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For further information:
Sabien Leemans
Senior Policy Officer, Biodiversity
sleemans@wwf.eu

Edel Shanahan
Communications Officer, Biodiversity & Agriculture
eshanahan@wwf.eu

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Human activities have significantly altered three-quarters of the Earth’s land and two-thirds of the ocean in recent decades. This has led to a catastrophic loss of biodiversity and is exacerbating already dangerous levels of climate change. Since 1970, there has been, on average, a decline of 68% in wildlife populations. Furthermore, the outbreak of Covid-19 has brought into sharp focus just how much human health and well-being and the health of our planet are inextricably linked. Already now, the degradation of our natural world due to human activities is having a negative impact on the well-being of at least 3.2 billion people.

An EU law for nature restoration

In the 2030 Biodiversity Strategy published in May 2020, the European Commission announced that it would propose “legally binding EU nature restoration targets in 2021 to restore biodiversity and degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters.” WWF welcomes the proposal as a key tool to contribute to halting and restoring biodiversity loss and for climate change mitigation and adaptation.

Conversely, protecting and restoring nature and well-functioning ecosystems is a fundamental tool in tackling the twin crises of biodiversity loss and climate change, and in preventing the future emergence and spread of diseases. Large-scale nature restoration is an investment that yields a range of benefits beyond improving biodiversity and sequestering carbon, such as flood protection, water retention and prevention of wildfires. Nature-based solutions, such as the restoration of natural forests and rewetting peatlands, could provide more than one third of the climate change mitigation efforts that are needed before 2050. Nature restoration also increases the resilience of our societies and economies. On average, the benefits of restoration are ten times higher than the costs.

This brochure showcases a variety of Europe’s restoration success stories, from the peatlands of Estonia to the Danube Delta in Romania, all of which clearly demonstrate the benefits of nature restoration for both people and the planet.

To ensure that the binding restoration targets are a success, the restoration law must:
- Contribute as its primary objective to halting and reversing biodiversity loss, resulting in the restoration of habitats and species and ecosystem functioning, connectivity and resilience at the level of landscapes across the EU.
- Contribute to climate change mitigation and adaptation as the secondary objective.
- Focus on ecosystems with high carbon storage potential and those that contribute to mitigating floods, wildfire prevention and water retention, such as forests, peatlands, wetlands, rivers, biodiversity-rich grasslands, coastal areas and marine ecosystems such as kelp forests etc.
- Set a defined number of km²/ha² on land and sea that must be restored both in the EU and for EU Member States, using 2020 as a baseline. WWF is calling for a target of at least 15% of both the EU’s land and sea, amounting to at least 650,000 km² of land and at least 5,000,000 km² of sea area (sea area to be adapted to EU27 EEZ). Within this target, the Commission must also:
  - Commit to restore at least 25,000 km of free-flowing rivers by removing physical barriers, and to scale-up this ambition to achieve 13% of rivers restored to a free-flowing state in 2030 through barrier removal and floodplain restoration.
  - Set a target for CO₂ removal by natural sinks as a separate target from the EU 2030 emissions reduction target.
- Ensure that the restoration measures result in permanent change aiming to restore high quality and resilient nature with a significant improvement compared to the starting condition of the ecosystem.
- Use and encourage both active and passive restoration techniques.
- Require EU Member States to submit restoration plans, which must include clear quantitative targets in terms of locations, areas, types of ecosystems to be restored, financial tools to be used and requirements for active public participation. To be effective, the restoration law must contain clear deadlines regarding the establishment of the restoration plans and the implementation of all restoration measures.
- Create an obligation for the EU to co-fund restoration.
- The restoration law should lay the groundwork for activities developed in conjunction with local stakeholders to determine adequate interventions for each landscape and community. The legislation should take into account local livelihoods and existing social dynamics.
- Include obligations for Member States to actively engage the public. The law should establish a process through which stakeholders and local communities can submit complaints or queries to the Commission, while simultaneously granting affected stakeholders and civil society organisations legal standing to address these issues nationally.
The Estonian mires are crucial for protecting biodiversity and the climate alike. Acting as major carbon sinks, the mire habitats provide climate change mitigation and boost biodiversity by creating habitats for important wetlands species such as the western capercaillie (*Tetrao urogallus*), the moor frog (*Rana arvalis*) and dragonflies (*Leucorrhinia*). Mires also contribute to water retention and regulate the water balance, which directly impacts the surrounding land, and also protects local communities and other habitats further downstream. Despite the clear benefits for biodiversity, climate and people alike, mires are becoming rare and degraded across the EU. In Estonia, areas have been severely damaged by drainage for agriculture, forestry and peat extraction, and as a result of lowering water levels, trees and shrubs expanded, causing the typical Estonian fen mosses to disappear.

