FOREST EUROPE
High-Level Talks

POLICY BRIEF

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

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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?

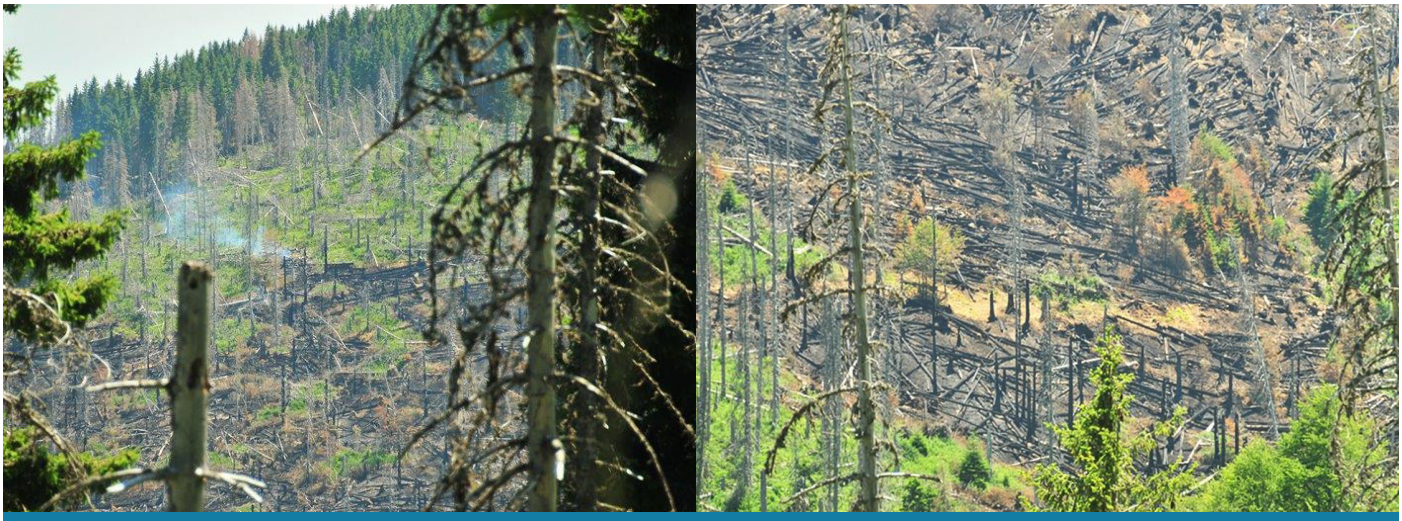

Figure 1: Interlinkages between disturbance risks are important as often storm damage is followed by bark beetle outbreaks or wildfires can trigger land erosion. The Bistrishko Branishte reserve in Bulgaria was affected by a sequence of disturbances, starting with a windstorm in 2001, subsequent bark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

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.

FOREST RESILIENCE: WHAT IS IT?

There are different concepts of forest resilience. The most commonly used definition refers to the ability of a forest system to return to pre-disturbance conditions. However, with the ongoing environmental changes, our forest ecosystems also evolve. Ecological resilience thinking considers that species composition of forests following a disturbance may no longer return to the equilibrium that existed before an event such as a bark beetle outbreak. The most holistic concept, however, is social-ecological forest resilience. It explicitly includes adaptation and learning by the actors involved in managing forest ecosystems and related forest value chains in order to provide a range of ecosystem services in a sustainable manner.

For SFM and the unprecedented challenges from extreme climatic events and related disturbances, it is crucial to consider how active management (as a component of social-ecological resilience) can prevent or at least mitigate disturbance impacts.

WAYS AHEAD: HOW CAN FOREST RESILIENCE BE ENHANCED?

While acknowledging the diversity of European forests and management approaches at the landscape level, some examples on how to develop resilient forest systems are shown here. Such approaches hold the potential to create synergies and co-benefits with other aims of forest policy and management, such as maintaining or enhancing both forest productivity and biodiversity.

Pro-active management to prevent forest disturbances and mitigate future impacts

Evidence shows that mixed forests (mixed in age, species diversity, but also in horizontal and vertical structures) are more resilient to various disturbance risks. Monocultures of trees grown outside of their natural distribution range are particularly vulnerable, e.g., to biotic threats. Therefore, converting them into mixed forests is a key strategy to enhance forest resilience. Proactive underplanting and establishing a layer of advanced regeneration in forest stands facilitates rapid recovery of the forest if the mortality among main canopy trees is high. This is important to prevent soil exposure, avoiding hot and dry site conditions that are more frequently hindering successful forest regeneration under climate change.

Prestoration – integrating climate change adaptation with forest restoration

Disturbances create huge economic losses of timber value and may involve social challenges in times of limited labour capacity, but they also create opportunities to enhance biodiversity and develop more resilient forests for future SFM. It is crucial to ensure that forest recovery is targeting prestoration, i.e., combining forest restoration and climate change adaptation, by creating mixed stands of species that are well adapted to the changed climatic conditions.

