AFTER THE FIRES:

RESTORATION AND RESILIENCE IN AN UNCERTAIN FUTURE

An NGP think piece

Uncertainty is our new normal. As yesterday's climate risks become today's problems, the future of our landscapes depends on our adaptive capabilities. This is a study tour in adaptation.

The last year has brought some of the worst rural fires ever recorded. In January, Chile suffered the most catastrophic fires in its recorded history, which killed 11 people and destroyed around 600,000 hectares of plantations, native forest, grasslands and agricultural land. The fire was so strong that entire communities were destroyed, including a town of more than 3,000 inhabitants.

In June, Portugal's deadliest ever fires claimed 64 lives. Fires blazed across southern Europe well into autumn, scarring around 850,000 hectares – four times greater than the average for the last nine years. British Columbia experienced its largest wildfires in recorded history, declaring a state of emergency that lasted more than two months: 1.2 million hectares were burnt, and nearly 40,000 people were evacuated. Wildfires in California's wine country killed more than 40 and caused more than US$1 billion of damage.

With climate change bringing hotter weather and longer dry spells, fires are likely to become an ever greater threat in more and more regions. According to a recent WWF study, 84% of the surface area of all global ecoregions critical for conserving biodiversity is threatened by increasing frequency and intensity of fire. This is the new normal to which we need to adapt. To prevent further loss of life and livelihoods, damage to ecosystems and economies, and increased greenhouse-gas emissions, there's an urgent need to learn more to prevent and control fires and improve the resilience of fire-prone landscapes.

As Chile begins the huge task of recovering the landscapes razed by the fires, we have an imperative and an opportunity to do things better. On this NGP study tour, we'll be heading to the region of Maule in central Chile, which suffered the greatest damage. Participants from around the world will be learning and sharing insights and experiences as we seek to develop solutions for restoring landscapes and strengthening their resilience.

Forest fires and plantations in Chile

Wildfires are a naturally occurring phenomenon. In parts of the world, from the boreal forest to the grasslands of southern Africa, ecosystems have evolved with fire, and it plays an important role in ecological cycles. In Chile, however, natural ignition of wildfires (for example by lightning strikes) is rare: 99% are caused by human activity, from deliberate arson to the carelessly discarded cigarette.

The scale and ferocity of this year's fires were unprecedented. Several years of exceptionally dry, hot weather had left vegetation tinder-dry. When the fires started, all the ingredients were in place for a catastrophic conflagration: temperature above 30°C, relative humidity below 30%, winds above 30km/hour, or a 30-30-30 situation.

Plantations made up around half of the 600,000 hectares destroyed by this year's fires. As well as causing huge economic losses, this did further damage to the industry's reputation, with many blaming plantations for the scale of the disaster. There's a perception that fires are harder to control in monoculture plantations, eucalyptus especially – although events in British Columbia and California suggest that humid natural forests and agricultural land can be just as flammable according to the climate conditions.

It's clear, then, that new approaches are needed. As we seek to restore the forests and landscapes destroyed by the fire, we need to rethink our approach to landscape design and management to reduce fire risk under the new climate paradigm. Replacing large contiguous areas of single-aged monoculture plantations with mosaics of different species and ages interspersed with biodiversity corridors, restored areas of native vegetation and agricultural areas may help improve fire resistance. But this alone is not enough: more adaptive strategies with strong local community involvement are needed to enable rapid and effective responses to unpredictable events.

This can't just happen at the site level – fire doesn't respect property boundaries or jurisdictions, so different land owners and communities need to work together across landscapes. As temperatures rise and droughts lengthen, building resilience will require stronger local governance and land stewardship. New adaptive policies, partnerships and economic models are needed to strengthen local capacity for fire prevention, climate change adaptation and landscape restoration.

Spotlight on Maule

The Maule Region, where most of the study tour will take place, is one of Chile´s 16 main administrative divisions and the region hardest hit by forest fires this year. It's also the birthplace of Chile's plantation forestry sector.

Plantations of exotic species were first introduced in Maule in the late 19th century – in part to improve resilience by combating erosion and desertification caused by deforestation and poor agricultural practices. Today, the region has nearly 600,000 hectares of plantations, out of a total of around 2.5 million hectares nationwide, and forestry is one of the most important economic sectors.

Maule Region is also Chile's main wine-growing centre, producing around half of the country's export wines. Fruit, vegetables and flowers are also widely grown for export. Around a third of the region's population lives in rural areas – the highest proportion in Chile – and many depend on the land for their livelihoods.

