

National Outline Plan for Forests and Afforestation

NOP 22

Policy Document



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Jerusalem 2011

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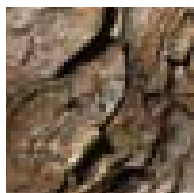
Print

Maor Wallach Ltd.

ISBN: 978-965-90438-1-1

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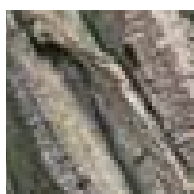
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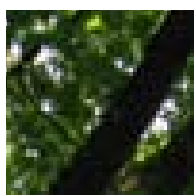
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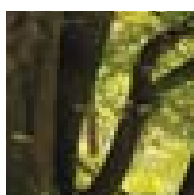
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All that is in forests bespeaks poetry

Shmuel Yosef Agnon, In Town and Forests



A Word from the Chairman

This year, 2011, marks the International Year of Forests. KKL-JNF, alongside its extensive planning work, has been cultivating Israel's forests for more than 110 years – work that has seen the planting of more than 240 million trees since the organization's inception. In fact, Israel is the only country in the world that now has more trees than were there a century ago. The planting work continues; in the campaign we are leading, of a Tree for Every Resident, KKL-JNF will plant an additional 7.5 million trees in the coming years.

The National Outline Plan for Forests and Afforestation, NOP 22, marks a milestone in the efforts to preserve Israel's image and landscapes. Because of the plan, which was approved by the Israeli government in 1995, KKL-JNF has managed to create a statutory "wall" around the country's 1.62 million dunams (10 dunams equals 1 hectare) of planted forest, natural woodlands and open spaces, which were not protected by any other framework.

Nor has KKL-JNF rested on its laurels since the approval of the plan. The growing demand for open spaces, forestry innovations and technological advances obliges us to keep apace of developments, to respond effectively to the changes sweeping Israel and to instill an environmental approach in society.

All these find expression in the chapters of this updated document. Since the approval of NOP 22, KKL-JNF has implemented significant measures to promote its policy, integrating a broad range of disciplines in close cooperation with research institutes. Planning emphasizes innovative trends, such as sustainable forest management and forests as ecological corridors. Several of the terms we coined – metropolitan parks and social-community forests – to our satisfaction have become common currency and made inroads into planning institutions. The results are evident in the field: metropolitan parks are being created in Jerusalem and Beersheba while community forests are sprouting up at numerous locations countrywide for the benefit of nearby population centers.

Working unremittingly, we have created to date some 180 detailed master plans for forests as called for by NOP 22. NOP 22 has been assimilated in national and regional master plans, constituting a vital, unprecedented tool to protect Israel's forests and open spaces.

Nor is the updated policy document accompanying NOP 22 the end of the story. We will carry on planning and preparing, initiating and executing in order to continue meeting the challenges that the future may hold in store.

Yours truly,



Efi Stenzler
Chairman, KKL-JNF Board of Directors

Foreword

It is more than a decade since the National Planning and Building Council formulated National Master Plan¹ 22 and the government approved it. This is sufficient time to enable a review of the plan's basic concepts, the tasks it set itself, and its efficiency in protecting the country's woodlands and preserving its open spaces.

This same period saw the conception, planning and approval of NOP 35 – the Integrated National Outline Plan for Building, Development and Conservation, which revolves around the country's character and the connections between man, society and place. Alongside the character of society and the urban landscape, the plan relates to the open landscape with its “variegated, multiple and differential scenic formations of great value. Landscapes that speak to us of a diverse heritage”.

Better than anything else, the landscapes of forests and agriculture represent the heritage of Israel's settlement and renewed culture. The challenge posed by NOP 35 to nurture and conserve these landscapes, is an important step towards achieving its aims.

Many studies have found vegetation, particularly trees, to be major contributors to the environment, the quality of life, energy conservation and the reduction of greenhouse gases, as well as raising the quality of built-up and open spaces. Israel's diverse woodlands have over the years become a symbol of the national landscape and an expression of culture and quality of life.

The discussion stimulated by NOP 22 about forests and their scenic, ecological and social significance has been deepened in this document. The main purpose of NOP 22, however, was to identify the expanses of forestland and their development potential, and to conserve and create the infrastructure to nurture them.

Has NOP 22, since its approval, succeeded in its mission? Without a doubt.

Woodlands and afforestation occupy a central place in the planning discourse and are represented in the formal, organized statutory layer of Israel's planning mosaic. Forestland's potential has received the protection of proper care along with the requisite flexibility that it deserves.

NOP 22 serves as a balancing and moderating factor against uncontrolled processes of development, especially against land-greedy suburbanization. At the same time, the mechanisms of flexibility written into NOP 22 enable limited, local development consistent with the national planning principles of responding to changing needs.

Israel's planning system will continue to regard NOP 22 as an important plan to conserve open spaces and the assets of nature and landscape. Just as land is required for additional building and development to meet the needs of a growing population, developing society and expanding economy, so it is proper to continue strengthening, nurturing and indeed extending leisure and recreation areas and green lungs, including forestland and natural woodland.

They are no less important than built-up areas, infrastructures and development; both are required for Israel's residents to enjoy a high quality of life.

Shamai Assif, Architect
Director, Planning Administration
Ministry of the Interior

¹ National level master plans are known as national outline plans, hereafter NOP.

Preface

NOP 22, the National Outline Plan for Forests and Afforestation, was prepared over a five-year period, 1990-95. In November 1995, it was approved by the government of Israel, thereby joining the system of national outline plans shaping the character of the state. NOP 22 adds a vital aspect to national planning by relating to increasing the quality of open lands and nurturing the country's resources.

The size of the areas falling under NOP 22 is 1.62 million dunams or 7.4% of the total area of the state (14.6% of the area if we discount the region south of Beersheba). The plan classifies and delineates forest and afforestation formations, guiding their preservation, cultivation and integration into the overall planning system. The areas for future forests and afforestation were selected with care, in recognition of each area's characteristics and their benefits to the public, and out of great concern for the increasingly dwindling open spaces due to development pressures. The plan lays the foundation for the organization of built-up and open spaces in the heart of the country, in the most congested, saturated region, by stipulating forest areas meant primarily to benefit the densely-populated center of the country: planting the banks of streams running down from the hills to the coast, sending green fingers into the central cities, developing sandy coastal parks, and afforesting a hilly axis on the slopes to the east. This has become the accepted guideline in national planning and today is integrated into the body of national plans.

In the time that has passed since the government's approval of NOP 22, it has had a strong impact on the field of planning and development. The plan has been assimilated by all national and district outline plans, including the *Integrated National Outline Plan for Building, Development and Conservation* - NOP 35, and its influence is felt down to the level of local planning committees.

NOP 22 is hereby presented to the reader in a new format, with a review of the effect of the plan on the field of planning and on countrywide work. Special attention is paid to local plans deriving from NOP 22 and to the amendments to the instructions of the plan and the diagrams since its approval.

Pinchas Kahana
Director
Forests and Parks Planning Division
KKL-JNF

Background to the Preparation of the National Outline Plan for Forests and Afforestation – NOP 22

At the end of 1976 the National Planning and Building Council called for the drafting of a national master plan for forests and afforestation. At that time, more than 20 years ago, the goals of the plan already rested on basic principles that are still valid and relevant today. The Council sought to set aside existing and additional forestland in such a way as to ensure the quality of the environment for the welfare of the population of that time and that projected for the year 2000. The plan was to define a variety of functions for forests –providing scenic beauty, allowing for extensive and intensive recreation, and providing for future settlement reserves. Council directives also emphasized the importance of forests for protecting natural assets, scenery and historical heritage. In addition, they stressed that cooperation was required between the various parties concerned. In 1977 the Minister of the Interior imposed the task of drafting the plan on the Afforestation Division of KKL-JNF's Land Development Authority, the Ministry's Planning Authority, and the Israel Lands Administration.

The first version was drawn up in 1980 and submitted to the National Council. It was discussed in subcommittee and reached the stage of hearing comments from district committees. It, however, met with much opposition and was shelved; from 1985, it was no longer discussed by the planning institutions.

The plan's second version was introduced at the start of 1991. Circumstances had changed: in view of the sizable immigration that began in 1989 from the former Soviet Union there was a growing demand for land allocations. This again highlighted the need to build into planning a proper definition of and protection for Israel's forest land. As a result, the drafts were resubmitted to the National Planning and Building Council, which instructed that they be reworked. Apart from that instruction, all the processes of planning and approval in fact started afresh.

The formulated goals of the new plan were not very different from the 1976 version. Nevertheless, there was an evident need to draft a totally different program in spirit and character. The 10 years between the two versions had brought far-reaching change to Israel's quality of life and to the environment. In the 1980s, there had not yet been talk of Israel's surging population density and the need for land. High-rise buildings were few and there was growing demand for detached homes with gardens. Along with the wave of immigration, these processes made the shortage of land resources a tangible danger ("Master plan for Israel for the year 2000", Adam Mazor [ed.], 1993).

This was illustrated by two large national master plans at the start of the 1990s: NOP 31 – for the first time established the principle of concentrating on existing infrastructures and settlements and preventing the establishment of new ones; the master plan for the 2000s – formulated the principles and rationale concerning the scarcity of Israel's land resources and the vital need to protect them.

Thus, the planning rationale behind NOP 22 in its new form was maximum protection for forests and woodlands that are a scarce, valuable and dwindling resource under constant threat.

Against this background, the plan in its new version set itself an overall quantitative goal: to conserve as large as possible an area of the various forestlands and natural woodlands.

To achieve this goal, the plan embarked simultaneously on two courses of action: one – to clearly formulate the overall goals and properly explain them to the bodies and authorities that had been involved in drawing up the plan, and two – to itemize in fine detail the areas slated for forestry.

On 3 August 1993 the plan was submitted to the National Planning and Building Council. It was approved in principle and transferred for comments to the district planning committees. Their comments, as well as the comments and remarks of government ministries, local authorities and bodies dealing with open spaces were discussed for two-and-a-half years by the plan's steering committee. On 7 February 1995 the plan was resubmitted to the National Planning and Building Council and in November of that year it was approved by the government, promulgated as law, and became an integral part of Israel's macro-planning.

National Master Plan for Forests and Afforestation Update NOP 22

On the 19th anniversary of the approval of NOP 22
and amid intensive work on its derivative local plans,
the policy documents have been subjected to review.
The results are presented here – NOP 22 in a new, updated form.
Pinchas Kahana conducted the plan's update.

Assisting in its writing and adding valuable comments were:
Dr. Zvika Avni, Anat Gold, Dr. Omri Boneh, Israel Tauber, Nina Amir, Moshe Shaller,
Hannah Jaffe, Ilan Be'eri, Dr. Yagil Osem, Prof. Avi Perevolotzky and Dr. Yossi Leshem.
Their help is gratefully acknowledged.

*In memory of David Nahmias,
Director of JNF-KKL's Land Development Authority
who guided and led the preparation of the
National Master Plan for Forests and Afforestation*

Document Structure

The policy document of NOP 22 was promulgated in 1999 with explanations, summaries and comments. The present document expands on, and updates, the previous one, presenting NOP 22 in a new, current form.

It reviews the impact of NOP 22 on planning and development trends in Israel, and the work of KKL-JNF's Planning Division with reference to, and ensuing from, the plan.

The document consists of four main parts:

Part I – Introduction, historical background: a review of Israel's forest development, forests in Jewish sources and the cultural context, related legislation and a brief outline of forestry policy.

Part II – Conceptual Framework, the topics that shaped NOP 22, such as ecology, recreation and tourism, urban forests, community forests, economic benefits, sustainable forest management (SFM) and afforestation in Israel.

Part III – NOP 22, direct explanations of the plan, its goals, the methodology used in preparing the plan, and summaries of national forest areas.

Part IV – NOP 22 in the national planning field, the concepts behind the plan's national distribution, its relation to open spaces and a description of designated forestland, its impact on national and regional planning systems, the preparation of local plans for NOP 22, and the main monitoring and control aspects in the decade since its drafting.

Appendix

Appendix 1 – Instructions of NOP 22

Part I
Introduction





Historical Review

The natural conditions of the land of Israel, especially its Mediterranean sections, are conducive to forest development. The Mediterranean regions and desert frontiers were covered by forests prior to the country's settlement. Although the composition, nature and image of the early forests remain unknown, they may well have been similar to the natural forests returning to life in the country: an analysis of ancient granular pollen and dendroarcheological findings reveals a good deal of similarity in the composition of the tree populations then and now.

Forests in the Bible

Forests and forest trees are interwoven in Israel's landscapes. The prevalence of forests in the land of Israel finds expression in numerous biblical passages and the dozens of forest species described – pine, cedar, cypress, acacia, oak, pistachia etc. – although it is uncertain whether the names refer to the same trees then and now. The Bible also mentions local forests – the Carmel, Ephraim, Negev, Lebanon, and *Hereth* – denoting their distribution and identification with a specific locality. In addition, settlements are often denoted by forests or trees: Kiryat Ye'arim, Har Ye'arim, Emek HaEla, Alonei Mamre etc. In the Targum, the Sharon Plain was referred to as "Darimus", i.e., forest; in fact, the Sharon is often described as forested (Josephus, Crusader writings and so forth).

Population growth and the demand for farmland were responsible for clearing forests far back into antiquity: "If thou be a great people, get thee up to the forest, and cut down for thyself there..." (Joshua 17:15) Apparently, in the periods that farming flourished, it was at the expense of forestland and when communities and agriculture retreated, forests returned to the cultivated areas. In the words of Isaiah: "In that day shall his strong cities be as the forsaken places, which were forsaken from before the children of Israel, after the manner of woods and lofty forests; and it shall be a desolation (Isaiah 17:9).

Forests and trees are often presented in the Bible as a symbol of the lofty and exalted: "grow like a cedar in Lebanon" (Psalms 92:13); shall all the trees of the wood sing for joy (Psalms 96:12); and in the prophecies of comfort, as a symbol of settlement and rebirth: "I will

plant in the wilderness the cedar... I will set in the desert the cypress", (Isaiah 41:19). Abundant metaphors are bound up with forest trees, such as Jotham's phrase in Judges (8:9): "The trees went forth on a time to anoint a king over them" and, as in the words of the Midrash: "When Solomon introduced the cabinet into the house of study, all the trees flourished, and the cedar produced fruit, for it is said 'planted in the House of the Lord,' in the courts of our Lord shall they flourish, and they increasingly gave fruit from which there was much income for the young priests." Forests sheltered animals – "as a lion in the forest," (Jeremiah 12:8) "all the beasts of the forest," (Psalms 104:20) and were often mentioned as a site of conflagration – "As the fire that burneth the forest (Psalms 83:15).

Forests played an important role in the economy of the land of Israel and its surroundings: King Solomon gave "twenty Galilee towns" to Hiram, King of Tyre, in exchange for cedars and cypresses... the main uses of trees were construction and, apparently, then too there was a management regime for planting and forest maintenance. King David appointed an overseer for "the olive-trees and the sycamore-trees that were in the Lowland" (1 Chronicles 27:28). In the building of the Tabernacle, royal palaces and the Temple, trees were crucial construction material: "And he built the walls of the house within with boards of cedar; from the floor of the house unto the joists of the ceiling, he covered them on the inside with wood; and he covered the floor of the house with boards of cypress (1 Kings 6:15).

Second Temple to the End of the Byzantine Period

As the country's population grew, demand for farmland grew and forest land shrank. It appears that there were forests and woodlands in the uncultivated areas frequently mentioned in the sources. Many parts of the country were characterized by the trees growing there. "A sign of mountains is milin [Cyprus Oak], a sign of valleys is palm trees, a sign of rivers is cane, and a sign of the plains is Sycamore trees" (Tosephta Shviit:87:6) and "anyone not growing sycamores – Upper Galilee, anyone growing sycamores – Lower Galilee." The raising of fruitless trees is mentioned as necessary for "fences and beams," that is, for hedges or wood production. The sycamore was an important building tree and special

pruning methods were developed to cultivate long straight beams. There was discussion of the comparative qualities of different trees, for instance – the sycamore versus the cedar. In wartime, forests were damaged and cut down to construct bulwarks around besieged towns, light fires and flush out people hiding in the woods (Josephus, *The Wars of the Jews* 5,6,2,7,6,5). At such times, the protection of forests diminished along with their proportion of the country's landscape.

Forests under the Arab Conquest

For more than a millennium, from the start of the Arab conquest to the end of the 20th century, there the country's landscapes and forests underwent numerous transformations. The sources contain few scenic descriptions and these are generally limited to the vicinity of roads and settlements. Presumably, the Arab conquest with its shepherds and grazing flocks were not beneficial to forests. The dominant form of vegetation in this period was degraded scrubland, low, truncated trees, thickets and brushwood. Limited groves developed only at sacred sites where trees were preserved. At the same time, however, in some locations, more extensive forests were apparently preserved, such as the forest of Tabor oaks around Nazareth-Tabor and at Alonim-Shfaram.

Forests at the End of the Ottoman Period

From the abundant literary sources, travel books and diaries of visitors to the land of Israel in the 19th century, data may be gleaned on the distribution of the country's woodlands in this period. Few travelers, however, described the surroundings in detail or accurately, dwelling mainly on areas near roads or the immediate vicinity. Travel book descriptions, especially the diary of the Reverend Henry Baker Tristram from 1863-64 and his comments on forests, present a picture of widespread vegetation in the country. (Note that Tristram's journey did not include Upper Galilee and the Sharon, so that those forests are not in his descriptions.)

The dominant vegetative formation was scrubland, stunted, degraded brushwood thickets. Forest formations appeared less extensively. Tristram described the vegetation at several points on his journey: around the Kziv Stream, as clad in dense tangled thickets; the Tabor, as covered by woodlands in the northern part and, in the southern part, by a thin veil of shrubby trees, mostly oak; the road from Jerusalem through Kiryat Anavim to the lowlands is described as donning small oak, arbutus and various shrubs; on the Carmel, most of the area is covered by thickets of small shrubbery and at the top, by a forest of oak. Along the Jordan River, too, and Ein



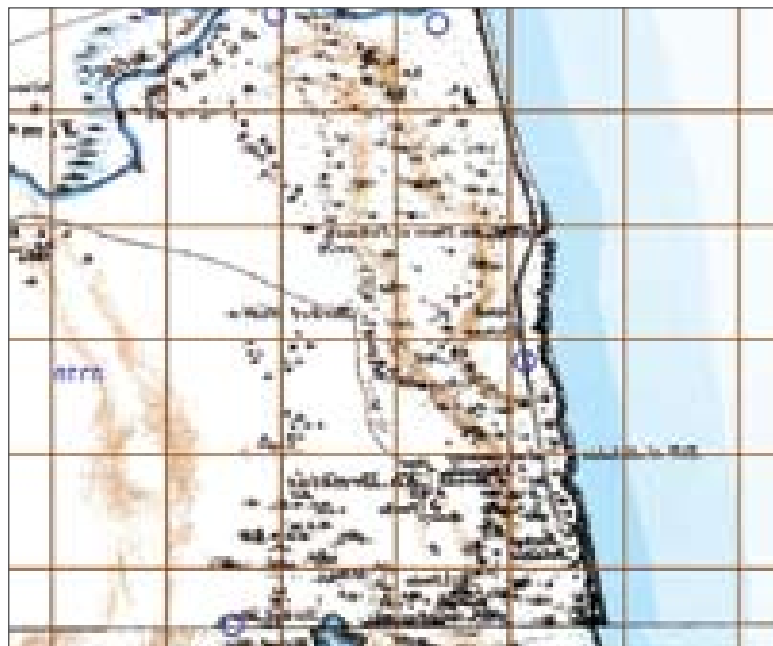
Forest and woodland remnants around Mt. Gerizim, 19th century
(from: *Domestic Life in Palestine*, Mary Eliza Rogers)



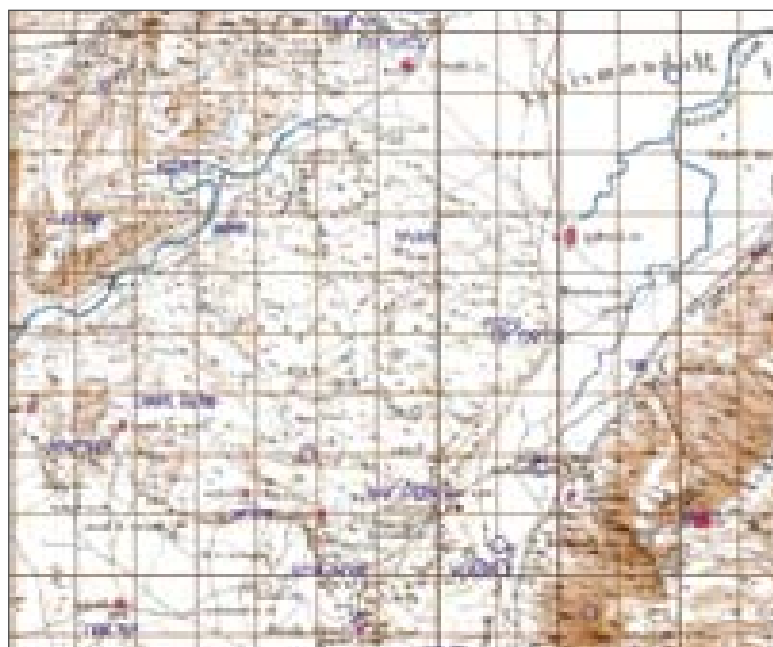
Olive grove, mid-19th century
(from: *Domestic Life in Palestine*, Mary Eliza Rogers)

Gedi, developed vegetation is described of tamarisks, Ziziphus and acacias. Tristram compared the two banks of the Jordan: while the Gilead was covered in woodlands and looked fresh and green, the groves and woodland on the west were despoiled and degraded.

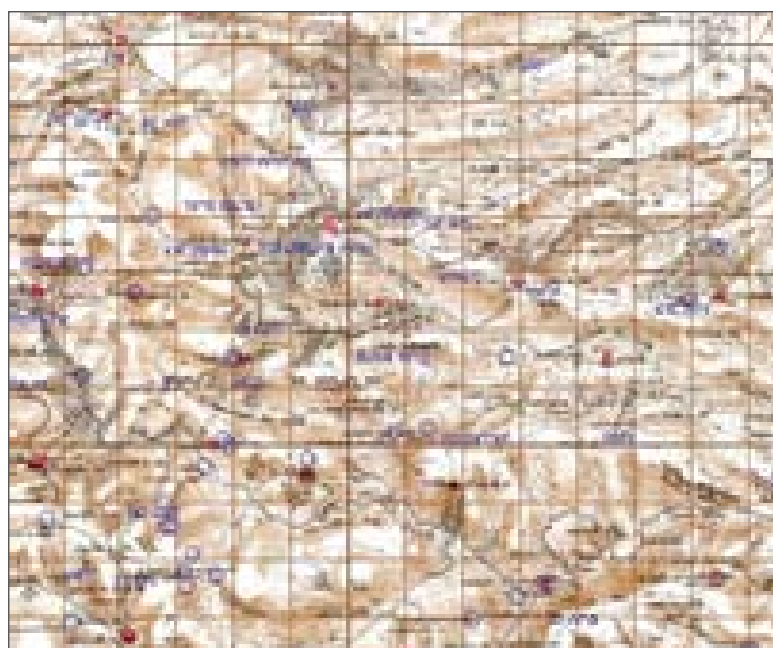
The most reliable source of woodland assessments in the land of Israel at the end of the 19th century is the detailed mapping conducted by the Palestine Exploration Fund in 1871-78. The legends describe different types of vegetation: forest, thicket and pine forest. The textual survey is highly detailed with descriptions of local vegetative formations, forests, groves and degraded vegetation, and references to the state of the vegetative cover in different parts of the country. This mapping by the British Fund serves as a starting point for research of the country: it was the first reliable mapping done of the country and the only cartographic source for an appraisal of the character and distribution of forests in the land of Israel during this period. The picture yielded by the mapping is of the forests in different parts of the country: Upper Galilee was mostly covered by natural woodlands, apart from farming areas. Large areas in eastern Galilee were described as bare – and remain bare to this day due to soil and rock conditions. Lower Galilee, too, had large concentrations of woodland, the large oak forest on the slopes of Shfaram being especially noteworthy. The Carmel is described as mostly covered by woodland and was virtually uncultivated. In Samaria, large patches of woodland are described in the northern part and western foothills. On the



Map of HaSharon Park and Hadera forests
Palestine Exploration Fund



Map of Alonim forests around Tivon
Palestine Exploration Fund



Map of Judean Hills and Jerusalem forests
Palestine Exploration Fund



Tabor oak forest
park on the Menashe
Range
Photo: SPNI Open
Landscape Institute

coastal plain, there were several large forest blocks of Tabor oak, from Caesarea to the Yarkon Stream. In Judea, a woodland was described that extended from the national watershed to the western foothills. In the Jordan Valley and the streams descending to it and to the Dead Sea, quite extensive areas were described as covered in woodland.

In addition to the British maps, which are a highly reliable source, there are numerous descriptions by travelers of the landscape and surroundings, including forests and woodlands. Most of these are consistent with the cartographic documentation of the Palestine Exploration Fund.

The picture of natural woodlands at the end of the 19th century, which was the close of a quite stable period in the land of Israel, shows them having a much greater extent than their present development. Population needs – felling, pasture – and vegetative development were presumably fairly balanced. This balance held until the First World War when forests were damaged and forest land diminished. However, despite their extent, forests, in many places, were apparently degraded, the predominant formation being scrub. The main mapping unit to appear was scrub. In Conder's summary of the country's forests (1878), he notes particularly that: the wild vegetation in Palestine comprises shrubbery and a few isolated trees. Galilee contains many large trees and in Judea, virtually none were found apart from groves of oak, pistachia, carob and sycamore, which had been consecrated and preserved. He describes the woodland formation as a dense cover of thickets, composed of dense, dark mastic trees, short oaks, laurel, crab apple and other shrubs, scattered over the mountains and creating an impassable wood. The forests he saw were, as noted, mostly in the north of the country: "an open oak forest on the lower hills south of the Carmel and north of the Sharon, comprising the remains of a large forest described by Strabo, which he deemed one of the lovelier places in the Holy Land". The forest limits described were the national watershed. The eastern slopes were

bare and dry. Conder also described the attitude of the inhabitants to forests: "in the absence of protective laws, the farmers cut down and burnt the trees to the roots, to make coal for heating/fuel".

A comparison of the forest distribution in the maps of the Palestine Exploration Fund and the maps made during and after World War I (the German map, an update of the British map and numerous aerial photographs from the war years) shows considerable shrinkage of the woodlands in most parts of the country. The later maps were made in haste during the war and thus do not provide an accurate forest picture in this period. As a rule, it may be said that Tabor oaks virtually vanished from the coastal plain and center of the country (a forest often mentioned in the writings of travelers from Napoleon to the start of the 20th century when it was totally destroyed). In the rest of the country, the forest area was greatly diminished except for on the Carmel and the Alonim-Shfaram Hills, where extensive woodland apparently remained.

There were many causes for the sharp reduction in forestland in this period. Due to immigration from neighboring lands, the Arab and Beduin populations grew significantly and they lived off herding and various wood uses. This increased the pressure on the land and the clearing of forests. Meanwhile, technical knowhow and forest access for felling improved. Wood was also used for war purposes, for building and fuel. The Ottoman Turks used forced labor to fell trees for the tracks of the Hijaz railway and locomotive fuel. A special branch of the railway line was built from Tul Karm to Kanir (Regavim, today), 15 km. in length, which transported timber to the sawmill. This activity put an end to the Sharon forests, the Nazareth-Tabor forests and others.

All these along with the lack of forest protection on the part of the authorities and the failure to renew and replant, reduced the area of forestland within a very short period of time.



At the end of the 19th century, the Ottoman regime instituted regulations to protect forests. But these were apparently ineffective because the enforcing authorities tended to issue permits for felling in exchange for bribes, then an accepted practice. The regime made several attempts at planting on the eve of WWI, mainly in order to stabilize drifting sands, though without success. The end of the period was marked by massive forest felling.

Forestry at the Start of the Jewish Settlement Period

In parallel with the reduction in forestland in the Ottoman period, forestry activity was initiated, mainly by the new settlers of the land of Israel. In 1883, eucalyptus seeds were brought in for the first time and planted at Mikve Yisrael by Karl Netter. Actual forestry work may be seen in the plantings executed to drain marshlands in Petah Tikva and Hadera in the final decade of the 19th century. The eucalyptus forest south of Hadera had its beginnings in those plantings and in the replacement of existing species. On the Carmel and the approaches to Haifa, extensive areas were planted by the German Templers. Plantings of Aleppo (Jerusalem) and stone pine transformed the Carmel's landscape, and remain to this day. At the Sejera collective farm, settlers nurtured the nearby oak forests that spread over thousands of dunams in 1901-13, noting, in their memoirs, activities of tending and thinning. Forests were a source of coal and building materials until they were cut down in WWI.

Forests and Forestry under the British Mandate

The British, early on in their mandate over Palestine, embarked on forest protection measures. This approach drew on a long tradition of planting and rehabilitating woodlands in England (from the 13th century) and in the British colonies. Apparently, too, the regime nurtured a special concern for the historic landscapes of the Holy Land and a desire to restore the image of the land of the Bible. In addition, there was an economic aspect: the lack of raw materials in the country was a source of anxiety for the authorities.

The earliest forestry activities were carried out in drifting sands in an attempt to stabilize them and prevent their encroachment on farmland. The 1922 Sand Drifts Ordinance empowered the authorities to appropriate sandy areas and recruit locals to plant trees and shrubs to stabilize them. Thousands of dunams were planted in this way in the sands of Acre, Caesarea, Nabi Rubin and Gaza. These tracts were declared protected forestland.

Under the Forestry Ordinance, 430 forests were declared nature reserves during the Mandate, totaling some 830,000 dunams in area.

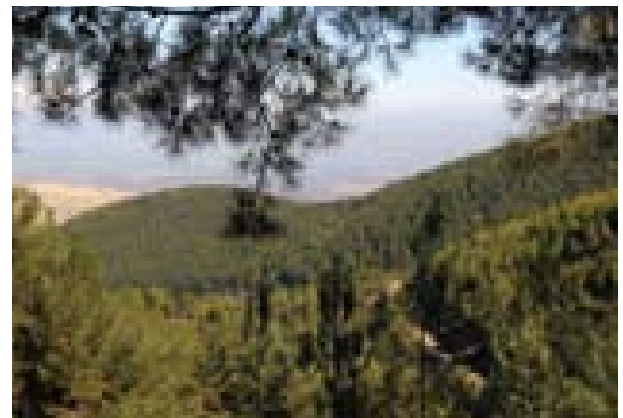
Alongside the legislative and formal declarations protecting forestland, the regime began actual forestry activities as early as 1918. Tree saplings and seeds were imported and planted in sandy and rocky soil. Inhabitants were encouraged to plant trees with seedlings distributed by the regime, and cultivated land was exempt from taxation. Tree nurseries were established to supply saplings for forestry work, seedlings were distributed to public institutions, and public information campaigns were held. The first forests planted were on the Carmel, around Nazareth, in Nablus, in Jerusalem and along the road leading up to Jerusalem.

Until 1935, forestry work was under the jurisdiction of the Ministry of Agriculture. Thereafter, the Forestry Service was an independent department. Forestry policy was formulated in the 1930s, its chief goals being to prevent erosion, stabilize drifting sands, yield wood and other forest products, preserve the remaining forests and nurture the natural plant life.

The Mandate government planted some 41,000 dunams countrywide – on the Carmel, around Safed, in Nazareth, at Shaar HaGai, Um Tsafa, along the Jordan River, in sandy areas etc.

The Work of KKL-JNF

At the Sixth Zionist Congress (1903), the Land-of-Israel Committee announced the establishment of an Olive Tree Fund – to plant olives in lands purchased by Keren Kayemeth LeIsrael-Jewish National Fund. The future fruit was to serve as a source of income for national needs. However, after founding father Theodor Herzl passed away, a decision was taken to name the olive groves to be planted after him. The plantings began in 1911 around Ben Shemen, but succumbed to locusts and the ills of the WWI. Following the Balfour Declaration on the establishment of a Jewish national home in Palestine, KKL-JNF stepped up its land purchases and development, including its forestry work. The goals defined were to expand forests in a bare and desolate land, and to “stake out” areas where land had been



Planted forest
Photo: Avi Hirshfeld, KKL-JNF Photo Archive



purchased. The first forests were planted in the 1920s in Ben Shemen (continuing on from the previous work), in Hula, Kiryat Anavim, Be'er Tuvia, the sands of Rishon LeZion, Merhavia, Kinneret and Deganya. Some of the forests were damaged during the Arab Revolt (1936-39). Forests, in this period, were also planted by PICA (Palestine Jewish Colonization Association) and private institutions and individuals. By the establishment of the State of Israel (1948), 80,000 dunams had been planted around the country: about half by the Mandate government, some 20,000 by KKL-JNF, some 12,000 by PICA and some 6,000, by private bodies.