In 2015, the LIFE Mires Estonia project coordinated by the Estonian Fund for Nature turned the fate of these degraded mires around. Six sites were selected for restoration in the ongoing project that aims to secure the favourable conservation status of wetlands, especially transition mires, active raised bogs, bog woodland and fennoscandian deciduous swamp woods. The project also aims to increase biodiversity by improving the living conditions of several wetland birds, frogs and butterflies. Before the works began, an inventory was carried out to ensure that the restoration would create quality habitats for local species and to ensure that there would be no negative impacts on ecosystems elsewhere. Based on this, 7,640 ha were selected for restoration. Approximately 300 km of drainage ditches were closed and outflows stopped – therefore the area began to naturally re-wet. Although degraded, the mire was still present, which means that the characteristic vegetation is expected to come back within five to ten years. Additionally, 650 ha of forest was logged, mainly to restore open habitats and also to allow machinery to gain access along the drainage ditches.

The benefits of mire restoration to climate and biodiversity are still being quantified. However, data from a peat extraction zone of 136 ha in size that has been restored shows that, in the 30 years since peat extraction ended, the drainage of peat in the area has let to the emittance of approximately 1,000 tonnes of carbon and the amount of peat that has been degraded is almost 3,300 tonnes. The re-sequestration of the same amount of carbon back into a wetland of similar area would take approximately 300 years. Additional analysis is required in regard to whether the carbon sequestration function recovers and at which rate but various studies have indicated that carbon loss can decrease by 50% in less than ten years in recovered areas compared to the situation prior to recovery works. In addition, the water retention will be improved.

Furthermore, the LIFE Mires Estonia project has brought visitors to mires to increase awareness and knowledge of their role and value to the environment and climate.

The restoration of the Estonian mires is a perfect example of how bringing nature back will contribute to solving both the biodiversity and climate crises.
The Côte Bleue Marine Park is located close to Marseille in France and is part of the Natura 2000 network. It was created in 1983 to enable the sustainable development of small scale fishing activities, to protect the environment, for scientific research and to raise public awareness about environmental issues. Local public authorities and professional fishers will work together to maintain long-term maritime economic activities. The coastal zone managed by the park is made up of extremely rich and diverse ecosystems, including virtually all of the different Mediterranean species and habitats.

The park aims to protect specific Natura 2000 habitats and species, such as Mediterranean coral reef habitats, fish such as the dusky grouper and Posidonia seagrass meadows. Seagrass meadows are highly biodiverse ecosystems that host 25% of all Mediterranean species. The meadows also protect the coast, reduce erosion and account for more than 10% of the total amount of ocean carbon storage. Their ability to rapidly store organic carbon into sediments, where it remains ‘locked’ for long periods of time [5] is essential in mitigating climate change.

The Côte Bleue park contains two strictly protected areas (“no-take zones”): Carry-le-Rouet (89 ha since 1983) and Cap Couronne (210 ha since 1996), where all kinds of fishing, dredging, anchoring and scuba diving are forbidden. In the rest of the park (10,000 ha), all activities, including recreational sports such as sailing and sea kayaking, are authorised under the general regulations at sea. Between 1983 and 2014, the park installed 4,884 m³ of two types of artificial reefs producing reefs and protection reefs. The production reefs were suberged on seabeds devoid of natural habitats to attract, shelter and support flora and fauna. 2,900 m² of protection reefs were deployed to act as a barrier against illegal trawling, creating 17.5 km of physical barriers. These reefs protect the most fragile elements of the ecosystems such as Posidonia meadows and coral producing rocks.