This year's fires affected around 280,000 hectares, or nearly a tenth of the total area of the region. This included around 200,000 hectares of plantations, along with grasslands, shrublands, native forest, vineyards and agricultural land, as well as thousands of homes.

Responses to the fires

Chile's two largest forestry companies, Arauco and Forestal Mininco (part of CMPC), were both hit hard by the forest fires. Arauco lost 90,000 hectares, while Forestal Mininco lost around 19,000 hectares. Both companies have responded by releasing plans for fire prevention and forest restoration which reflect their participation in NGP.

Arauco's plan, called "De Raiz" ("From the Root"), is based on four lines of work:

- **Preventing** fires by working with neighbours, public agencies and other institutions
- **Protecting** by strengthening fire-fighting capacity and creating a network of structural firebreaks
- **Reforesting and restoring** affected areas of plantations and native forest and recovering biodiversity
- **Boosting** the local economy and the quality of life for local people by supporting productive activities.

Read more at deraiz.arauco.cl [in Spanish]

CMPC has promised action in similar areas:

- **Preventing and combating rural fires** through its plantation design and management, reinforcing the company's firefighting capacity and collaborating with communities and the fire service
- **Supporting reforestation** of native species on its own and neighbours' properties
- **Collaborating with local communities** on reforestation, economic restoration and fire detection/monitoring.

Read more at www.reforestemoschile.cmpc.com [in Spanish]

Meanwhile, the Chilean government – which was criticized for an inadequate response to the fires –has pledged to create a Chilean Forest Service to strengthen the institutional management of the country's forest resources. (The current National Forest Corporation, Corporación Nacional Forestal (CONAF), is a private non-profit organization overseen and funded by the Ministry of Agriculture.) The Ministry of Agriculture has developed a forest policy for 2015-2035 and, in line with this policy, an action plan for the restoration of burned areas and a protocol for new plantations. Meanwhile, the Ministry of the Environment has created an advisory committee to recommend biodiversity and climate change priorities in the restoration process.

While restoring 600,000 hectares of land is a huge challenge, it also provides opportunities to create shared value for companies, society and the environment. For example, interspersing plantations with agricultural areas and native vegetation creates firebreaks while benefiting the local economy and biodiversity. Similarly, experience elsewhere has shown that when companies invest in providing economic opportunities for neighbouring communities, fewer fires are deliberately started and people are likely to raise the alarm more quickly.