Forests and Forestry in the State of Israel

The functions of the Mandate Forestry Service devolved onto the Forestry Department of the Ministry of Agriculture of the State of Israel. The Department continued to care for forests and forest reserves according to the 1926 Forestry Ordinance. In time, some of the forest reserves were rezoned for other uses, including nature reserves, national parks, towns and army bases. Forests were planted in a considerable portion of these. In 1959, a decision was taken to transfer the responsibility for forestry and forest care from the Ministry of Agriculture to KKL-JNF. On the basis of a Covenant signed between the government and KKL-JNF in 1961, regulating land management and preservation, a Land Development Authority was created at KKL-JNF with a Forestry Division responsible for existing forests, forest reserves and continued forestry

activity. Responsibility for the Forestry Ordinance still abided with the Minister of Agriculture, through KKL-JNF's Land Development Authority, and the Ministry continued to be in charge of forestry research, which was concentrated at the Ilanot research stations.

From 1948, the pace of planting accelerated: instead of hundreds of dunams planted annually, from 1950 on, 10 thousand to 20 thousand dunams were planted annually. The goals in these years were the afforestation of most of the areas unsuitable for farmland, the creation of a forest belt against wind and dust in cultivated areas in the Negev, and the protection of the soil from erosion. Nonetheless, it appears that the main goal of the prodigious forestry work performed in those years was to help create jobs for the mass of immigrants arriving on Israel's shores in this period.

In the 1950s, the foundations were laid for the country's main planted forests, those around Jerusalem and the Judean Hills, in the Adullam region, the Judean lowlands, the Galilee and on the Gilboa.

Until statehood, some 80,000 dunams were planted. In 1950-60, some 190,000 dunams were planted and in 1960-70, some 210,000. From the 1970s, the pace slowed down along with the decrease in potential planting areas and the need to allocate resources for existing forests.

In 1970-80, some 140,000 dunams were planted. In 1980-90, some 150,000 dunams were planted. In 1990-98, some 160,000 dunams were planted.

From 1998 to 2007, some 160,000 dunams were planted, 50% of which involved the renewal of forests planted previously.

Ben Shemen Forest, one of the first planted in the country, in the 1920s
Photo: Avi Hayoun, KKL

2.

Forestry Legislation in Israel

The first laws and regulations regarding forests appear in the Talmud and presumably mark the earliest legislation on the topic. Forest regulations were instituted during the Second Temple period and perhaps even earlier— it was permissible for small cattle to be raised in forests. Indeed, regulations on forest grazing accompanied Joshua's entry into the Land of Israel (and centuries

later were interpreted by Rashi as grazing being permissible not only in forests in the public domain but also in private forests). The Jerusalem Talmud interpreted the passage as permitting grazing by nomadic herds moving from one land to another. Still, a level of forest protection was stipulated: the grazing of small cattle was permitted only in mature forests that would not be damaged by it.



Forest pasture
KKL-JNF Photo Archive

During the Arab conquest, there was no protection of land that had no owners, including forests. This was reflected in the Ottoman land laws based on Islamic law, which dealt with woodlands and forests. Land in the public domain (*matruka*) containing “woodlands that, since ancient times, had been apportioned to the villagers or a town of wood hewers, could be used only by them, for their own purposes, and was not taxed, but should it have been used for commercial purposes – a tithe should be paid; whereas for land without owners outside of the village (*mawat*), the law stated: trees that grow wild on hills and belong to no one... are free for all, trees that grow wild on hills – everyone may hew beams and timber of them, and they may be purchased by hewing alone.

The start of modern legislation on forests began in the early years of the British Mandate over Palestine. In 1922, a Sand Erosion Ordinance was promulgated empowering the authorities to expropriate sandy lands, plant stabilizing trees and shrubs and enlist local residents to do the work. In this manner, thousands of dunams were planted in the sands of Acre, Caesarea, Nebi Rubin and Gaza. These areas were declared protected forests. In 1920, the Woods and Forest Ordinance was promulgated, to regulate the marking and registration of state forests. In 1926, the Forestry Ordinance was promulgated (based on the English forestry law of 1200, enacted under King John, signatory to the Magna Carta; appendices and further details were added in 1937 and 1943).

By force of the Forestry Ordinance, 430 forest reserves were declared in the Mandatory period on a total area of 830,000 dunams. Of these, some 80,000 dunams were defined as closed forest areas. Most of these lands were designated in 1926-28; at that time 166 forest reserves were declared on 446,000 dunams. The pace of declaring reserves then slowed down. During the Arab Revolt, 1936-39, the work of delimiting and declaring reserves virtually ground to a halt. In the war years, 183 reserves were declared on a total area of 150,000 dunams. The last reserves were declared in the final days of the British Mandate, in the spring of 1948.

The sole forest legislation in the State of Israel is based on the Forestry Ordinance of the British Mandate of 1926. The Forestry Ordinance was aimed at protecting forests and creating and managing special sites for forests. On its basis, rocky lands not in private ownership were surveyed and delimited, and declared “special forest areas.” The Ordinance defines an afforestation area, stipulates regulations, prohibitions and permissions of forest use and the use of forest products, sets safeguards and fines, and lists protected trees, including outside of the forest boundaries. The Ordinance stipulates which body is to execute the legislation and defines its powers and obligations for the purpose of execution. The Ordinance, and the amendments and regulations that were added to it under the Mandate and since statehood serve as the basis of forestry policy in Israel. The Ordinance makes it possible to declare lands on which forests grow or which are intended for forest growth “special areas for forests or forest reserves,” and it distinguishes between closed forest areas, where no felling or grazing activity is permitted, and open forest areas, where forest products may be utilized – against a permit issued by the Forest Clerk. The Ordinance protects a series of trees and shrubs, both inside and outside of forests, from uprooting and harm. The regulations based on the Forestry Ordinance define the types of permits required and the rate of taxation to be levied for extracting products from a forest.

To some extent, the planning system for forests, parks and nature reserves is based on a program by Arieh Sharon – Physical Planning in Israel. This program identified particularly lovely areas of superior attributes and scenery and designated them as parks and green lungs on the national level. NOP 8 – the National Outline Plan for Nature Reserves, National Parks and Scenic Reserves – defines these areas and many others as nature reserves, scenic reserves and national parks. Many forest and woodland areas in the Galilee, the Carmel and Judea were included in this framework. NOP 22 completes the process, lending statutory force to Israel’s forest and woodland areas and to other open spaces for which no other plan offers a framework of preservation and cultivation.

3.

The Character of Forests in Israel

The country's forests divide into two main categories:

- » Natural woodlands, subdivided by habitat and plant community.
- » Planted forests, differentiated from one another by type of planting and tree species.

Natural Woodlands

The natural woodlands appear chiefly in Mediterranean regions where the average precipitation is at least 350 mm./year. The dominant formation is scrub. Forest formations developed only in areas that were protected from human harm.

There are four main types of natural forests:

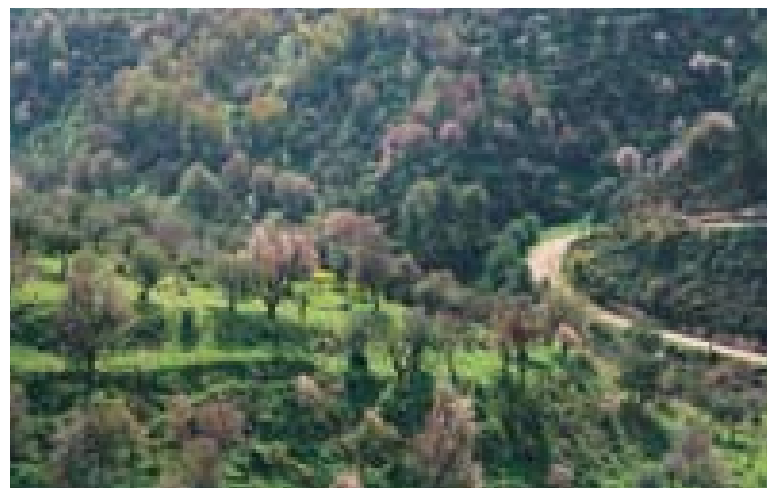
1. Oak – Terebinth Community

This is the most common community in Israel, found in the Mediterranean hills with a yearly precipitation of at least 400 mm. In areas of lower precipitation, it rarely appears. It is found mainly on northern slopes that preserve excess moisture.

The vegetative formation is that of scrub, often tangled and closed; in a few places, which were protected and tended, forest formations developed.

The oak-terebinth community prevails mostly on terra rosa soil, which weathers from cenomanian-turonian hard limestone and dolomite although it also appears on dark rendzina soil, which develops on hard limestone.

The community has several variants. One typical variant appears in Lower Galilee, on the Carmel, in Samaria and Judea, along with the arbutus, officinal styrax, broad-leaved phillyrea, Palestine buckthorn, numerous shrubs, creepers and grasses. In Upper Galilee, in moist habitats where precipitation reaches 700-1000 mm./year, a mesophytic variant develops, accompanied by the boissier oak, the true laurel/sweet bay, and the Syrian maple. A xerophytic variant appears at the edge of the distribution of the Judean community, along with, mainly, the carob, broad-leaved phillyrea and mastic/lentisk shrubs.



Natural scrub mixed with forest
Photo: Avi Hirshfeld, KKL-JNF Photo Archive



Natural oak scrub, pruned and cultivated
KKL-JNF Photo Archive



Oak saplings at British Park, Judean Lowlands
Photo: SPNI Open Landscape Institute

2. Aleppo (Jerusalem) Pine Community

The Aleppo pine community is found in mountainous Mediterranean regions with an average precipitation of at least 400 mm./year, in light and dark rendzina soil weathering from limestone and marl. The forest formation is sparse, dominated by pines of varying ages. Its distribution area is limited today, apparently due to considerable damage caused by: its development on rendzina soil that is attractive for reclamation and cultivation, and the demand for pine wood, which develops straight timber, suitable for construction. Moreover, pines do not resprout after fire. The Aleppo pine community is accompanied by the common oak, arbutus, Palestine buckthorn, mastic tree, shrubs and creepers.

Natural forests of Aleppo pine today may be found in limited areas in Judea (near Beit Meir), on the Carmel, in Upper Galilee (near Beit Jann), and in the western Galilee (near Rosh HaNikra).

3. Tabor Oak Community

The Tabor oak appears in the Mediterranean region, usually at an altitude of up to 500 m. with an average precipitation of 500-600 mm./year. The vegetation formation is that of an open forest park. This tree community develops on various soils and rocks, though chiefly on dark and light rendzina on hard limestone and on terra rosa, red loam and "karkur" (calcareous sandstone) soils. The community subdivides into several variants; the main variant is the Tabor oak – officinal styrax, which appears in Lower Galilee. The Tabor oak forests of Alonim-Shfaram-Tivon deserve particular mention, appearing today as a park with grass species. This type of forest apparently developed due to human activity of felling, grazing and farming. The Tabor oak appears also in eastern Galilee, accompanied by the mastic and jujube trees. The coastal community of Tabor oak developed on red loam and karkur, and only a few vestiges are left of it in the Sharon area.

4. Carob – Mastic Tree Community

The distribution area of this community, at an altitude of up to 400 meters, is on the slopes to the west of Israel's central mountain ridge, from Upper Galilee to Mt. Hebron. For the most part, it is found in the form of a park or open woodland. The community develops in a variety of soils: light and dark rendzina, sands, red loam and karkur. The chief variant appears in western Galilee, on the Carmel and in Judea and is accompanied by the Palestine buckthorn, the spiny hawthorn and broad-leaved phillyrea. In the east, the south, and on the desert's edge, this community includes the Atlantic pistacia, the jujube and the spiny hawthorn; around Caesarea, a variant including carob and mastic shrubs extends on the sands.

Additional Communities

In addition to the above communities, a number of others deserve mention, appearing in limited areas: riverbank (or streamside) forest communities, consisting of oriental plane trees, *Fraxinus syriaca* in the north, and the Euphrates poplar and brook willow (*Salix acmophylla*); a savannah-like community with the jujube and white acacia; arid-zone colonies with the tamarisk (northern Negev) and the twisted acacia (in the Arava).



Carobs and Atlantic pistachio on slopes of British Park, Judean Lowlands
Photo: SPNI Open Landscape Institute



Tamarisk tree at Tel Najila, Shikma Streambed
Photo: SPNI Open Landscape Institute



Twisted acacia, a protected species growing in the Arava and at some spots in the Negev
KKL-JNF Photo Archive



Planted Forests

Forests were planted in the land of Israel from the start of the 20th century and are spread all over the country today, especially in the Mediterranean regions, the hilly areas, and on the edge of the desert. At the end of the 1990s, the planted area totaled 800,000 dunams. They were, on the whole, in rocky areas or gullied badlands where farming had failed, and in regions with an average precipitation of at least 200 mm/year. In the hills, planted forests consist mainly of conifers; in the northern Negev, the eucalyptus is a major component. In size, the planted forests vary from a few dozen to thousands of dunams. Large forest belts are to be found in the Galilee – around Hanita, Baram, Safed and Ahihud, around Nazareth, on the Carmel, and in the east – on the Menashe and Gilboa Mountains; in the center of the country – near Horshim, Ben Shemen-Modiim, between Tzora and Eshtaol, on the approaches to Jerusalem and in the Adullam region; in the south – around Shahariye, Ruhama, Be'eri, Lahav, Yatir and Dudai>m, north of Beersheba.

Types of Planted Forests

The predominant forest type is coniferous. Its main planted tree is pine, usually Aleppo pine, as well as Calabrian pine and cypress. These types of forest were planted in hilly Mediterranean regions and on the edge of the desert. Where precipitation is higher, Canary and stone pine are also planted, in dark terra rosa and rendzina soil. Many forests show evident regeneration of the natural vegetation, yielding mixed forests of natural scrub and conifers.

Mixed forests: These are conifer forests planted in and near natural scrub or created when scrub developed within planted forests. The result is a more spacious woodland, comprising two main layers: the tall conifers and an understory of low scrub species. This type of forest is found in the area of Goren, Um Tsafa, Shaar HaGai, Nes Harim etc.

Forest parks: These are well-spaced plantings, mostly intended as grazing land – hills planted with carobs in the Judean lowlands, planted forests of Tabor oak, jujube and Atlantic pistachio.

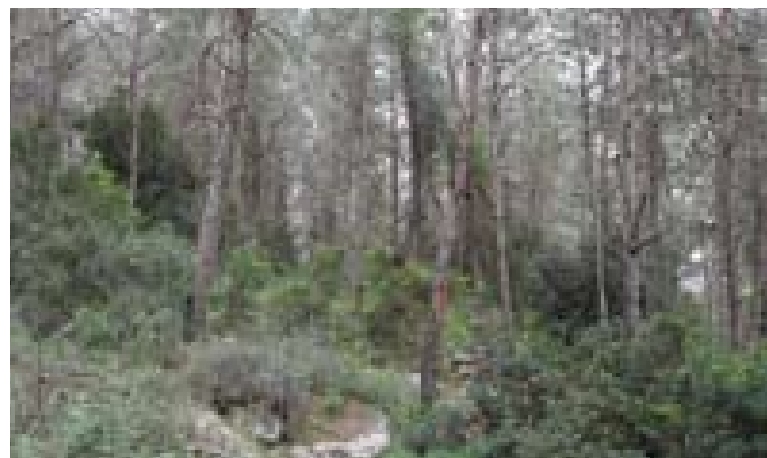
Eucalyptus forests: These were planted in the northern Negev, in loess badlands along dry streambeds as protection from soil erosion, and they create green axes in cultivated areas.

Arid-zone plantings: In areas where the average annual precipitation is 200-220 mm., spacious forests are planted to capture runoff. Notable examples are the limans as far south as Sde Boker and the tamarisk groves between Beersheba and Mitzpe Ramon.

“Bustan” plantings: Olives, almonds and carobs are interspersed in forests, mainly along rehabilitated terraces in the Galilee and in Judea, Yatir Forest and Haruvit Forest. Sycamores and vines are included in this type and developed as forests in sandy areas.



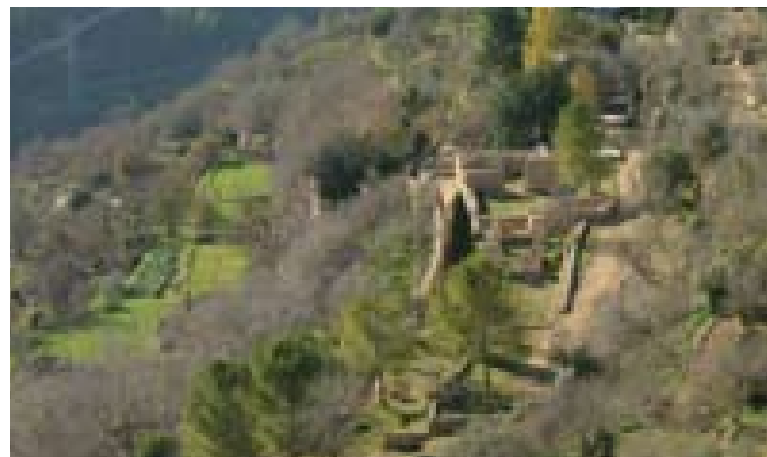
Be'eri Forest
Photo: Limor Edri, KKL-JNF



Regeneration of conifers, British Park
Photo: SPNI Open Landscape Institute



Tabor oak forest park with farmland in its midst
Photo: Albatross Aerial Photography, KKL-JNF



“Bustans” at Sataf, Jerusalem Hills
Photo: Gidi Bashan, KKL-JNF

4.

Forestry Policy – Goals, Achievements, Critique

The planting of forests in the land of Israel began towards the end of the 19th century with the start of Zionist settlement. Afforestation came to signify the restoration of the country's ancient landscapes and assets, and became symbolically bound up with the values of renewal and revival. The early planters embraced the concept along with the practical benefits of afforestation, and forestry work has not stopped since.

Forests were planted diligently and the natural scrub all over the country was restored and nurtured. The dry, bare landscape that had been dominant at the start of the 20th century gradually gave way to forests and woodlands that became an integral part of the open landscape and became part of the character of the land of Israel.

From the start, the public was actively involved in the afforestation efforts. Afforestation followed different directions and shared different aims closely connected with Zionist settlement – conquering the wilderness, providing labor and employment, and taking its place in the country's scenery. It was generally accompanied by controversy, which in one form or another continues to this day.

At the start of the 20th century, agronomist Aaron Aaronsohn strongly advocated restoring the country's forests. His reasons were ecological, listing the impact of forests on the environment, in moderating the climate and preventing erosion: "If you wish to save the valleys, protect the hills [through afforestation]." In a 1913 memo to the Ottoman authorities, he reviewed the sorry state of the woodlands in that period and warned against the widespread felling and overgrazing. He insisted that new plantings be carried out and recommended methods of acclimation, types of trees and protective legislation for forests. Only later generations were to adopt these principles and for different reasons than those put forward in the early days of afforestation; namely, to make the desert bloom, restore the country's landscapes, and create a solid bond between the land and the Jews returning to their homeland. This conception rested on the assumption that the land of Israel had been covered with forests and woodlands in the past and that the act of afforestation restored its former glory. It is an assumption disputed by researchers today. In any case, afforestation symbolized the Jewish people's restoration to their homeland and was held up as a

prominent achievement of the new Jewish settlement. David Ben-Gurion gave expression to these trends at the opening of the Second Knesset when he spoke of the need to afforest five million dunams – about a quarter of the new State of Israel: "To wrap in trees all the mountains in the country... all the hills and rocky land, sands, Negev wastes, up to Eilat, we are a beginning state repairing the ills of generations... for the people and the land of Israel." His approach had a direct impact on the scope and geographical location of afforestation. Nonetheless, the decisive factor of afforestation in early statehood was its direct contribution to providing employment for immigrant absorption. As part of these efforts, thousands of immigrants were settled in frontier areas where they worked in afforestation and land reclamation, creating land assets and infrastructure to sustain life in the region. The advantage of the work was its simplicity in professional terms and the fact that it required neither infrastructure nor capital. Many of the country's forests were created in this way – in the Jerusalem Corridor, the Judean lowlands, the western Galilee, Upper Galilee and so forth.

The character of Israel's forests was also influenced by the founding fathers who brought with them the image of European forests: thick, dense forests, including conifers. Their outlook played a considerable role in designing the conifer forests that continue to dominate the country's scenery to this day.

All these approaches and their ideological and pragmatic foundations led to large-scale planting endeavors that visibly and significantly changed the face of the country. Planted forests, particularly conifers, became an integral part of the scenery, leaving their mark on numerous sites and regions.

National Planning and its Approach to Forests and Afforestation

The foundations of Israel's general national planning were laid in 1951. Forest regions, parks and scenic reserves were all designated back then, in a conclusive work entitled *Physical Planning in Israel*. This plan did not differentiate between the aims of afforestation, nature conservation and lands of historic value, distinctions that came to the fore in subsequent national planning. However, the work served as the basis for subsequent planning. For the first time, a national framework was stipulated for the distribution of open landscapes, including forests, in several large blocks and along streambeds.



In the 1950s, the Planning Authority at the Ministry of the Interior and other bodies began to draft legislation to protect areas of natural, scenic and recreational importance, including large forest and woodland tracts. The plan encountered obstacles regarding the designation and definition of these areas – whether they were to be preserved in their natural state or reserved for public recreation and relaxation, in addition to the protection of historic and cultural sites. The conflict was exacerbated with the increase in leisure time, the growing public awareness of outdoor recreation options and the expansion of motorized travel. The preservation-development dichotomy is a familiar dilemma worldwide. The conflict is even sharper in densely-populated countries with limited land resources. These opposing trends ultimately resulted in the establishment of two separate authorities, responsible for two types of space: the Nature Reserves Authority and the National Parks Authority: the former was responsible for lands intended to be left in their natural state, with minimal intervention; the latter was responsible for areas slated for public recreation and relaxation. Some of the planted forests were included in the national parks, which were defined as recreation areas. Due to the opposition of KKL-JNF, most of its forests were excluded from these two types of land designations. (In 1998, the

two authorities merged to form the Israel Nature and National Parks Authority – INNPA.).

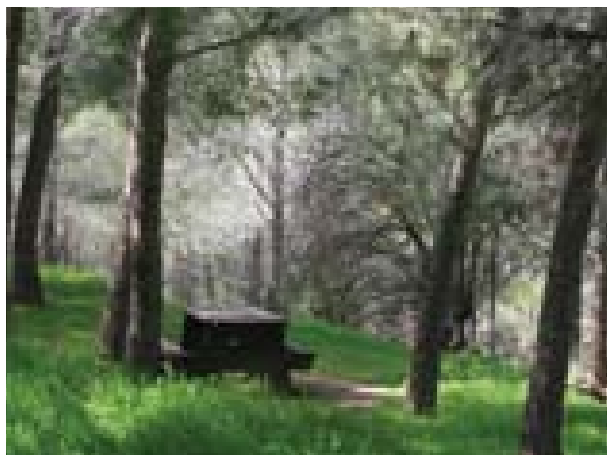
As the country's forests consolidated, their characteristics, functions and interaction with the environment drew criticism. At the end of the 1950s, controversy arose over the water consumption of planted forests and natural scrub; calls were heard to replace forests and scrubland with grasses for grazing that ostensibly consumed less water and raised the economic value of the land. However, studies conducted by the Soil Conservation Division of the Ministry of Agriculture and the Israel Water-Planning Authority showed no preference of the one over the other in land management. As for the design of the forests and their place in the scenery, criticism was leveled at the density of planting and at the limited use of species – mainly conifer and eucalyptus – which created scenically and climatically uniform forests. It subsequently transpired that the density and uniformity created a hotbed for pests and disease. The treatment of natural woodlands/scrub was minimal in comparison with the resources invested in planted forests. Widespread rehabilitation and the tending of scrub began in the 1980s. Other claims related to the competition between grazing land and densely-forested areas, which resulted in a forest policy combining pastures and forests to create multi-purpose forests.



Lookout in Ben Shemen Forest
KKL-JNF Photo Archive



Bicycle path, Menashe Park
Photo: Yaacov Skolnik, KKL-JNF



Picnic site, Aminadav Forest
Photo: Flash 90, KKL-JNF



Marked and signposted hiking trail, Ein Pik
Photo: Avi Hirshfeld, KKL-JNF



Liman in the Negev
Photo: Nira Zadok, KKL-JNF

New Afforestation Trends

In the late 1970s, the emphasis shifted to forest planning that would take into account ecological, scenic and cultural factors. Special attention was devoted to creating long-lasting forests – able to regenerate themselves, mixed conifers and scrub resistant to pests and disease. Forest plans include an environmental, ecological survey detailing natural and scenic values to be preserved in forestry activity. The surveys elaborate the expected impact of forestry activity and development on ecological services, water and other environmental resources.

In recent years, the policy of multi-purpose forests has been taking shape, combining a wide range of needs and trends for forestland and the open domain. This policy goes beyond planted forests to include the rehabilitation and regeneration of natural scrub, riverbank/streamside plantings and plantings in the sands of the coast. The national outline plan gives expression to these trends.

During this period, there was growing recognition of the role of forests as a public haven for rest and relaxation. Increased leisure time and private vehicles raised the demand for outdoor recreation opportunities, and

forests provided a suitable response. The planning of new forests takes these trends into account: several forests have been developed as open parks with the addition of rest areas, lookouts, trails/roads, camping sites, and recreation areas.

The social approach, whereby the chief purpose of forests is seen as supplying the public with outdoor leisure and recreation services, makes it necessary to study and understand the attitudes and approach of the public to forests. Forest planning and development takes these into account and the trend is to augment forest use by the entire public and all its sectors, to increase public satisfaction, and to improve the experience of forest visits.

Forest planning today includes an important component of environmental education and efforts are being made to raise the environmental consciousness of visitors and draw their attention to the value of forests.

Forest planning involves a number of alternatives to enable decision makers to choose the most beneficial option and help the public understand the implications of the various proposals.



Yatir Forest

Photo: Albatross Aerial Photography, KKL-JNF

Forestry in the Negev

Planting in the south has special importance. In 1964, the first forest was planted in semi-arid conditions, at Yatir, south of Mt. Hebron, followed by forests in the area of Lahav, Meitar, Beersheba and the western Negev. These forests have had a real impact on changing the landscape, creating green belts and patches around towns and communities.

Large parts of the world have succumbed to desertification – the loss of vibrant land, farmland and forests, to aridity. Desertification is prominent against a background of accelerated, uncontrolled development, of severe pressure for land, and global climate changes. In Israel, where some 60 per cent of the territory is arid or semi-arid, the problem can be seen in all its severity. Afforestation activities have helped halt desertification processes; it has been shown that areas on the edge of the desert, of little economic value, can be transformed into areas of high environmental value and development potential – for grazing, farming and tourism.

The gullies, loess lands and dry streambeds in the northern Negev, particularly in the basins of the Shikma and Besor streams, are susceptible to erosion and undermining, to loss of soil and farmland. Here, trees were planted with the clear intent of soil conservation, typically creating a network of forest extensions along dry streambeds between farm tracts. Along the main roads in the Negev, as far south as Sde Boker, small groves called limans were planted in areas dammed by the banks of the dry streambeds. In recent years, planting in the Negev has increased – concomitantly with its decrease in the northern and central parts of the country. This has been due to the discovery of suitable areas for planting, the great demand for land, and the recognition that forests are both necessary and highly beneficial in the south. Techniques of widely spaced planting were developed, and land was sectioned into runoff-contributing and runoff-absorbing areas. Water is collected in the latter, where the planting is carried out.

These techniques originated in ancient times (Nabatean farming). Refined agro-technically, they have managed to extend the possibility for planting forests in the south to areas of precipitation of 180 mm. and less.





Part II

Conceptual Framework



5.

The Ecological Function of Forests

The implications and importance of the ecological function of forests will exceed the here and now. The main implications concern the impact of the earth's vegetation on the composition of the atmosphere and the greenhouse effect. According to current trends, the concentration of carbon dioxide and other greenhouse gases in the atmosphere will soon double compared to the concentrations at the end of the 19th century.

This increase has far-reaching implications including global warming which will lead to a rise in the sea level and shoreline flooding. Alongside the emission of carbon dioxide and other gases, which accelerate the greenhouse effect, it is important to note the massive deforestation in our times. Deforestation is detrimental to the oxygen supply and the absorption of carbon dioxide, a function filled by forests. The conservation of existing forests worldwide and the planting of new ones have enormous ecological importance: forests emit oxygen into the atmosphere and capture carbon in their biomass. Without forests, carbon dioxide stays in the air as a greenhouse gas. Accordingly, forests contribute to conserving the desirable composition of gases in the air and mitigating the greenhouse effect. With worldwide deforestation, particularly in tropical regions, and the severe damage to forests in Europe from acid rain, every instance of additional forests or forest renewal is important. This was reflected by the Eco-Committee at the Earth Summit in 1992, which highlighted the contribution of a number of countries that adopt a forest-renewal policy, including Israel. Worldwide deforestation (particularly in tropical regions) has reached some 11 million ha/year (according to the UN World Commission on Environment and Development). In other words, forest conservation and activities of forest renewal in Israel, within the parameters of NOP 22 are the equivalent of one per cent of the annual reduction of forests worldwide. This figure is of sufficient magnitude to be considered important.

Forests function locally as buffers around industrial zones and dense built-up areas. Forests absorb and capture pollutants, reduce their effect on man and the environment, and serve as a barrier against dust and noise. Forests play a part in protecting the soil from erosion and depletion, thereby indirectly affecting or reducing flood damage, limiting the build-up of debris

in reservoirs, and averting the blockage of drainage channels and avenues.

Forests, especially natural scrub/woodlands, play a key role in conserving biodiversity by supplying protection and shelter for numerous plant and animal species in their natural environment. NOP 22 stipulates the need to conserve areas of different stages of succession, from scrubland and garrigue to well-developed woodlands; each and every dynamic stage has its own typical species – plants, animals and natural values. By including varied areas of forest and woodland types at different stages of development and with different dynamics, NOP 22 contributes ecologically to preserving diverse habitats and species. In view of the accelerating extinction of species and ecosystems around the world, this contribution goes beyond the local significance of preserving Mediterranean biodiversity. In fact, it was one of the reasons for the pains taken to incorporate in NOP 22 a maximal variety of forest and woodland types in various states of development, which represent different environments and contain as many different species as possible.

Forests as Ecological Corridors

An ecological corridor refers to a unique strip of land with certain attributes (i.e., differentiated from its surroundings) that connects large distant areas sustaining plant and animal life. The corridor connects nature reserves and areas of ecological importance, and enables the species to pass between them.

In Israel, ecological corridors have added importance. From the start, the conception of nature preservation here derived from a desire to protect regions of botanic, zoological, aquatic (and other) interest and uniqueness. This conception gave rise to the nature-preservation provisions in Israel. In early statehood, the nature reserves themselves were surrounded by other natural areas and sufficiently remote and protected from threats and harm. Over the years, the population grew along with built-up regions. Increasingly, the developed areas encroached on the nature reserves until they became small islets, closed, surrounded by and under direct threat from building and industry, or from farmland, intensively cultivated with fertilizers and pesticides harmful to natural conditions.

The nature reserves became fragmented, small and distant from one another. Fragmentation isolated the reserves and disturbed species reproduction. Distance and fragmentation prevent the interchange of genetic material, cut off plant and animal colonies from one another, and reduce the genetic diversity of the population, rendering it vulnerable to external threat and danger. The small dimensions of Israel's nature reserves, which can sustain only small populations, exacerbate the problem. It is thus easy to understand why it is important to conserve the open spaces around distinct natural areas – i.e., nature reserves, including farmland, and strive to protect them with ecological corridors.

The INNPA conceived the idea of creating a network of ecological corridors in Israel (Shkedi and Sadot, 2000). These corridors are meant to connect “areas that enjoy statutory protection and the open spaces between them” to support nature conservation in Israel. The goal is to channel development away from the corridors and encourage – within the corridors – a regime of open farming and outdoor leisure and recreation uses. The concept of “ecological corridors” as developed in Israel defines large strips of land, generally containing nature reserves and open spaces. These strips are meant to permit movement and the passage of species between the natural areas. They contain many forests, some planted, some natural. The forests are an essential part of the ecological corridors, promoting their contiguity and integrity.

Figure 1 is a schematic representation of the ecological corridors, overlaid by the layer of forests of NOP 22. As can be seen, the forest distribution clearly corresponds with the ecological corridors in the regions of the Golan and Upper Galilee, on the Carmel and Menashe mountains, along the central range of hills, in the Judean Lowlands, in the Jerusalem Hills and south of Mt. Hebron, on the approaches to Lahav and Duda'im.

Biodiversity

Preserving biodiversity has become a chief aim of nature conservation in recent years. Changes in the variety of species change ecological processes and systems: the smaller the population, the less the genetic variation. Large, contiguous habitats are a condition of conserving a large population of broad genetic range. Israel's biodiversity is extraordinary at every level, due its geographic location at the intersection of continents, climates, and bio-geographical regions. At the same time, it is one of the most densely-populated countries in the world and human land uses compete with the need to protect natural species.

