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YOU CAN'T SEE THE WOOD FOR THE TREES: THE CEDAR OF LEBANON AS A SYMBOL OF A COUNTRY AND AN ECOSYSTEM

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INTRODUCTION

"When they had come down from the mountain, Gilgamesh seized the axe in his hand: he felled the cedar. When Humbaba heard the noise far off, he was enraged; he cried out, "who is this that has violated my woods" From the Sumerian Epic of Gilgamesh.

This reference to cedars in the Epic of Gilgamesh confirms two realities. Firstly, that the cultural recognition of the magnificence of these trees is very old and dates from prehistory (Mikesell, 1969). Secondly, whether willingly, through commerce, plunder, or as a tribute to various conquerors, Cedar of Lebanon (*Cedrus libani*; in Arabic *arz*) timber was a valuable commodity in Phoenician history, and the cedar forests were systematically over-harvested throughout the subsequent millennia.

The earliest mention of cedars, as a focus for conservation initiatives, can be traced to the second century A.D., when the Roman Emperor Hadrian designated a protected area in what is now Lebanon and named four tree species, including the cedar, that were strictly under his protection

(*ibid*). This is perhaps an indication of how depleted supplies of cedar were, even in those days. Indeed, over the last four hundred years the Cedar of Lebanon has become an icon for the ravaged eastern Mediterranean forests where there was a prevailing conception that cedar forests in Lebanon had been reduced to a few surviving trees (Evelyn, 1679). This was a view common through to the late 19th Century when the British botanist Joseph Hooker visited Bsharre and reported it as the only cedar grove left (Hooker, 1862). By the 1870s Rustum Pasha, Governor General of Lebanon at the time, built a wall around this grove, with the financial help of Queen Victoria of Great Britain.

Today, the cedar in Lebanon survives only as fragmented populations constituting a mere 3% of the total forest cover of the country, which is estimated at less than 10% of Lebanon's territory (reviewed in Talhouk *et al.*, 2001). Nevertheless, the love and respect that the Lebanese have for the cedar tree is almost unequalled in terms of a people's concern for a national plant. Cedar trees crowning the mountains of Lebanon is the image most Lebanese associate with their homeland. As such, the value of the cedar in Lebanon is no

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Fig. 1. Map of Lebanon showing the distribution of Cedar of Lebanon forests. (Altitude in meters above sea level).

longer limited to the physical attributes of the tree itself, but has evolved to include ecological, social, economic and symbolic dimensions (Khuri and Akeroyd, 1999).

DISTRIBUTION OF CEDAR OF LEBANON

The natural distribution of the Cedar of Lebanon is not limited to Lebanon; it extends to Syria and Turkey. In fact, the largest natural Cedar of Lebanon forests, estimated at c. 100,000 ha, are found on the Taurus Mountains of Eastern Turkey. Thus, although the cedar is threatened with extinction in Lebanon, the World Conservation Union (IUCN) has classified the species as lower risk through its global range (Khuri and Talhouk, 1999).

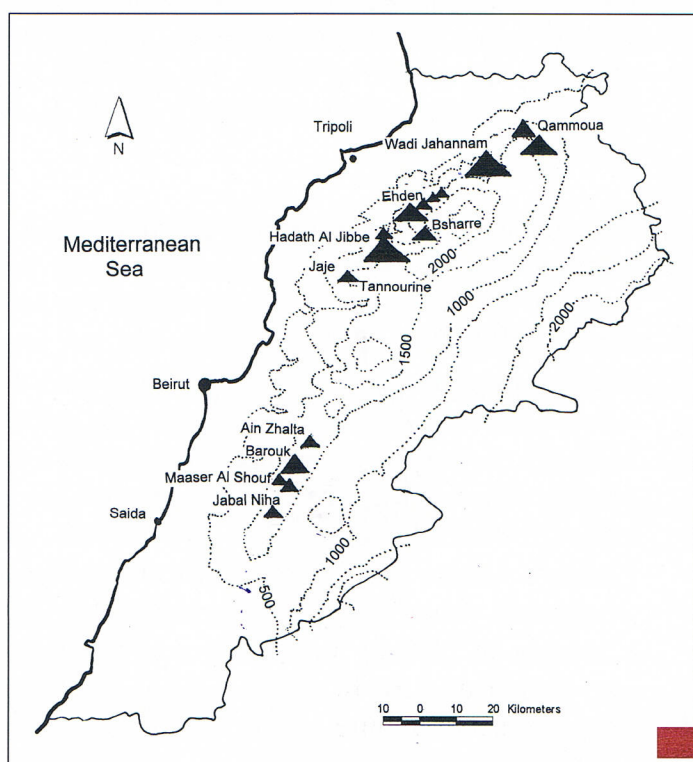
In Lebanon, centuries of intensive use have left several fragmented cedar forests covering a total of approximately 2300 ha on the western slopes of the Mount Lebanon Range, between 1,050-1,925m above sea level (Khouzami, 1994). The cedar is found either as the dominant tree species of the forest, or it grows in mixed forests with fir, oak, pine and juniper. The forests extend from Jabal Niha in the South to Qammoua in the North (Fig. 1).