Beyond the conservation and physical restoration actions, the active involvement of stakeholders in the Côte Bleue was a crucial component of the marine park’s success story. For example, the involvement of fishers in management and monitoring has proven effective in ensuring sustainable artisanal fishing activities. Several studies have shown the tangible results of this co-management, with the “reserve effect” (i.e. the increase in fish size, density, biomass as well as species richness [7]) being demonstrated by the return of the dusky grouper as well as the brown meagre fish in no-take areas (i.e. marine protected areas that do not allow any fishing, mining, drilling, or other extractive activities [7]). The fishing yield has also increased sevenfold since the creation of the no-take reserve of Couronne. As a result, fishers have adopted a more positive view of management decisions, with the number of local species and the quantity and size of fish.

The Côte Bleue Marine Park has increased the number of local species and the quantity and size of fish. The park demonstrates how Marine Protected Areas can deliver good ocean governance and benefit local communities and economies.
RESTORATION OF THE MAHMUDIA WETLANDS, ROMANIA

A COMMUNITY BENEFITS FROM FLOURISHING ECOTOURISM

The formerly degraded wetlands of Mahmudia in Romania have been hailed as the first ecological reconstruction of the Danube Delta implemented by a local community. The wetlands are home to approximately 300 bird species, such as pelicans and white-tailed eagles, and provide carbon sequestration, flood protection and ecotourism to the local people.

Up until the 1990s, the wetlands of Mahmudia had been drained to create space for unsustainable agricultural land, resulting in reduced flood protection and decimating local biodiversity. But in 2006, things began to change. After encouragement from the local WWF office, the then local mayor took the decision to restore the agricultural land which was under the ownership of the Mahmudia Council to benefit biodiversity but also to attract tourists. Mahmudia is situated at the edge of the Danube Delta, a popular ecotourism destination. Normally, visitors have to travel to the middle of the Danube Delta to experience the local natural environment, which takes time and consumes fuel because of the long drives needed to get there. The restoration of Mahmudia was seen as an opportunity to allow tourists to visit the Delta’s nature in a more accessible area at a lower cost to tourists.

An ecological restoration project began the work to restore 960 ha of agricultural land. The project received finance from the European Structural Funds and was implemented by WWF and the local Mahmudia Council with support from the Danube Delta Biosphere Reserve Administration. The area, previously separated from the inner lakes and wetlands, was reconnected by the removal of dams and the relocation of dikes, which returned the natural water flow to the area. Farmers were compensated with new land closeby and fishers welcomed the initiative in the hope that fish stocks would recover.

Before the restoration of Mahmudia, there were almost no tourists in the area. However, since the project began, 15 guest houses have been built and they are unable to keep up with the demand from ecotourists.

WWF is now monitoring the results of the project with help from the community, which is eager to get involved in a citizen science project covering the wetlands of Mahmudia. Unfortunately, despite the good example of Mahmudia in the Danube Delta area and the clear benefits for nature and the community, there have been negative developments. In the last two years, 5,390 ha of wetlands that are used as fish farms in the surrounding areas have been dried and transformed into agricultural land, largely driven by the direct payments of the EU Common Agricultural Policy (CAP). If landowners transform their land into agricultural land, they are then rewarded with CAP subsidies. These perverse incentives are driving large-scale land use change away from healthy ecosystems into farmland across the Danube Delta.

“I work in tourism in the area of Mahmudia. Until 2016, the Carasuhat area was the village’s pasture, there were no tourists. There was nothing for them to see here, nothing to do. It was just like going into the fields. These days, the community of Mahmudia is very happy with the ecological restoration in the Carasuhat Area. We now have fish and a lot of water birds and the tourists have started to come to visit our place.”

Constantin Musat, a local entrepreneur.
The natural salt marshes of Germany along the coastline of the Baltic Sea act as a physical barrier to waves and protect the coast from flooding and erosion. The peat soils also act as major carbon sinks. Despite this, Germany’s salt marshes were cut off from the sea by dikes and through drainage for land conversion into agricultural grasslands. This practice led to vast amounts of carbon dioxide being emitted from carbon sinks into the atmosphere and to the degradation of the area’s rich natural biodiversity.