The State of Israel is a signatory to the Biodiversity Convention and its recommendation that every state act upon a national plan to conserve its biodiversity. However there are difficulties involved in defining biological variety as an operative goal of nature conservation. The necessary actions taken include restoring extinct



Photo: Staff of writers and editors

species, strengthening and regulating the populations, rehabilitating and reconstructing habitats, and the active management of landscape units.

Birds in Forests and Woodlands

Israel is located on a major migratory route of birds with an exceedingly large number of species for its size. Migrating birds find the Mediterranean region and its plant kingdom highly important stations for rest and to “refuel.” The varied services offered by the plant life are vital to a great number of migrating species.

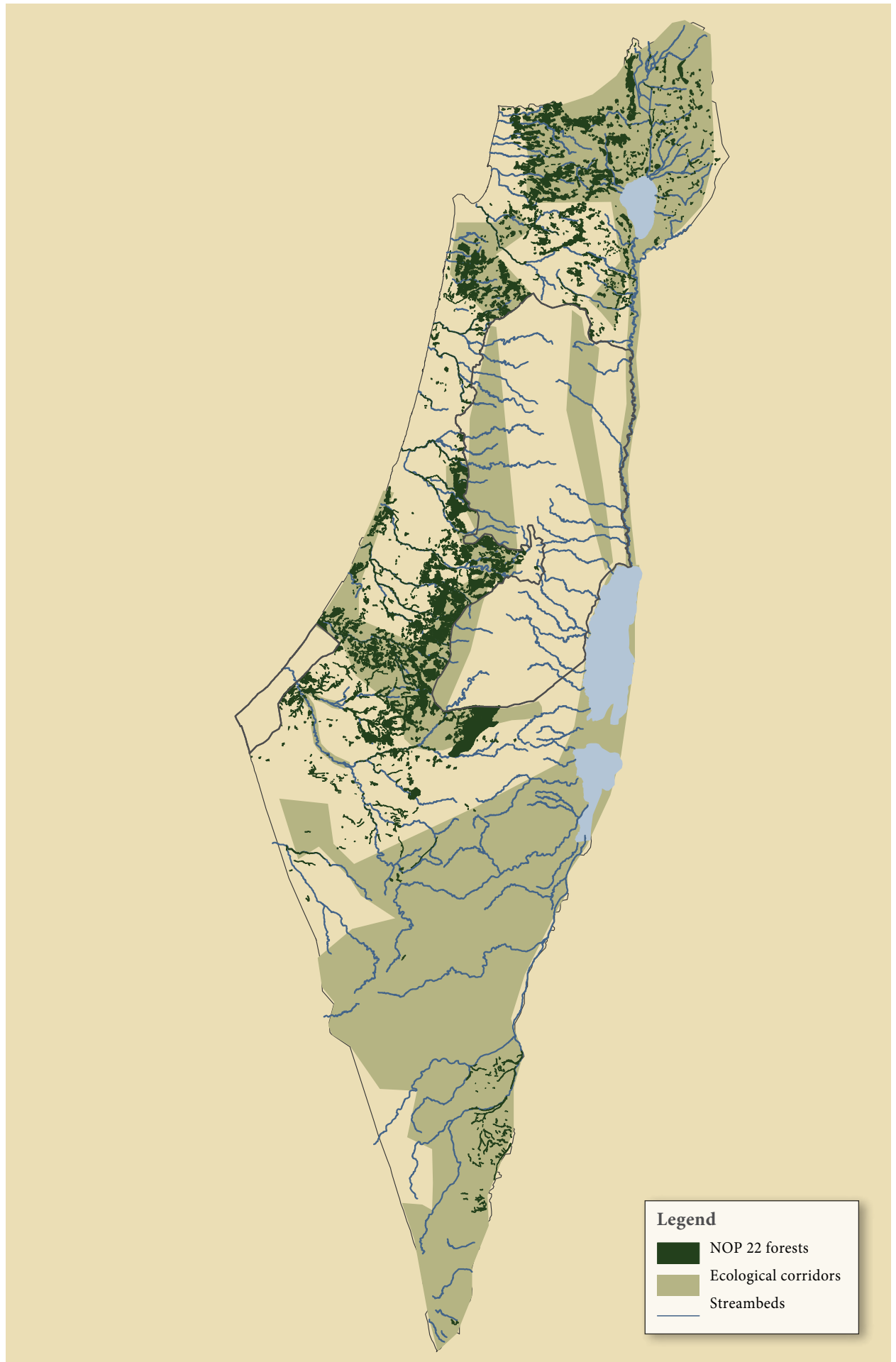
Since statehood, the country's landscape has changed enormously as natural woodlands developed and regenerated, and extensive forest tracts were planted. The vegetative cover changed drastically and affected the bird population: nesting birds require open hunting grounds; the short-toed snake-eagle or long-legged buzzard, for example, can hardly find reptiles in forests. The hawk, on the other hand – a typical forest bird that prefers European conifer forests – has grown considerably in the past two decades from a handful to hundreds of pairs today nesting in KKL-JNF forests.

Migrating species use the forests as way stations. The lesser spotted eagle, whose entire world population passes over Israel, stops overnight in the forests of Nazareth, Ben Shemen, Lahav-Dvir and Yatir, and along the central ridge of hills.

KKL-JNF has initiated forest excursions for pupils, families and tourists. Forests offer unique and novel opportunities for bird-watching: cameras placed at nests can transmit online directly to schools and homes. In the migration seasons, visitors can be taken to view flocks of birds landing and taking off in the evening and morning hours – exciting not only seasoned enthusiasts, but the public at large.

The sight of thousands of lesser spotted eagles or *short-toed snake-eagles* soaring southward overhead on an autumn morning is not soon forgotten. Moreover, this activity has significant economic potential.

Figure 1
NOP 22 forests on background of ecological corridors



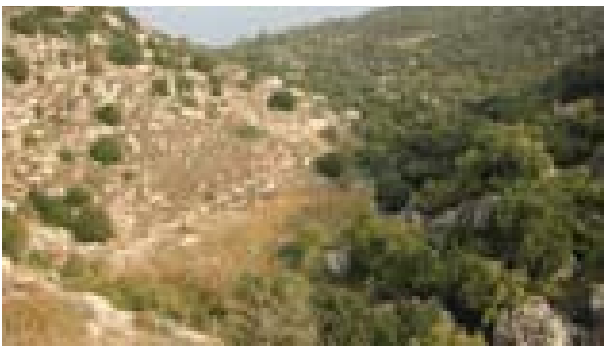
6.

The Place of Forests in the Country's Landscapes

Despite its tiny size, Israel is endowed with a wealth of different landscapes and physical formations. This scenic diversity is one of its assets; indeed, a natural resource.

Scenic diversity finds its expression in the country's varied plant life, which is connected to the climate, geology, topography, and the varying regime of resource use during different periods. NOP 22 seeks to highlight this diversity by using forests/woodlands as a botanic and scenic component to intensify the uniqueness and variation between the different areas. One of the main goals of NOP 22 is to create forests/woodlands typical of each area. The emphasis on diversity is of visual and esthetic significance as distinct from the above-mentioned ecological importance of preserving diverse species. The plan delimits natural areas and determines appropriate, distinctive vegetation for each. A detailed division appears in Chapter 17 below – the National Distribution of Forests and Afforestation in Israel. The general format is as follows:

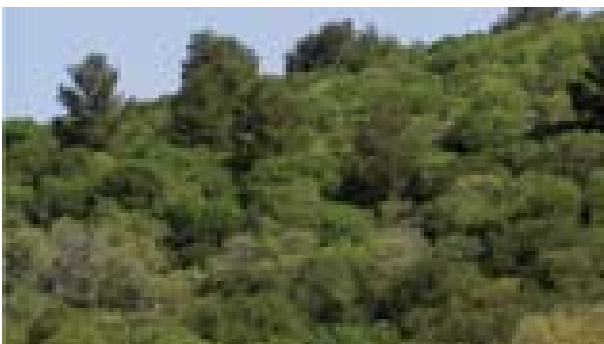
- » Planted forests, intermixed with typical local natural woodlands in the Galilee, on the Carmel and in Judea
- » Planted forests, chiefly in the northern Negev
- » Mediterranean scrub of all types and characteristics, on high and low mountains (in the Galilee, the Menashe Hills, on the Carmel and in Judea)
- » Forest parks (in areas of the Golan, eastern Galilee, Lower Galilee, the Menashe Hills and the northern Negev) - widely planted and intermixed with grazing land
- » Coastal forest parks intermixed with sandy and karkur vegetation
- » "Riverside"/dry stream plantings
- » Arid-zone plantings of vegetation suitable to local conditions and employing suitable techniques



Natural Mediterranean scrub, Jerusalem Hills
Photo: Staff of writers and editors



Plantings along the Alexander Stream
Photo: Eyal Yaffe



Forest mixed with natural scrub, Mt. Horshan
Photo: Avi Perevolotzky



Arid-zone plantings
Photo: Menachem Zalutsky



7.

Open Spaces, Recreation and Tourism

One of the major components of NOP 22 is the conception of forests as a basis for present and future infrastructure of tourism and recreation. The plan thus follows Israel's population distribution, future directions of development and settlement, and the concomitant needs for leisure and recreation.

Recognition of the function of open spaces as sites of public rest and recreation has increased with leisure and the awareness that spending time in nature and the outdoors as a form of recreation. This trend is worldwide, and embraces forests, parks and nature reserves. Tourism and recreation, which in the past focused on beaches and specific sites of interest, has broadened to include excursions to green environments and all the activities they offer. Known as green tourism or ecotourism, this form of recreation is becoming increasingly important in world tourism and attracting growing attention in terms of both planning and the investment of resources. Israel shows the same tendencies with planted forests gradually becoming a major base of recreation and internal tourism. Visitors to forests find amenities such as hiking trails and sites for camping, field workshops, rest, recreation, sports and picnics.

These trends have gradually replaced former afforestation purposes. Today, the common approach is to regard forests as related to tourism, recreation and public welfare.

Israel's land resources being extremely limited and its population density being among the highest in the world, increase the importance of forest recreation. In addition, with the high rate of natural increase and the absorption of immigrants, population density is constantly rising. The demand for land for construction, roads and industry eats into areas that function as rest and recreation sites or have the potential to do so, making conservation all the more imperative. These principles and the need to protect and properly manage forests are the cornerstones of forestry policy planning and modern forest management. The policy rests on trends of recent years when a good deal of attention was paid to developing forests for the public, in the sense of "forests for man": as in planning open parks in combination with hiking trails and tourism sites in



Marked hiking trail, Carmel forest park
Photo: Avi Hirshfeld, KKL-JNF



Mt. Tabor, forest and scrub frame a historical area
Photo: Avi Hirshfeld, KKL-JNF

and around forests, or connecting forests to historic and archeological sites.

NOP 22 seeks to provide green spaces for rest and relaxation on an appropriate scale and with good public access, both nationally and locally.

From the overall national perspective, the plan specifies the main forest foci in the country. These are mostly planted though some are natural. They are: Baram, Nazareth, Carmel, Ben Shemen, the Judean Hills including Jerusalem and the block of Adorayim as far as Lahav and Yatir in the south. These forests constitute the infrastructure of internal tourism (along with the beaches) and most of the provisions for recreation and hiking are connected to them in one way or another: such as accommodations outside of the Carmel Forest or on the approaches to Jerusalem, recreation areas, active recreation facilities and camping sites.

Nationally, forest functions should interface with other systems dealing with open spaces: nature reserves and national parks.

Alongside nature reserves, forests fill the function of active recreation and attract visitors. They thereby reduce the pressure on nature reserves and help realize their function as areas that are meant to remain natural.

Near national parks, forests present a complementary background: they are used as vacation sites for visitors combining an interest in the theme of a national park and recreation in nature.

The combination of planted forests, nature reserves and national parks together make up a complementary whole, providing open spaces to meet the population's

needs for tourism and recreation. Distributed all over the country, forests function as a national relaxation and active recreation backbone. Overall, it is vital to stress the scenic importance of forests/woodlands that green the surroundings and provide them with visual variety. The country's renewed forests/woodlands (the former by plantings, the latter by care and conservation) have become an essential, integral part of the landscape of open spaces and a key element of Israel's scenery.

On the local level, the plan seeks to create a green mantle and an environment for relaxation and recreation near residential areas, especially the large cities. The goal is to enable the residents of all the large population centers easy access to a green hinterland close to home.

In the spirit of this conception, NOP 22 takes into account the distribution of urban communities and stipulates green areas close by. Green spaces near urban settings have an additional function as green belts preventing undesirable urban sprawl that could result in townships merging into massive conurbations – at the expense of open spaces. The prevention of such conurbations is an important component of national planning in Israel. Urban forest plantings help delimit town boundaries, enhance a city's image and identity, and prevent its extension in undesirable directions.

Most planted forests today and a large portion of the natural woodlands are crisscrossed by a network of scenic routes and trails.

As part of the policy to open the forests to the public, they now include recreation areas, bicycle trails, jeep routes, lookouts, sports and games facilities, and explanatory signposts. Many sites were made accessible



Green hinterland for urban centers
Photo: Staff of writers and editors

to the physically handicapped. In addition, KKL-JNF hosts forest events and excursions, including outdoor concerts, moonlight walks and activities for children.

Cultural and Heritage Assets within Forests

Planted forests and woodland are ingrained in the country's landscapes and largely reflect its history and heritage. Forests mark sites of settlement and regions mentioned in Jewish sources – in the Bible, halakhic literature and the Midrash – the backdrop to the history of the land of Israel. Virtually at every site, visitors and excursionists on forest trails are exposed to milestones and pointers in the chronicles of the land of Israel.

The bond between forests and the country's heritage harbors a great potential for exposing recreationers to the culture and values of the land of Israel. This fact brought up the possibility of integrating historical motifs in the planning of forest routes and the surrounding expanses.

Forest routes incorporate historical motifs, greeting visitors with the relevant scenic and cultural background. Tracing the footsteps of biblical heroes and events enhances understanding of the biblical tales and offers visitors a direct sense of the landscape setting.

Excursions in the wake of history connect a site's special flavors and scents, landscape, views and archeological remains to illuminate the ancient texts in a new light.

In the decade since the approval of NOP 22, much effort has been invested in developing forest rest and recreation areas, and pedestrian trails. If formerly, forests were known for their leisure offerings – sitting alcoves, lookouts, playgrounds and picnic sites, today they have become hiking sites offering attractions. Scenic routes pass historic sites, archeological ruins and nature spots that have become an integral part of the forest landscape and its network of trails and outdoor recreation.

A special series of heritage and historical routes – Hiking on the Paths of the Past – was developed with hiking trails passing unique sites and accompanied by explanations, flyers and appropriate signposts.

Another series of routes emphasizes the country's diverse landscapes. In a particular region the route will highlight local assets; morphology and topography; nature; the typical vegetation and its integration with a forest; local, traditional and modern farming culture; and the characteristic form of settlement that developed there.

Today Israel's forest expanses are filling up with leisure sites, hiking routes, rest spots and activity sites. There are also assembly venues for study activities, for artistic performances and for experiences related to a forested landscape and its surroundings.



Lookout over the Sea of Galilee, Swiss Forest
Avi Hirshfeld, KKL-JNF



Beit Keshet Forest Park – the schematic map shows visitors the forest roads and scenic route, the rest areas and various services
Map design: Noga Mizrahi

8.

Urban Community Forests

Community Forests

Community forests have grown in importance worldwide: adjoining large population centers, these green areas are a vital environmental resource for the quality of life of residents. Generally right next to a town, they primarily serve a local community. The term “community forest,” accepted worldwide, connotes forests in and around urban areas, woodlands/scrub, as well as boulevards, shrubbery and trees in parks and along the streets. In recent years, forestry theory has been developed and adapted to accommodate urban areas.

Community forests reflect environmental, social, educational and economic values, drawing townspeople closer to nature and conservation. Their physical proximity engenders a sense of belonging and responsibility, involving residents in forest management – in planning, development and maintenance; in encouraging forest activities and recruiting public support for the forest’s development.

Community forests create green lungs around a city, bring nature into built-up areas, help reduce air pollution and contribute to a community’s physical and emotional wellbeing. They are a powerful tool for cultivating a bond between urbanites and nature.

Urbanization and Community Forests

More than 80% of the population of developed countries lives in urban areas today. The rapid urbanization of the developed world has seen the population move from village to town within 200 years, with physical and spatial repercussions. The distance from green open spaces essentially changed the relationship between human society and the natural environment. In this process, the first areas to succumb to urbanization were nearby forests. Community forests are subject to two opposing forces: the constant pressure of creeping urbanization threatens them while the need to provide open spaces for city-dwellers encourages their conservation.

Community Forests in Israel

Population density and development exerts enormous pressure on green open spaces, including forest. Forest land is continually eroding and shrinking, especially community forests around cities.

Relatively small, Israel’s community forests are under terrific development pressure due to their immediate proximity to built-up areas. As a result, in recent years, KKL-JNF has promoted the adoption by local communities of nearby forests as a key component of its work and based on the accepted theory and management of community forests in Europe and the US.

KKL-JNF activities in this sphere rest on the following principles:

- » The conservation and cultivation of community forests and their natural and heritage assets
- » Free access and use for all residents to all parts of a forest and its facilities
- » Management of forest life through partnership, mediation and communication of forest managers, the local authority and the local community
- » Maintenance of a proper, controlled balance between intensive development and nature conservation

Urban Forests

NOP 22 pointed to the need for plantings and green belts in and around communities. Referring to this need for southern communities as a means of sprucing up their appearance, the approach broadened into establishing urban forests in towns and on their outskirts.

Urban forests are developed intensively with paths, promenades, sports and amusement facilities, and local attractions for city residents.

Over the past decade, KKL-JNF initiated several urban forests that were integrated with large city parks. Some were created in dry streambeds running through or near a town, and giving expression to the rehabilitation and care of streams in urban environments.

These are the cities in which forests were either developed over the past decade or are in planning:

Lydda

With a population of some 70,000, the city has few “green spaces” to serve residents and visitors.

Two main parks are being planned:

HaShalom Park – The city’s existing park is neglected though it contains many sites worth preserving and enhancing. The project proposes developing the park with – among other things – a tourism route passing the important sites such as the Turkish olive press, the Square of the Three Religions, the large mosque, the Ottoman Hilu Khan and a mosaic.

After the park’s rehabilitation, this green lung within the city of Lydda will be a park of historic significance and great tourism potential, for the benefit of both residents and visitors.

Maaleh Adumim

The city park will follow the route of the city’s main entrance. Overall, the planned area is 150 dunams and is to include a (five-dunam) pond, sports fields and recreation areas. Envisioned as a focus of different recreation uses, it will add landscaping to the Maaleh Adumim Junction and the northern entrance to the town.

Beit She’an

In light of the town’s recognized tourism potential, considerable resources are being invested in rehabilitation and reconstruction work. The result is that in the past decade, the town has had a facelift with the addition of numerous parks and scenic spots.

In the south, near the wholesale market, KKL-JNF planted a eucalyptus grove which is to be part of a central park being built to serve residents for recreation, leisure and events. The heart of the park is landscaped with lawns lined with groves and trees.

Beit Shemesh

The city has seen economic and social growth in the past few years targeting investors, developers and new residents. The burst of development has created a need for large, urban rest and recreation areas.

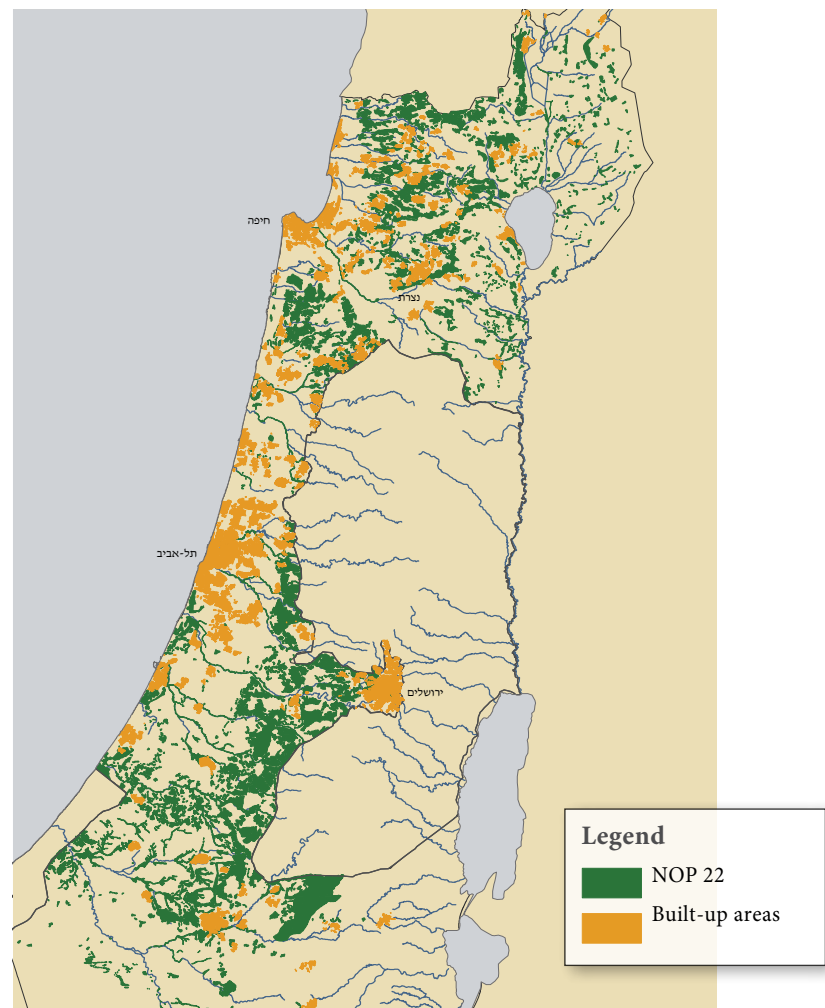
The Olive Park extends over some 160 dunams next to the city’s western main entrance and close to the center of town. It will serve as the main assembly venue in the old city with a memorial promenade overlooking the park from the north.

An additional sports area will be developed with two swimming-pool areas surrounded by lawns.

In the park’s current planting area, development plans call for picnic sites, a network of paths, and recreation facilities. This park is intended as a rest and recreation area for all city and regional residents.

Figure 2

NOP 22 forests on background of built-up urban areas, 2003




(Nahal) Beersheba Stream Park

Formulated on the basis of a master plan to rehabilitate and develop the Beersheba Stream.

The Beersheba Stream Park is an important public resource contributing to the welfare of residents of the city and of the metropolitan region. Planned as a green lung in the city of Beersheba, it is subject to regional limitations as regards ecology and scenery, and the potential to utilize various areas. It will include archeological and heritage sites along with rest and recreation areas. Its specific themes (including desert ecology, geology, desert botany and the environment, Beduin culture and human life in the desert through the ages) will make it a key tourism center of varied options, accessible and attractive to the visitor public.

The park is to extend over 4,500 dunams, including 30 kilometers of rehabilitated stream banks. The character of contiguous parks and open spaces will be adapted to the developing urban fabric and consist of three main areas: the western portion, from the Beka Stream to the southern approach will comprise the urban portion; the



central portion, between the southern approach and the eastern bypass road, will be the park's main rest and relaxation area; the eastern portion, along the exposed chalk rock, the confluence of the Beersheba and Hebron streams, and the compound of the Beersheba Tel will serve as a transition between the urban zones and the natural spaces in the east.

Connection to the City

The master plan for the stream's development envisions a continuum of urban connections along green axes, promenades and bicycle trails between the different urban centers and the park. The overarching idea is to change the character of the stream and its environs so as to give the city a facelift and focus it on the stream as a network of urban opens spaces – the heart connecting the different main parts of the city, its neighborhoods and metropolis.

The network of green axes creates city views over the stream. "The area of influence of the stream park will include the adjacent built-up areas, and send out 'green fingers' into the existing municipal fabric. The utilization of existing green open spaces and the development of boulevards leading from the park to the heart of the city and existing neighborhoods centers will improve the connection between the city, the stream and the park." The banks will boast a promenade from which "green fingers" will reach into the municipal space, connecting neighborhoods, points of interest, public parks, events and fair grounds. Offering pedestrian paths and biking routes, sports centers, playgrounds and squares, the park will join up with municipal commercial and entertainment centers. The stream park will thus be a link between the city and the surrounding desert expanse.

9.

Economic Benefits

The most important economic contribution of open spaces, including forests and natural woodlands, is actually not quantifiable. It is comprised of all the various forest functions, especially its visual impact.

The esthetic contribution of forests and natural woodlands, the salient “builders” of the country’s landscapes, are certainly not quantifiable but their importance in fashioning the country’s image is immeasurable. Nonetheless, one can point to the economic contribution of forests, which is quite substantial and may be translated into economic terms, in several areas:

- » Recreation and tourism – Forests are basic to the infrastructure of these economic fields. Numerous tourism sites are located in or near forests to which they owe a good deal of their power of attraction. This economic contribution cannot be measured directly. Similarly, forests create jobs in recreation and tourism – inviting entrepreneurs to invest in the immediate, existing infrastructure.
- » Appreciation of land values – Land is, of course, the foundation of residential, recreation and tourism areas and land values rise if there are forests in the vicinity, particularly for residential purposes. Homes near forests and parks, in both urban and rural communities, are relatively high in value, sometimes by as much as two-figure percentages more than other locations. Conserving forest land – as green lungs and barriers, particularly in urban environments – is a national interest, keeping real estate values up and safeguarding the population’s quality of life.
- » Wood production – is a byproduct of other forest functions, such as thinning and renewal. In recent years, wood production has yielded some 30,000 tons/year, more than 15% of the country’s entire wood consumption.
- » Creating jobs – for numerous workdays of skilled and unskilled labor in forest planning, construction, soil reclamation, planting and maintenance.
- » Amelioration of grazing land – especially in bare regions where the shade and fodder provided by trees

are important; forest parks, stipulated by NOP 22 on a broad scale, fill these functions.

- » Natural vegetation, including forests and woodlands, protect the soil from runoff and its havoc. Planting forests and restricting overgrazing, which was rife in previous centuries, have brought erosive processes to a halt and promoted the soil’s rehabilitation. As a result, reservoirs and water channels have not been blocked by debris, and more water has percolated into the soil and enriched the groundwater.
- » Forests are a source of nectar in beekeeping – This branch has been active in the country for 120 years, and supplies work for some 500 beekeepers (as of 2005). Israel consumes 3,600 tons of honey/year, with demand constantly rising. In recent years, the nectar supply has decreased considerably, mainly due to the uprooting of orchards and urbanization. To increase the potential once more, beekeepers annually plant 100,000 saplings of nectar-producing trees, especially on uncultivated farmland. Ecologically important to the development of green lungs, the work receives substantial support from KKL-JNF in recognition of the significance of these plantings for Israeli forestry.



Photo: KKL-JNF
Photo Archive

10.

Sustainable Forest Management *

The aim of creating a “sustainable forests” has recently become a principle of forestry agencies the world over, including in Israel. The management of sustainable forestry is defined as “Managing and utilizing forests in a manner and to a degree that protects and sustains the biological diversity, productivity, regeneration, vitality, and potential of forests to fill ecological, economic and social functions without causing harm to other ecosystems.” Various definitions and interpretations of sustainable forest management (SFM) have spawned a conceptual framework and charted a course for the desirable approach to management of the forestry resource.

Forests are productive ecosystems and a regenerating natural resource. Different types of forest cover extensive areas of the earth, serve as habitats for a broad range of organisms and are utilized by man in a variety of ways. The relatively recent environmental awareness has grown along with the recognition of the importance of forest sustainability. What is sustainability and how is it connected to forestry? Can sustainable forests be defined and created? Can forest uses and care be determined in its light? How? This chapter attempts to answer these questions, if only partially.

The first part deals with sustainable forest development from an overall world perspective; the second focuses on activities in Israel.

Milestones

The worsening world environmental crisis sowed growing awareness that accepted modes of action, if continued, would speed up the degeneration of ecosystems, impair their capacity to provide man with the necessary resources, and cause severe harm for future generations.

In 1987, the World Commission on Environment and Development (WCED) published *Our Common Future*. Known also as the Brundtland Report, the document recognized both man’s responsibility for environmental degradation and man’s obligation to remedy the situation. A call went out to adopt an approach of sustainable development, which recognizes that man is dependent

on the ecosystems around him. The term “sustainable development” was defined then by the Commission as: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). Following the Brundtland Commission, the UN Commission on Environment and Development (UNCED) convened what is informally known as “The Earth Summit” in Rio de Janeiro in 1992. At this conference, a number of important documents were formulated and adopted, among them Agenda 21 (principles of action to implement sustainable development), the Kyoto Protocol (which deals with global climate change), a convention to conserve biodiversity and, alongside these, a declaration on the sustainable development of forests worldwide, The Forest Principles (UNCED, 1992).

In 1991, the International Tropical Timber Organization (ITTO), comprised of timber production and consumption members, first formulated a list of criteria for the sustainable management of tropical forests (ITTO, 1998). In 1994, a working group was established, known as the Montreal Process, to formulate criteria for the sustainable conservation and management of forests. These criteria were approved and signed in a joint declaration known as the Santiago Declaration (Forestry Working Group, 1995). In 1998, at the Lisbon Conference, some 40 European states formulated the Pan-European Forest Process on Criteria and Indicators for Sustainable Forest Management. In 1990, FOREST EUROPE was established, the Ministerial Conference on the Protection of Forests in Europe (MCPFE), which is the pan-European policy process for the sustainable management of the continent’s forests. Updated and improved lists of criteria and indicators are published periodically by the various organizations – the result of follow-up and cumulative experience in monitoring and implementing management activities to achieve the different aims (MCPFE, 2002).

* This chapter was published as an article by Yagil Osem, Nir Asmon and Avi Pervolotzky in the journal *Yaar*, December 2005.

Sustainable Forest Management - SFM, An Old-New Concept

Based on the description of milestones, SFM might appear to be the product of the past 20 years. This is not the case. There is written evidence of SFM in Central Europe (Germany, Austria, Czechoslovakia), and even a German term for sustainability – *Nachhaltigkeit* – from the 17th century (Schuler, 2000). Forests, in these areas, were an important source of subsistence and culture. As the population developed and the use of forest wood for building and energy accelerated, natural forests were destroyed over extensive areas. Early in the 18th century, the ruler of Saxony promulgated a detailed directive on SFM. Forests there were utilized intensively for the construction and operation of salt mines, which was a highly important source of income. At that time, the sense of sustainable management derived primarily from the need to ensure ongoing wood supplies for various needs. Over the years, there was also growing awareness of the connection between deforestation and soil erosion, floods and snow avalanches, broadening the connotations of SFM (Schuler, 2000).

Definitions of Sustainable Forest Management

Though the term “sustainability” has been variously defined, certain meanings have always been retained: continuity over time (Gray, 1991; Conway, 1994), utilizing resources without harming their “health” or production capacity (Constanza et al., 1992), and the integration of economic, environmental and social components in resource management (Hermanides & Nijkamp, 1995; Munda, 1998; Renning & Wiggering, 1997). 9 reflects the growing commitment to wise environmental management in acknowledgment that natural resources are not merely assets, which we inherited from the past but assets, which we must bequeath to future generations in good condition (WCED, 1987). SFM is a direct object of this approach. Thus, forestry activities must conserve the productivity and regeneration capacity of forests and, at the same time, protect landscapes, natural habitats and cultural assets (Hall, 2001).

SFM has been defined and interpreted in different ways.

Wang (2004) formulated it as the ways and processes of managing forest resources to respond to the needs of human society in the present and the future, without harming the ecological content and natural regenerative potential. Smith & Jenkins (1999) described it as interconnecting transitions: from silviculture to ecoculture (ecological development of forest resources), from quantity to quality, from trees to landscapes, from private ownership to public management councils, from consumerism blind to environmental repercussions to consumerism conscious of the ecological price. One of the basic requirements of sustainable development,

including SFM, is broad public participation in decision making (Agenda 21, (UNCED, 1992). Furthermore, various operative SFM programs repeatedly raise the need to conserve biodiversity, forest health and productivity, the forest impact on drainage basins and the global carbon cycle while maximizing social and economic benefits (Lane & McDonald, 2004). The discussion may be summed up by a detailed definition from MCPFE: “*The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems.*” The various definitions and interpretations of sustainable development and management form the conceptual framework and mark a direction for the desirable approach to development activities in general and management of the forest resource in particular. These definitions, however, cannot provide policymakers and field workers with a structured working program to manage the various forestry activities required. Consequently, the focus today is on formulating and defining specific, practical indicators and criteria (I&C) for the purpose.

Criteria and Indicators of Sustainable Forest Management

According to Land & McDonald (2004), a criterion (or test case) is an aggregate of conditions or processes in a specific category, by means of which one may evaluate the sustainability of forest management. Every criterion has a series of indicators, which can be monitored periodically to assess change. Indicators are qualitative or quantitative measures of one aspect of a criterion and they are meant to serve as a basis of monitoring the condition of a forest and the level of its progress towards a state of sustainability (Anonymous, 1995; Prabhue & Mendoza, 2004). An operative set of criteria and indicators creates a science-based framework on which to rest the practical work (Hall, 2001). Like economic indicators (interest rates or inflation rates), which serve as governmental factors in assessing the state of the economy, indicators of sustainability help decision-makers take action to bring a forest to the desirable state.