The largest cedar forests are those of Tannourine - Hadath Al Jibbe (547 ha), and Seer Al Dhinniya (565 ha). Forest stands ranging between 100-300 ha include those of Barouk, Bmohrai-Ain Zhalta, Ehden, Sweisse, and Qammoua. Small stands less than 50 ha include those of Ain Mraaj, Al Najas, Bsharre, Jaje, Dahr Al Arz, Jiwar Al Abhal, Maaser Al Shouf, and Jabal Niha (reviewed in Khuri *et al.*, 2000). In most of these forests, the cedar trees grow amidst rocks, steep eroded slopes and cliffs. Therefore, conifers such as Cedar of Lebanon and the Grecian Juniper (*Juniperus excelsa*, in arabic: *lazzab*) are ecologically very important in these habitats, providing forest cover and reducing erosion and slope instability.

Three other cedar species related to the Cedar of Lebanon are distributed around the Mediterranean Basin and the Middle East. The Atlas Cedar (*Cedrus atlantica*) grows in the Atlas Mountains of Morocco, Cyprus Cedar (*Cedrus brevifolia*) in Cyprus and the Himalayan Cedar (*Cedrus deodora*) in the Western Himalayas. The genetic affinities of these species awaits clarification (Khuri and Talhouk, 1999).

THREATS TO CEDAR FORESTS

Current anthropogenic activities are having devastating effects not only on cedar forests, but also on other natural landscapes in Lebanon. The main threats facing cedar forests today are uncontrolled building development (in and around towns, tourist resorts), unregulated quarrying, and expansion of agro-pastoral activities into forest areas (Fig. 2). Cutting of cedar trees in remote rural areas for subsistence is still going on, as is the grazing of sheep and goats within the cedar forests (Talhouk *et al.*, 2001). Over-grazing prevents regeneration of young trees, destroys the vegetation underneath the trees, and increases the likelihood of erosion and ecosystem decay. Other important threats are forest fires, common in Mediterranean forest ecosystems, and the increased incidence of forest pests that are contributing to tree decline and affecting overall forest health (discussed elsewhere in this issue).



Earlier conservation efforts were initiated by the government of Lebanon and led to the production of the first complete forest cover map of Lebanon

and the preparation of several projects for the reforestation of the Lebanese mountains. One of the earliest actions for conservation was the vast reforestation efforts taken in 1960s when 140,000 hectares of cedars were planted in Al Shouf region; an attempt at re-establishing cedar forests in their natural growth zone.

Today the cedar of Lebanon is prominent in Lebanon's portfolio of protected areas, and several local non-governmental organizations (NGO) have been established to support and complement the government's activities regarding the conservation of cedar forests. There are currently two cedar forest areas, the reserves of Horsh Ehden and Al Shouf, which are protected under a Global Environment Facility (GEF) funded project (Hamze *et al.*, 1996). Each of these two areas embraces several cedar stands (Fig. 3). For example, Al Shouf reserve includes cedars at Jabal Niha, Maaser Al Shouf, Barouk and Ain Zhalta. Through this project, local NGOs have succeeded in restricting grazing and access to both reserves, which has promoted natural regeneration within cedar forests. The project has also supported studies to generate updated inventories of plants and animals within the reserves (Tohme *et al.*, 1999 a and b) and to initiate public awareness campaigns.

Funds to preserve forests, cedar or otherwise, that are outside the protected areas are minimal. Conservation of these forests takes the form of conifer-specific laws and ministerial decrees regarding particular stands (reviewed in Hamzeh *et al.*, 1996). Again, however, the government has insufficient resources, both budgetary and personnel, to enforce these laws (Akl, 1998), and only a small percentage of habitat conservation objectives have been met so far. These limitations are recognized in the Lebanese National Biodiversity Strategy and Action Plan (Ministry of Environment, 1998); this document also establishes

