

Incentivizing nature-based solutions for wildfire risk reduction

Abstract

As wildfire risks continue to rise, attention has turned to their mitigation including through nature-based solutions (NbS) that lower hazard intensity while enhancing biodiversity, carbon storage, soil stability and local livelihoods. Insurers can support and incentivize NbS in many ways, including 'greeniums' by offering premium and deductible benefits to policyholders who implement risk-reducing ecological measures. A first-of-its-kind wildfire greenium has been implemented in Tahoe Donner, California, where premiums were reduced by nearly 40% after ecological forest management. Motivated by the Tahoe Donner and other experiences, researchers in The HuT project have developed a wildfire catastrophe model for Sardinia that accounts for nature-based forest treatment. In Italy and elsewhere, greeniums can be a game changer if enabled with public support and enabling regulation.

Key points

- Insurers can play an important role in catalyzing nature-based solutions (NbS), especially by offering reductions in premiums and deductibles for implemented NbS, referred to as 'greeniums'.
- Wildfire risk can be reduced with ecological forest treatment, including thinning, prescribed burns, grazing and mixed forests.
- A first-of-its-kind wildfire greenium rewarded extensive ecological forest-treatment measures in Tahoe Donner, California.
- The Tahoe Donner insurance resilience product can be a game changer; however, scaling it up will depend on public support and enabling regulation.

Nature-based Solutions (NbS) for disaster risk reduction (DRR)

NbS targeted specifically for DRR are actions that protect, sustainably manage and restore ecosystems to reduce hazard exposure and vulnerability while delivering human well-being and biodiversity benefits (UNDRR 2021). In the terminology of the Intergovernmental Panel on Climate Change (IPCC AR6), NbS are important ecosystem-based adaptation measures. Proven examples include restoring floodplains and wetlands to attenuate flood peak flows; reforestation and managing protective mountain forests to reduce avalanches, rockfall and debris flows; restoring dunes and mangrove forests to buffer storm surges; and applying ecological forest management to reduce extreme wildfires. When enabled by risk governance and financing frameworks, NbS can deliver measurable avoided losses, making them increasingly relevant for public and private decision makers. At the same time, NbS face significant hurdles including difficulties in generating bankable returns, short-term investment horizons and misaligned incentives (Martin et al. 2025).

How can insurers support NbS?

The insurance industry can help overcome NbS investment hurdles with an array of underwriting and investment products and activities that de-risk and incentivize NbS investments (Linnerooth-Bayer et al. 2024). Among them, insurers can offer 'greeniums', which refer to a pricing benefit, typically in the form of lower premiums and/or improved deductibles, to policyholders who implement risk-reducing ecological measures. Insurers can also underwrite

natural capital. Archetypal cases for pro-NbS underwriting include insurance cover for storm damage to the coral reefs along the [Mesoamerican coastline](#), as well as offering protection for catastrophe and political risk to enable a [blue bond](#) for financing the protection of Belize's oceans and coastline (Linnerooth-Bayer et al. 2024).

Turning to the investment pillar, insurers hold large amounts of capital that, by factoring nature into their investment activities, can go a long way toward supporting nature-based solutions. Indeed, insurers are increasingly motivated to steer their investment portfolios toward nature-positive assets in order to reduce i) physical risks from rising insured losses, ii) transition and liability risks from rapid changes in regulations and policies, and iii) reputational risks from shifting societal expectations.

Example: greeniums for wildfire NbS in California

In 2024, a first-of-its-kind wildfire insurance greenium was explicitly incorporated in an insurance policy introduced in Tahoe Donner, California. The policy is priced to reward the policyholder, the Tahoe Donner Association (TDA), for carrying out a major forest treatment program to reduce wildfire risk. In comparison with the premium without forest treatment, the insurance product is offered with a 39% premium reduction and an 84% deductible reduction.



Figure 1: Tahoe Donner Lake.

The \$2.5 million wildfire resilience product covers over a thousand acres of Tahoe Donner's forested and recreation land owned by the TDA, including trails, ski slopes and forests adjacent to housing areas. The policy complements existing property insurance by providing financing for restoration activities following a major wildfire.

The product was developed by WTW in collaboration with the Nature Conservancy and the Center for Law, Energy and the Environment (CLEE) at UC Berkeley. This unique partnership not only combines public-private financing, but also assures that pricing reflects actuarially justified risk reduction, environmental integrity, and governance safeguards.

The Tahoe Donner forest treatment measures have focused on reducing hazardous wildfire fuels through various methods, including mechanical thinning, mastication, limbing, prescribed fire, and fuel breaks. Based on guidance from the IUCN (2020) and the European Environment Agency (2025), forest treatment can qualify as an NbS if it is part of an ecosystem-based adaptive management strategy that contributes to restoring natural disturbance regimes and enhancing biodiversity and ecosystem resilience, in addition to reducing wildfire risks. While the Tahoe Donner project has by necessity prioritized the reduction of wildfire risk to households and assets – with potentially controversial measures like mechanical clearing – its advocates would agree that the hybrid NbS is preferred to the alternative of large-scale suppression. According to Dave Jones at UC Berkeley and former California Insurance Commissioner:

"Federal, state and local governments, homeowners, homeowners' associations and businesses are doing the right thing to reduce wildfire risk and invest in nature-based forest management" (The Nature Conservancy, Willis, & Center for Law, Energy & the Environment, 2025).

The greenium was based on the risk reduction or savings in average annual losses (AAL) from the implemented fuel-reduction measures. In this case, risks were not estimated with fire spread simulations as part of a probabilistic catastrophe model, but rather from a simplified, qualitative counterfactual comparing AAL without forest

treatment (based on four historic fires) and with forest treatment (based on a model developed for the close-by French Meadows Reservoir) (WTW, The Nature Conservancy, & Center for Law, Energy & the Environment, 2025). Willis placed the insurance with Globe Underwriting as part of the Lloyd's market.

WTW emphasizes that the product is a "significant step toward acknowledging the value of proactive forest management in insurance underwriting and a groundbreaking nature-based solution" (WTW, 2025). The question for Europe is whether the Tahoe Donner case will inspire broader adoption of similar insurance products that recognize the benefits of nature-based forest treatment. In Europe, putting greeniums into insurance practice will depend on several critical motivating conditions, including urgency on the part of insurers in addressing rising insurance stress, supportive public contributions to financing treatment costs, and strengthened regulatory systems. Concerning the latter, in California insurers are required to account for risk-reduction measures in their pricing (California Regulation 2644.9).

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Figure 2: Before and after forest treatment (source: Apotheker, 2025).

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