Indicators and criteria of sustainable forest management are generally divided into different levels of execution. These are defined at the national level and aim to promote policy, such as legislating laws and regulations; they also serve to formulate I&C at the local level. Definitions at the local or forest level are meant to guide specific management activities undertaken in a specific area. These activities may change from one forest to another or from one district to another (Castañeda, 2000; Morsek, 2001).

Measuring Forest Sustainability

There is no general criterion that can measure sustainability. The necessary analysis must combine and weigh various criteria and indicators to ultimately create a measure of this sort.

The assessment of forest sustainability should take into account the aggregate of different indicators and their mutual influences.

The Degree of Importance and Desirable Value of Every Indicator

A reasonable gauge of the importance of each indicator, its desirable value and the degree to which a given forest approaches that value should be based on a thorough knowledge and understanding of the forest and its related economic, social and cultural systems. It is fairly easy to agree on the criteria and indicators of sustainability, but far more difficult to agree on their relative importance, the desirable values or even the optimal management to promote sustainability.

Sustainable Forest Management in Theory and Practice

SFM is based on utilizing forests to an extent that does not exceed their productivity and regeneration. Cycles of felling, on the one hand, and forestry activity to accelerate growth and encourage regeneration, on the other, can therefore serve as a basis of SFM. The method of plantings and cyclical felling is widespread, simple to employ, and possesses certain economic advantages. For the most part, however, it creates even-aged, mono-species forests of low biodiversity, susceptible to the spread of disease and pests and, therefore, at high risk to soil erosion and the destruction of habitats following extensive, full felling. These features are inconsistent with the idea of sustainability.

As one possible response to these problems, the uneven-aged forest is gaining importance, and is commonly also known as continuous cover forestry – CCF (Pummerening & Murphy, 2004). This approach strives to create forests of constant cover and density in time and space. Such uniformity is achieved in forests of diverse ages and species, the variety being sustained at several levels and in cycles approaching close-to-nature silviculture (Ciasio & Nocentini, 2001). Uneven-aged forests have a number of characteristics: 1) a high, continuous level of cover; 2) continuous regeneration; 3) high photosynthesis due to much utilization of the vertical dimension; 4) varied species composition; 5) low density (biomass/area) relative to mature even-aged forests but of uniform distribution in time and space; 6) individual felling based on criteria such as

trunk diameter as opposed to full felling over extensive areas.

The CCF of uneven-aged forests and avoidance of full felling may prevent soil erosion, damage to the landscape, and the massive destruction of habitats. Structural complexity and a variety of tree species may help expand a forest's biodiversity (birds, mammals, insects etc.), improve resistance to pests and disease, and raise a forest's tourism value. Wood production in these forests is not necessarily lower: forest management is merely more complex, requiring skilled labor and close knowledge of the forest and its different species.

Israel has several types of forest – from planted conifers and eucalyptus, which characteristically are even-aged and mono-species in structure, to older planted forests some of which are uneven-aged today with diverse, complex Mediterranean scrub, based on local vegetation that developed alongside human activity over many years. The main emphases of forestry theory at Israel's establishment – such as conquering the wilderness, “making the desert bloom” and creating jobs – gradually made way for other directions based on creating multi-purpose forests with scenic, ecological, tourism and economic objectives. Defining the purpose of Israel's forests, setting priorities for all existing types of forest, and formulating consensual, feasible criteria and indicators can serve as a basis for SFM in Israel. Though the process should rest on foundations that have already emerged and been defined elsewhere, there must also be a unique component (the essence of the forests of the land of Israel), which should be defined and characterized as a major step in determining the country's forest management.



Photo: Avi Perevolotsky

11.

Sustainable Forestry in Israel – Implementation

Sustainable forestry is an important ingredient of the global strategy to protect the earth's resources and their appropriate development. Israel's forest policy is conceived as part of this worldwide endeavor.

The issue goes back to the UN Resolution of 22.12.1989 as to the convening of an international conference to formulate strategies to halt environmental degradation and to lead to sustainable development on earth.

In 1992, the United Nations Conference on Environment and Development (UNCED) convened in Brazil and became known also as the Rio Declaration – Earth Summit. It published a series of principles that served in the preparation of Agenda 21, an environmental agenda for the 21st century: this is a comprehensive, detailed action plan covering numerous areas to achieve a form of development that will sustain the earth's resources and bequeath them to future generations.

Among the main documents of Agenda 21 are a statement of forest principles and a convention on biodiversity. Both of them – alongside other documents – have implications for the molding of a sustainable forestry policy in Israel. Agenda 21 has four sections: I) **Social and Economic Dimensions**; II) **Conservation and Management of Resources for Development – the physical aspect**; III) **Strengthening the Role of Major Groups – the human aspect**; IV) **Means of Implementation**.

The development of sustainable forests is connected to almost every clause of Agenda 21. However, the main topics, which will be discussed below, are connected to Section II – conserving and managing resources for development – which contains the following chapters:

- » **Atmospheric Protection** – includes recommendations related to the role of forests in supplying oxygen and absorbing carbon dioxide;
- » **Integrated Approach to Use of Land Resources** – relates to the place of forests in the system of land uses;
- » **Combating Deforestation** – is one of the main chapters of Agenda 21 with principles of forest development and management, and the aspiration to expand forest land worldwide;

- » **Halting Desertification** – includes accelerated afforestation and renewal of forests in arid zones with fast-growing, drought-resistant plants – a central topic of forestry in Israel;
- » **Protecting Mountainous Ecosystems** – soil and pasture conservation are important aspects of their protection;
- » **Sustaining Biodiversity** – including forests and natural woodlands, which play a major role in protecting and nurturing ecosystems and their biodiversity.

Section IV of Agenda 21, Means of Implementation, contains recommendations for collecting the necessary data and creating indicators to promote sustainable development.

The following chapters will describe aspects of forest management referencing Agenda 21 and offering a system of indicators to promote sustainable forestry in Israeli conditions.

Agenda 21 – Select Topics on Forests and Afforestation

Forestry resources are highly important in environmental conservation and development. Proper management helps create jobs, supply wood and reduce poverty.

Uncontrolled deforestation, fire and overgrazing lead to soil erosion and degeneration, damage water sources, destroy plant and animal species, harm biodiversity and accelerate global warming.

Agenda 21 calls on all states to strengthen their institutions and organizations of forest development and protection, and to promote forest functions with a view to ecological, social, cultural and economic aspects.

Agenda 21 recommendation: Encouraging the involvement of different sectors – such as trade unions, rural cooperatives, local communities, youth, women, the private sector, NGO user groups and organizations – in forest-related activity.

Implementation in Israel: Forests are one of the elements of Israel's recreation and tourism infrastructure. Numerous tourism sites are located inside forests or nearby, and their advantage and power of attraction are



bound up with those of the forest. This yields an economic benefit – one, however, that cannot be measured directly. In the same context, it is worth mentioning the creation of jobs in recreation and tourism in and around a forest, and the existing forest infrastructure that beckons to entrepreneurs.

Opening the forests to the public has become a key component of KKL-JNF's forestry policy. This has many aspects:

Development and tourism – sites that absorb masses of visitors and serve as the infrastructure of a nature culture in Israel; physical development of forest roads, recreation sites, sports facilities and playgrounds along with appropriate signposting for the benefit of forest users. In addition to these activities, KKL-JNF initiates active partnerships with different groups for varied forest activities: youth movement activities, camping, forest studies, scouting and orienteering, hiking, artistic performances etc.

Agenda 21 recommendation: forestry research, including collecting data on the dimensions of forested land, the areas suitable for forests and their ecological value.

Implementation in Israel: The Forest Survey Department systematically collects data on the forests, their composition and development. The Research Committee of the Land Development Authority (LDA) initiates and funds research in various fields of forestry.

The overarching goal of the studies financed by a research fund of KKL-JNF's LDA is to expand the knowledge base of forestry, the environment, soil conservation and the management of open spaces, and to facilitate wiser management of land resources.

KKL-JNF annually funds an average of 60 research studies at an overall cost of NIS 3.5 million. These are applied studies intended to respond to current practical needs, such as choosing suitable tree species for the natural conditions of a slated planting site, improving reproductive techniques, ensuring plant acclimation, destroying competing vegetation, locating seed sources for wood producing forests, integrating pastures and forests, and protection from pests. It also funds research of a more theoretical nature aimed at a better understanding of ecological processes and mechanisms as well as genetic and other characteristics that demand long-term study and monitoring. Here are some examples of research topics: the rate of growth of specific trees, salinity trends in irrigated soil, forest adsorption capacity of carbon dioxide, water balances, and water purification processes. The studies are conducted by accredited researchers from various Israeli institutes who and have proven track records in their specialty. Studies are usually partnered by a KKL-JNF staff person or persons, also specializing in the research topic: foresters, water experts, soil conservationists or planners. KKL-JNF does not simply fund a research project. In many cases,



Natural scrub, banks of the Alexander Stream
Photo: Paul Orlev



Broad-leaved plantings, terraces at Yatir
Photo: SPNI Open Landscape Institute

it also provides the physical-operational infrastructure for the study since its purview covers all of Israel's open spaces and, in terms of administration and execution, it is involved in thousands of land-related projects from Mt. Hermon to Eilat. Two fields closely related to KKL-JNF's work are environment and agriculture. It thus stands to reason that the research funded by KKL-JNF's LDA aims to serve these broad fields on a national level from both theoretical and applied perspectives. Support for research also helps weave a mutually enriching fabric connecting KKL-JNF with all the research systems in the country – a situation benefiting all the parties involved, including the state and state institutions.

In recent years, efforts to raise funds for research managed by KKL-JNF have been quite successful, including from overseas and for specific studies. These efforts require considerable investment in organization, financial management and personnel, as well as precious

time – all in order to assure sufficient research funds to advance KKL-JNF towards more enlightened work, based on policy set by its directorate.

Israeli forest land is growing. It is one of the few countries in the world that annually adds forest areas, despite its limited territory and the great pressure on land for building and development. Alongside the planting of new forests, work proceeds on the renewal and rehabilitation of natural woodlands, and cultivating plantings along streams and the coast.

Agenda 21 Recommendation: Forest renewal in mountainous regions, on bare ground, on degenerated farmland, in arid and semi-arid zones and in coastal areas.


Implementation in Israel: Planting in the south has special importance. In 1964, the first forest was planted in semi-arid conditions, at Yatir, south of Mt. Hebron, followed by forests in the area of Lahav, Meitar, Beersheba and the western Negev. These forests have had a real impact on the landscape by creating green belts and patches around towns and communities.



Afforesting wadis in the Negev
Photo: KKL-JNF Photo Archive

Terraces that are part of an ancient agricultural system.
Photo: Gidi Bashan, KKL-JNF





Desertification – the loss of vibrant land, farmland and forests to aridity is widespread throughout the world. Desertification is a product of uncontrolled, accelerated development, heavy pressure on land, and global climate changes. In Israel, where some 60 per cent of the territory is arid or semi-arid, the problem is especially severe. Afforestation has helped halt desertification processes; it has been shown that areas on the edge of the desert, of little economic value, can be transformed into areas of high environmental value and development potential – for grazing, farming and tourism.

The gullies, loess lands and dry streambeds in the northern Negev, particularly in the basins of the Shikma and Besor streams, are susceptible to erosion and undermining, loss of soil and damage to farmland. Here, trees were planted with the clear intent of soil conservation, creating a characteristic landscape of forest “fingers” along the dry streambeds between farming tracts. The main roads in the Negev, as far south as Sde Boker, are lined with small planted groves – limans – in areas “dammed” within the banks of dry streambeds. Planting in the Negev has increased in recent years simultaneously with its decrease in the northern and central parts of the country. This resulted from exhausting the supply of areas suitable for planting together with the great demand for land in the north and the acknowledged benefits of forests in the south. Techniques of wide-set planting were developed with the area divided into patches that contribute and absorb runoff. Planting takes place in the latter areas where the water collects. These techniques originated in ancient times (Nabatean agriculture) and have been refined agro-technically, managing to push south the areas where planting is possible to regions where precipitation is 180 mm. or less.

On abandoned farmland, hillsides and in the valleys of dry streambeds, KKL-JNF reconstructs and restores the remnants of ancient agriculture: building terraces and planting fruit gardens in combination with planted forests and natural woodlands, restoring and maintaining ancient irrigations systems, watch-keeper huts and farm structures. Though this form of rehabilitation and care requires numerous resources, such restored areas are becoming a major focus our forests, a lure for visitors and hikers. Sites such as Sataf, where ancient agricultural systems have been restored, are national attractions.

Agenda 21 Recommendation: Stimulating development of urban forestry for the greening of urban, peri-urban and rural human settlements for amenity, recreation and production purposes and for protecting trees and groves.

Implementation in Israel: Because of Israel’s tiny size and its numerous communities and population density, a considerable portion of forestry activities takes place

near urban and rural localities, creating a system of connections between a forest and nearby community. In recent years, KKL-JNF has helped in the planting of large urban parks in municipal areas and the restoration of dry streambeds crossing towns in order to create green lungs and leisure sites at the heart of communities.

Agenda 21 Recommendation: Creating and expanding systems of protected areas, characterizing types of forests, managing according to drainage basins, preparing an inventory for forest planning, felling and renewal, promoting conservation of old forests (incorporating them in a convention on world heritage).

Implementation in Israel: Protecting opens spaces – In Israel, open spaces are under constant threat and pressure of conversion into built-up areas. Yielding open spaces to built-up areas is a necessity in a state where the rate of natural increase and development are among the highest in the world yet, at the same time, caution and economy must be exercised, given the limited land resources at the state’s disposal. The presence of a planted forest serves to slow down or inhibit building plans – both statutorily (if the forest is protected by an outline plan, especially a national one – NOP 22) and by its mere existence.

Detailed forest plans – procedures promoted by the Planning Division in recent years create a defensive mantle for forests on top of the protection of the national plan. These plans detail and define the types of forests, their boundaries, assets and relationship to their surroundings.

Agenda 21 Recommendation: The treatment of mountainous regions – mountainous regions contain water sources, energy, minerals, forestry and agricultural products, as well as foci for recreation. They have rich biodiversity, including species under threat of extinction, and they are a vital part of the world ecosystem.

Mountainous ecosystems are highly vulnerable; they change rapidly, are extremely sensitive to climate change, soil erosion, landslides, and the rapid loss of habitats and genetic diversity. Widespread poverty, constant population increase and the loss of local knowledge among mountain peoples lead to deforestation, tilling depleted soil, overgrazing, the loss of vegetative cover and other forms of environmental degradation.

The conservation of mountainous ecosystems calls for the care of forests and pastures and the cultivation of wildlife: nature reserves would be appropriate in mountainous areas as they conserve a wealth of species.

Implementation in Israel: Most of Israel's forests and natural woodlands are in mountainous regions. Proper SFM in these areas would treat all the aspects listed in the principles of Agenda 21. Quite naturally, these principles stress topics related to erosion and soil conservation. In fact, the treatment of these topics was one of the central goals and pillars of planting forests in Israel's mountainous region: preventing erosion, stabilizing the soil, terracing and reclaiming mountainous areas. Israel's mountain regions today may be said to be wrapped in forests, natural woodlands, scrubland and grassland, and that apart from a few areas which still suffer from overgrazing, the mountain lands do not show soil erosion. Today, the major topic facing forestry and nature conservation authorities is the stabilization of mountainous ecosystems and the conservation of their biodiversity along with the development of recreation and tourism sites.

NOP 22 establishes a hierarchy of land uses in mountainous regions: "natural forests for preservation" are similar in characteristics to "nature reserves" and both together form a protective core for the wealth and diversity of local plant and animal life. Alongside them, there are natural woodland areas, forest parks and planted forests adapted to the natural state of an area and the need to provide leisure and social services to the surrounding population.

In recent years, KKL-JNF signed an agreement with the Israel Nature and National Parks Authority (INNPA) whereby: the areas of an existing forest, as determined by NOP 8, will be defined as forests in NOP 22, and several areas of woodland given in NOP 22 will be defined as reserves in NOP 8. In addition, existing forests in NOP 8 and defined as declared nature reserves or declared national parks will be transferred to the management of KKL-JNF – according to the state of the resource and its potential, along with its natural, environmental and social assets. An overall, comprehensive, regional view of land resources meets the requirement of Agenda 21 for the management of mountainous systems (like other systems) and promotes the sustainable development of these complex systems.

Data Systems and Indicators for the Development of Sustainable Forests

Agenda 21 calls on all states to make concerted efforts of data collection as a basis for development activity. The important databases will relate to the environment, especially air quality, water quality, land resources – including forests/ natural woodlands and biodiversity.

Data collection should be ongoing and use advanced data processing models and GIS analytical systems.



Between Mt. Eitan and the Lavan Ridge
Photo: Uri Ramon

The databases are to help characterize, evaluate and understand changes and trends for every topic, in addition to characterizing indicators of sustainable development.

Following the call of Agenda 21, UN organizations and various states have striven to develop indicators in different fields. One such field is the condition of forest resources and forest policy.

Based on the work done, which developed indicators on the topic of forests and afforestation, it is possible today to collate and adapt the indicators to the conditions of Israeli forests. These are:

1. Overall Forest Area

This indicator has two parts:

1. The areas added to forests – through plantings, renewal or rehabilitation
2. The areas subtracted from forests for other uses, such as deforestation for purposes of cultivation or fires.

This indicator is measured simply, by positioning the added and subtracted areas on a timeline.

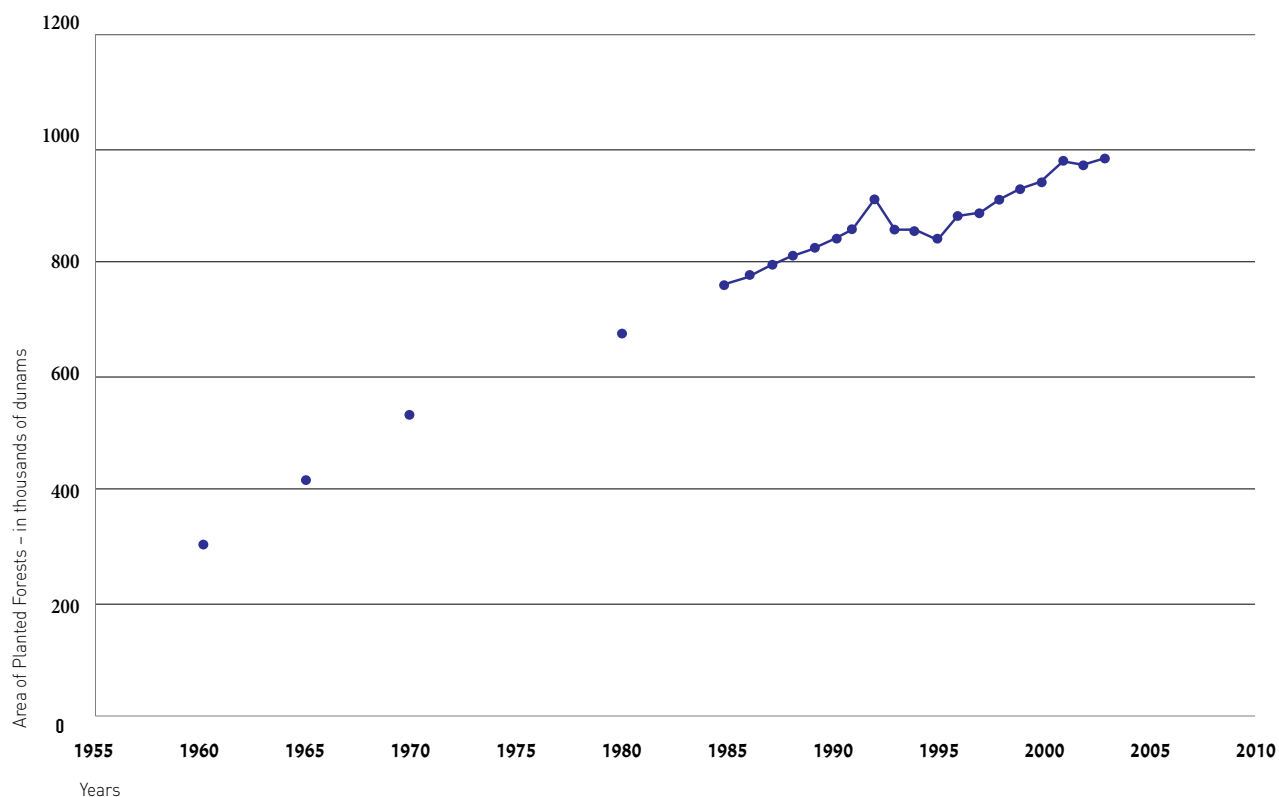
Chart 1 presents the expansion of an area designated as forest land in Israel, based on data of the Central Bureau of Statistics (CBS) for 1995-2010.

2. Forest Biodiversity

Forests contribute to biodiversity, to protecting plant and animal species living in and near them. Israel's biodiversity is exceedingly rich due to its geographic location. Nonetheless, it is threatened by increasing population density and development needs.

The forests that play the greatest role in sustaining biodiversity are natural woodlands and mixed forests. The age of a forest is an additional indication of biodiversity: older forests have more species. A simple indicator of the maintenance and stability of biodiversity may be the overall area of natural woodlands of different types, including coastal forest parks and "riverside" plantings on the banks of streams, as well as the determination of the age of different forest areas.

Chart 1 – Area of Planted Forests



3. Wood Production

The indicator relates to wood production in forests of sustainable conditions – i.e., felling that permits regeneration and does not harm the resource for coming generations. Another indicator in this context is the economic and employment value of wood production from local forests.

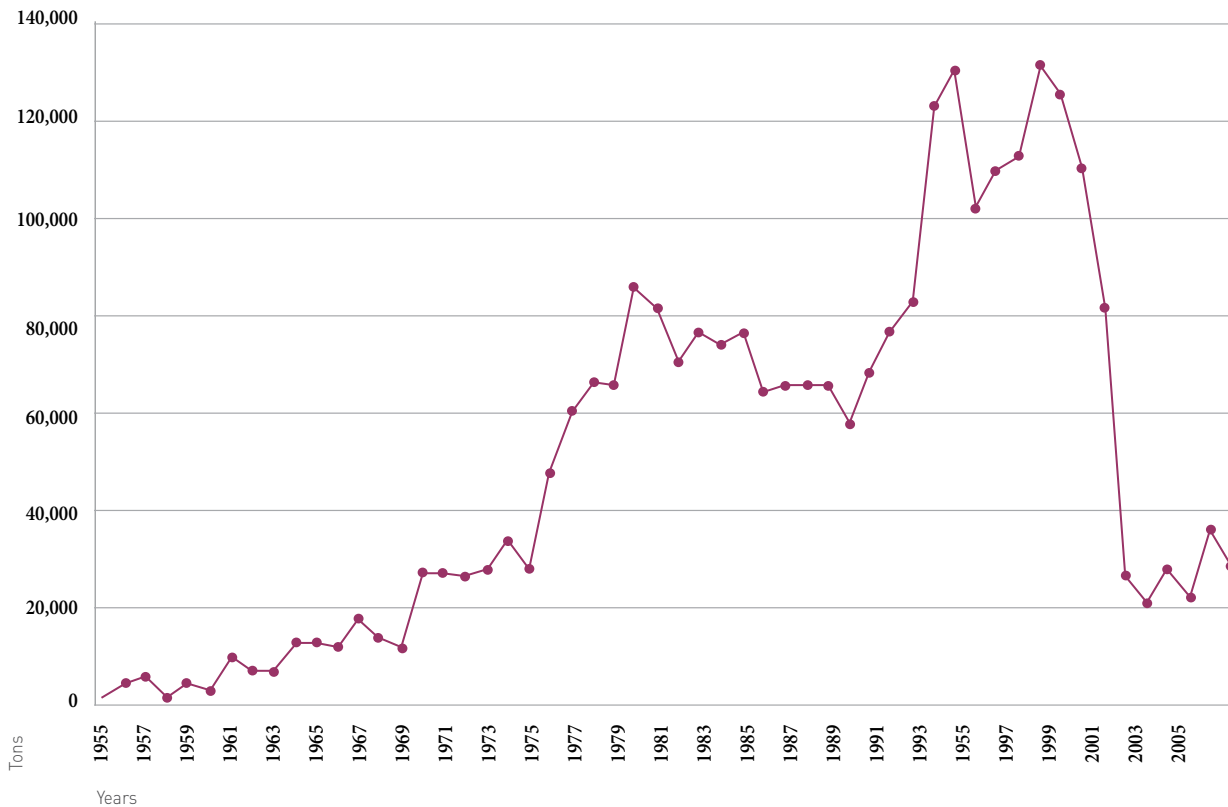
Wood production is also a byproduct of other forest functions, such as thinning and renewal. In recent years, wood production from forests has reached some 30,000 tons annually – more than 15% of the overall consumption of wood in Israel.

Chart 2 shows wood production in tons for the years 1955-2005.

4. Economic Values – Appreciating Land Values in Forest Areas

This indicator measures the appreciation of land in and around forests, its direct impact on a forest and its function as residential infrastructure and infrastructure for recreation and tourism areas. Homes near forests and parks in both urban and rural communities are relatively high in value, sometimes by as much as two-figure percentages more than other locations. Conserving forest land – as green lungs and barriers, particularly in urban environments – is a national interest related to the protection of real estate values and a high quality of life.

Chart 2 – Wood Production





Part III

Describing Program



12.

The Goals of the Plan

The National Planning and Building Council laid the foundations of the plan goals when speaking of its functions: to designate forests for improving the quality of the environment and regulating environmental nuisances, as well as forests for intensive and extensive recreation, and for pasture and wood production.

The goals were accordingly stipulated in the instructions of the plan, as follows:

- » To define and designate forestland: both existing and proposed forestland, including planted forests, natural woodlands, forest parks, coastal forest parks and “riverside” plantings, i.e. along dry streams;
- » To establish that afforestation activity will be executed in order to protect Israel’s scenic diversity and the character of its varied landscape types and open spaces;
- » To establish guidelines and instructions for the drafting and approval of detailed plans for proposed forests;
- » To establish permissions, restrictions and prohibitions regarding land uses in forests or proposed forest areas;
- » To establish the interrelationship of this and other plans and land uses.

Overall Goals

NOP 22 has two overall goals, yielding a series of subordinate aims.

The two chief goals are:

- » Protecting Israel’s vegetative resources – including its planted forests and natural woodlands;
- » Maintaining the quality of the environment as an open, green hinterland for the population, for purposes of relaxation, leisure and recreation.

Subordinate Aims

For each goal, subordinate aims were stipulated, elaborated and referenced. The aims were subdivided into categories – social, environmental, scenic-natural and economic. These are the subordinate aims:

Social Aspects

- » Cultivating areas for leisure and relaxation close to home and accessible to all residents, particularly to urbanites;
- » Maintaining proper forest infrastructure to support internal tourism: rest areas and sites for recreational activity, excursion trails, camping and field craft;
- » Tying the forest network to Israel’s general tourism infrastructure: national parks, antiquity sites and hiking/excursion routes;
- » Creating a series of cross-country (east-west) recreation axes integrated with dry-stream axes and linear parks, and connecting the central mountain ridge with population centers in the lowlands;
- » Improving the landscape in communities on the edge of the desert (particularly the northern Negev) to promote urban development in these areas;
- » Planting within and around desert zone communities.

Environmental Aspects

- » Soil conservation, preventing erosion and blockage of runoff channels and reservoirs, especially in the gullied northern Negev;
- » Urban afforestation, creating barriers and protection against environmental nuisances – absorbing pollutants, dust and noise;
- » Creating shade and pleasant micro-climates to counter Israel’s high temperatures;
- » Halting desertification on the edge of desert zones;
- » Ecologically contributing to mitigating the global greenhouse effect by releasing oxygen into the atmosphere and absorbing carbon dioxide.

Natural and Scenic Aspects

- » Preserving scenic diversity, maintaining the value of scenic diversity and the wealth of plant life as resources in their own right, nurturing forests that reflect and highlight the uniqueness of local landscapes;
- » Protecting the different types of woodlands and forests and the special species and plant forms that face extinction, on the local and national levels;
- » Integrating plantings in the rehabilitation and regulation of Israel’s dry streams/waterways;

- » Protecting the association of forests/natural woodlands and nature reserves, the former as restricted buffers and environmental background for the latter and as open corridors between different geographic regions for the passage of plants and animals;
- » Protecting the dynamics of natural vegetation, fostering representation of successive stages in woodland development;
- » Creating shelter and refuge for animals in their natural habitats.

Economic Aspects

- » Production of wood and forest products – as a by-product of the main forest uses, maintaining tree farms in certain soil conditions and climates, with economic considerations taking priority over other alternatives;
- » Developing intensive forest recreation sites, nature recreation, hostel facilities and active recreation areas as a base of employment and sources of income;
- » Upgrading land values by improving the landscape and surroundings in potential settlement areas (mainly in the northern Negev);
- » Forest and pasture – improve grasslands within forests and open lands and designating fodder areas where suitable, mainly in forest parks;
- » Preventing soil erosion in sensitive areas, enhancing water infiltration to the aquifer.

13.

Methodology

The situation of the State of Israel is complex, both geographically and socially. Its location, high population density and unequal territorial distribution, the national need to absorb immigrants, the demand for land and the pressure on land resources due to increased development requirements – all these call for integrative national planning, including in many complex areas. Israel's national planning rests on a system of heavy constraints deriving from this situation; it must find appropriate ways to represent the different interests and needs of Israel's economy and society.

Despite the fact that NOP 22 is generally narrow in focus and places emphasis on spatial aims for forests and afforestation, it is compelled to take all current and future planning factors and constraints into consideration.

Moreover, the planning itself is intricate and includes conserving forests and natural woodlands, developing new afforestation directions. It must also relate the topic as a whole to land resources, values, public moods and the different disciplines of nature and landscape conservation that have raised public awareness and involvement. All this made it necessary to construct a consistent system and outline a course of work to promote the plan and its aims.

Methodological Model

NOP 22 relates to a time frame of the next 20 to 30 years. One of its functions is to respond to needs and achieve goals for a wide range of aspects related to space, nature, landscape and population. The plan deals with not only the fixed database of the existing situation, but also with the uncertainty of development trends, such as population growth, density and distribution, and the array of open spaces and road networks. It seeks a place in the general, national planning system, directing and intervening in predictable processes, impacting on Israel's physical and spatial character. In these conditions, planning must rely on a suitable, consistent methodological model. Accepted models may be divided into two main groups: the first includes models resting on spatial scenarios; different alternatives are examined, evaluation criteria are constructed and the optimal alternative is chosen in the light of these. The

second group is made up of logical models of planning in fixed conditions with a limited range of options aimed at achieving predefined goals. The function of the plan is to design the best, most convenient way to achieve these goals.

The Chosen Model

As said, NOP 22 deals with environmental and social patterns largely determined by fixed, existing patterns. No far-reaching changes are expected in the environmental configuration in the foreseeable future. The major population centers will continue to be concentrated along the coast, especially in the Tel Aviv area. Three other centers – Jerusalem, Haifa and Beersheba – have the highest population growth rates in the country. The trend of strengthening the periphery, especially in the north and the Negev – should it materialize – cannot change this overall picture. At the same time, as regards the distribution of forests and open spaces, the large concentrations are located in distinct regions in the north and Judea, in contrast to a shortage in the center of the country. These are the basic fixed conditions faced by the plan. The spheres of uncertainty relate to prospective population growth, particularly immigration, and to long-term policy regarding the distribution of population relative to open spaces.

These conditions, dominated by fixed components, call for planning on the basis of the logical model. Currently, given the timeframe of the plan, it is impossible to posit a realistic alternative to the arrangements of population distribution and the array of open spaces. The plan must therefore adjust to a series of problems and constraints deriving from the existing situation, while attempting to influence the country's physical and scenic character within the framework of current possibilities.

The few open spaces that remain are diminishing in size and quality due to development pressures. Consequently, rather than present alternatives to the distribution of forest areas, the plan seeks to cover as much forestland as possible, of maximal quality and merit. In view of existing constraints, NOP 22 hopes to include in its purview the enrichment and diversification of open spaces while allowing for the demand for land development and community expansion, in an optimal balance between built-up areas and open spaces. From the initial working stages, the planning approach relied



Planted forest and farmland
Photo: KKL-JNF Photo Archive

on the logical model: according to given data, constraints and problems, setting realistic operational thresholds, and charting the best ways to reach the set goals.

Once the basic planning idea was adopted, an orderly working program was formulated. It is meant to encompass the country's broad geographical references (the entire state) and the numerous, varied areas touched on by NOP 22.

Formulating the Bases of the Plan

Planning Policy

A national outline plan represents a concept and planning approach, and sets goals on the national level. NOP 22 is founded on knowledge of the landscape character of the land of Israel, its natural assets and aspects of public wellbeing, recreation and leisure culture. These concepts inform the entire plan; they were adopted and adapted to differing forest formations on the local and regional levels. For every area, the functions of forests and afforestation were examined in the light of these basic assumptions, of the overall concept and the overarching goals.