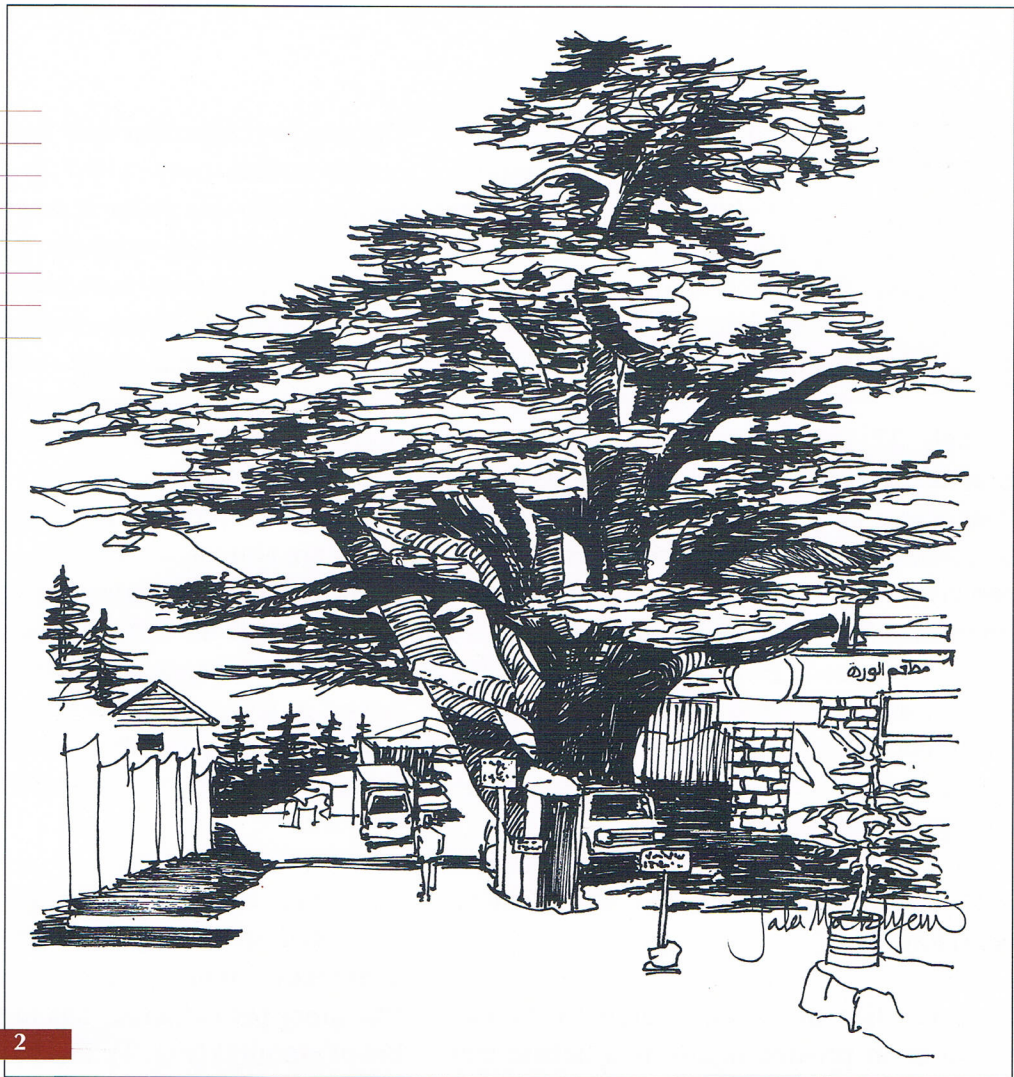
the need to gather data that would be sufficient for policy making.

Underneath the current economic and social obstacles to cedar conservation, often lies a misunderstanding of the aims and scope of nature conservation. As a result, the benefits of conservation are undermined, or at best, narrowly construed. Nature conservation is not only concerned with nature (species, habitats and landscapes) but also with the cultural value of nature, be it historic, aesthetic, symbolic or spiritual. Cedar conservation needs to draw on both arguments: the scientific argument for conservation, which is informed and guided by ecology, and the cultural one, which draws upon the moral, aesthetic and educational value of conservation.

THE ECOLOGICAL CONTEXT FOR CONSERVATION

Lebanon, as part of the Mediterranean Basin, belongs to one of five regions of the world that share a unique mediterranean climate regime of wet mild winters and hot dry summers (Mediterranean Basin, California, Central Chile, the Cape Region of South Africa, and Western and South Australia). These regions, whilst covering only 5% of the earth's surface, hold 20% of the world's total botanical diversity (Rundel, 1998). They are recognised as biodiversity hotspots holding extraordinary concentrations of endemic species. The largest and most diverse of these five centres is the Mediterranean Basin, with 25,000 plant species, 13,000 of which, *i.e.* over 50%, are endemic (Médail and Quézel, 1997; Myers *et al.*, 2000).