Developing resilient forests, forest value chains, and society

Enhancing forest resilience as an increasingly important prerequisite of practicing future-oriented SFM goes beyond forest management, as the whole social-ecological forest systems need to embrace uncertainties. Planning for enhanced resilience of the forest value chain could include new logistics and market patterns to reallocate wood resources after disturbances and the development of new technologies and products responding to changing timber qualities and assortments. Increasing societal resilience may require some diversification by replacing traditional resource use with higher value-added products and ecosystem services.

Recent research as part of the Horizon2020 project RESONATE proposed an operational resilience assessment framework (ORF) with eight steps to evaluate the effectiveness of resilience enhancing management measures in different forest management circumstances (Fig. 2).

These examples underline that SFM needs to evolve further under climate change and increased disturbance risks. Forest resilience management as a concept can be used to support decision-making to this end.

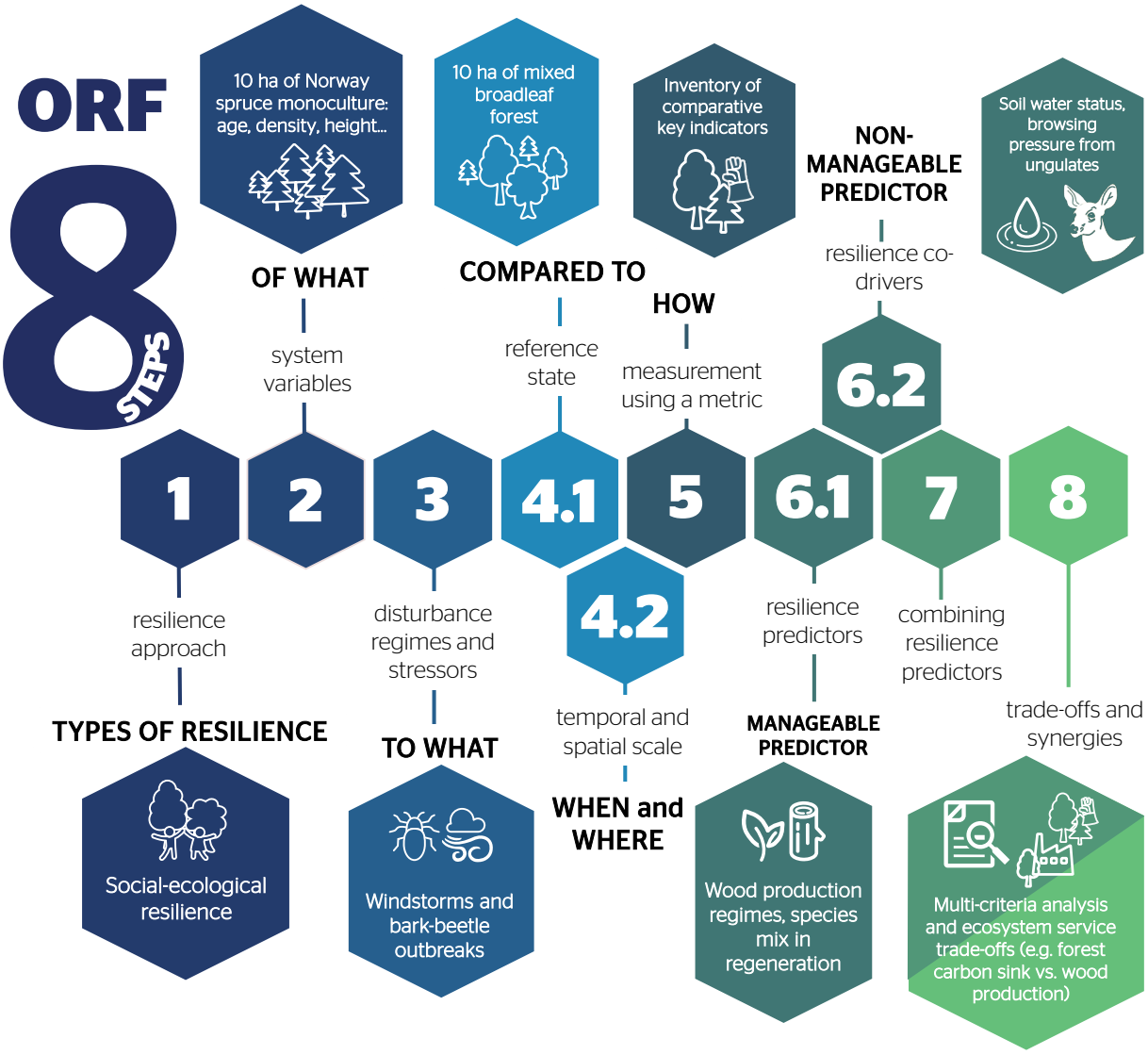

Figure 2: The eight steps of the operational forest resilience assessment framework (ORF) illustrated by the example of a Norway spruce forest in Central Europe: The social-ecological forest resilience assessment is applied to analyse resilience to windstorms and bark-beetle outbreaks in a small forest enterprise by comparing the performance of a Norway spruce monoculture and a mixed broadleaf forest. The selection of indicators depends on the context and distinguishes between manageable resilience predictors and non-manageable co-drivers of resilience. Note that browsing pressure from ungulates is considered as a critical resilience co-driver affecting tree species composition. (Adapted from a graph by Lloret, Hurtado & Jaime; www.resonateforest.org)

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RESONATE
Resilient Forests for Society

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