Cartography Format

The level of precision of the plan (expressed in its map scale) greatly affects the direction and boundaries of its influence. This is true of the presentation of the overall concept, the drafting of plans on the local level, the treatment of details, its accuracy and its relationship to other plans. Existing national outline plans are usually on a scale of 1:50,000 or 1:100,000 (NOP 8). In the early stages of work on NOP 22, while formulating the methodology and collecting and processing the scope and nature of the data, the need arose for a scale of 1:50,000 (extending the decision of the National Planning and Building Council, which had called for a scale of 1:100,000). The reasons for this scale were both cartographic and pragmatic: beyond the conceptual plane, the plan touches on local detail with much precision, defining forest and afforestation regions all over the country. These local levels demand a fair amount of detail. NOP 22 presents thousands of polygons of eight types of forestland. Clarity and detail – for areas ranging from 20-30 to thousands of dunams – are thus necessary. The scale of 1:50,000 is sufficiently detailed to reference the local level yet sufficiently general to reflect the plan's basic concept and achieve a comprehensive national view.

Population Data, Distribution, Density and Pressures

Based on CBS data, the population centers were divided by region, local density and growth projections. The ratio between population centers and recreation areas, in a given radius and at various levels of access, was examined quantitatively. The examination related to the year of the plan's drafting and the year 2020, when the projected population will number some eight million. Using the West's ratio of population to open land, comparisons were drawn with current Israeli data and regional breakdowns, and the demand for forests and open spaces was surveyed. At the end of this stage, indices and levels were determined to accommodate the physical area.

Creating Databases

Throughout the planning period, data were collated and updated from a variety of sources:

- » **Planted forests** – from 1:5,000 scale forest maps of KKL-JNF's Forestry Division. The information was transferred digitally to the scale of the plan – 1:50,000.
- » **Forest parks** – from the Forestry Division's forest maps and computer files defined as "Forest Park."
- » The identification of **natural woodlands and sandy vegetation** – As part of the plan, aerial photographs and satellite images of the whole country, north of the 220-mm. precipitation line, were studied. The aerial photos were overlaid with the distribution of natural woodlands, yielding definitions of their vegetative formations, condition, density and development. The information was transferred to auto-CADStar maps on a scale of 1:10,000 and from that, to the scale of the plan, 1:50,000.
- » **Proposed planting areas** – Areas unfit for agriculture, rocky lands and gullied lands were identified from the 1:10,000 scale aerial photos. Fit, cultivated lands, and lands fit or unfit for cultivation were differentiated on 1:50,000 scale maps. From these maps, the recommended planting areas were extracted for proposed forests and proposed forest parks.
- » **Hydrological data** – On national geological maps of various scales, three units were classified according to permeability and groundwater connection: units in contact with the aquifer, the aquiclude, and intermediate units serving as the aquitard. This mapping benefited from the assistance of the Geology Institute of the Hydrogeology Department at Water Planning for Israel Ltd. Numerous maps of various scales were used and merged to achieve a scale of 1:50,000.
- » **National and regional outline plans** – All the national and regional outline plans relating to open spaces were used. The compilation map of national

outline plans, drawn by the Planning Authority of the Ministry of the Interior, was extremely helpful. The various types of land zoning were collated from the different plans, providing the background and basis of an additional planning layer – designated forests and afforestation.

The main plans scanned for these purposes were:

- » NOP 8 - on National Parks, Nature Reserves and Landscape Reserves;
- » NOP 6 - on Population Distribution;
- » NOP 13 - on the Mediterranean Coast;
- » NOP 14 - on Mining and Quarrying;
- » NOP 31 - on Building, Development and Immigrant Absorption;
- » Regional outline plans – north, center, Jerusalem, and the south;
- » Local plans of spatial significance (e.g., the local outline plan of Mateh Yehuda/the Judean Hills (No. 200), the plan of the Ashkelon Coast Regional Council, the plan of the Merom HaGalil Regional Council etc.);
- » A review of the literature, studies and previous works – primarily landscape and environmental surveys conducted in various frameworks: KKL-JNF, the INNPA, the Society for the Protection of Nature in Israel (SPNI), universities and research institutes. The fields involved were geo-botany, the botany of the land of Israel, afforestation, nature and landscape values, archeological surveys.

Zoning Criteria

The plan is based on a clear formulation of the criteria for choosing afforestation areas and classifying the zoning formations (of eight forest types in the plan). The criteria were formulated according to the goals, their function being to examine potential areas and their adaptation to the proposed forest types.

The system of criteria distinguished between two sets of considerations:

- » General considerations relating to the identification of areas fit for forests or afforestation in the outline plan;
- » The adaptation of the area to the forest type.

General Considerations in the Identification of Areas

The first and most important criterion was the complete distinction between areas that are cultivated or fit for cultivation and areas that are not cultivated or fit for cultivation. The guideline was that cultivated land, whether through modern or traditional agriculture,

would be omitted from the plan. This principle is entrenched in Israeli forestry – afforestation has always been executed on rocky, gullied land unfit for farming. The quality of agriculture was defined by accepted characteristics, the chief ones being: rocky or stony land, gradient, gullies, and erosion. These characteristics were identified in aerial photographs and a distinction was made between lands fit for cultivation (whether actually cultivated or abandoned in the present) and lands unfit for cultivation. The afforestation areas were chosen from the latter, based on a series of planning criteria and considerations, as specified below.

Note that in extraordinary cases, it was decided that areas of some agricultural worth were not fit for modern cultivation methods – ancient terraces, small, fragmented patches or patches far from water sources. These were then included in the potential areas for afforestation (mostly as “bustans” or forest parks). In any case, all land of clear agricultural potential was omitted from the plan.

The one exception was sandy areas on the coast. Sands do have agricultural potential following appropriate reclamation and leveling. However, in the current conditions, their function as recreation areas and a green hinterland for the shoreline appears to be immeasurably more important than any agricultural function they may have. Moreover, the areas in question were zoned for reversible forests and afforestation, which do not impede the agricultural designations.

Adapting an Area for Afforestation

The plan stipulates eight types of forests and afforestation:

Planted Forests

Planted forests were designated according to the situation on the ground (from aerial views and maps). Nevertheless, from the existing configuration, areas appearing to block the expansion of existing communities were removed. These deletions (of a considerable scope of almost 250,000 dunams) were coordinated with the Israel Lands Administration (ILA) and regional planners at the Ministry of the Interior.

Proposed Planted Forests

Proposed planted forests were designated according to the following criteria:

- » The area does not contain natural woodlands and has low or no potential for natural regeneration;
- » Based on desired ratios of open spaces to population (See Chapter 12), additional plantings are needed for public wellbeing and recreation;
- » Areas in which landscape changes are important for absorbing population and improving the surrounding scenery (northern Negev);



Olive groves above Sataf
Photo: Gidi Bashan, KKL-JNF

- » Creating green belts around urban communities;
- » Plantings would generally not be added to aquifer refill areas lest there is even the smallest chance of reducing infiltration to the aquifer.

Existing Forest Parks

As in the case of planted forests, the designation of these areas is based on the situation on the ground – sparse forests fall within this definition; “bustans” and olive groves were also included.

Proposed Forest Parks

Forest parks were designated on grazing land to consolidate the infrastructure of natural pastures where the vegetation of grasses and grains is rich (in hard limestone rocky soil from the Eocene age, in eastern Galilee), in basalt areas on the Golan and in eastern Lower Galilee, on the sandstone hills along the coast, around Adullam-Bet Guvrin etc.). One of the considerations taken into account was the visually open characteristic of sparse forests for areas on the edge of the desert.

Natural Woodlands for Nurturing

The main criterion here was to maximize the representation of all the vegetation communities and the scenic formations in the country. Their various stages of development were also taken into account. Thus areas representing successive development for natural woodlands such as scrub and garrigue, were also included.

As a rule, the natural woodland areas were designated on the basis of facts on the ground and the state of vegetation development to provide for the representation of plant communities. The areas were graded in importance and rarity on the basis of a review of the literature, current work being done and surveys conducted with the help of professionals (and the cooperation of KKL-JNF, the INNPA and the SPNI).



Natural Woodlands for Conservation

This category includes different types of forests, from planted to natural woodlands and forest parks. The instructions of the plan gave special emphasis on the conservation of natural woodlands. Several criteria taken together designated areas to be conserved:

- » Special attributes, the botanic and visual, the rare and exceptional
- » Areas defined as Nature Reserves according to NOP 8

Note that all the forest types are included in this category: planted forests, natural woodlands, forest parks, and “riverside” plantings

Coastal Forest Parks

These include sandy coastal areas with coastal vegetation and “bustans” typical of the coastal strip.

The zoning criteria for coastal forest parks were:

- » Their location on the coast, on sands or sandstone ridges in sandy areas (generally, the first and second sandstone ridges)

- » The existence of sand vegetation typical of the area
- » Their real contribution to public wellbeing and recreation in the center of the country
- » Their open landscape – a hinterland complementary to the shoreline

“Riverside”/Dry-Stream Plantings

The streams included in the plan are mainly coastal streams, viewed as axes of lateral recreation and easily accessible to population centers. Sensitive stream sections with unique vegetation or other assets were included under natural forests for preservation.

Natural scrub of acacia albida on karkur hill
Photo: KKL-JNF Photo Archive

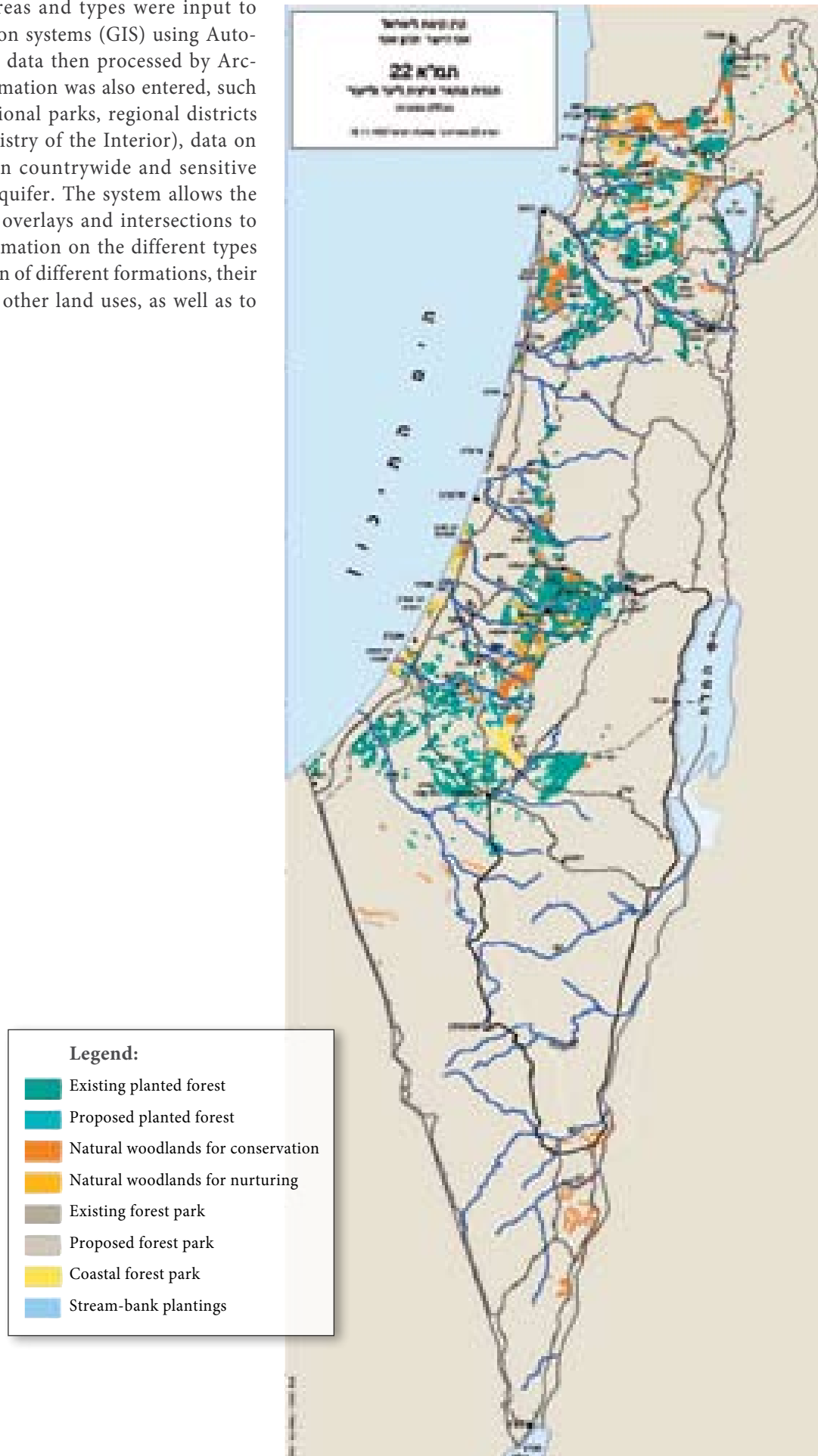


Data Processing, Computerization and Mapping

The different forest areas and types were input to geographical information systems (GIS) using Auto-Cad software, with the data then processed by Arc-Cad. Background information was also entered, such as nature reserves, national parks, regional districts (as defined by the Ministry of the Interior), data on population distribution countrywide and sensitive areas in terms of the aquifer. The system allows the data to be analyzed in overlays and intersections to yield quantitative information on the different types of forest, the distribution of different formations, their relation to zoning and other land uses, as well as to demographic data.

Illustration 3

NOP 22 forests, in general, by forest type



14.

Summaries of Forests and Afforestation Areas - NOP 22

Table 1
NOP 22 - Areal Summaries (in km.2)

Existing planted forest	536
Proposed planted forest	142
Natural woodlands for conservation	75
Natural woodlands for nurturing	181
Existing forest park	176
Proposed forest park	428
Coastal forest park	44
Stream-bank plantings	39
Total	1,621

Chart 3
NOP 22 - Areal Summaries

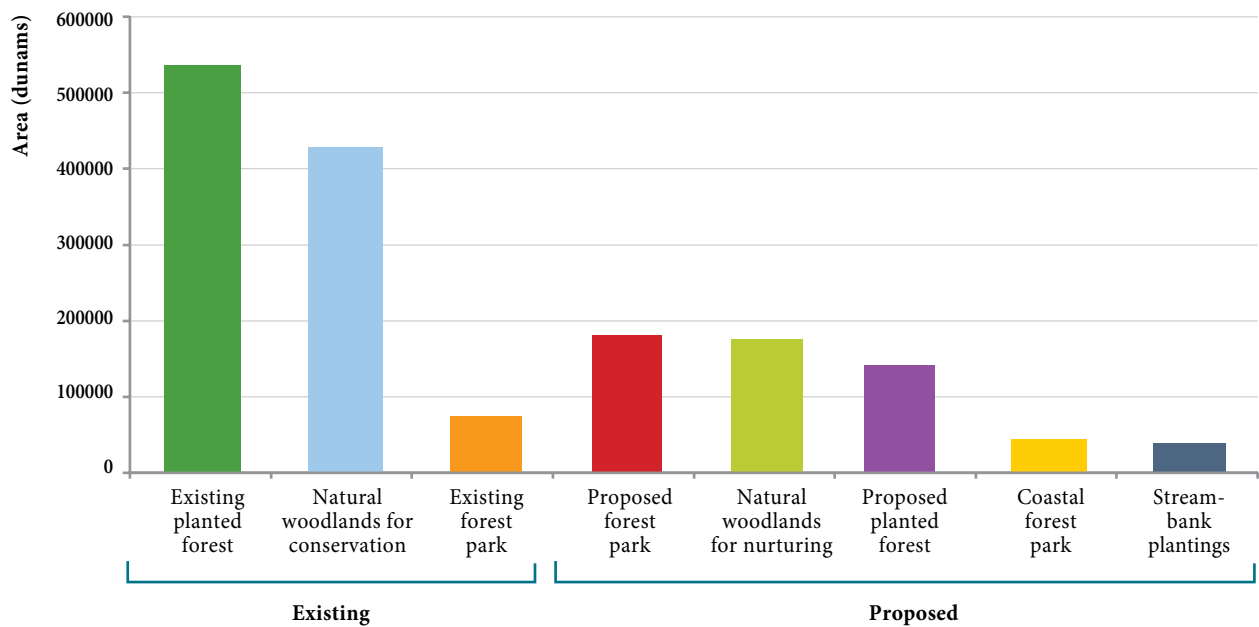


Chart 3 expresses **Table 1** in graphic form. On the left are the existing forest areas: existing planted forest, natural woodlands for nurturing, existing forest park, and natural woodlands for conservation. On the right are the proposed forests: proposed planted forest, proposed forest park, natural woodlands for nurturing, and stream-bank plantings.

Table 2

NOP 22 – Areal Summaries (km.), by District

District	Existing planted forest	Proposed planted forest	Existing forest park	Proposed forest park	Forests for conservation	Natural forests for nurturing	Coastal forest park	Stream-bank plantings	Total
North	205	20	8	46	147	91	0	2	519
Haifa	36	3	3	2	58	9	3	5	119
Center	32	9	14	14	19	0	13	10	111
Tel Aviv	0		0	0	0	0	0	0	2
Jerusalem	87	3	17	13	26	60	0	3	209
Ashkelon	61	52	2	18	65	16	28	17	259
Beersheba	115	55	32	88	112	0	0	0	402

Chart 4

NOP 22 – Areal Summaries (km.), by District

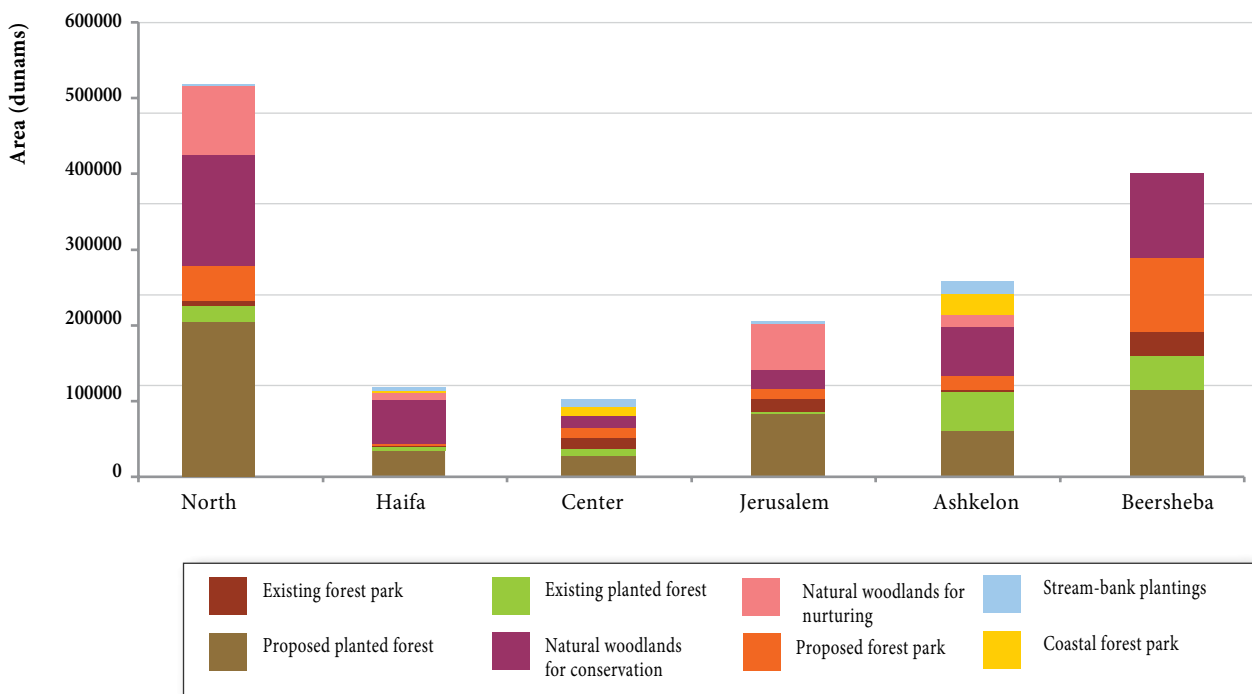
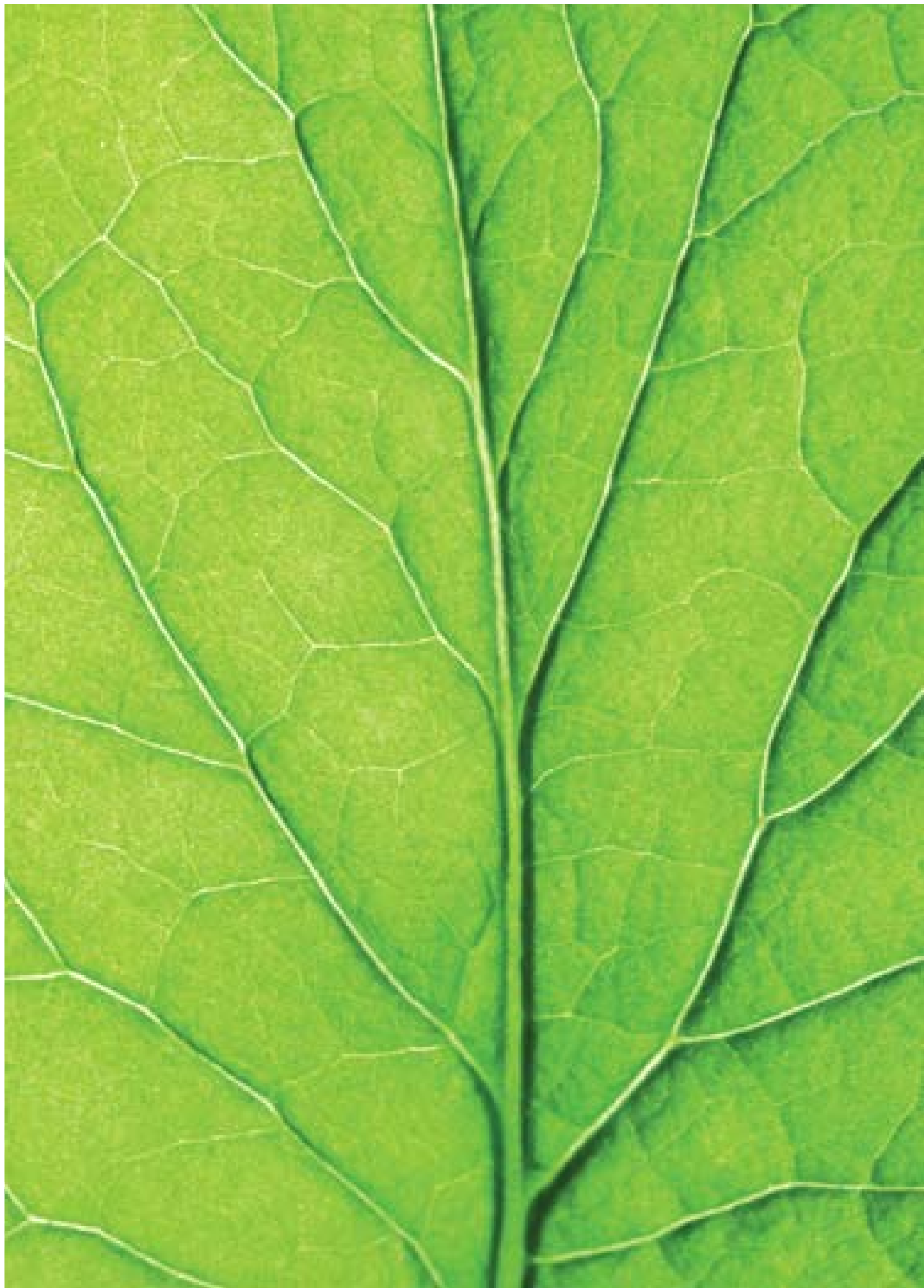


Chart 4 gives graphical expression to Table 2, showing the total area of existing and proposed forests, by district.

Part IV

NOP 22 in national planning



15.

NOP 22 and Open Spaces

NOP 22 is a planning mechanism to conserve Israel's open spaces. Its importance has risen with the growing awareness of the risk posed to the country's land resources and the danger of their depletion, an issue of decisive weight in the corridors of national planning. Natural population increase and the rise in quality of life have seen ever-growing demands for building land and with it – diminishing land resources, in both quantity and quality.

The problem of open space in Israel emanates from the country's tiny area and limited carrying capacity. The issue was already raised under the British mandate in a controversy over the country's ability to absorb and sustain millions of people. In early statehood, the trends of population distribution were mainly aimed at control of the territory, backed up by political and security reasons. Little consideration was given to the land resource, its limitations or the potential of open spaces as natural assets, landscape or public welfare. The policy of population planning and distribution rested on dressing the territory in a "robe of concrete and cement," to quote a popular song of the times.

The result was the settlement configuration typical of Israel – abundant settlement points scattered all over the territory, connected by road networks and infrastructure installations bisecting open spaces. The heavy pressure on open spaces engendered a sense of claustrophobia. On the other hand, the advantage of size and lure of employment and culture attracted large-scale urban settlement to the coastal plain, and continues to do so to this day. A similar process took place around Jerusalem and Haifa, which are increasingly closing in with a form of development that is drawn to existing infrastructure and leaves behind less and less open spaces.

In the areas of Tel Aviv, the central district, Haifa and Jerusalem, the rates of population density and urbanization are high. More than two-thirds of the state population lives in congested areas, in terms of open spaces and their functioning. These population centers negatively affect the functioning of infrastructure and transportation systems, as well as environmental quality.

The national distribution and span of built-up versus open areas shows great variation: built-up areas are concentrated north of Beersheba whereas open spaces are massed in the south. The proportion of open spaces in the Beersheba district is some 98% and population density is 26 people/sq. km. Yet this large space – some 60% of the state's territory – does not function as a green hinterland or open space for public leisure. A large portion of it is used as closed military zones. It is remote, largely inaccessible, dry desert in character, and its natural carrying capacity is highly limited (apart from the very specific assets of desert landscape).

North of Beersheba, which is basically the state's living space, land is in short supply and the population density is the highest in the western world – nearly 600 people/sq. km. Here, too, the distribution of open areas and population density varies greatly, ranging from 6,600 people/sq. km. in the Tel Aviv area, which functions as a metropolis, to 180 people/sq. km. in the northern part of the country.

According to all prospective scenarios, by the year 2020 developed areas will constitute at least 30% of every district, except for Ashkelon and Beersheba. These projections were obtained from even the most optimistic forecasts, based on the encouragement of a policy of population dispersion, which calls for a balanced approach to open spaces. In other words, the state of Israel is striding towards extreme congestion and land shortages – and all that it entails environmentally, socially and functionally.

The Direction of Planning

Non-interventionist planning (the scenario of "business as usual") will in the coming decades lead to a virtually closed conurbation between Ashkelon and Haifa, including Haifa, Tel Aviv, the central district and Jerusalem. At first, there will be a network of adjoining, connected cities (this nuclear situation already exists) superseded inevitably by their merging into one "city state." The consolidation of the metropolis of Tel Aviv, which includes the "autonomous" cities of Ramat Gan, Givatayim, Holon and Bat Yam, is a concrete example, forming one conurbation. The same sort of accelerated

process may be seen today with the cities of Rishon LeZion, Nes Ziona and Rehovot; gradually losing their agricultural partitions, they are merging into a built-up continuum threatening to convert them into a single conurbation.

The formation of this kind of “city state” has implications for numerous spheres. Socially, life becomes severed from the values of landscape, nature and environment, areas for rest and relaxation are few, and the poorer population is cut off from open spaces. Overcrowding brings social deterioration and familiar urban ills – poverty, violence and crime. Culturally, the native landscape of most of the population will don the cover of “concrete and cement” typical of a densely-populated coastal area. Nature and landscape assets will become “museum pieces” displayed in closed, marginal nature reserves to the detriment of the appearance and character of Israeli society. The coastal conurbation will adversely affect environmental quality: there will be a high concentration of pollutants emitted by vehicles and industry without the dilutants of open expanses and spaces, massive pollution of the coastal aquifer located in the central area, and disrupted percolation of water refills to the aquifer due to construction and soil blockage.

An obvious sign of the lack of open spaces is the shortage of areas for public recreation, particularly in the center of the country, as evidenced by the public rush on weekends and holidays to recreation areas further away. This situation reflects a real need for open spaces for excursions, rest and relaxation, and that need is only growing with the increase in leisure and the consciousness of a leisure culture. The tremendous increase in private vehicles also impacts on the demand for recreation areas while added rates of tourism compound the demand for open spaces.

Planning Policy - NOP 22

The Cultural Value of Forests

NOP 22 deals with open spaces, which bear much of Israel’s cultural heritage, as they are inscribed with events in the life of the nation and preserve the ancient landscapes of the land of the Bible. The continued

physical existence of Israel’s traditions and heritage, and the preservation of the historical collective memory are of national importance.

Forests and woodlands share in defining the country’s landscape. They frame built-up areas and can lend cities definite boundaries, uniqueness and identity. A wrap of green around built-up areas adds to their value and lends residents flavor and quality of life. Open landscape, forests and woodlands are a reflection of the country’s character.

Open expanses – planted forests, natural woodlands, parks and nature reserves – offer rest and relief for a population that, on the whole, inhabits crowded cities. A rising standard of living and with it, more leisure and awareness of a leisure culture, have raised the importance of forests and woodlands as a response to public needs.

The social function of forests has additional value as it is a means of drawing urban society closer to nature, the land and the environment. In a society growing further away from its sources and the natural heritage of its surroundings, this cultural-educational value is all the more significant.

The extent and future development of forests is thus not merely a technical question of supply and demand: the proper development of forests and woodlands is of cultural, systemic importance in molding the face of the country and bonding residents to their land.

Social Aspects

The social sphere embraces one of the main goals of NOP 22: the maintenance of well-developed forests as the basis of public recreation, leisure and wellbeing. Key importance is attributed to the inclusion and designation of open spaces for leisure and recreation in densely-populated areas, especially around Tel Aviv, the central district, Haifa and Jerusalem. The addition of such areas in these regions, according to the plan, will be part of the format of intensive development and increase their absorption capacity. Note that the importance of these areas in the center of the country does not concern their assets, but the fact that they are open, available and present to supply recreation and leisure services for the surrounding population.



16.

Planning Standards and Quotas for Recreation and Leisure Areas

Areas defined for purposes of rest, holidaymaking and wellbeing, according to the proposed concept, are appropriately zoned and of a quality necessary to fill these functions. This category includes forests, parks, national parks, antiquity sites, beaches and the banks of streams.

The question of matching various types of open spaces to population size and demand may be addressed using different approaches. Here, the discussion of quantitative measures pertains to the determination of areal quotas for the functions of public rest and recreation, and from the recognition that there are numerous provisos involved. A distinction should be made between the different factors constituting the system, the chief of which follow:

- » **Type of area** – Open spaces include various land uses and infrastructure such as: forest formations which vary in density and planting type, different types of natural woodland and forest parks, nature reserves, national parks, antiquity sites at different levels of development, beaches of diverse coastal widths with a hinterland and stream banks. Each form has its own carrying capacity and absorption conditions.
- » **Functioning** – Accepted practice distinguishes different urban formats: neighborhood, metropolitan, regional, national and, in many cases, even international, i.e., lands serving a number of countries.
- » **Degree of development** – Different forms of development impact on an area's capacity to absorb visitors; e.g. the carrying capacity on the edge of a well-developed forest, which includes level areas, recreation areas and facilities, differs from that of undeveloped thickets or nature reserves.
- » **Limited functioning of nature reserves due to their explicit designation** – Their prime goal is conservation or protection of natural assets and nature reserves. They nevertheless do have some capacity for meeting rest and recreation needs. Fallow, rocky or desert lands contribute little as they serve a very limited segment of the population.
- » **Location (service radius)** – Location is of prime importance; exposure and proximity to congested population areas enormously enhance the function of supplying rest and recreation needs. The functioning of remote areas, no matter how well-developed and available, is periodic (vacation and holidays).
- » **Access** – The system and caliber of the roads leading to rest and recreation areas are important; an efficient road network “shortens” distances and enhances accessibility.
- » **Attractiveness** – Attractive tourism areas introduced into open spaces raise their worth and functioning. An attractive antiquity area or eye-catching active recreation facilities increase the total assets of an area and the extent of its exposure to the public.
- » **Leisure Culture** – Public patterns of rest and recreation, awareness, free time, socioeconomic status and mobility all have a direct influence on determining quotas and the ratio between the population and open spaces.

Basic Assumptions

Level of Functioning

NOP 22 addresses the rest and recreation functions of forests and natural woodlands on the metropolitan, regional and national levels. In this framework, there is no reference to the local urban level (though the topic does have direct implications in the context of urban forests). Urban forests have recently been incorporated in forest planning (see Chapter 8).

Population

The point of departure is that the need for open spaces for rest and recreation is restricted to the urban population. For the rural population, this need is presumably met by their surrounding open expanses.