In Lebanon, the cedar forests constitute typical high altitude Mediterranean conifer forests that sustain a substantial level of biodiversity. The continued destruction of these forests will not only threaten the Cedar of Lebanon tree, but also the whole ecosystem associated with it. Recent studies by the Government of Lebanon have assessed the number of species of plants and animals thriving in cedar forests. In the reserves of Al-Shouf and Ehden, scientists recorded a significant incidence of endemic plants within these reserves including a number of globally threatened taxa (Tohme *et al.*, 1999 a and b). In Al Shouf reserve, which includes several pure cedar stands, scientists



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Fig. 2. Encroachment from uncontrolled development around towns, tourist resorts and centers are some of the threats to remaining cedar forests.

Fig. 3. Protection of cedar forests in Al Shouf reserve has prompted natural regeneration.



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reported the presence of 437 plant, 32 mammal, 33 reptile and 138 bird species (Tohme *et al.*, 1999a). A similar study conducted in the protected area of Ehden, where the cedar grows in mixed forests, indicated the presence of 533 plant, 25 mammal, 27 reptile and 148 bird species (Tohme *et al.*, 1999b). Forest destruction and/or overuse or abuse by people are threatening many of these associated species; indeed local people often perceive the protection of cedar forests as disadvantageous to them. So far, protection laws and policies have made few provisions to involve local citizens as participants in the establishment and management of cedar forests in Lebanon. As a result, local people feel left out and compliance with forest protection laws is weak.

THE CULTURAL SIGNIFICANCE OF CEDAR CONSERVATION

Whether value lies in nature altered by human intervention or in pristine nature is a debate that has played a key role in the changing approaches to nature conservation (Makhzoumi and Pengetti, 1999). Early attempts in conservation adopted a static and compartmentalized view of nature, often excluding change from natural and cultural processes. Recent trends in conservation biology acknowledge that nature is dynamic; it changes and adapts as does society's perception and appreciation of it.

Cultural values derive from ideas we attach to nature, the myths and stories we weave around trees and mountains and the aesthetic appeal of natural, semi-natural and rural landscapes (Makhzoumi, 2000). These different values, both natural and cultural, contribute to the perception of nature; their importance for conservation stems from their complementarity.

Cedar landscapes are not only valued as remaining vestiges of nature, having endured the ravages of time, albeit in a degraded state. They are equally valuable for their cultural significance to the people of Lebanon. The cedar has acquired a religious-mythical reference. The cedar grove in

Bsharre is referred to as a Sacred Grove, and the cedars within it are called the Cedars of the Lord (*arz er-Rab*); this grove is part of a World Heritage Site. The religious, symbolic and mythical seem to merge in the crafts associated with cedar wood, and are reflected in the choice of artifacts (rosary beads, icons) and their subject matter (holy inscriptions from the Bible and the Qur'an; images of the Virgin Mary and of Christ).

References to cedars in poetry, prose and popular songs are abundant. They are mentioned in association with the mountains (*arz al-Jabal*), an association as old as the Epic of Gilgamesh, quoted at the start of this paper. Cedars are frequently mentioned in songs and poems that express an immigrant's longing for the homeland, the people of Lebanon having for generations left their country in search of better fortunes.

The cedar tree is also the symbol of the nation: imprinted on its flag and referred to in the national anthem. "*majduhu arzuhi, ramzuhi lil khulud*" (the glory [of Lebanon] lies in the cedars, its symbol of eternity) (Fig. 4). The cedar tree, in addition, appears on denominations of the Lebanese Lira, is the emblem of the national airlines, appears on the logo of its oldest university, the American University of Beirut, and has been used by countless commercial enterprises, big and small.

The cultural significance of cedars represents nature as it is experienced and nature as a repository of national and regional history and heritage. Conservation needs the contact between people, other species and landscapes because it is "the energy that flames out from the recognition of nature" that is important (Adams, 1997: p. 104). Cedar forests are especially valuable in this context because they attract attention to natural landscapes that physically extend beyond the boundary of the forests themselves. The cedars are also a reality that people love, appreciate and can relate to. Using them as a flagship species for conservation would appeal to the collective imagination and secure public commitment.