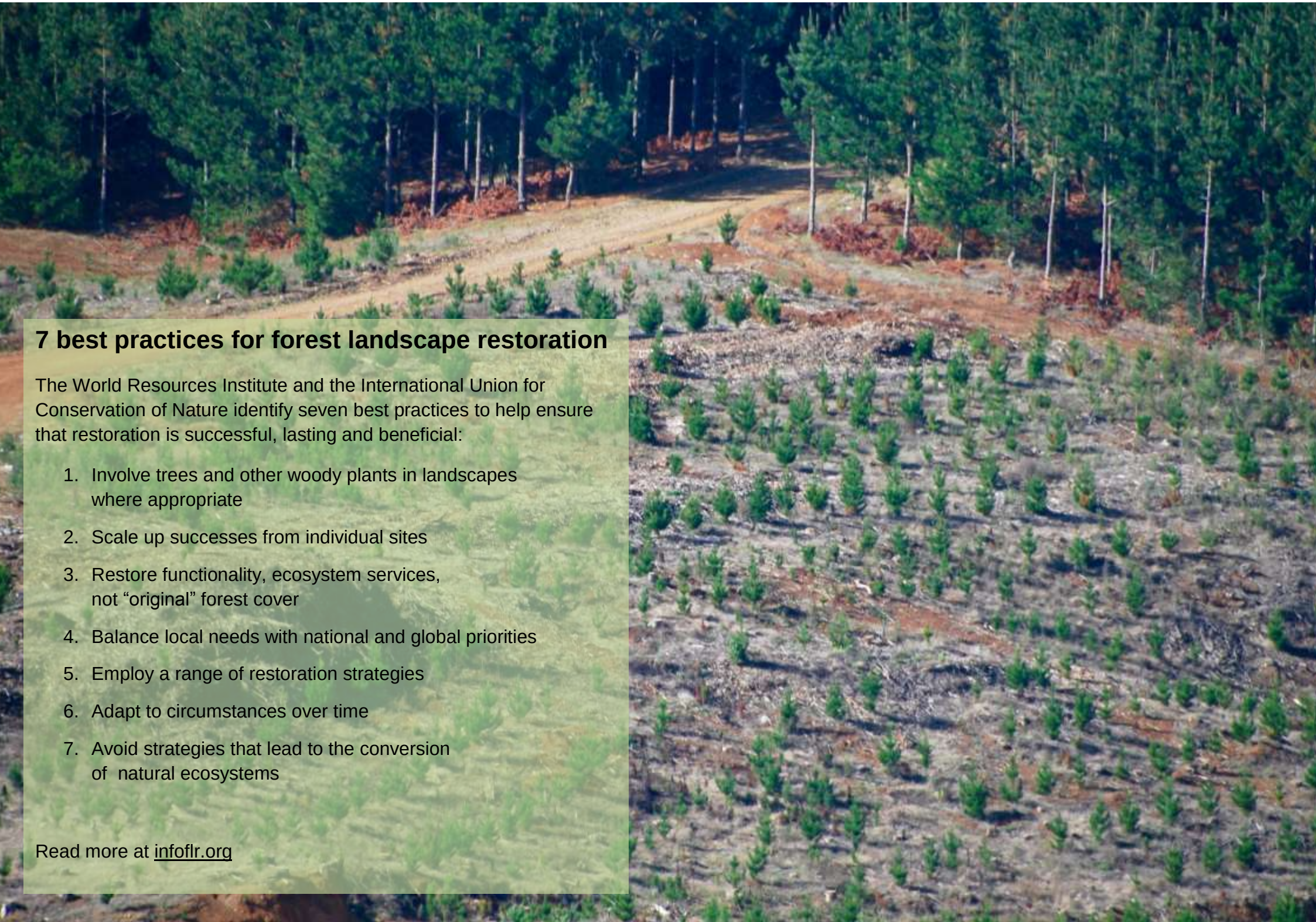
Restoration and resilience at a landscape scale

The post-fire recovery in Chile links to a much larger global restoration movement. The Bonn Challenge, launched in 2012, aims to begin the restoration of 150 million hectares of deforested and degraded lands by 2020, and 350 million hectares by 2030. Many countries have included large-scale forest restoration pledges as part of their national climate change plans, and various multi-country initiatives have been launched. These include AFR100, with a goal of restoring 100 million hectares of degraded forests across Africa by 2030, and Initiative 20X20, which aims to bring 20 million hectares of degraded land in Latin America and the Caribbean into restoration by 2020.

In addition, there's growing recognition of the importance of taking a more holistic approach to addressing big challenges like food, water and energy security, biodiversity conservation, poverty alleviation and climate change adaptation – and that this is best achieved at a landscape scale. These landscape approaches aim to balance competing demands within a given area: optimizing productive land uses such as agriculture and forestry, while maintaining vital ecological functions and providing for the needs of people.

Successful landscape approaches recognize that ecosystems and human society are interdependent. They seek to build resilience on both sides, enabling both social and ecological systems to adapt to and recover from shocks like fires, floods and droughts.

As forest restoration and landscape approaches take root, a number of principles and best practices are emerging. During the study tour, we'll be considering how these can best be applied in the Chilean context – while also discussing what lessons from Chile we can bring to this fast-evolving field.



7 best practices for forest landscape restoration

The World Resources Institute and the International Union for Conservation of Nature identify seven best practices to help ensure that restoration is successful, lasting and beneficial:

1. Involve trees and other woody plants in landscapes where appropriate
2. Scale up successes from individual sites
3. Restore functionality, ecosystem services, not “original” forest cover
4. Balance local needs with national and global priorities
5. Employ a range of restoration strategies
6. Adapt to circumstances over time
7. Avoid strategies that lead to the conversion of natural ecosystems

Read more at infoflr.org

10 principles for landscape approaches

The Global Partnership on Forest and Landscape Restoration (www.forestlandscaperestoration.org) outlines 10 principles for a landscape approach:

1. Continual learning and adaptive management: Landscape processes are dynamic. Decision-making needs to take account of changes in landscapes, knowledge and outcomes.

2. Common concern entry point: Focusing on a specific issue – such as fire prevention – can be a way to begin the process of working together and building trust between stakeholders. This can then form the basis for further collaboration.