Agricultural areas

Cultivated land is not used for rest and recreation under current agricultural conditions. This fact becomes doubly important if we consider that agricultural land harbors the only potential for open expanses, particularly in the center of Israel. The work on this plan was governed by the rule that areas fit for farming would not fall under NOP 22. Therefore, the plan does not address agricultural land in the center of the

country. Note that the pressure for rest and recreation areas in the center will make it necessary to modify this approach in future plans.

Standards for Setting Population Quotas/Rest and Recreation Areas

In order to identify shortages of rest and recreation areas, and foster rational distribution of forestland to relieve the situation, planning tools are needed for the necessary quantitative assessments.

This chapter speaks of two planning tools:

- » Planning quotas connecting population size to the dimensions and extent of the various types of areas
- » An area's carrying capacity, relating to the number of recreationists an area can bear

Planning Quotas

The quantitative measure of need for open spaces, in terms of their function as a supplier of public rest and recreation, is expressed by the quotas of open spaces in relation to the population within various radii of service. It is commonly assumed that the greater the distance from home to a recreation area, the larger the quota needed. However, the level of requisite development decreases with distance. To create a general basis of discussion, stipulate quotas for Israeli conditions and direct the work of NOP 22, a number of parameters will be presented, which are acceptable both in the West and in Israel.

Urban Format

Open public spaces at a high level of development: playgrounds, urban parks, sports fields, public gardens, walkways/paths and hiking trails; *radius of service* – 2-3 km.; *customary quota* – 20-40 sq. meters/resident.

Metropolitan Format

Open spaces in the format of a regional metropolis: forests and nature reserves, camping and picnic areas, lakes, swimming, fishing, sailing, riding trails, field-craft and sports out in the open; *radius of service* – 50 km.; *customary quota* – 100-200 sq. meters/resident.

National Format

Open spaces in a national format: General function – similar to that of the metropolitan format, but on a far more extensive level; *radius of service* – 60-90 km.; *customary quota* – 260 sq. meters/resident.

Israel's Special Conditions

Quotas in Israel should be higher than those in Western states, for the following reasons:

- » Israel's closed borders hamper excursions beyond its boundaries – an option that is clearly available in other countries.
- » Closed areas defined as firing zones comprise almost 40% of state territory.
- » The dichotomy between population dispersal and the distribution of open spaces: in the northern expanse, there is a shortage of land and high concentration of population; in the south, there are abundant open spaces, but of limited accessibility and availability.
- » Harsher climate conditions and a dry landscape, especially in the south, do not permit optimal year-round utilization of the territory.
- » High natural increase (compared to low, almost zero, natural increase in Western states) will reduce open spaces even further in the future, yet increase demand.

Recent works written by the Ministry of Construction and Housing and Adam, Teva v'Din (the Israel Union for Environmental Defense) referred anew to planning measures and guidelines for open spaces on the urban and regional (metropolitan park) level. The accepted standards today were laid down in the 1975 Tourism Master Plan. Its basic assumptions and stipulated values will be used in the present plan, subject to today's projections.

Principles and Quotas of the Tourism Master Plan

The plan relates to a population range of 5 million residents and stipulates an overall national quota of open spaces for recreational functions on a scale of some 500 meters/per capita; about half of this are sites on the urban-regional level, at a high level of development; the other half – on the national, extensive level. **Table 3** shows the areal quotas at the different levels, based on the Tourism Master Plan.

Remarks and Clarifications for the Table:

- » The table does not include urban quotas with a service radius of 2-6 km. The overall rate is some 40 sq. meters/resident.
- » This plan is based on the Tourism Master Plan which stipulates that regional and metropolitan quotas and service radii are merely indicative, and that their goal is to “designate areas for recreation and sports of a reasonable quantity and over a range designed to meet the recreation needs of tourism and the population.”
- » The quantitative and qualitative classification of activities was determined differentially by region, according to population needs, geographic and climatic conditions, and the areal connection to other areas and activities.

Table 3

Recreation Area Quotas (in sq. m. / resident) by Service Range and Development Level

Function	Development Level			Service radius (km.)
	Intensive	Extensive	Total	
Metropolitan	40	40	80	6-20
Regional	35	65	100	20-50
National	55	105	160	national
Total	120	210	330	

Recommendations for Planning

These are the planning quotas stipulated for NOP 22, at minimal rates:

- » On the regional level – 180 sq. meters per capita, at a radius of up to 50 km. (about a 30-minute drive)
- » On the national level – up to 400 sq. meters per capita, with no limitation of radius

Carrying Capacity

The carrying capacity is a planning tool facilitating a quantitative assessment of the supply of recreation with reference to a given area. The supply is expressed by the number of daily recreationists per dunam of area. The carrying capacity is determined by the type of area and its function, its level of development and geographic location in relation to population centers.

With the help of this tool, it is possible to “raise” the level of development and capacity of an area if it is in a congested location where demand is very high.

The carrying capacity relates to four main types of area:

High Level of Development

An area with a high level of development, relatively flat and comfortable, with plenty of facilities and activities – full, intensive development; very good access to all parts (examples: Canada Park, Hurshat Tal, Ein Hemed, HaYarkon Park).

Medium Level of Development

An area of moderate topography, including facilities and activities at a medium level of development, good general access (examples: HaShalom Forest, Yatir Forest, HaCarmel Park, Eshtaol Forest).

Low Level of Development

An area developed at a low level, moderate to steep topography; few facilities and recreation areas in relation to the area, little development (only roads), moderate to low accessibility (e.g., Martyrs/HaKedoshim Forest, Mt. Meron Reserve).

Undeveloped Area

An undeveloped area, steep and variegated topography, no facilities, low accessibility within and to the area, field conditions that make it hard to spend time there (e.g., desert nature reserves).

Following a review of the literature on the carrying capacity of various types of open spaces, comparative examinations and the adjustment of values to Israel’s quotas and conditions – quotas for carrying capacity were set for the different types of areas. The recommended quotas are shown in Table 4.

Table 4
Carrying Capacity

Type of Area	Visitors per Day per Dunam
High development level	20.0
Moderate development level	10.0
Low development level	1.0
Area with no development	0.1

Supply and Demand of Recreation Areas

The Demand for Recreation Areas

An investigation of demand is complicated. Demand is a social function influenced by numerous, diverse variables dependent on time, lifestyle and the supply itself. This is then further compounded by the definition of the working unit, i.e. – the unit of demand and for which region (e.g., does the demand of a Tel Aviv resident encompass Ben Shemen Forest?) Jerusalem Forest? the Carmel?). The area of demand for leisure areas subdivides between the regional-metropolitan and the national levels. Some of the factors that pose difficulties in defining demand and its relation to supply are:

- » Setting the distance between population centers and recreation areas, on the regional and national levels
- » Access, availability of transportation, the quality of the roads and the time it takes to get there
- » The variety of forms of recreation demanded by the public
- » The dynamics of demand, the constant rise in population growth, the growing public awareness of recreation and leisure
- » The difficulty of defining a geographic unit of demand, the overlapping of different units and the impact on adjacent units of demand

Various Parameters of Demand

The data system for examining supply and demand is detailed in quantitative, monovalent values that express area in terms of dunams and population – in the number of residents. In fact, demand is determined by the composition of the population, income level, leisure culture and social fads.

Note that alongside demand, forest development has additional values – cultural, social and educational. According to the conception of the present work, supply – i.e., forests – will create demand and reinforce the public's bond to the country's assets.

Area of Demand

The plan defines a unit of work broadly enough to circumvent the above-mentioned difficulties. The boundaries of demand are defined as a district based on the administrative divisions of the Ministry of the Interior. Two population levels were set: one – the situation existing in 1994 – according to CBS data; the other – population projections for 2020 based on the forecasts of population dispersal of NOP 6. A district is a convenient unit of work because of the available data. Future plans will be able to merge several districts into larger units of demand – or to divide them as needed into sub-units.

Table 5 presents data on population capacity and density for both 1994 and 2020, by district.

Table 5

Number of Residents and Population Density for 1994 and 2020, by District – CBS Data and NOP 6 Projections

District	District Area (km.)	Residents (thousands)		Density (People per Km.)	
		1994	2020	1994	2020
Golan	1,176	30	62	26	53
Safed	671	74	162	123	142
Acre	936	401	795	428	849
Sea of Galilee	521	82	158	158	303
Jezreel	1,197	331	695	277	497
Haifa	283	483	644	1,708	2,276
Hadera	571	239	441	418	772
Sharon	348	267	402	767	1,155
Petah Tikva	284	414	567	1,458	1,996
Ramle	312	155	336	495	1,077
Rehovot	298	338	433	1,134	1,453
Tel Aviv	170	1,141	1,313	6,711	7,724
Jerusalem	627	646	880	1,030	1,404
Ashkelon	1,272	321	472	352	371
Beersheba	12,835	414	856	32	67
Total	21,101	5,336	8,116	248	377

Illustration 4

Population Density, by District, 1994

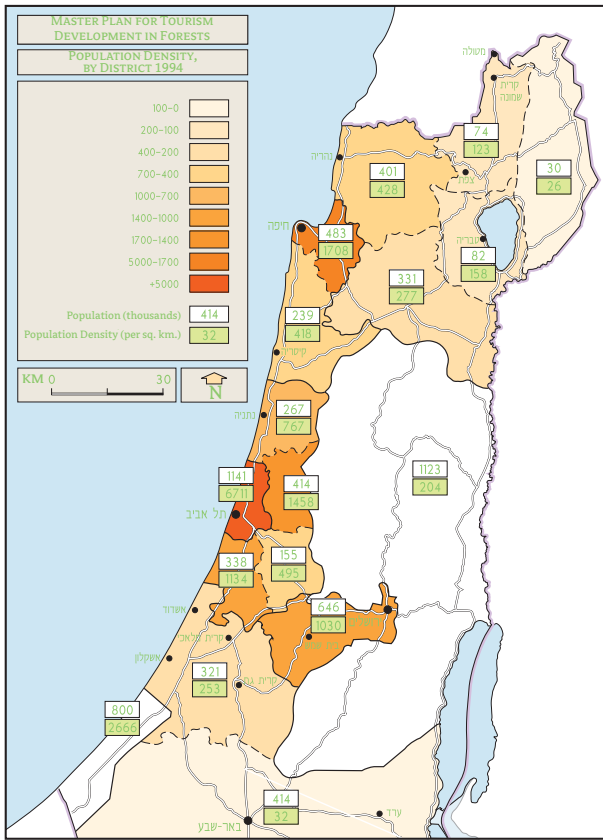
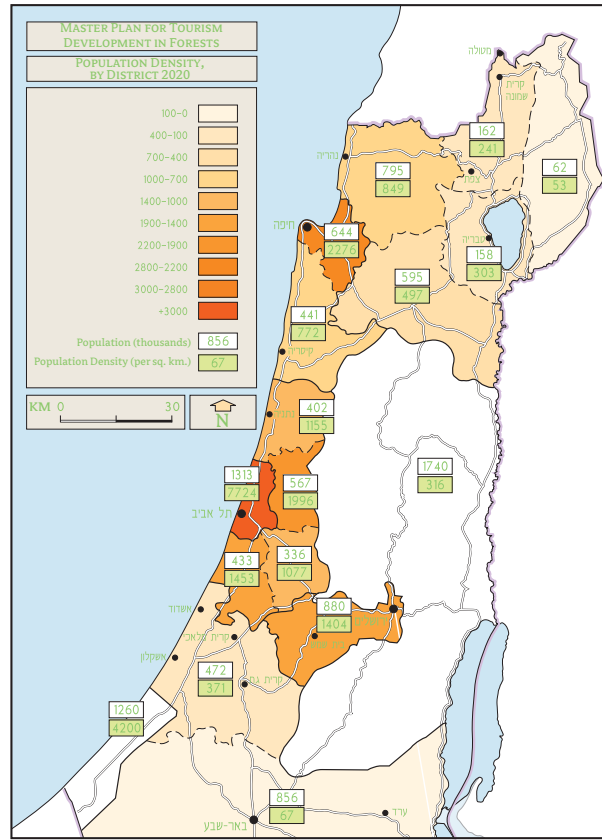


Illustration 5

Population Density, by District, 2020





Maps 4 and 5 present existing and projected foci of population density in graphic terms.

The table and map concretely illustrate the great variation in the country's population distribution. Large concentrations can be seen around the Tel Aviv metropolis, in addition to two local concentrations, in Haifa and in Jerusalem. This tri-fold structure affects the directions of planning.

The Supply of Recreation Areas

The supply defined in this plan is the total of existing and potential areas (in two separate divisions) able

to furnish public recreation and leisure services. Two parameters are defined: the size of the area and its effective functioning.

Table 6 presents the areas designated for leisure and recreation, by district. The table shows all types of areas: existing and recommended planted forests, forest parks, natural woodlands to be cultivated and preserved, coastal forest parks, stream-bank plantings, nature reserves and national parks.

The size of the area itself is only partially significant since its leisure functions derive primarily from the

Table 6

Recreation and Leisure Areas (in dunams). Distribution of Open Spaces for Recreation and Leisure on the National Level, by District: Forests, Natural Scrub, Nature Reserves and National Parks. Proposed planted forests include coastal parks and stream banks. Areal data are for 1994

District	Developed fores	Existing planted forest	Proposed planted forest	Natural forest for nurturing	Natural forests for conservation	National parks		Nature or Scenic Reserve	Total Supply of Effective Area
						Developed area (core)	Sur-rounding area		
Golan		11,499	15,861	1,286	12,014		1,728	3,850	46,238
Safed		63,074	7,185	18,284	31,881		6,616	82,109	209,079
Acre		86,742	5,505	55,290	54,249		3,384	120,080	325,250
Sea of Galilee	1,200	18,224	17,290	10,693	16,753		16,451	25,702	106,313
Jezreel	200	120,564	22,402	4,707	30,538	1,300	1,818	64,819	246,348
Haifa		21,041	1,669		5,841	5,000	1,778	66,595	101,954
Hadera		52,046	11,092	9,018	52,144		5,027	48,469	177,769
Sharon		4,386	2,666		1,135		1,441	957	10,585
Petah Tikva		12,838	11,874		3,103	100	6,922	225	34,962
Ramle		30,983	15,056		7,802		8,461	3,175	65,477
Rehovot		3,606	16,470		6,465		3,316	468	30,325
Tel Aviv		316	1,611				65		1,992
Jerusalem	2,500	165,202	19,676	59,628	26,120		8,710	38,143	319,979
Ashkelon		68,809	110,665	15,672	65,046	3,000	7,589	43,880	314,661
Beersheba	500	160,849	143,331		119,917	1,600	35,028	2,806,433	3,259,658
Total	4,400	820,179	402,383	174,578	424,938	11,000	108,234	3,304,905	5,250,617

level of development – the operational intensity. A park or national park will have the highest level of development and thus a greater capacity than either woodland for conservation or nature reserves where the level of development is lower.

The effectiveness of a given area in terms of the provision of leisure and recreation services is affected by its corresponding capacity and size, of course. The capacity values are subjective to a great extent, deriving from socially normative assessments. For every type of area, a coefficient is determined representing its capacity in

terms of recreation per dunam. The coefficients at this stage were set on the basis of cumulative experience, the evaluation of experts and a review of works and studies in western states. The 1994 areas include only existing forests, disregarding recommended planted forests, coastal parks or stream banks.

The types of areas and their coefficients are shown in Table 7.

Tables 7 and 8 summarize the effective provision of recreational areas, by district and type of area for 1994 and 2020. The resulting number is in units of population;

Table 7

Supply of Effective Recreation Area – 1994. The values in the table are obtained by multiplying each given area (in Table 6) by its typical capacity coefficient. The table depicts the existing situation for 1994, when proposed forests were not taken into account

District	Developed forest	Existing planted forest	Natural forests for conservation	National parks		Nature or Scenic Reserve	Total Supply of Effective Area
				Developed area (core)	Surrounding area		
Areal coefficient*	20	2	1	20	2	0.5	
Golan		22,525	12,014		3,456	1,925	39,920
Safed		126,148	31,811		13,232	41,055	212,246
Acre		173,484	54,249		6,768	60,040	294,541
Sea of Galilee	24,000	36,448	16,753		32,902	12,851	122,954
Jezreel	4,000	241,128	30,538	26,000	3,638	32,410	337,714
Haifa		42,082	5,841	100,000	3,556	33,298	184,777
Hadera		104,092	52,144		10,054	24,235	190,525
Sharon		8,772	1,135		2,882	478	13,267
Petah Tikva		25,676	3,103	2,000	13,644	112	44,535
Ramle		61,966	7,802		16,922	1,588	88,278
Rehovot		7,212	6,465		6,632	234	20,543
Tel Aviv		632			130		762
Jerusalem	500,000	330,404	26,120		17,420	19,072	443,016
Ashkelon		137,618	65,046	60,000	15,178	21,940	299,782
Beersheba	10,000	321,655	111,917	32,000	70,056	1,403,216	1,948,844
Total	88,000	1,639,842	424,938	220,000	216,470	1,652,454	4,241,704

* Areal coefficients – persons per dunam



thus, it may be said that the effective recreational area supply based on this definition is the number of people that a given area may hold. This is obviously a simplistic definition since it is impossible to describe a situation in which all areas are filled to capacity (100%). It is therefore preferable to regard this figure as a pure number, a coefficient representing the effectiveness

of the area to provide recreation. For example: the effective supply of developed forest parks and national parks for recreation in the Jerusalem district is 50,000, i.e. – the size of the area in this category, 2,500 dunams, multiplied by the specific capacity of this type of area, 20 people per dunam.

Table 8

Supply of Effective Recreation Areas – 2020. The values in the table are obtained by multiplying each given area by its typical bearing capacity. The table depicts the proposed status, for 2020, with proposed forests taken into account.

District	Developed forest	Existing planted forest	Proposed planted forest	Natural forest for nurturing	Natural forests for conservation	National parks		Nature or Scenic Reserve	Total
						Developed area (core)	Surrounding area		
Area coefficients*	20	2	5	2	1	20	2	0.5	
Golan		22,525	79,305	2,572	12,014		3,456	1,925	121,797
Safed		126,148	35,925	36,588	31,811		13,232	41,055	284,759
Acre		173,484	27,525	110,580	54,249		6,768	60,040	432,646
Sea of Galilee	24,000	36,488	86,450	21,386	16,753		32,902	12,851	230,790
Jezreel	4,000	241,128	112,010	9,414	30,538	26,000	3,638	32,410	459,138
Haifa		42,082	8,495		5,841	100,000	3,556	33,298	193,272
Hadera		104,092	55,460	18,036	52,144		10,054	24,235	264,021
Sharon		8,722	13,330		1,135		2,882	478	26,597
Petah Tikva		25,676	59,370		3,103	2,000	13,644	112	103,905
Ramle		61,966	75,280		7,802		16,922	1,588	163,558
Rehovot		7,212	82,350		6,465		6,632	234	102,893
Tel Aviv		632	8,055				130		8,817
Jerusalem	50,000	330,404	98,380	119,256	26,120		17,420	19,072	660,652
Ashkelon		137,618	553,325		65,046	60,000	15,178	21,940	853,107
Beersheba	100,000	321,655	716,655	31,344	111,917	32,000	70,056	1,403,216	2,696,843
Total	88,000	1,639,842	2,011,915	349,176	424,938	220,000	216,470	1,652,454	6,602,795

* Areal coefficients – in values of persons per dunam

Maps 6 and 7

The following maps present the effective area for 1994 and 2020, by district. The ratio between the supply of recreation areas and the demand -- the number of residents in the district -- is shown by the yellow boxes. The lower the number in the box, the greater the gap between supply and number of residents; i.e., there is a shortage of recreation areas.

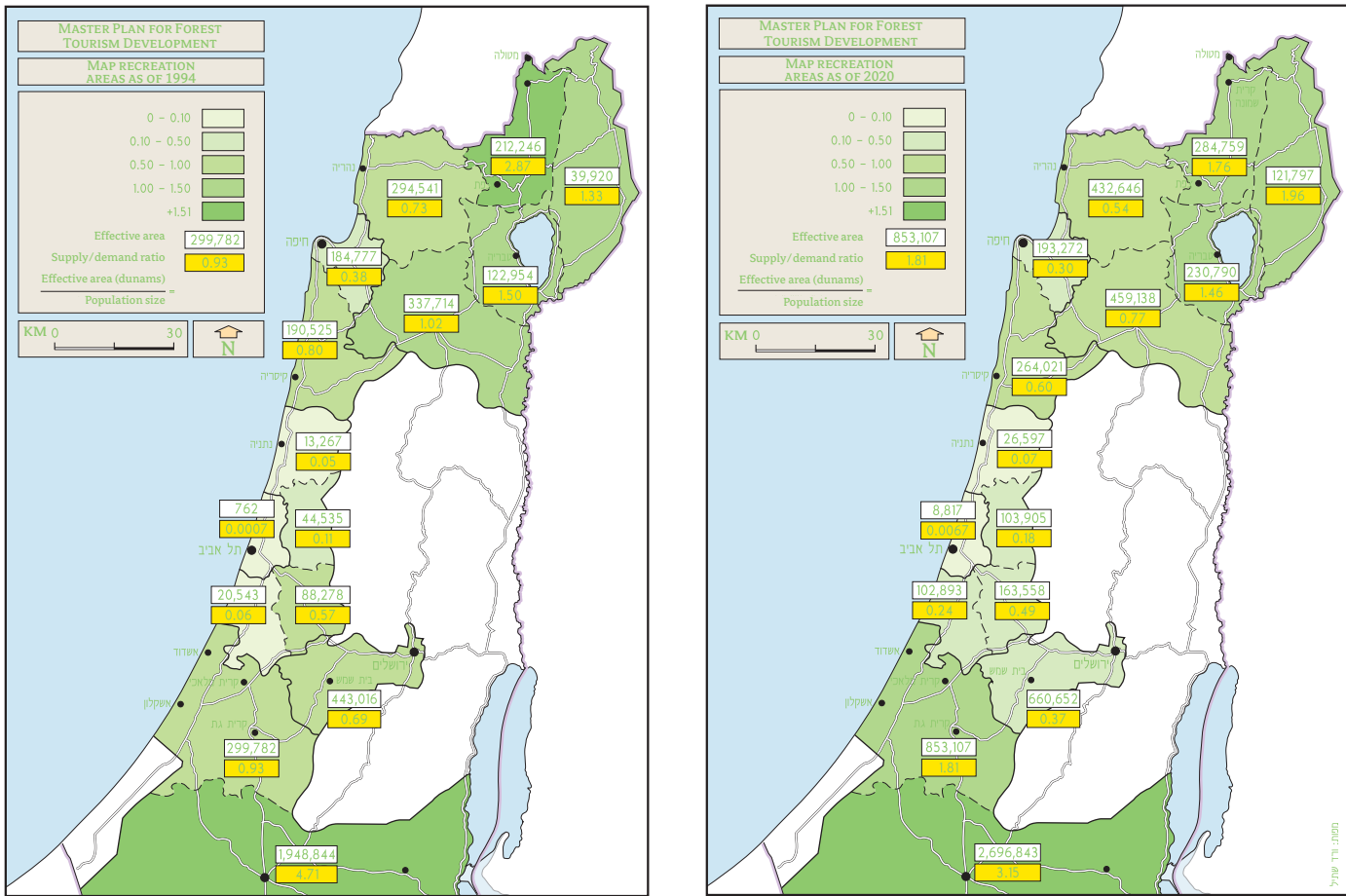
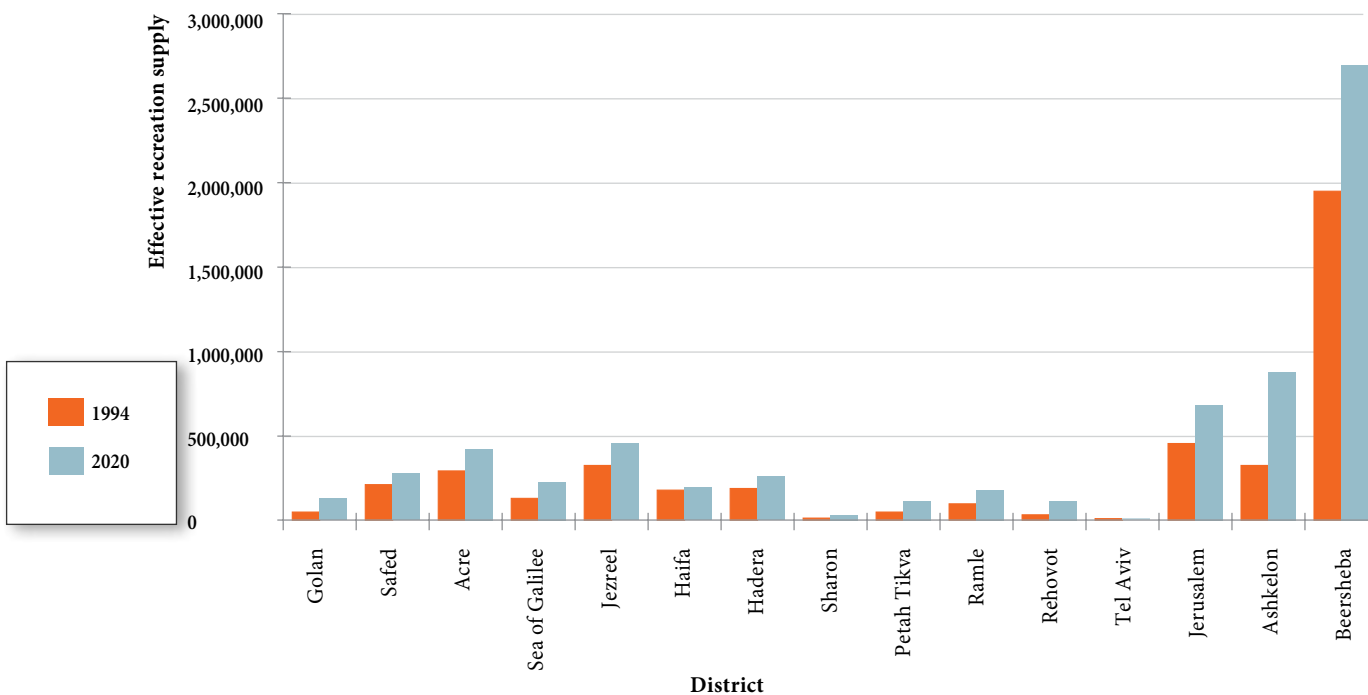


Chart 5

Chart 5 presents the data of Illustrations 6 and 7 in graphic form.



Comparisons of Supply and Demand

The results yielded by **Table 5**, existing and projected population sizes (representing demand), by district, were compared with the effective supply of recreation in the different districts (supply). This gave an initial idea of the ratio between supply and demand, which made it possible to identify points of current and expected shortages. To compensate for the simplistic calculations of the initial comparisons, detailed plans at the local level have been used to merge and divide work units (districts), and refine coefficients.

Table 9 presents the comparison between data of demand (Table 5) and data of supply (Tables 7 and 8), both expressed in population units. Thus the resulting

ratio is a pure figure, without units. It represents the relative degree of plenty or stress of different areas. For example: in the district of Safed, which is rich in forests and nature reserves, and low in population density, the ratio is 2.87; in contrast, in the district of Petah Tikva, which is densely populated and lacking in open spaces, the ratio is 0.11.

An excess of demand over supply, which points to a shortage of leisure areas, is found in the following districts: Acre, Haifa, Hadera, the Sharon, Petah Tikva, Ramle, Tel Aviv, Jerusalem and Ashkelon. The ratio between supply and demand there is less than 1.0. In the Sharon district, Petah Tikva, Rehovot and Tel Aviv, the ratio is especially low, around 0.1-0.3.

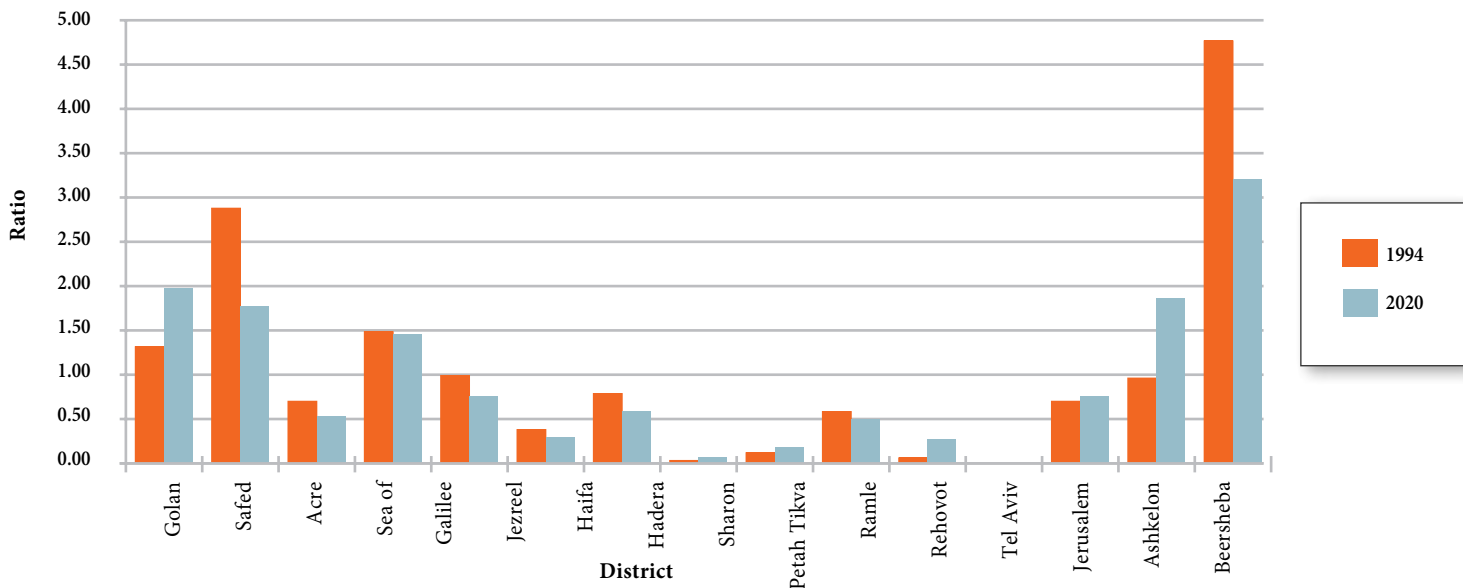
Table 9

Ratio between Supply (Effective Area) and Demand (No. of Residents), for 1994 and 2020

1994				2020			
District	Demand (Residents)	Supply (Effective Area)	Supply/ Demand ratio	District	Demand (Residents)	Supply (Effective Area)	Supply/ Demand Ratio
Golan	30,000	39,920	1.33	Golan	62,000	121,797	1.96
Safed	74,000	212,246	2.87	Safed	162,000	284,759	1.76
Acre	401,000	294,541	0.73	Acre	795,000	432,646	0.54
Sea of Galilee	82,000	122,954	1.5	Sea of Galilee	158,000	230,790	1.46
Jezreel	331,000	337,714	1.02	Jezreel	595,000	459,138	0.77
Haifa	483,000	184,777	0.38	Haifa	644,000	193,272	0.3
Hadera	239,000	190,525	0.8	Hadera	441,000	264,021	0.6
Sharon	267,000	13,267	0.05	Sharon	402,000	26,597	0.07
Petah Tikva	414,000	44,535	0.11	Petah Tikva	567,000	103,905	0.18
Ramle	155,000	88,278	0.57	Ramle	336,000	163,558	0.49
Rehovot	338,000	20,543	0.06	Rehovot	433,000	102,893	0.24
Tel Aviv	1,141,000	762	0.0007	Tel Aviv	1,313,000	8,817	0.0067
Jerusalem	646,000	443,016	0.69	Jerusalem	880,000	660,652	0.75
Ashkelon	321,000	299,782	0.93	Ashkelon	472,000	853,107	1.81
Beersheba	414,000	1,948,844	4.71	Beersheba	856,000	2,696,843	3.15

Chart 6

Chart 6 presents the data of Table 9 in graphic form and expresses the ratio between supply and demand for 1994 and 2020



(Note: to the projected demand, one should add the population of Judea, Hebron and the Gaza region, Jews and Arabs alike, alongside the supply of leisure areas in those regions. These interactions will become clearer in the future.)

The ostensible response to this stress is to enlarge the leisure areas. Expressions of this may be found in the additions of proposed forestland and natural woodlands in NOP 22, which should help to ease the shortage. However, a glance at the graph shows that the situation may improve only in the districts of the Golan, Ramle, Petah Tikva and Ashkelon. In all other districts, the ratio will decrease; i.e. – demand will grow and supply will shrink. The problem is particularly severe in districts in which demand greatly exceeds supply, a situation that will be exacerbated with the approach of 2020 despite the increase of the leisure areas proposed. Barring exceptional intervention, this will be true of the districts of Tel Aviv, Jerusalem and Petah Tikva. (It is important to remember that the demand for development and construction will also rise at every point in time in the future and, concomitantly, open spaces will increasingly shrink.)

“Exceptional intervention” means strict conservation of existing small areas and boosting their intensiveness. These topics will find expression in the detailed master plans for these regions.