INTEGRATED CONSERVATION: THE WAY FORWARD

The extent of environmental alterations and their cultural and ecological consequences the world over, have prompted a re-evaluation of past strategies in nature conservation. Strategies for the twenty first century generally favor decentralization, in which past top-heavy trends are replaced with a bottom-up approach with a balance between government funded conservation and administration and regional and local initiatives, and self-financed projects (McNeely, 1997). Community-based conservation offers a portfolio of methods that are being employed for successful long-term conservation of a habitat (Roe *et al.*, 2000). Local communities, working in collaboration with government agencies and NGOs, ensure that the approach is regulated to the benefit of the forests and of the local people, and that there is an equitable and fair sharing of any resulting benefits.

To ensure the survival of the cedar in Lebanon also

involves working with varied land owners (local and national government, religious and private) and those whose livelihood depends on harvesting resources from the forest. Communities have varying degrees of dependence on the forests for their livelihood. These needs may be recreational, i.e. relating to tourism, but are more often economic. For example, grazing animals can be a threat to ecosystem health, but these animals supply food and employment to the rural communities; harvesting of medicinal or ornamental plants from the understory may put some species at risk, but provides the harvesters with an income. In contrast to these largely subsistence demands, the cedars are increasingly threatened by speculative land developments, in particular ski resorts and exclusive country clubs and summer resorts.

Conservation groups will need to generate a willingness to invest in the protection of cedar forests. This will only be possible if people recognise the benefits of the forests and are given the proper incentives to modify current extractive activities (e.g. grazing, timber, medicinals) (Lusigi, 1995). For example, if part of a nature reserve is to be

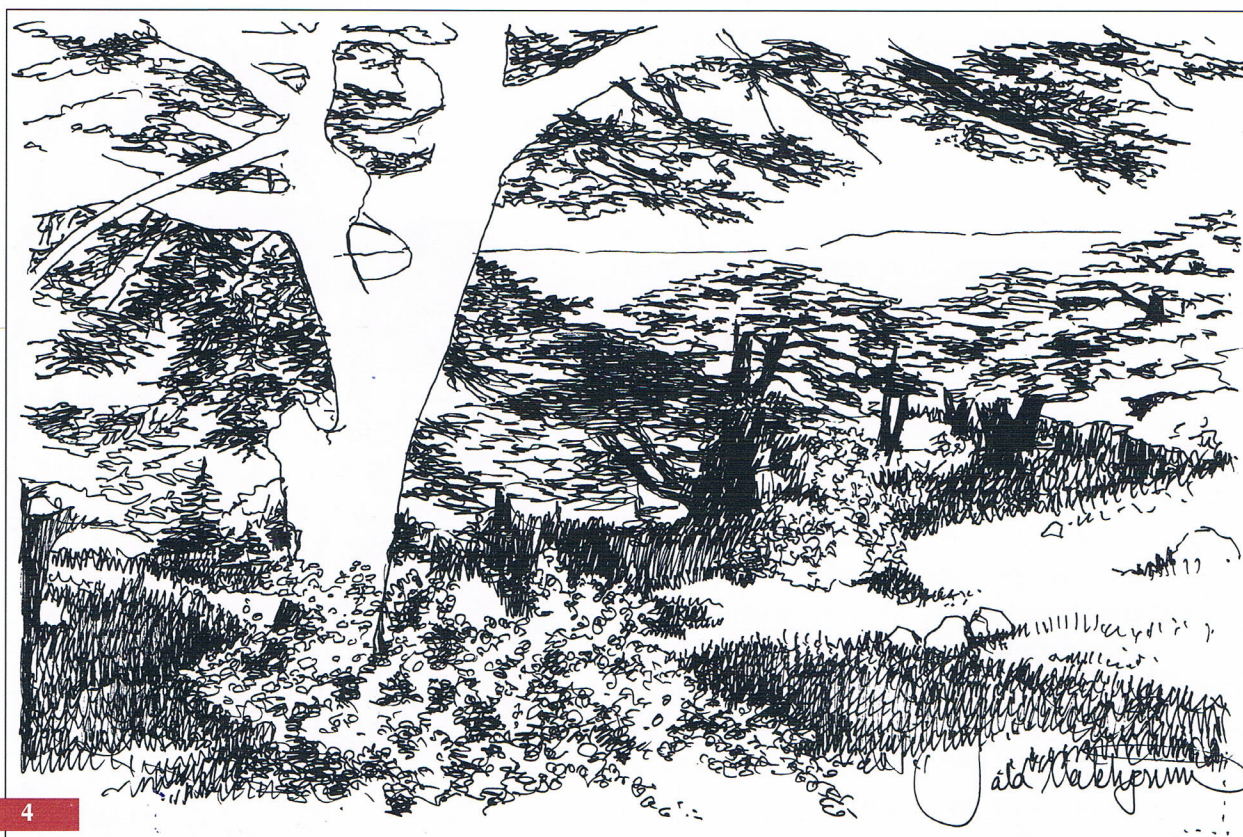


Fig. 4. Cedar forests constitute typical high altitude Mediterranean conifer forests that can sustain a substantial level of biodiversity.

