



The iconic *Jubaea chilensis* teeters on the edge of local extinction: a plea for enhanced conservation policies

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Abstract

One of the few remaining extra-tropical palm species in the world, the *Jubaea chilensis*, is facing imminent collapse. This letter aims to urgently call upon the Chilean state to take immediate action on six key initiatives focused on enhancing the conservation of this endemic species and its natural habitats.

Introduction

The impact of mega-disturbances, such as widespread wildfires, contributes significantly to the shrinking distribution range of endemic species in climate change scenarios (Manes et al. 2021; Ahn et al. 2024). This phenomenon emerges as a significant threat, escalating the risk of local extinctions on a global scale. Recent examples of large-scale wildfires include the 2009 and 2019–2020 fires in Australia, with more than 20% of temperate broadleaf and mixed forests burned (Boer et al. 2020), while the 2024 wildfire in Viña del Mar (central Chile) affected highly endangered forest ecosystem (Alaniz et al. 2016).

The recent (early-February 2024) “megafire” in central Chile was the second deadliest of the twenty-first century in the world, and the deadliest in the history of Chile, with more than 130 fatalities. The fire burned 45% of the grassland-forest cover and 10% of the built-up land of Viña del Mar. One factor contributing to the high mortality rate was

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meteorological conditions conducive to rapid-fire propagation such as heatwaves, prolonged drought, and winds exceeding 50 mph, along with massive invasion of highly flammable non-native plants, such as *Eucalyptus globulus* (Armenteras and de la Barrera 2023). Furthermore, poor urban design and planning in urban-wildland interfaces, as well as densely populated areas in Viña del Mar, makes these areas highly vulnerable. At the epicenter of the affected area lies the National Botanic Garden of Chile (established in 1951 in Viña del Mar city), spanning 395 hectares, of which 90% was incinerated, resulting in the loss of plant specimens of priceless heritage value preserved until now through ex-situ conservation, including most of the individuals of *Sophora toromiro*, an endemic species from Easter Island, now extinct in the wild (Maunder et al. 2000). The Botanical Garden also was home to the largest remnant of native vegetation that included *Jubaea chilensis* (Chilean palm), one of the few extra-tropical palm species in the world and the most emblematic native species of central Chile (Parsons 2007).

Chilean palms under threat

The estimated 120,000 palms that survive today represent roughly 2.5% of the abundance and area found at the beginning of the nineteenth century (Cordero et al. 2021). Viña del Mar city has the third largest population of Chilean palm in the country (El Salto and Rodelillo) with 6,061 adult specimens in 2008. In February 2022, a large-scale fire devastated 1,661 palms, mostly individuals over 500 years old, on 27% of the palm grove's surface area. Tragically, the megafire of the first week of February 2024 swept away most of the remaining population (Fig. 1).

The Chilean palm is a massive (up to 35 m tall) monospecific palm endemic to the Mediterranean-type climate region in central Chile. The remaining populations of this very long-lived relic species from Tertiary subtropical forests (Parsons 2007) are nestled within landscapes dominated by sclerophyllous forests. Despite their fragmentation, these



Fig. 1 A recently burnt Chilean palm (*Jubaea chilensis*) stand in El Salto, Viña del Mar (Photo: Patricio Novoa)

areas can and should be crucial in guiding ecological restoration programs in central Chile (Smith-Ramírez et al. 2023). Unfortunately, the sap extracted from Chilean palms can produce a highly prized syrup that has been intensively marketed. Millions of accessible palms were lost to this practice during colonial times and continued until the mid-twentieth century when laws were finally enacted to prevent further deforestation, they effectively ended the practice of felling entire trees for sap harvesting (Quintanilla and Castillo 2009). In the last 50 years, the Chilean palm has continued to diminish in numbers and area due to overharvesting of the edible and delicious seeds by exotic (*Rattus rattus*) and native (*Octodon* spp) rodents, and, due to anthropogenic pressures, such as land-use changes of native forest to agricultural lands, mainly (Cordero et al. 2021). Under the current scenario, reproductive collapse seems inevitable unless there are changes in public policy.

Six proposals to expand conservation efforts

Considering that this iconic and multi-use species is teetering on the edge of collapse, facing persistent threats even within botanic gardens and reserves, the Chilean government should enact rigorous and more impactful measures aimed at the in-situ conservation of the Chilean palm and its dwindling habitats as well as human life and infrastructure (Fig. 2).

Here, we present a series of conservation policy recommendations to preserve the Chilean palm and reconfirm the need for greater attention to and investment in conservation science and practice in Chile. In the medium-term, we call for actions to (i) accelerate the enactment of the ongoing law project on land-use-change to provide a regulatory framework for the coexistence between territorial development and the protection of surviving fragments of endemic and endangered plant species located in the urban-wildland interface (Fig. 2); (ii) establish a regulatory framework to reduce the abundance of highly flammable invasive species (e.g. *Eucalyptus globulus*), thereby mitigating the spread of fires through of use of “green fire breaks”; and (iii) strengthen the regulatory framework and certification related to seed harvesting and extraction for economic purposes. In the short-term, we



Fig. 2 The Chilean palm's stand in densely populated areas of Viña del Mar highlights the need for more effective conservation policies and sustainable urban planning (Photo: Patricio Novoa)

ask for (iv) the approval of the law project proposed in 2021 declaring Chilean palm as a “Natural Heritage” species (CDD 2021), which would allow penalties to be increased for arson leading to burning of palm groves (Fig. 1); (v) upgrading the local classification status of the species from “Endangered” (DS16/2020 MMA) to “Critically Endangered” due to the current decrease in area; and (vi) re-evaluation of the species in the IUCN Red List because of the underestimation of threats and associated extinction risk for this and other tree species (MMA 2020).

Increasing and strengthening conservation policies for Chilean palm is not only consistent with the commitments undertaken by Chile as a signatory to the 2023 Kunming–Montreal Global Biodiversity Framework (Convention on Biological Diversity 2023) but would also help to guarantee access to cultural and natural heritage for future generations of a palm species on the brink of collapse.

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Declarations

Competing interests The authors declare no competing interests.

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