

Prescribed burning on the island of Chios, Greece: results from a two-year pilot project

A pilot project on prescribed burning in Greece to introduce the use of fire as a tool for forest fuel management and to improve social and ecological resilience of natural ecosystems.



Treating and extending a shaded fuel break with prescribed burning.
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Conducting a prescribed burn in a fuel break.
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/// Context ///

Researchers and practitioners from the Institute of Mediterranean Forest Ecosystems of ELGO DIMITRA, WWF Greece, the Forestry Directorate of Chios Island and the Voluntary Action Team OMIKRON have implemented a two-year pilot project on prescribed burning on the island of Chios, Greece, with the aim of introducing this method as a tool for forest fuel management.

Prescribed burning is an effective management tool that can have beneficial outcomes such as reducing fire risk and promoting ecosystem health. Monitoring the effects of its use is essential to improve standards and procedures for its application and to minimise potential negative effects on the natural environment.

Fire behaviour data, obtained from experimental prescribed burning in Mediterranean-type forest ecosystems on the island of Chios, were compared with fire effects on different variables characterizing soil properties, the effects on trees, and in plant biodiversity.

The results showed that prescribed burning did not cause significant changes in vegetation physiological functions and soil properties, while there is evidence that it had a positive effect on plant diversity. The project's experimental trials also provided an excellent training tool for participants (firefighters, land managers and researchers).

/// Solution for a Resilient Future ///

The first efforts to introduce and use prescribed burning in Greece began in the 1970s, when members of the Greek forestry scientific community and the Hellenic Forest Service applied prescribed burning experimentally, analysed data and drew some preliminary conclusions. They took some steps to document the use of fire and study its effects before introducing prescribed burning as a tool to prevent forest fires. Unfortunately, without consistent funding, legal support, logistics, ongoing scientific guidance and clear objectives, these sporadic attempts failed to connect with the forest and fire management community and the effort was soon abandoned. Almost half a century later, fire is still not used for fuel management and fire prevention, and there is no institutional framework for the implementation of prescribed burning.

Inspired by the potential of prescribed burning demonstrated in other Mediterranean countries, and guided by fire science and best practices for forest fire prevention, a core team of researchers and practitioners from the Institute of Mediterranean Forest Ecosystems of ELGO "DIMITRA", WWF Greece, the Forestry Directorate of Chios Island and the Voluntary Action Team "OMIKRON" started a pilot project to implement prescribed burning on the island of Chios in 2021. The Fire Service of Chios Island and the Municipality of Chios supported the pilot project by providing water trucks and personnel during the burns. The General Directorate of Forests and Forest Environment of the Ministry of Environment and Energy provided all the necessary permits for the implementation of the pilot application of prescribed burning in Chios.

Throughout the project, prescribed burning was experimentally applied to surface fuels in pine (*Pinus brutia*) stands, tall evergreen sclerophyllous shrubs, low spiny Mediterranean shrubs (*Phrygana*) and young pine regeneration, with the aim of maintaining fire and fuel breaks by reducing fuel loads and controlling regeneration. Through these efforts, prescribed burning was successfully demonstrated. The results provided strong evidence that prescribed burning can be a very effective fuel management tool for many forest ecosystems in Greece. There is now a good basis for applying the method in the country, although further research (e.g. under different conditions and in additional

ecosystems) is needed before it can be fully adopted and included in the toolbox of forest fire managers. Standards and procedures for the application of prescribed burning in Greece are being developed following the successful paradigm on Chios. The official adoption of this method by the Hellenic Forest Service will strengthen its role and effectiveness in fuel management and improve cooperation between state agencies and local stakeholders. In addition, the use of prescribed burning under the guidance of the Forest Service can become an excellent training tool for professional and volunteer firefighters.



Prescribed fire treatment of a shaded fuel break covered by young *Pinus brutia* trees.
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Prescribed fire treatment of a shaded fuel break without killing its *Pinus brutia* trees and *Pistacia terebinthus* shrubs.
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/// Always Moving Forward ///

Prescribed burning is used in some Mediterranean countries, but not in others, such as Greece. The potential benefits are known, but there are also pitfalls, so there is a general reluctance to adopt this method. This reluctance is often due to lack of familiarity with its use. In addition, there are often legitimate questions about its effects, which can vary from one ecosystem to another. The pilot project on Chios aims to overcome both of these drawbacks. On the one hand, it demonstrates the feasibility and parameters for the effective use of prescribed burning, and on the other, it evaluates the ecological effects through carefully planned and detailed

monitoring, trying to identify potential problems.

The knowledge gained from this work can help to institutionalise prescribed burning in Greece, following specific application standards that are currently being developed. These standards will include carefully planned reporting practices that will help to build knowledge, evaluate results, improve effectiveness and efficiency, and identify any undesirable consequences early on. It is also hoped that this work will provide an example for other countries around the Mediterranean to follow in adopting the method in their fire management practices.

Further information

- Athanasiou, M, Bouchounas, T, Korakaki, E, Tziritis, E, Xanthopoulos, G, Sitara, S. 2022. Introducing the use of fire for wildfire prevention in Greece: pilot application of prescribed burning in Chios island. https://doi.org/10.14195/978-989-26-2298-9_227.

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