Two Remarks on the Troublesome Situation of Leisure Areas:

» A substantial proportion of the areas proposed in NOP 22 are firing zones. Though they may function as reserves for future rest and recreation, it does not appear that they will be available any time soon, given the great pressure for land.

» Today’s population projections should already work on a figure of at least 9 million and steps should be taken to deal with increasing population density. Israel’s natural increase is high in comparison with the western world though its standard of living is quite similar. A situation of population growth on fixed or even shrinking land resources (due to development) raises constant concern regarding the land reserves needed for conservation and public wellbeing.

Summary

Two avenues of action are suggested by NOP 22: one relates to the size of an area; the other, to the form of its development.

Size of an Area

NOP 22 covers all potential afforestation areas identifiable in the northern region (state territory excluding the district of Beersheba), and principally in the central area. The plan zoned areas even if they were of low value in terms of plant and landscape resources, i.e. – their importance was emphasized in terms of recreation and leisure services, not necessarily in terms of their natural assets.

Form of Development

Intensive development– for parks, open gardens and stream axes – in densely-populated regions promotes maximal public exposure and carrying capacity. Intensive development and greater capacity will make it possible to utilize an area to a great extent and absorb a great number of visitors per unit area. In this way, the plan relieves the stress on and great demand for leisure areas in the center of the country, promotes accessibility even for populations with few means, and reduces the public’s holliday rush northward.



17.

National Distribution of Forests and Afforestation in Israel: Conceptual Framework

The National Distribution of Forests and Afforestation and Characteristics of Different Types of Forests, by Landscape Units

The national distribution of types of forest appearing in NOP 22 will be presented by district. In every district, the main landscape units and their components will be described along with the characteristics of the forests and natural vegetation. Next, the planning approach for forestry development of these units will be presented. The division by district is meant to correspond to the work of the planning institutions dealing with the topic, which are administratively divided by district.

The Spirit of the Place – Landscape Units of the Land of Israel

Israel's landscapes are highly varied: very – and sometimes extremely – different units of landscape, climate and vegetation come together in this tiny country. This richness is one of its treasures, constituting “many different countries,” so to speak, in a very small space.

The plan abides by the concept of “the spirit of the place,” the roots of which reach far back into the past. The plan highlights the uniqueness and essence of every site, developing from the areal resources rather than foisting itself on them.

Landscape and Forest Units

Just as the natural landscape of the country is multifaceted, so too is the man-made landscape, including afforestation. In the history of the land of Israel, a material culture developed from the attributes of the natural landscape units. Man helped strengthen and hone the varied landscapes, thereby creating a culture of distinct forest landscapes in different regions. The image of a landscape and special appearance of a place are described in Jewish sources. Forest trees were a hallmark of the country's landscape: “Rabbi Shimon ben Gamliel used to say: ‘A sign of mountains is milin [oak], a sign of valleys is palm trees, a sign of rivers is cane, and a sign of the plains is Sycamore trees’” (Tosephta Shviit 87:6 – Pescham 53:71).

The diversity of landscapes and ability to distinguish between different units is more blurred today. There is a trend of merging landscapes and creating monotonous sequences – building and development are similar all over the country. Very different environments are treated identically, in isolation from their character, and they merge, become blurred and lose their uniqueness.

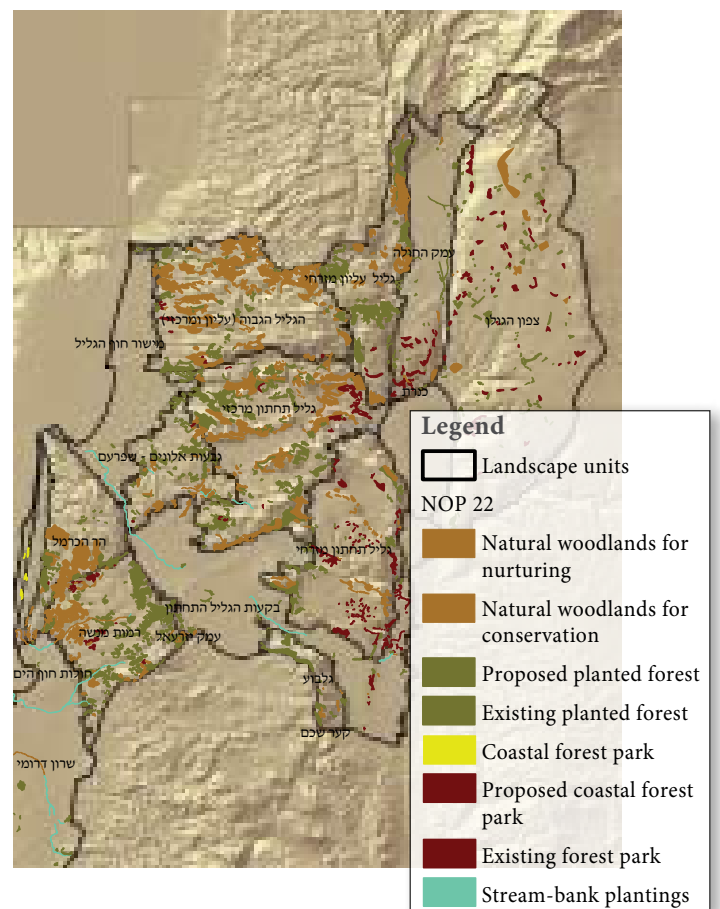
The plan aspires to match to each landscape unit the type of forest suited to it – whether natural woodland or planted. This will reinforce the “spirit of the place,” its characteristics and uniqueness.

Haifa and the North

The northern district comprises the Galilee and Lower Galilee, the Golan Heights and Mt. Hermon, the basin of the Sea of Galilee and the Beit She'an Valley, and the district of Haifa with Mt. Carmel and the Menashe

Illustration 8

Scenic and Forest Units, NOP 22, in the Northern and Haifa Districts





Montfort Castle.
Photo: Michael Hori,
KKL-JNF

Range. This expanse has the largest, most important concentration in the country of green open spaces, forests and natural woodlands, large nature reserves, national parks, and historical and archeological sites.

They are highly important both in terms of habitat – abundant regional water supplies, good regenerative conditions for natural vegetation that is the least disturbed in the country; and in terms of quantity – a sufficiently extensive region to preserve a fair balance between the natural environmental components. Population density in the north is relatively low compared to the rest of the country (with the exception of the south). The region also contains the state’s largest, most important water sources. These characteristics make the north the most important reserve nationally for nature, recreation, landscape. The national outline plan reflects this position, calling for the continued designation of the Galilee as a region to be cultivated in terms of landscape,

areal resources, recreation and tourism. The proposed development is meant to focus mostly on existing cities with the open spaces carrying landscape and nature values, along with providing leisure services.

The Haifa district includes Mt. Carmel and the Menashe Range. These units are covered by extensive forests, designated as such and as reserves, particularly planted forests and well-developed natural woodlands. These large forest blocks in the center of the country between Haifa and Tel Aviv are an important, available leisure and recreation area for the large population centers.

Subdivisions

Upper Galilee

Upper Galilee is a high mountainous mass. It is composed mostly of hard chalk that creates slopes and escarpments covered with dense, varied Mediterranean scrub, and it contains the largest, most developed planted forests in the country. The components of the natural woodlands are the Palestine oak, terebinth, Boissier oak, eastern strawberry tree, red bud, laurel, hawthorn, jujube and Syrian pear. Several rare plants grow in the mountains: such as coral peony and prickly juniper. A dense Mediterranean scrub grows in Western Upper Galilee, particularly in the valleys of the large streambeds. Its components include: Palestine oak, terebinth, laurel, red bud, Boissier oak, Syrian maple and officinal storax. Perennial stream banks also have stands of oriental plane trees, dense shrubs of holy bramble and lilac chaste trees, along with various ferns.



Baram Forest – Planted forests and dense natural scrub in large forest blocks.
Photo: Avi Hirshfeld, KKL-JNF



Naphtali Range Forests - Planted forests and natural scrub mixed with grassy vegetation.
Photo: Avi Hirshfeld, KKL-JNF

For the Upper and western Galilee, the plan included extensive areas of natural woodland for nurturing and natural forests for conservation.

The main blocks of natural woodland are around Mt. Adir (at Sasa), on the approach to Maalot, and in the tributaries descending to the streams of the western Galilee.

Planted forests are found mainly in the western part of the Galilee, in several large blocks: the forests of Hanita, Shlomi and Ahihud. The plan does not propose additional planted forests or forest parks for these areas. In general, the desirable character for the area is that of large-scale natural woodlands and forests.

Eastern Upper Galilee

This region abounds with Eocene limestone and terra rosa soil rich in kaolin. These conditions are usually conducive to grassy habitats of an open character and the development of sparse natural woodlands. On the Naphtali Range, where hard Cenomanian limestone predominates, Mediterranean scrub develops on the slopes and escarpments descending to the Hula Valley and in the valleys of the following streambeds: Kadesh, Dalton, Hatzor and Dishon. This area has large planted forests that develop well in the local rock and soil formations: Safed Forest, Biriya Forest, Baram Forest and on the Naphtali slopes. The plan designates large areas of planted forest in the existing forest blocks, as well as natural woodlands for conservation and nurturing in

the natural areas. The plan does not propose additional planted forests. In the areas of Eocene limestone, rich in grassy vegetation and serving as pasture, the plan designates forest parks alongside pine forests, which develop well in this rock. There are also large pine forests in the areas of hard Cenonian limestone west of Safed.

The Golan Heights

The Golan is an open basalt highland, serving mostly as pasture.

The most predominant, impressive botanic element in the northern Golan is Mediterranean scrub at Odem Forest and the Bashanit Range – a remnant of the woodland that once covered most of the region. The



Biriya Forest – A planted forest extending over a large area.
Photo: Albatross Aerial Photography, KKL-JNF

components of this woodland are: Palestine oak, Bossier oak, spiny hawthorn, jujube, Syrian pear, officinal storax. The further south one goes, the more these are replaced by the Atlantic Pistachio and Tabor oak.

In the basalt canyons of the southern Golan (Meshushim-Yehudia, Zavitan), an open forest park of Tabor oak predominates, accompanied by Atlantic Pistachio, buckthorn and jujube. In the southern part of the area, a variant of Tabor oak has developed, accompanied by Palestine oak and other plants, including the buckthorn and prickly burnet. Brooms grow on the bare chalk. The western slopes are covered by open savannah-like woodland of jujube and buckthorn.

Large sections of the Golan forests are included in extensive nature reserves.

The plan seeks to strengthen the character of the Golan as an open space of forest parks and pastures by conserving the local vegetation in existing forest parks, augmented by new forest parks of appropriate species such as: Tabor oak, buckthorn, Atlantic pistachio.

Lower Galilee

The landscapes of the Lower Galilee are quite soft and mild: hills of hard limestone, chalk and marl, between which broad valleys cross the Galilee from east to west. These conditions facilitated more settlement than in the Upper Galilee and thus also more disturbance to the natural landscape and vegetation. The region is distinguished by great diversity and an emergent combination of urban and rural communities, traditional and modern agriculture, planted vegetation in an open expanse that is rich in forests and natural woodlands.

The hills of Galilee are covered by Mediterranean scrub composed of three layers of Palestine oak and terebinth. On the higher ridges, above 700 meters in altitude, Boissier oaks accompany the woodlands. In areas cultivated in the past or serving as pastures, one finds also the mastic tree which is more resistant to grazing sheep, goats and cattle. On the slopes, at the lower altitudes of 400 meters, there are communities of carob and mastic trees that generally form an open woodland. Around Bet Keshet, there is an open forest of Tabor oak and officinal storax.

The valleys of central Galilee and even parts of the hillsides are cultivated intensively, growing mainly olive groves.

Here, too, the plan emphasized the nurturing of natural woodlands concentrated mostly in several blocks – around Ma'ar, along the Hilazon Stream and more. In certain places, sensitive and especially high-quality natural woodlands and forests were zoned for conservation. Along with these – which are extensive in Lower Galilee, mostly around Nazareth and Migdal HaEmek – existing planted forests were included in the plan. No new planted forests were proposed.



Olive groves typical of Western Galilee valleys with carpets of flowers between them.
Photo: Staff of writers and editors



The western slopes of the Golan Heights covered by a forest park of Ziziphus and sabra cactus.
Photo: KKL-JNF Photo Archives



A Tabor oak forest park at Alonim-Shefaram.
Photo: KKL-JNF Photo Archive



Carmel Park, panoramic bridge – a rich, dense forest and a sense of forest depths.
Photo: Michael Hori, KKL-JNF

Givat Alonim-Shfaram

The region is characterized by rolling hills separated by moderately broad pleasant valleys. Densely populated, its dominant character is rural farming. Substantial stretches are tilled, mainly by the Beduin population; this is one of their large centers in the country.

Large expanses in the region, especially in the south, are covered by a handsome forest park of Tabor oak and officinal styrax, along with terebinth and Palestine buckthorn. Climbers grow on the trees (ivy and Common Black-bryony). In the northern parts, there is dense woodland and Palestine oak. The plan stipulates planted forests in the northern part of the unit, in several large blocks around Tamra, Misgav and Shfaram. Natural woodland areas for nurturing serve as pasture and were marked in the area of Tabor oak, which centers in a strip between Kiryat Tivon and Kibbutz Solelim.

Yavne'el

The area is characterized by a basalt system of consecutive inclined highlands along the eastern flank of Lower Galilee and including Issachar, Yavne'el, Poriya and Arbel. Their heights branch down slightly to the southwest with the steeper slopes descending to the northwest. The slopes are separated by dry streams and broad valleys carved out by the fault lines of the rift valley: the Issachar, Tabor and Yavne'el dry streams, the Yavne'el Valley, the Rakat dry stream, Arbel Valley and Arbel dry stream. The unbroken landscapes created by the channels extend into the Jordan Valley.

The open expanses of alternating rocky stretches and farmland contain some of the largest, most well-developed grazing lands in the country. The stream beds crossing the region sprout hydrophilic vegetation

– willow, cane, reeds, bristles and raspberry, with jujube and Ziziphus growing up the valley sides. A small number of white acacia can be found in the rivulets of the Tabor stream, marking the northernmost appearance of this species in the world.

The plan recommends continued development of forest parks to create open, spacious landscapes that contribute to, and integrate, grazing land. The patches designated as natural forests for conservation look out above the channel of the Tabor stream onto natural areas, escarpments and stream valleys with local, well-developed natural scrub. This sequence of natural vegetation, which is designated as natural forests for conservation in the valleys and channels, extends into the Jordan Valley up to the point that the Tabor stream meets the Jordan River.

Mt. Carmel

The Carmel is an important part in Israel's landscape. It also plays a central role in its tourism infrastructure, being designated to do so since early statehood. It has a high concentration of national parks, nature reserves and



The slopes down to the Sea of Galilee are marked by open spaces, alternating rock land and farmlands. Photo: KKL-JNF Photo Archive

forests, and its location near the sea and relatively close to the center of the country adds to its importance.

The biblical name “Carmel” denotes an area of abundant vegetation. The Carmel has three forest and woodland communities: the community of Palestine oak and terebinth predominates, appearing in the form of dense natural woodlands in the central and eastern parts of the mountain. The higher parts of the mountain are dominated by a community of Aleppo pine and Saint John’s wort – marking the main distribution of natural pine in Israel. On the western part of the Carmel, exposed to wind and sea, the prevalent species are carob and mastic trees, along with wild olives.

The areas of planted forests are mostly found in the central block of the Carmel plateau, while natural woodlands and forests are mostly concentrated in the nature reserves of the high Carmel.

The plan incorporates most of the planted forests and natural woodlands typical of the Carmel in its framework of woodlands for improvement and forests for conservation. Planted forests included in scenic reserves (Hotem HaCarmel) are designated as natural forests for conservation.

Menashe Range

The Menashe Range is a distinct, defined landscape unit: chalky, rocky hills covered by garrigue and generally bare of natural woodland, bounded by the Carmel and the Samarian Hills. East of the unit, one finds extensive planted forests (Menashe Forest, HaZore’a Forest); west of the unit – on Mt. Hurshan and the Alona Hills on the



HaNadiv Valley – Developed natural scrub creates the park’s forest landscapes on the Menashe Range.
Photo: Staff of writers and editors

approaches to the Nadiv Valley, one finds well-developed natural woodlands of Palestine oak, terebinth, Tabor oak and carob. In the past, this woodland apparently covered the whole Menashe Range but was mostly destroyed.

The plan regards the area as a bare, open space in contrast to the green Carmel and Samarian Hills, and seeks to strengthen the planted forest patches east of the range, a region that serves as local and natural infrastructure for recreation. West of the unit, the plan proposes additional areas of natural woodland for improvement and conservation integrated with Alona Park around Mt. Hurshan. The open character of the expanse is emphasized by the forest park it offers.

Mt. Gilboa

The Gilboa Range is an inclined block; its moderate flank spills down to the southwest while its steep flank



Flowers on the Gilboa in the heart of a planted pine forest.
Photo: KKL-JNF Photo Archive



drops down to the northeast, to the Harod and Beit She'an valleys. Its topographical peak is Mt. Malkishua as the range steadily loses height towards the northwest. By the time it reaches the Jezreel Valley, it has become a moderate ridge, partly level, partly mounded with broad valleys.

This region is known for its dry, bare character (Ye mountains of Gilboa, let there be no dew nor rain upon you, II Samuel 1:21).

Substantial areas of the Gilboa Range are covered with large planted pine and eucalyptus forests. The slopes bring together several plant communities: Mediterranean scrub – represented by carob and mastic trees; large concentrations of the Gilboa iris and tulips; Mediterranean pioneer vegetation represented by hawthorn, Atlantic pistachio, small-leaved almond and Dominican sage; savannah and desert vegetation on the southeastern slopes, with jujube, white broom, red sage and cat-thyme germander.

Most of the planted forest areas on the Gilboa were incorporated within the format of existing planted forests. NOP 22 does not designate additional areas for planting.

The Center and Tel Aviv Districts

Virtually no natural areas remain in the central region, which has been under man's impact for years and used mainly for construction and agriculture.

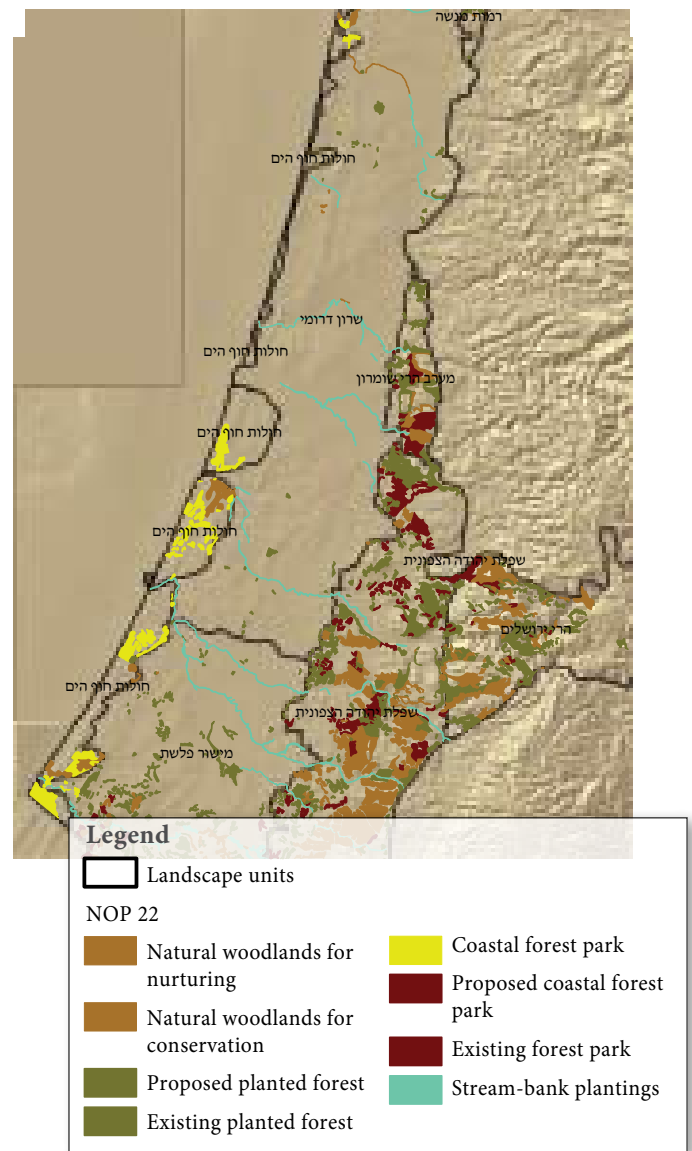
The region includes the central district and Tel Aviv with a high population density. Some half a million people are concentrated over a small area that has increasingly yielded land due to development pressures. The region is quite far from the large green expanses of the Galilee and Judea, and outdoor recreation is not an option for the segment of the population restricted by distance and mobility. This situation finds expression in the heavy pressure on the green environment – urban parks, public open spaces – and on the beaches, especially on the Sabbath and holidays. The trend is expected to worsen as construction continues and more people crowd into the area. NOP 22 takes into account the needs of this population and seeks to provide a close, immediate green hinterland to every urban configuration. The green surroundings may take various forms, such as a green belt or interfingering into the congested region.

The outline plan presents several ways to bring leisure and recreation areas, such as forests or varied plantings, closer to the cities and imbue them with content:

1. Further consolidation of planted forests at high levels of access and development, along the country's hilly ridge – the Samaritan Lowlands from Rosh HaAyin in the north to Ben Shemen Forest in the south. This area is closest to the population centers

Illustration 9

Scenic and Forest Units, NOP 22, Central and Tel Aviv Districts

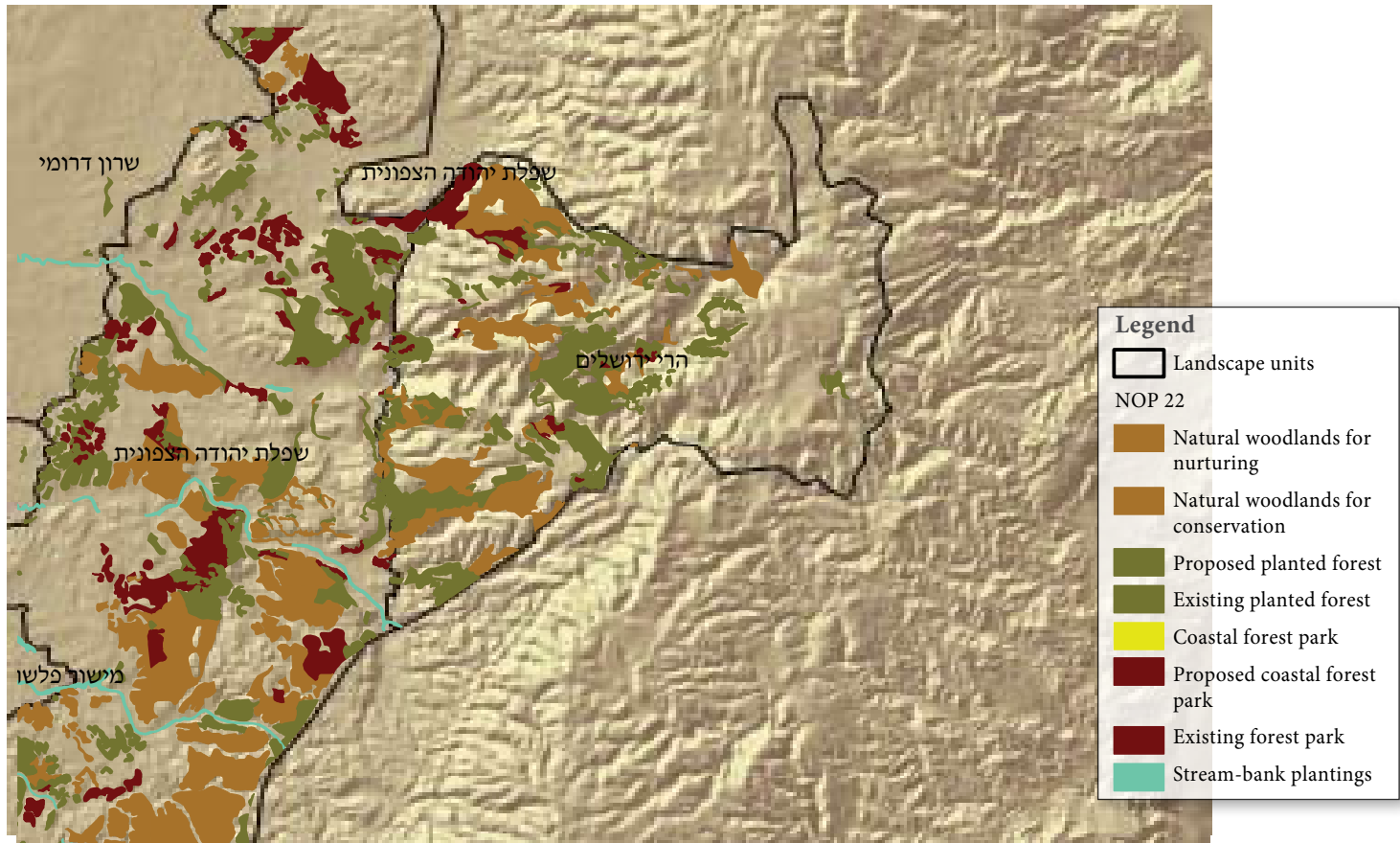


of the Dan Region, and is intended for the natural function of a green hinterland for that population. The allocation and designation of green areas here take on added importance given the construction plans along this ridge and the construction of the Trans-Israel Highway (No. 6) at the foot of the hills. These development plans threaten to form a massive conurbation that will join up with the Dan Region and close off the remaining open space vital to residents of the central metropolis.

2. Planting coastal forest parks around the Dan Region Recycling Facility, the sands of Yavne and the block of sands between Ashdod and Ashkelon. The coastal park is part of the recreation activity taking shape on the seashore, a hinterland complementing the beaches. It is the only open space of decent quality left in the center of the country and its zoning as a national coastal park adjacent to the population centers of the coastal plain responds to some extent to that situation.

Illustration 10

Scenic and Forest Units, NOP 22, Jerusalem District



3. Planting along stream axes descending from the hills to the coastal plain in the central region and passing near, and within, urban centers. Stream axes have great potential as new open routes in the urban expanse, as environmental urban parks injecting open landscapes into the heart of a city.

A prominent feature of the Jerusalem Hills is a swathe of planted forests; Jerusalem Forest surrounds the city and serves as its green lung along with natural forests slated for conservation in the steeper, hilly areas.

The Jerusalem District

The Jerusalem Hills

The Jerusalem Hills are rich in natural woodland, forests and bustans, springs and historic sites from different periods. The layers of base rock in the Jerusalem Hills commonly alternate between hard limestone and soft marl. These changes create natural terraces, leading to the development of a farming culture typical of the region and flanked by settlement on the hills. In the areas of ancient terraces, efforts are being made today to restore the culture of hillside bustans, olive groves and vineyards. The successful restoration of the terraces at Sataf is a good example of this.

The area of the Sorek Valley, the Sansan Stream, the Maara (Cave) Stream and others are covered with Mediterranean scrub of Palestine oak and terebinth, the eastern strawberry tree, Boissier oak and other species found together with oak and terebinth communities. Substantial areas in the Jerusalem Hills are covered with planted pine forests (Martyrs forest, the Sorek extensions, the Refa'im Ridge etc.).

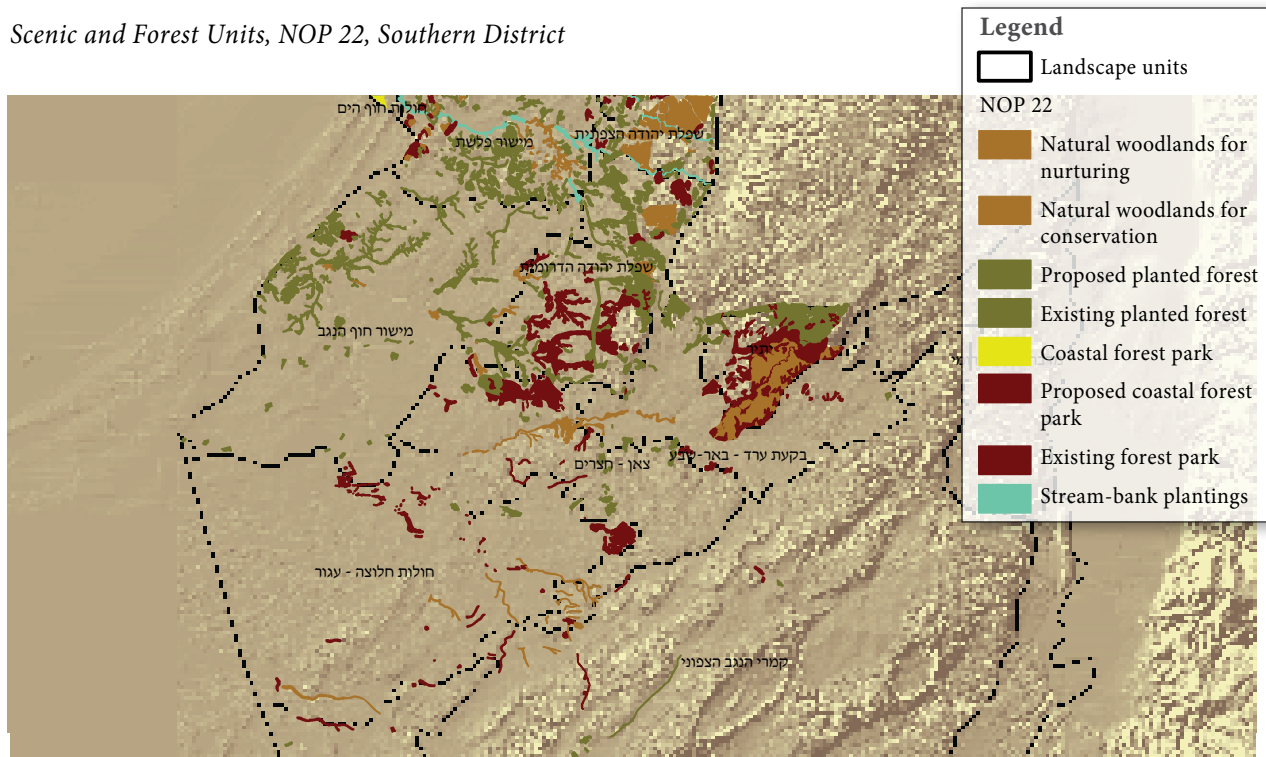


View of sparse natural scrub around Kefira.
Photo: Staff of writers and editors



Illustration 11

Scenic and Forest Units, NOP 22, Southern District



In all national and regional development plans, the region has been defined as an open green area, the green entrance to the capital and its mantle. NOP 22 reinforces this approach by delineating the forests and natural woodlands around the high hilly region for nurturing and conservation. The plan regards the area as having both national importance – it being the main recreation expanse of the two large metropolises, Tel Aviv and Jerusalem – and international importance – the ancient terraces are part of our world heritage (it has been suggested that they be included in UNESCO’s World Heritage sites).

The Judean Lowlands

The Judean Lowlands – a transitional area between the high hills and the coastal plain – is made up of soft, round chalk hills creating a mild landscape. In between the hills, there are broad, cultivated ravines, including the valleys of the large streams: the Ayalon in the center of the Ayalon Valley, the Sorek and the Ela.

The Judean Lowlands are divided into two longitudinal units on the north-south axis: in the east the lowlands are higher, reaching an altitude of 450 meters amid a network of streams that bisect them and create rolling, interconnected hills in-between, covered for the most part by planted forests and natural woodland/scrub; in the west, the landscape is more undulating and moderate, the hills are not connected but separated by broad valleys and stream channels.

The Judean Lowlands join the Jerusalem Hills in filling the important function of recreation near the center of the country. NOP 22 calls for conserving and developing the existing abundant forest resources,

as planted forests and existing forest parks, adding forest parks (mainly in the form of hills of carob trees), and improving the natural woodlands typical of the area.

The Adullam-Bet Guvrin Region

The region is rich in natural woodland – the southernmost natural woodlands in the country. The region of Adullam, Bet Nir, Bet Guvrin and Adorayim – centered in the Bet Guvrin National Park with its numerous scattered caves – have become a prime tourism and vacation site in recent years. Reinforcing the region’s character as a large natural expanse and area of tourism and recreation receives expression in NOP 22: to conserve the natural woodlands and forests and to add a forest park of local species integrated into the natural woodlands of southern Israel and the open character of the region.

The Southern District

The Negev expanses are the state’s largest land reserves. However, these areas, particularly in the northern Negev, do not have many landscape and natural assets in comparison with the north of the country and Judea. Clearly, then, the main potential for development and population absorption lies in this region. This potential is reflected by Israel’s national outline plans, which designate the northern Negev as the main region for large-scale population absorption.

However, the aridity and image of the Negev as having a low quality of life have always posed an obstacle to settlement: “One of the main problems in attracting a strong population to the southern region is the quality



Yatir Forest – the largest planted forest area in the country.
Photo: KKL-JNF Photo Archive

of life there... the northern Negev suffers from a lack of attractive areas for development for purposes of recreation and leisure...” Consequently, “it is important to cultivate green areas around the settlements” (NOP 31, development plan).