used for tourism, then the tour guides should be local, the visitor's shop should sell locally-made artisanal handicrafts and the advertised trip should link directly with local cafés, restaurants and hotels (*ibid*) (Fig. 5). In fact, the *Arz Al*

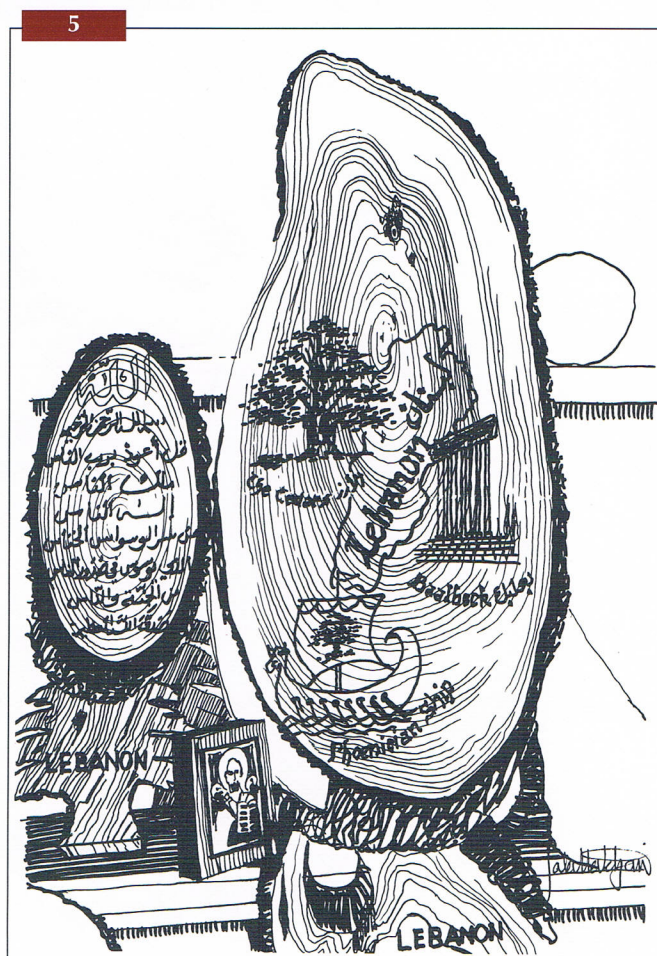
Shouf organization, currently managing the *Al Shouf* Reserve, is already utilising some of these principles, a trend which should be encouraged throughout Lebanon.

Integrated conservation has as its foundation the conservation of all levels of biodiversity (genes, populations, species, habitats and ecosystems), which is essential to ensure the resilience of the habitat and its ability to sustain levels of human use (McNeely, 1997). The Convention on Biological Diversity (CBD, <http://www.biodiv.org/>), of which Lebanon is a signatory, advocates the sustainable use of biodiversity resources (Article 10), while at the same time calling for the protection of ecosystems (Article 8). The two objectives can be fully compatible. The CBD recognises that local communities need to be involved in the decision making, and makes reference to "economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity" (Article 11).

An effective management programme can be undertaken using the multi-disciplinary approach of a biosphere management system (von Droste, 1995; Khuri and Talhouk, 1999). Biosphere reserves are landscapes that are managed in such a way as to marry the conservation of biodiversity with its cultural significance and sustainable use (UNESCO, Man and the Biosphere Programme, <http://www.unesco.org/mab/wnbr.htm>). In the case of the Lebanese cedar forests and their larger mountain landscapes, areas would be divided into three management zones. A core area would be protected to maintain the forest ecosystem, with associated research and monitoring activities. An outer zone, the largest, would include agricultural landscapes, villages and towns in which landscape and resources are managed sustainably. In between a buffer zone would support a certain amount of regulated human activity. These three zones provide ecosystem services and resources (e.g. water-

sheds, erosion control, seasonal grazing) that support working landscapes and their resident communities.

Integrated conservation strategies draw upon environmental and cultural perspectives. This holistic framework recognizes that the conservation of ecosystem biodiversity needs to be complemented with efforts to learn about the visual characteristics and local perceptions of cedar landscapes. Therefore, it is necessary to research the cultural dimension and to develop approaches that can promote individual and public appreciation of nature and landscape. Environmental educational campaigns, local community initiatives, and commissioning of landscape artists are ways of building long-term public awareness and appreciation. Ultimately, local communities that develop a sustainable rapport with cedar forests will ensure their conservation (Fig. 6).