In 2014, WWF Germany embarked on a groundbreaking project supported by funding from the German Federal Ministry of the Environment – to restore two polders (i.e. artificial coastal areas created by means of dikes and draining) of 100 ha each to their natural marine state. The main aims of the project were to create a suitable habitat for wetland birds and plant communities, to restore the carbon sinks into the atmosphere and to bring back the coastal protection function of the wetland. The project - supported by funding from the German Federal Ministry of the Environment - to restore two polders (i.e. artificial coastal areas created by means of dikes and draining) of 100 ha each to their natural marine state. The main aims of the project were to create a suitable habitat for wetland birds and plant communities, to restore the carbon sinks into the atmosphere and to bring back the coastal protection function of the wetland. The project provided long-term resilience, is cost-effective and has had a major impact on biodiversity recovery, climate mitigation and flood prevention.

In the first case, the Baltic Sea Foundation had already bought the land from a State agency with the long-term aim of converting the polder back into a salt marsh. The farmer who had been using the grassland to intensively harvest grass crops was allowed to rent the land for grazing cattle on the restored salt marshes and was further supported by EU Common Agricultural Policy subsidies.

In the second case, the land was partly privately owned and partly owned by the Karsten Nendel Foundation. The owners were compensated for their losses in market value for the land and for the loss of reduced crops over the next 25 years. They maintained their ownership of the land through an agreement in the official land ownership register that they would never restore the old hydraulic system or rebuild the dikes that had been removed. Once again, the landowners were allocated subsidies through the EU Common Agricultural Policy, which was of utmost importance for them.

Once an agreement with all the landowners had been finalised, the restoration works began, planned and managed by WWF. 4.5 km of dikes were removed, which allowed former meadows to be re-wetted with seawater. New dikes were built and the two polders were successfully flooded in November 2019 and March 2020. Once flooded, the former polders quickly started to revert back to being salt marshes. As a result of the project, both biodiversity and climate have benefited. 5,000 tons of carbon dioxide are locked in the ground every year and the area is now a hotspot for water birds and migrating birds such as waterfowl species.

The restoration of the German salt marshes is a perfect example of a nature-based solution in action. The restoration project provides long-term resilience, is cost-effective and has had a major impact on biodiversity recovery, climate mitigation and flood prevention.

“Our municipality has supported the project because we were actively involved from the start and our wishes for our touristic infrastructure were integrated into the project. The project has become an asset for our municipality.”

Andreas Klug, Mayor of Rambin municipality.

The Robledo de Chavela Dam, which is located west of Madrid Province, was built in the Cofo River to supply water for the Robledo de Chavela Municipality. Construction work began in 1968 but, due to water quality problems caused by the dumping of livestock waste, the dam stopped functioning in 1990. Initially, the local Mayor wanted to repair the dam. But the reservoir was so badly clogged with toxic sludge from discharges from upstream intensive cow farms and sand sediments, that the capacity and viability of the dam had diminished. Leaks also developed over time and reparation was impossible.

The Tagus Basin Authority therefore took the decision in 2014 to demolish the Robledo de Chavela Dam and return the river to a free flowing state. Before the dam was removed, the reservoir was emptied and several electro-fishing trips were carried out to guide as many fish as possible to safe zones. A prior analysis of the sediment contamination was also performed. Once it was confirmed that there was no contamination, sediments were partly moved to restore other areas along the river where they were confined and stabilised by planting native vegetation.

After the dam was removed, a survey was carried out to assess the changes in the local ecosystems along the river. The survey showed that there had been a considerable improvement in the diversity of habitats due to the mobilisation of sediments that had directly led to the recolonisation of the river fish species, which were absent in 2016. The survey also showed that the connectivity of the river had recovered. The increase in the population of barbel fish is particularly noteworthy, as well as the consolidation of the populations of vogue, goby and chub, which were absent, or practically absent the first year. These all appeared in the study area after the demolition of the dam and a clear increase in catches were also observed.

However, an improvement in the quality of the ecosystem did not occur everywhere. One part of the river runs into a channel, which does not allow the natural flow of the river or the development of a high quality forest on its banks.