3. Multiple scales: Numerous, diverse local and external factors affect outcomes on the ground. Being aware of these processes and the scales at which they operate can improve local interventions, coordination, and higher-level policy and governance.

4. Multifunctionality: Landscapes and their components have multiple uses and purposes, each of which is valued in different ways by different stakeholders. Tradeoffs between the differing landscape uses need to be explicitly addressed and reconciled.

5. Multiple stakeholders: All stakeholders need to be recognized and engaged in an equitable manner in decision-making processes.

6. Negotiated and transparent change logic: Transparency is the basis of trust among stakeholders. All stakeholders need to understand and accept the general logic, legitimacy, and justification for a course of action, and to be aware of the risks and uncertainties. Building and maintaining such a consensus is a fundamental goal of landscape approaches.

7. Clarification of rights and responsibilities: Rules on resource access and land use shape social and conservation outcomes. The rights and responsibilities of different actors need to be clear to, and accepted by, all stakeholders, and there should be a fair system of conflict resolution.

8. Participatory and user-friendly monitoring: To facilitate shared learning, information needs to be widely accessible. Stakeholders share an interest in assessing progress toward commonly agreed goals.

9. Resilience: System-level resilience can be increased through an active recognition of threats and vulnerabilities, drawing on local learning and lessons from elsewhere. Actions need to be promoted that address threats and increase capacity to resist and respond to shocks.

10. Strengthened stakeholder capacity: People need to be able to participate effectively and to accept various roles and responsibilities – which requires certain skills and abilities (social, cultural, financial).

Read more at www.forestlandscaperestoration.org/topic/ten-principles-landscape-approach

Asking questions

NGP brings together people from different countries and different perspectives, with different experiences and different knowledge, to tackle common problems. None of us know the whole solution, but we can all contribute part of it.

Forest fires, landscape restoration and resilience are major concerns in all countries where plantations are found. So there's a lot that can be learnt from the situation in Chile – and a lot that Chile can learn from the rest of the world.

During this study tour, we'll be asking an overarching question:

How can landscape restoration after large-scale forest fires improve socio-ecological resilience?

To begin to answer this, we need to understand the landscape we're talking about. What are the ecosystems and land uses present? What are the socio-economic conditions? What stakeholders are involved? Are there potential conflicts between local needs and priorities and national/global ones? What are the environmental risks, and how can these be mitigated? Are there particular areas where ecosystem services and functionality could or should be restored? What issues could bring people together? Are there successful initiatives that could be scaled up?

It's also important to understand what we mean by resilience. A resilient landscape is one that continues to function and provide a full range of ecosystem services and socio-economic benefits, and that can withstand, adapt to and recover from changes and disturbances. These might include sudden shocks like fires and earthquakes, but also include the longer-term effects of climate change and demographic change, or external influences in the world economy. This is why we need to think in terms of *socio-ecological* resilience: how people plan for, react to and prevent fires in future is as important as mitigating the biophysical fire risks.

Underneath this overarching question, we'll be considering three key underlying questions:

What policies and stewardship practices can enable the effective governance of fire-prone landscapes?

This is about the structures and processes, relationships and responsibilities for planning, making decisions and taking action within the landscape. How do we link with existing institutions and arrangements, and what are the gaps that need to be filled? This includes both government and company policies and institutional arrangements: what changes do we want to see? But it also covers more informal collective action and collaboration, such as with communities and between different land owners: what's needed, and how can this be put in place?

What forestry/agriculture economic models will promote and accelerate landscape restoration, and what financial instruments/investors will fund the implementation of landscape restoration?

Restoration is expensive. And doing restoration well – in a way that brings the greatest ecological and social benefits for the long term – is more expensive still. How can NGP help the forestry and agriculture sectors channel vital funding for this work? How could public-private partnerships leverage funding for restoration and create shared value for companies, society and the environment? Is there an opportunity to build an investment case for large-scale restoration, packaging the landscape products and services in a way that offers clarity and certainty for investors?

What changes are needed to re-design and re-develop new management practices, improving landscape resilience in an uncertain future?

This is about practical actions on the ground. It covers management practices specifically addressing fire – from prevention and early warning to fire-fighting. But we also need to think about wider actions that will improve socio-ecological resilience in a changing climate. Of course, many good practices are already in place – but it's important to reflect on what works, what doesn't, what can be improved, or where entirely new ideas are needed.

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