CONCLUSIONS

Given the long and fluctuating conservation history of the Cedar of Lebanon, it is only right to retain this legacy using the most appropriate conservation methods currently avail-

able. An integrated and collaborative conservation program can have far-reaching implications for the magnificent cedar tree and its habitat. An icon for millennia, the cedar can become a working symbol to support the conservation of an entire ecosystem and as such can benefit the landscape, the people and the economy of the region.

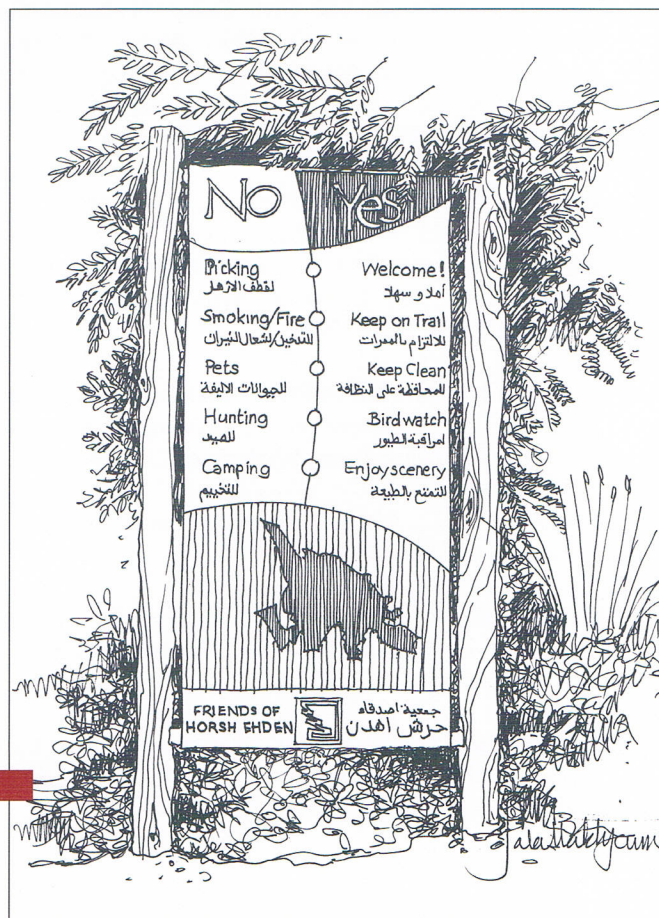
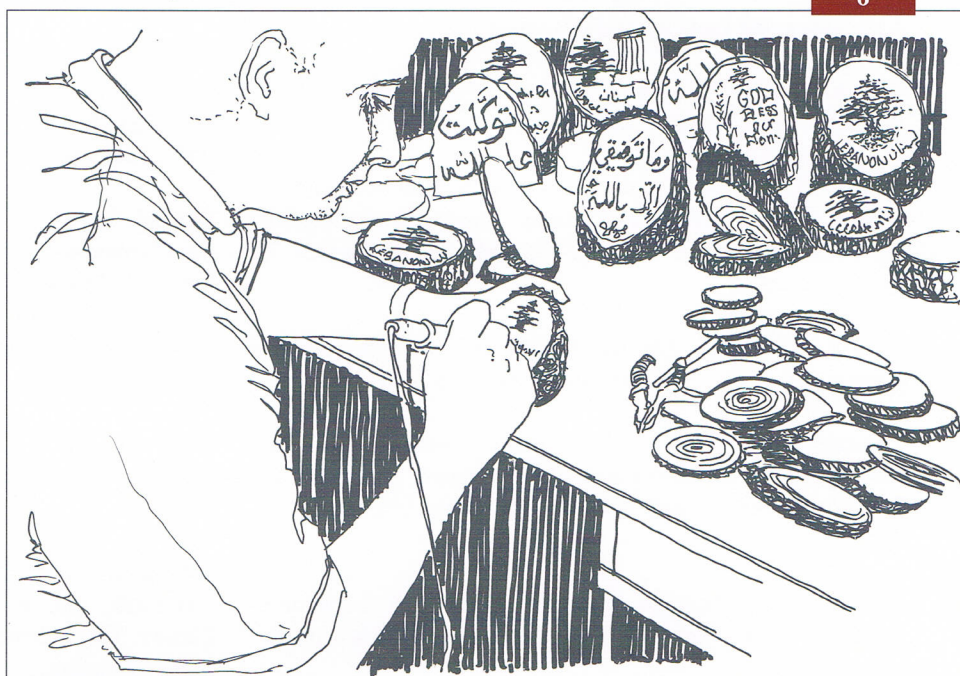
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Fig. 5. Cedar forests are valued not only as remaining vestiges of nature, but also for the cultural values they have come to possess for the people of Lebanon.