In summary, the demolition of the Robledo de Chavela dam and the restoration actions have allowed the section of the Cofo river, which was previously affected by the presence of the dam and its reservoir, to recover. But it is important to keep monitoring the situation to observe possible evolutions in the ecosystem which can develop over the long-term.
Mount Parnitha, which is located 30 km north of Athens, Greece, is a forested mountain range seen by citizens as a symbol for the capital. The forest, part of a National Park and the EU’s Natura 2000 network, is home to the endemic Greek Fir tree (*Abies cephalonica*) and to several mammals, birds, plants and herbs species, including some protected animals like wolves and red deer, and rare local endemic flowers such as the bellflower (*Campanula celsii*).

In 2007 was a record year of megafires in Greece, which decimated the forest and destroyed the region. 4,900 hectares of Mount Parnitha were burned, destroying 62% of the forest and destroyed the region. 4,900 black pines, 800 downy oaks and 209,778 Greek fir trees were planted first to create shaded ground for the young fir. The Forest Department also contracted expert forestry companies to restore the burnt area. In addition, seeds from remaining fir trees were collected in order to develop a nursery of fir trees with local genetic material.

2,500 trained volunteers and more trees are still growing in the Parnitha forest nursery due to be planted in the coming years. In addition, 1,913 km of anti-erosion works have already been completed since the first year of restoration.

The Greek Forest Department views the rehabilitation as an action to protect against land use change, not simply for biodiversity, and the restoration work sends the message to the local people that this area is not going to change.

The Parnitha forest restoration project has been a success, largely spurred on by community engagement, political pressure and the legal obligation of post-fire restoration in Greece.

“The Management Authority of the National Forest Park of Parnitha still continues the implementation of the Reforestation Project, according to the Restoration Management Plan, that developed immediately after the fire of 2007. The works and techniques that were carried out and continue to be carried out concern the reconstruction of the burned fir forest and the restoration of the ecosystem.

The results of the interventions are very encouraging since there is already a satisfactory growth of the planted seedlings, exceeding our expectations based on data from similar projects in other areas.

Although this is a very difficult and time consuming project, with the excellent cooperation of the competent services and the support of all stakeholders, we expect the maximum result, which is the gradual afforestation of Parnitha and its restoration to its original state.”

Dr. Georgios Karetsos, The President of the Administrative Board of the Management Authority of the National Forest Park of Parnitha.

2007 was a record year of megafires in Greece, which decimated the forest and destroyed the region. 4,900 hectares of Mount Parnitha were burned, destroying 62% of the endemic Greek fir tree (*Abies cephalonica*). Fortunately, the Greek forest law obliges the Forest Department to survey an area after a fire and declare it an area for restoration (either technical or natural restoration, depending on the survey). However, in reality, restoration work is not always carried out due to a lack of political will or budget constraints.

In the case of Mount Parnitha, the local community acted fast and called on its government to carry out the restoration work. Within ten days, a huge protest was organised via social media. Thousands of people wearing black protested in front of the Greek Parliament, calling on politicians to act.

In 2008, the restoration of the Parnitha forest began. WWF Greece, the Forest Department and the Management Authority of the National Forest Park of Parnitha trained almost 2,500 volunteers, who assisted with the forest restoration. As fir need shade to grow, pine trees (*Pinus nigra*) were planted first to create shaded ground for the Greek fir. The Forest Department also contracted expert forestry companies to restore the burnt area. In addition, seeds from remaining fir trees were collected in order to develop a nursery of fir trees with local genetic material.

Fast forward 13 years and a mix of natural and active restoration has brought life back to Mount Parnitha. In line with the results of the survey, 1,374 hectares were restored naturally by banning grazing, hunting and logging, which has a negative impact on natural rehabilitation or future technical restoration. In the actively restored area, 193,000 black pines, 800 downy oaks and 209,778 Greek fir trees have been planted. Of the Greek firs, 16,101 were planted by 2,500 trained volunteers and more trees are still growing in the Parnitha forest nursery due to be planted in the coming years. In addition, 1,913 km of anti-erosion works have already been completed since the first year of restoration.

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