and bark-beetle

Media engagement



https://www.quarks.de/umwelt/klimawandel/waldbraende-klimawandel-sommer-hitze-europa-duerre/

Quarks

Umwelt

Gesundheit

Technik

Gesellschaft

Weltall



Ein anderer Ansatz wäre es etwa, die **Wälder widerstandsfähig** zu gestalten. Was das bedeutet, erklärt Dr. Marcus Lindner, leitender Wissenschaftler im Forschungsbereich Resilienz am European Forest Institute (EFI) in Bonn: „Resiliente Wälder grundsätzlich standortangepasste, gemischte Wälder, die idealerweise ein echtes Waldinnenklima besitzen und somit dunkler, feuchter, kühler und windstill sind.“

Wird der deutsche Wald vom Klimawandel zerstört oder ist doch noch nicht hoffnungslos verloren? Eine Suche in Daten

Das lässt sich fördern, wenn die Wälder möglichst naturnah bewirtschaftet werden, wenn es also nicht rein um die Holz geht. Auch, was mit abgestorbenem Holz geschieht, spielt eine Rolle: „Totholz sollte im Bestand abseits der Wege gelassen werden, damit vermehrt Kohlenstoff und Wasser auf und im Boden gespeichert wird. was gleichzeitig fördernd für die



En Imagen Francisco Lloret

La devastación de los bosques: descubre cómo detenerla en la conferencia de este martes

POR REDACCIÓN

LUNES 16 DE ENERO DE 2023, 13:01H



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Imprimir



Enviar

Especialmente afectados por el cambio climático pero también por otra serie de factores como explotación humana, la degradación del suelo o las plagas que interactúan entre sí, no parece que los bosques tengan ante sí un futuro excesivamente favorable. Cuál es su situación actual que se podría hacer para revertir los males que les aquejan va a ser precisamente el tema de nueva cita, este martes 17 de enero, de la programación cara al público de la Real Academia Conquense de Artes y Letras con la conferencia que, con el título de "El destino de los bosques ante la emergencia climática", dará en la institución el catedrático de Ecología de la Universidad



Droogte, brand en keverplagen: Europees bos zucht onder klimaatverandering

Door Rolf Schuttenhelm

12 dec 2022 om 08:56

Update: 9 maanden geleden

535 reacties

Delen

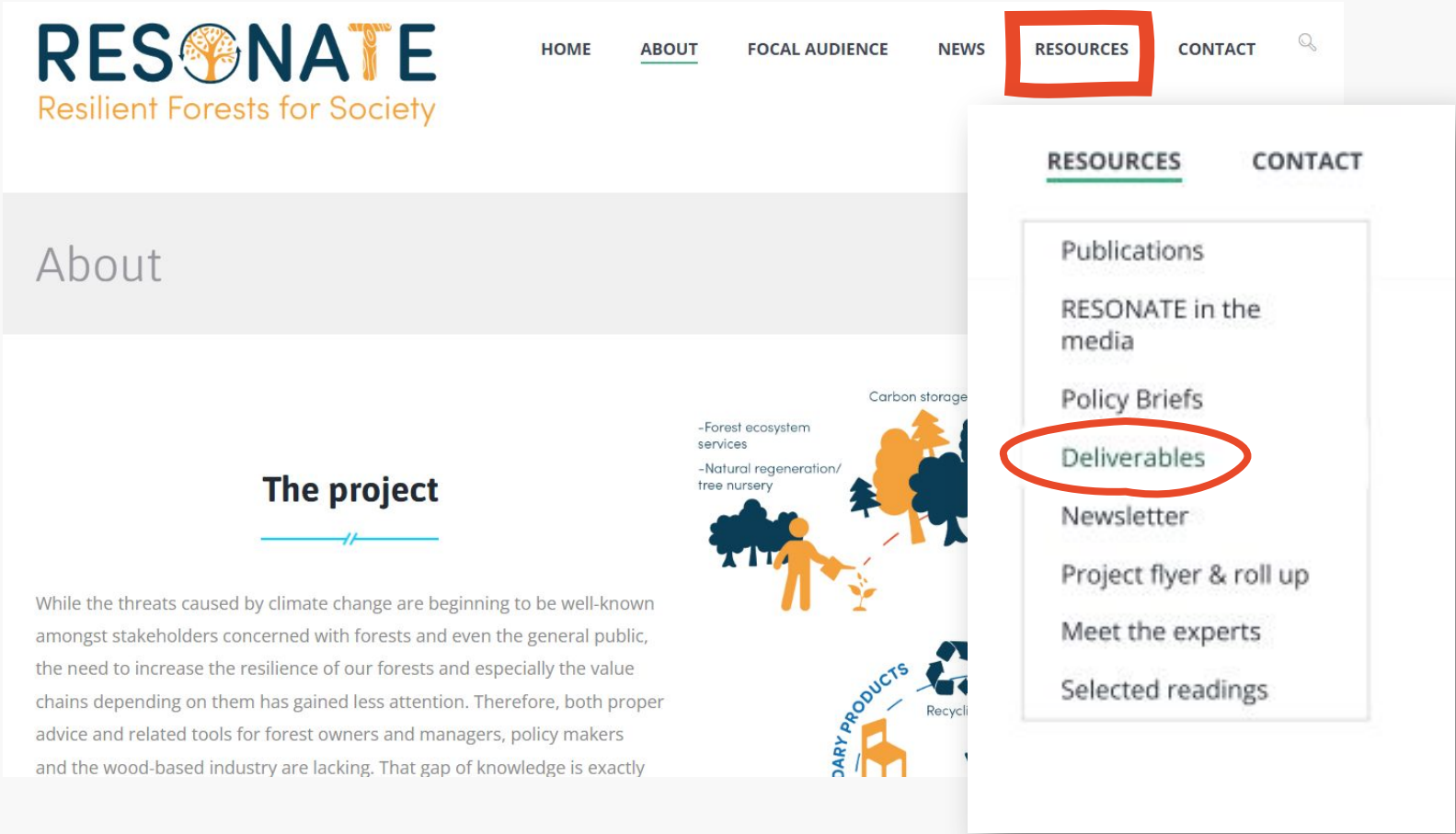
Klimaatverandering drukt steeds zwaarder op Europese bossen, blijkt uit nieuw internationaal onderzoek onder leiding van Wageningen University & Research. Dat is niet alleen een probleem voor de natuur en de houtindustrie, maar ook voor ons klimaatbeleid: de bossen dreigen zelf een bron van CO2 te worden.

Stormschade, droogte en bosbranden, maar ook plagen van schimmels en kevers horen bij bosgebieden. Maar volgens het onderzoek dat maandag verschijnt in vakblad *Global Change Biology* zijn ze de afgelopen twintig jaar met meer dan 50 procent toegenomen.

"Er zijn wat verschillen per regio en periode, maar over het geheel zien we dat sinds 1950 alle klimaatgerelateerde verstoringen in de Europese bossen zijn toegenomen", vertelt hoofdauteur Marco Patacca van Wageningen University & Research tegen NU.nl.

Our website

- <https://resonateforest.org/about/>



Development of guidance material and educational products: upcoming...



Development of more guidance material for policy and forest value chain decision-making



Development of resilience modules for educational use

Stay tuned!

RESONATE



RESONATE project meeting 2023 – visit to CS Croatia



RESONATE

Thank you!

RESONATE: Resilient forest value chains – enhancing resilience through natural and socio-economic responses

Horizon 2020 RIA, project no. 101000574

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