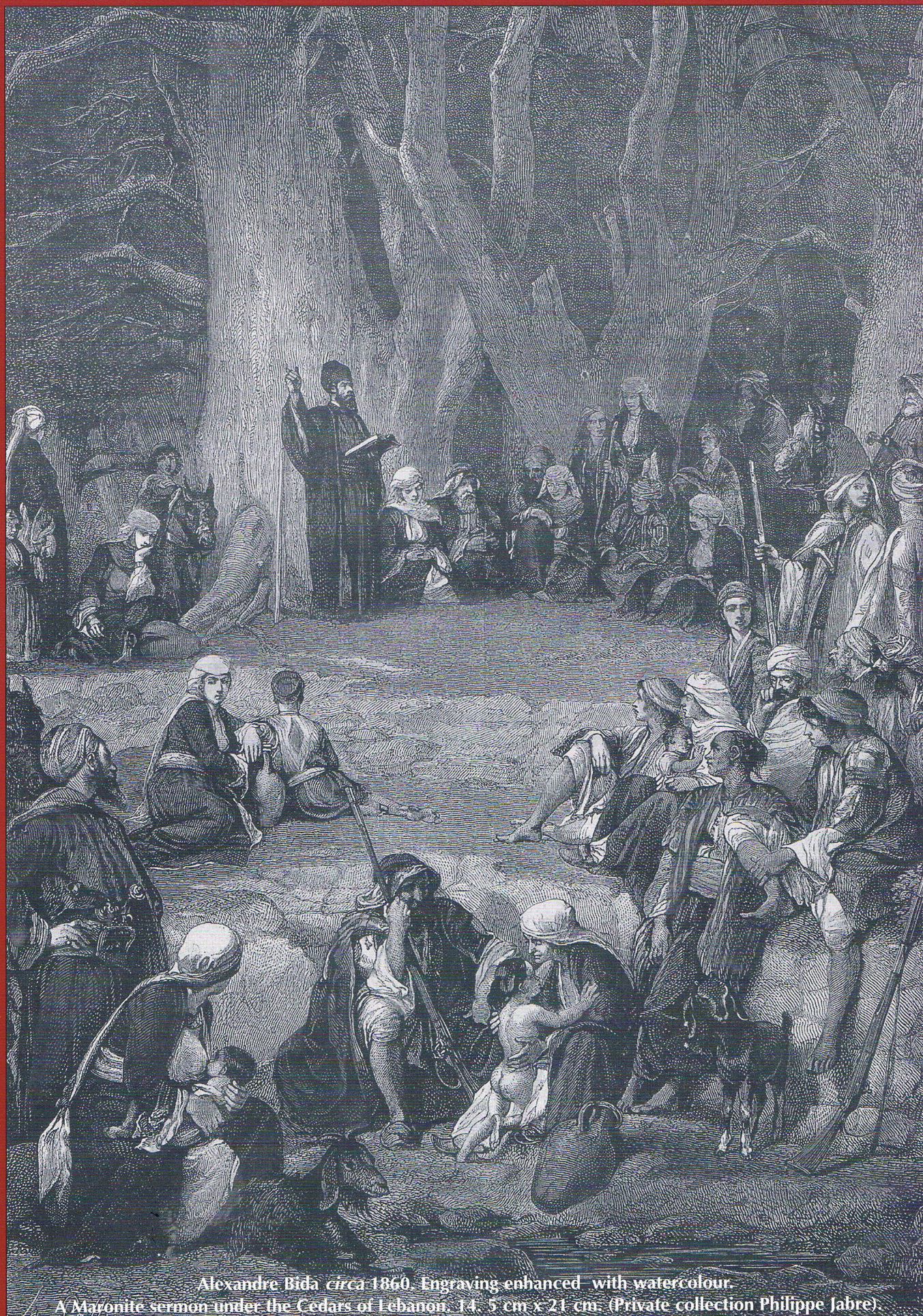
Fig. 6. The protection of the Cedar of Lebanon forests will only be possible if people recognize the benefits of these forests and are given the proper incentives.

Fig. 7. It is the cultural appreciation of nature and public awareness of environmental issues that will ultimately allow science-based conservation efforts to succeed.



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Alexandre Bida *circa* 1860. Engraving enhanced with watercolour.
A Mayonite sermon under the Cedars of Lebanon. 14. 5 cm x 21 cm. (Private collection Philippe Jabre).