NOP 22 proposes ways to promote these trends. The plan reflects the idea that the development of a varied green environment in the southern region – on the edge of the semi-arid desert where the annual precipitation is 150-300 mm. – will change the aspect of the region and create available infrastructure for future settlement

and development. NOP 22 regards this as a national goal and defines the major part of the proposed areas as planted forests.

This approach finds expression in two planning frameworks: 1) reinforcing and broadening the large forests in the southern district – Yatir, Lahav and Adorayim-Kiryat Gat – and planting additional forests on a limited scale in the northern Negev; 2) creating green belts around communities, particularly the large urban communities through interfingering into and around city boundaries.



Forests planted on rocky hills – a high quality green ring around the Beersheba metropolis.
Photo: KKL-JNF Photo Archive



Subdivisions

The Judean Negev-Yatir Block, Mt. Anim, Mt. Ira

The central mountain plateau of the land of Israel rises to an altitude of 750 meters here, creating a distinct climatic and geobotanic region in the northern Negev. The dominant factor is Yatir Forest – the largest in the country, extending over more than 30,000 dunams and noted for its uniqueness and diversity. NOP 22 seeks to extend the forest boundaries, especially southward on the western side of the watershed along the axis of the Anim-Ira Ridge. The conifer forest that is characteristic of the Yatir region will gradually change into a forest park, becoming more spacious, thinning out towards the south, and intermixing with areas designated for the conservation of edge-of-the-desert vegetation in this transitional area.

The Lahav-Duda'im Region

The forests of Lahav and Duda'im grow on chalky, rocky hills and are among the largest in the country. Their function is to improve the landscape and create recreation areas for southern residents. The trend of NOP 22 is to add planted forests and new forest parks to strengthen the green ring around Beersheba and change the dry image of the region as a step towards encouraging settlement and developing the region.

The Gullied Badlands, the Drainage Basins of the Shikma and Besor Streams

Undermining and gullies are common phenomena in the loess areas of the Negev. These natural erosion processes are accelerated by man's agricultural activity. Erosion damage appears upstream - in the gullies penetrating the cultivated land - and downstream, in the blockage of drainage channels and reservoirs. NOP 22 suggests further plantings on the banks of wadis and in the gully areas, in combination with engineering work to stabilize and conserve the soil. Following this work, the landscape will look like tree hedges or boulevards along the streambeds, green boundaries around farmland that for most of the year is ochre. This form of planting will gradually change the bare, arid character of the region.

Northwestern Negev, the Sandstone Ridges

The strip of sandstone ridges (around Gvaram-Mavki'im) represents a landscape unit that has virtually disappeared from the country. The last remaining sandstone hills are to be found in the south on quite a large scale – thousands of dunams; in the center and north, there are few remnants. Greater protection is needed for this rare landscape resource and its physical, geobotanic diversity and assets. The proposal put forward here is to incorporate the area into a forest park with existing pastures, as part of the conservation area.

The Sands of Agur, Halutza and Nitzana

The sandy regions in the northern Negev are a landscape unit in their own right. The first plantings of tamarisks were carried out under the British mandate. It is proposed that these areas be conserved as forest parks and augmented in places where they interface with the public, around communities and along roads. Several wadis in which Byzantine terraces have been preserved near Shivta and Nitzana have been included in the category of natural forests for conservation.

The Arava

The concentration of acacias in the large streambeds - of the Paran and the Hayun that descend to the Arava Stream in the southwestern Negev – have been included in the plan as natural forests for conservation.



Forests along gullies. Extensive surrounding farmland emphasizes the changing scenery and interplay of colors between farming and forestry. KKL-JNF Photo Archive



Trees on a karkur ridge. Photo: Staff of writers and editors

18.

Zoning – Types of Forests and Afforestation

The plan's provisos are laid out here with their practical and legal applications. The maps, on a scale of 1:50,000, delineate the areas to which the provisos apply. Zoning refers to forest type. The maps define eight types of zones which may be subdivided according to existing and proposed forests, afforestation form or type of resource.

Division by Existing and Proposed Forestland

Existing state: Existing planted forests, existing forest parks, natural woodlands for conservation;

Proposed state: Proposed planted forests, proposed forest parks, natural woodlands for nurturing, riverside/stream-bank plantings, coastal forest parks.

Division by Type of Forest

- » Existing planted forests, proposed planted forests;
- » Existing forest parks, proposed forest parks;
- » Natural forests for conservation (mainly woodland scrub), natural forests for nurturing;
- » Coastal forest parks;
- » Riverside/stream-bank plantings.

Planning Units

The plan provides for rezoning forest and afforestation areas. The change depends on the type of forest and ranges from 5% to 25% (see details in the plan provisos at back). According to the provisos, the changeable work units are delimited in keeping with the decrease in the stated rate. These units were designated as "forest areas" and constitute a homogenous geographic space around different types of forest and afforestation tracts. Rezoning will hereafter apply to all the forestland of "forest areas" rather than to each patch separately (e.g., in a "forest area" encompassing 3 existing forest tracts and 5 proposed forest tracts, rezoning will be permitted by regulation as follows: 10% of the total area of the 3 existing forest tracts and 30% of the total area of the 5 proposed forest tracts).

The planning units were delimited on the basis of two chief criteria:

- » **Division into Scenic Units** – The basis of the division is lithological and geomorphological, which dictate



A natural forest mixed with scrub.
Photo: KKL-JNF Photo Archive

landscape formations, the existence of a natural vegetative setting and a defined surface. Forest types were determined on the basis of the units and according to habitat and plant families.

- » **Administrative Division** – Forestry Division: An effort was made to allow for different factors and constraints, and to formulate a homogenous planning unit convenient for interface and management. The aim was to adopt the recommendations of NOP 22 and connect the plan to forestry work in the field.

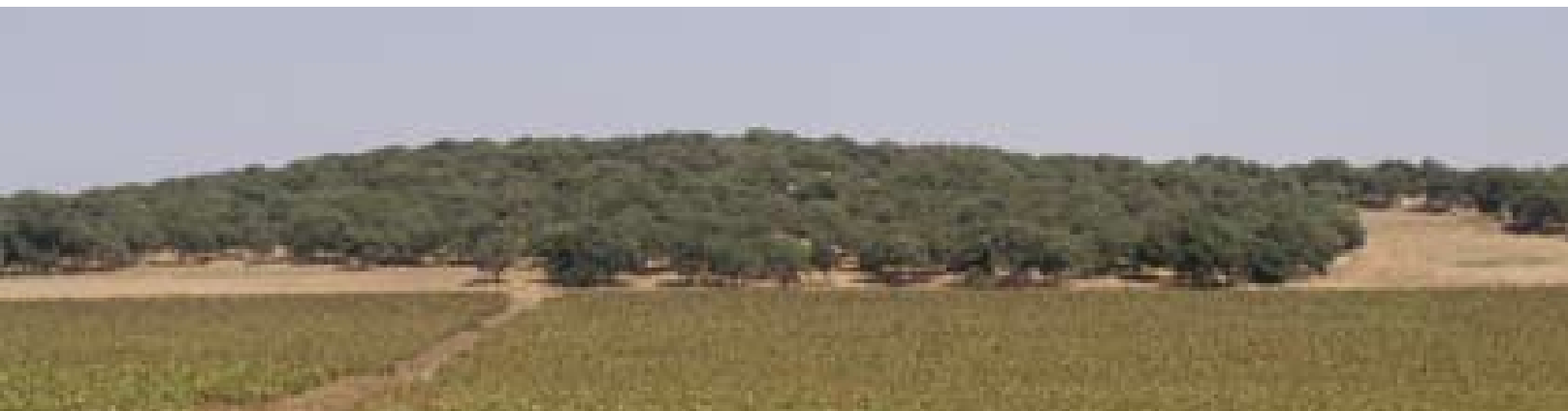
Zoning Description

Existing Planted Forests

The plan presents the existing national distribution of planted forests dating back to the start of the 20th century. Some are grouped together in large blocs – the Carmel, Ben-Shemen, Eshtaol, HaKdoshim (Martyrs), Yatir and Lahav forests; others are small scattered patches. These forests play the main role in meeting the needs of recreation, hiking and camping, and constitute the base of internal tourism. Most of them were included in the national master plan due to their prominent presence, their contribution to the country's landscapes, and their functions with regard to leisure and relaxation.

Natural Woodlands for Conservation

Different types of forest fall into this category. Their zoning was determined by special forest or woodland attributes, or by environmental or statutory



Tabor oak Forest Park at Alonim-Shefaram.
Photo: Staff of writers and editors

characteristics that lend them special importance. NOP 22 accords their designation special attention.

Included in this framework are:

- » Well-developed natural woodlands of high standard, varied species and high biotic value, in excellent condition and regionally or nationally important;
- » Other plant formations – scrubland, garrigue, sandy vegetation and degraded Mediterranean woodland – expressing rare assets in danger of extinction and in order to protect them as an important intermediate stage in successive development or as potential for future forest and woodland regeneration;
- » Planted forest areas, forest parks and bustans of important vegetative, cultural or historic value (e.g. agricultural terraces in the Judean Hills, transitional vegetation on the edge of the desert);
- » Forests included in NOP 8 under the category of “Scenic Reserves” – it was agreed that these may be included in NOP 22 under natural woodlands for conservation.

Proposed Planted Forests

The plan envisions new planting areas mainly in the south, from the Kiryat Gat-Ashkelon coordinate to the Beersheba dry stream; a green ring for Negev settlements, improved scenery and a higher quality of life and infrastructure to absorb additional population in the northern Negev. Another area for which planted forests have been proposed is the line of hills east of the coastal plain. The flurry of development expected here with the completion of the Trans-Israel Highway and the expected rise of new communities as a result, make it necessary to allocate lands and to protect existing areas serving as an available green hinterland for the residents of central Israel.

In the parts of the country with a lot of forests and woodlands – Galilee, the Carmel and Judea – no additional tracts were proposed for planted forests except in places of special consideration: i.e. to fill in forest blocs, afforest areas around communities or industrial zones and cover eyesores.

Natural Woodlands for Nurturing

Natural woodlands occupy central place in NOP 22. Their qualities and assets find expression in a rich diversity of plant and animal types and in their apt representation of the rock-soil-climate system. Surveys conducted as part of this report identified the country’s main woodland concentrations, habitats and plant families, and defined the degree of development and the assets of specific areas.

The plan views natural woodlands as an integral part of the country’s forest landscape. Woodland contributions come to the fore in scenic assets, recreation, tourism, nature and ecology, pasture and wood production. Woodlands are long-lived and may be integrated with planted forests in different ways, adding to their unique qualities (e.g., Umm Tzafa Forest, Goren Forest and others).

Existing Forest Parks

This category encompasses spacious or scattered planted or natural forests (the accepted standard is 10-20 trees/dunam). Their special importance is that they constitute natural pasture sustaining high-quality grasses between the trees. Apart from contributing to the animal food supply, trees create airy, shady areas. In addition, forest parks create typically open scenery, especially in the lowlands, on the edge of the desert and in the northern Negev.

The main forests in this category are: the natural forest parks of Tabor oak in western Galilee, jujube forest parks, Atlantic pistachio and carobs in eastern Galilee; carob groves planted in the 1950s, particularly in the Judean Lowlands; bustans and olive groves sometimes intermixed in the regeneration of natural woodlands all over the country; and widely-spaced plantings in the south which harvest runoff.

Proposed Forest Parks

Areas of basalt and Eocene limestone in eastern Galilee (from Amiad in the north to Moledet in the south) are marked by sparse vegetation. These areas, virtually devoid of trees or shrubs, are exposed and arid. A large part of Israel’s natural grazing land is found here. In



this area a forest park has been proposed, suited to the terrain and consisting of trees typical of the area (jujube, Atlantic pistachio and carob) to ameliorate the exposed landscape.

Plantings and maintenance will be integrated with the regular grazing already in place and improve the quality of the pasture land.

Coastal Forest Parks

Israel's shores, sands and sandstone soil sustain extensive areas of low development, particularly from south of the Dan Region to the Gaza Strip. These have no settlements, roads, agriculture or industry (in general, the security establishment is responsible for their current condition). They are of substantial importance largely because of their potential to ease the pressures of population congestion and respond to the high demand for land in the region.

Areas of proposed planted forests next to an existing forest.

Photo: KKL-JNF Photo Archive

Natural scrub and exposed rock.

Photo: Staff of writers and editors





The shoreline warrants a broad, cooperative planning perspective by local authorities – cities, local and regional authorities – and by the tourism, landscape and nature authorities. Because of the shore's size and importance, it cannot be isolated from overall planning on a national scale.

Some of the proposed development principles are: defining several open strips of shoreline to create coastal “respites” in the urban-industrial conurbation from Nahariya to the Gaza Strip. These strips would be free of settlement and industrial pressures. The proposed open, spacious coastal forest parks would serve as a hinterland of recreation and tourism for the large population centers nearby and – because of their vital integration with the shoreline – for the country's population as a whole.

The coastal forest park would comprise local, traditional vegetation: sycamores, palms, vines, figs (the traditional plants in the region, relying on the high water table), brooms and sandy vegetation. This would create a new type of forest to enrich the country's forest culture and its surroundings.

The main stretches proposed in this framework are:

- » Rehabilitating and fostering natural vegetation in the sands of Hadera and Caesarea, especially next to main traffic routes, to restore part of the landscape of the Sharon forests;
- » Shafdan – the Dan region sewage treatment facility of central Israel – connects up with the Palmahim National Park, Nebi Rubin, the (Nahal) Sorek Stream and their sites. This park will serve mainly the towns of the south: Rishon LeZion, Rehovot and Ness Ziona.
- » Segments between Yavneh and Ashdod, including abandoned sandstone quarries and their rising water table – with a possible connection to the White Acacia Reserve;
- » Nitzanim, its sandstone quarries, ponds and the intensive development that is already taking place, with a possible connection to the Nitzanim reserves, creating an interface with segments of the extension of Ashdod and a green hinterland for Ashdod and Ashkelon;
- » Areas in the Zikim sands and Netiv HaAssara, rich in bustans and sandy vegetation. This area includes the Sycamore (Shikma) Reservoir and Dry Stream.

Riverside/Dry-Stream Plantings

The enormous pressure for land in the Dan Region and coastal towns rules out converting broad areas for scenic and recreation purposes. As a partial solution, the program proposes using the axes of dry streams in the center of the country to develop areas of relaxation and leisure in this densely-populated region.

The large dry streams dropping down from the hills to the sea flow for much of their length over the coastal plain. These axes are near population centers and defined as state land (under the responsibility of the Drainage Authority). Dry streams and their surroundings are of special value and interest. They can be developed via various means of afforestation and the installation of recreation facilities and rest areas. This would create green recreation areas which are much in demand near population centers.

One important consideration here relates to the internal area of a dry stream: due to the stream's natural elongated form, the internal area is immeasurably larger than the envisaged forest or conventional expanse, so that the landscape value – as a rest and relaxation area – is much higher than that of a regular forest. This sort of development also has economic implications.

The dry-stream/forest axis may serve as a connecting line between more extensive areas of interest (e.g. archeological mounds, national parks, nature reserves and so on), thereby creating theme routes over and beyond local leisure and recreation.

The plan embraces the major dry streams – Kishon, Taninim, Poleg, Hadera, Alexander, Yarkon, Ayalon, Sorek, Ela and Shikma and their main tributaries. The axes, flowing east to west, cross the country's various landscapes from the hilly ridge to the sea and offer an easy way to view the rich variety of our physical and cultural surroundings. The axis parks, the sites they connect and their entry into urban centers may give Israel's urban landscape a new face. Moreover, the possibility of reviving the dry streams and restoring their waters in the future, whether seasonally or year round, would lend the entire plan a new attractive dimension.



Hadera Stream – a green recreation area next to population centers.
Photo: Albatross Aerial Photography, KKL-JNF

19.

The Impact of NOP 22 on National and District Planning

The Integrated National Outline Plan – NOP 35

The Integrated National Outline Plan, NOP 35, was approved by the government in 2005 and replaces NOP 31. NOP 35 adopts the forest designations anchored in NOP 22 and adds several forests from approved regional outline plans, which are in advanced planning stages.

The designation of “forest” in NOP 35 embraces all the different areas and types of forest in NOP 22. However, the instructions of NOP 35 reference the instructions of NOP 22 for the zoning of various forests, thereby distinguishing between types of forests.

NOP 35 adopts the planning basics stipulated in NOP 22 in a number of ways:

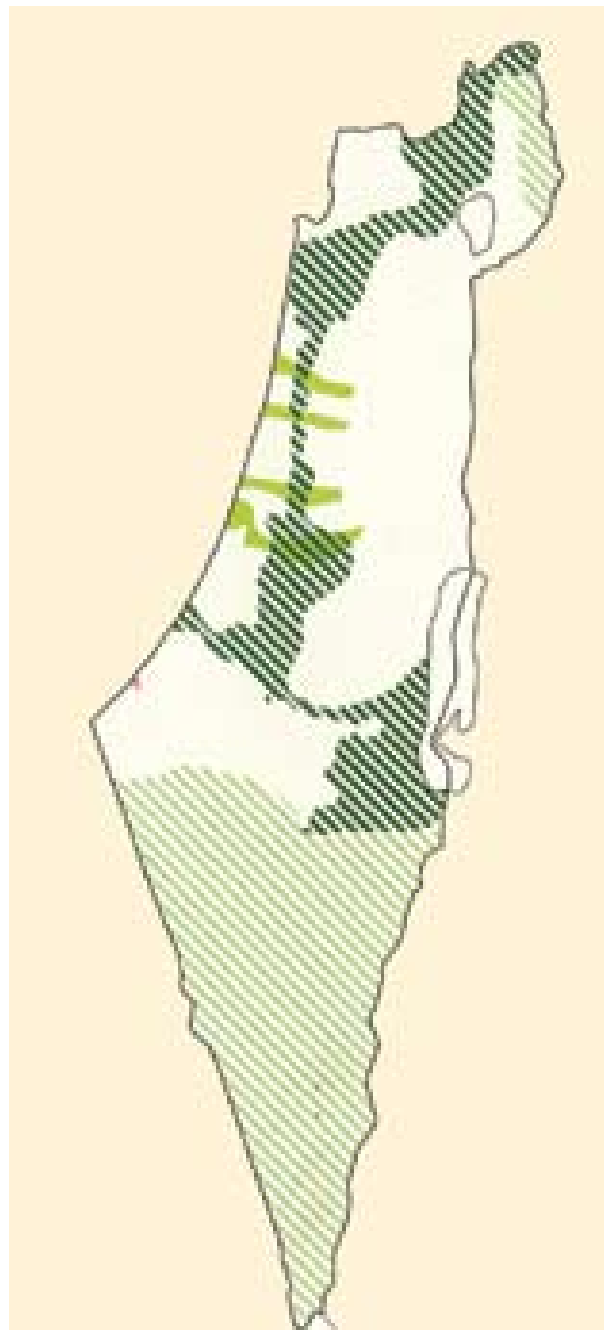
1. The Green Boulevard – NOP 35 presents a general spatial conception centered around the principle of a green boulevard: a continuum of open spaces the length of the country, joining the large metropolitan regions and containing open spaces of diverse character and standards – farmland, nature reserves and forests. This boulevard has horizontal sections – the coastal dry streams, which create an open barrier between the urban systems in the center of the country. NOP 22 designated almost the entire length of these strips for “riverside/stream-side plantings.” This spawned the overall conception in NOP 35 of a system of open spaces: integrated into the green boulevard are the forests of the Golan and Galilee, the Carmel Range and Menashe Range – in the north; the forests on the edge of the Samarian hills – in the center; the Jerusalem Hills and Judean Lowlands and the forests of Lahav and Yatir – in the south. The picture of a lengthwise boulevard is complemented by horizontal axes containing plantings on the banks of the main streams in the heart of the country.

2. Scenic Clusters reflect the values and image of the country, the heritage of early settlement and the cultural values representing different periods and conveying a sense of the country’s character. This designation in the national outline plan lends protection to agricultural areas and open spaces not provided for in previous national outline plans. The plan provides for several scenic clusters including forest landscapes – the Alonim block (around Bethlehem of Galilee), the land of the Annunciation

(the oaks of Bet Kesht), the slopes of the Carmel, Ramat HaShofet, the road to Jerusalem and Ein Karem, and the Lakhish-Adullam region, containing extensive natural woodlands and agriculture along the banks of the streams.

Illustration 12

The “Green Boulevard” of NOP 22





3. Riverside/Dry-Stream Plantings - NOP 35 marked the axes of the main streams with special reference in its instructions: "The strip of dry stream includes the stream channel, the banks and an area of 100 meters on each bank." A considerable portion of these dry streams are designated in NOP 22 for riverside/stream-bank plantings. NOP 35 thus complements and expands on one of the important ideas of NOP 22 – protecting the stream axes and utilizing parts of them as recreation routes in the center of the country.

To summarize: NOP 35 includes the forest zonings of NOP 22. The forest areas reflect the plan's spatial conception – forests of different types along a green boulevard, and plantings along the banks of dry streams in the open horizontal sections as part of the scenic cluster.

Note that the areas designated for development contain hardly any forestland. Where such overlap does exist, the plan's instructions deduct from the forest area unless it is natural woodland for conservation and on condition that a plan for a similarly-sized forest be submitted to the authorities.

The scenic clusters in the mountain regions – the Menashe Range, Jerusalem Hills, Judean Lowlands and Lakhish Region – contain large-scale forests.

As can be seen, most of the large coastal streams, including Kishon, Hadera (and its tributaries), Yarkon, Ayalon, Sorek, Lakhish and Shikma, are within the plan boundaries.

Illustration 13

The relationship between forest areas and Built-Up Textures, NOP 35



Illustration 14

Scenic Clusters in NOP 35 in Relation to Forest Areas

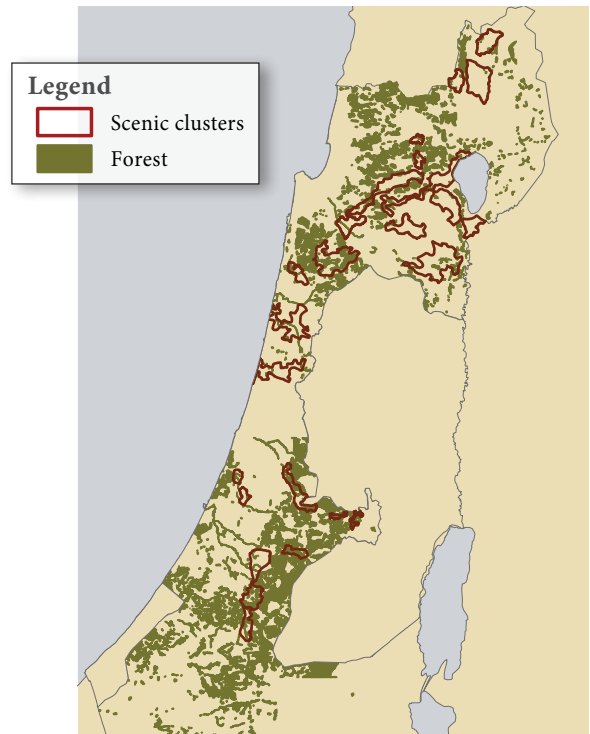


Illustration 15

Stream-Bank Plantings according to NOP 22 on a Background of the Stream Axes of NOP 35



District Outline Plans

Most of the district outline plans have been reworked in the past decade and include the forests appearing in NOP 22, in the category of open spaces. In certain districts, they carry great weight relative to other uses. The forest designations come to the fore in the maps and instructions of the plans: these include forests designated in NOP 22 and additional forestland designated by the district plan.

The instructions of the district plans on forest and afforestation areas, proposed both in NOP 22 and in the district plan, draw on the instructions of NOP 22. “The instruction of the national outline plan, NOP 22, will apply to the area marked as forest” – i.e., the instructions of NOP 22 will apply to all the areas in the district plan according to type of forest.

The forests of NOP 22 are included in the metropolitan leisure and recreation areas defined in the district plans. These areas include forests, farmland and stream axes; they serve most of the state population and bear most of the leisure and recreation activity.

In the Haifa metropolis, the main large open space are the expanses of Mt. Carmel and the Menashe Range, designated primarily as forest parks and planted forests integrated with reserves and agricultural land.

In the central metropolis and Tel Aviv, the main open spaces are the stream axes, which include riverside/stream-bank plantings and agricultural land serving

as an open barrier between communities, as well as the beaches, coastal forest parks and the axis of hills afforested mainly by man.

The metropolis of Jerusalem defines the heart of preservation – the region of the Judean Hills – as a high-standard open space composed mainly of extensive forests, nature reserves and tracts of traditional agriculture.

The metropolis of Beersheba includes planted forests serving as a green swathe for communities in a desert environment.

The large forest tracts in the north and the desert expanses in the south serve as a nationwide buffer of natural regions between the built-up areas, which include both metropolises and smaller communities.

The District Outline Plan for the North – DOP 2/9

The northern district comprises forestland and natural woodlands that constitute a substantial proportion of the district territory. The district’s forest area amounts to 404 sq. km. – some 11% of the total district territory.

Most of the forests are anchored in NOP 22; some – in the nature reserves of NOP 8 (e.g., Mt. Meron, the Khziv Stream, Alonim-Shfaram, which have both natural woodlands and planted forests.)

The open spaces in the district plan subdivide into three main zoning areas:

Illustration 16

Forests of NOP 9/2 – Northern District Outline Plan

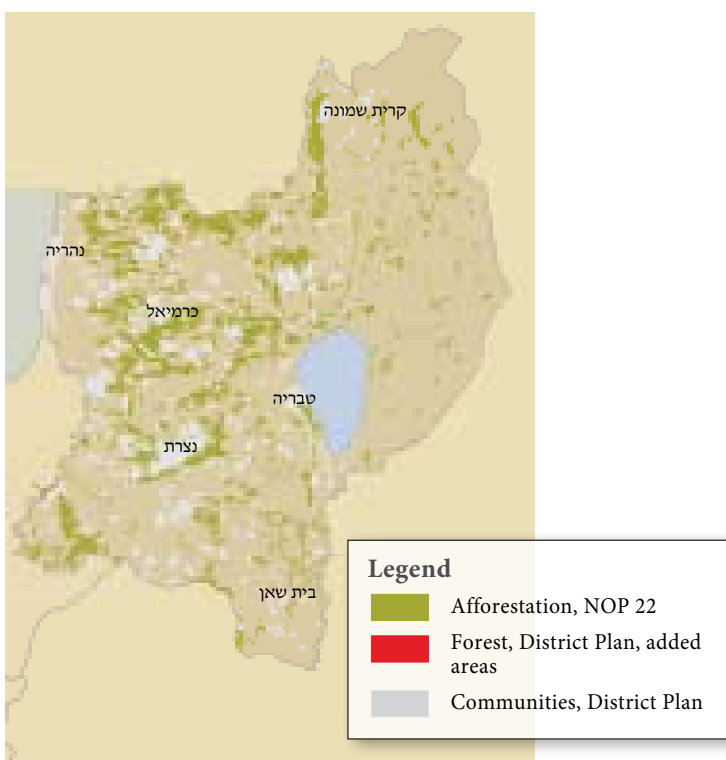
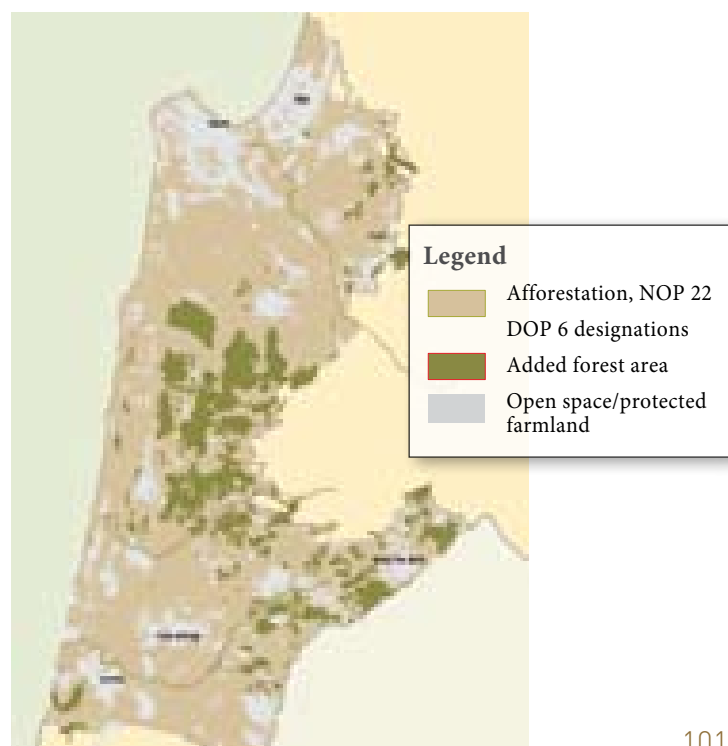



Illustration 17

Forests, District Plan 6 – Haifa District Outline Plan



- 
1. Nature reserves and national parks
 2. Forestland
 3. Farmland/Open rural landscapes

The forest areas based on NOP 22 appear in this format in the district plan and extend throughout the district. One can see large forest blocks in Upper and central Galilee, and the groups of smaller forests in the southern part of the district – around Yavne’el; and in the southwest – Alonim-Shfaram.

The district outline plan for the north is the only one not to have added forestland over and above that specified in NOP 22.

The Outline Plan for the District of Haifa – DOP 6

The DOP for Haifa designates the forests of NOP 22 as forestland subject to the latter’s instructions. The forestland amounts to 125 sq. km. – about 14% of the total district territory.

The areas of forests, reserves and farmland zoned as protected open/agricultural land are the district’s main open spaces of high standard. They create a large, continuous block encompassing most of the Carmel and Menashe Range, which is partially included in national outline plans such as NOP 22 and NOP 8, and partially – in the district outline plan.

The purpose of these zonings/designations is to conserve open spaces in order to protect areas where nature, landscape, heritage and agricultural resources are concentrated and to meet the needs of outdoor recreation on the district and national levels. This area – because of its size and central location between the Haifa and Tel Aviv metropolises and in the heart of the state’s largest population center – bears the main leisure and recreation functions and encompasses some of the nation’s main natural and visual assets.

Little forestland has been added in the Haifa district. The few additions made consist of forest patches aimed at filling in the continuum of protected open spaces and forests. The partial DOP for the HaNadiv Valley adds forestland that does not fall within NOP 22, and anchors it in the system of district planning.

The Partial DOP for the HaNadiv Valley Environs – DOP 5/6

The plan for the Nadiv Valley Environs deals with open spaces as a value in their own right; around these, land purposes and zoning are organized in the spirit of the national outline plan for Israel 2020 and NOP 35. These plans call for the planning and zoning of open spaces with the same care accorded built-up areas.

This is the first plan to fall within the category of Conservation-Worthy “Textures” cited in NOP 35, the Integrated National Outline Plan on Building, Development and Conservation.

The area of the Nadiv Valley is rich in natural assets, farmland, scenery and culture, representing various periods and styles. Its beauty and proximity to the center of the country has spurred great development demand, which threatens the assets of the open expanse. The area’s high standard and great sensitivity have resulted in it being given high priority within the Texture plans for open spaces.

The Nadiv Valley Environs plan and integrated plans for neighboring areas connect to form an extensive continuum of open spaces, at varying levels of development – for purposes of agriculture, afforestation, nature reserves, and leisure and recreation.

The concepts and planning language of this plan focus on open spaces. The plan’s intension is to recommend approaches which can serve subsequent plans and devise ideas to organize the open expanse and incorporate it in the “Texture” of life.

Marking Forests on the Maps of the Partial District Outline Plan

The forests in the partial district outline plan of the Nadiv Valley Environs are demarcated as designated in NOP 22, as are the classifications of added forestland. Illustration No. 18 distinguishes mainly between forestland demarcated in NOP 22 – forest zones with a green background – and the forests in DOP 5/6, on a white background and referred to in the legend as: “forests... of this plan.”

Added Forestland

The plan adds some 1,000 dunams of natural woodlands for nurturing and some 250 dunams of existing forest parks, forest parks of garrigue, grasses and Tabor oak in the vicinity of the Nili Valley and as an extension of the existing forest park designated in NOP 22.

In the sample map of the region south of the valleys, the color red denotes the additional forestland on forested hills that, in fact, are not anchored in NOP 22. The Nadiv Valley Environs plan complements the forest stretch along the hills and designates actual planted forestland, rocky hills and woodlands as forest areas in the district plan.

The Goals of DOP 5/6 in Zoning Forestland

Conserving the country’s vegetative resources with its planted forests and natural woodlands, and maintaining a high-standard environment to serve as an open, green hinterland for the population, for purposes of wellbeing, leisure and recreation;

Ensuring that forest work will be executed amid preservation of the country’s diverse scenery and ecological systems, and in consideration of the character of the various landscape units and open expanse.

Illustration 18

NOP 22 on Background of Partial DOP 5/6, Nadiv Valley Area

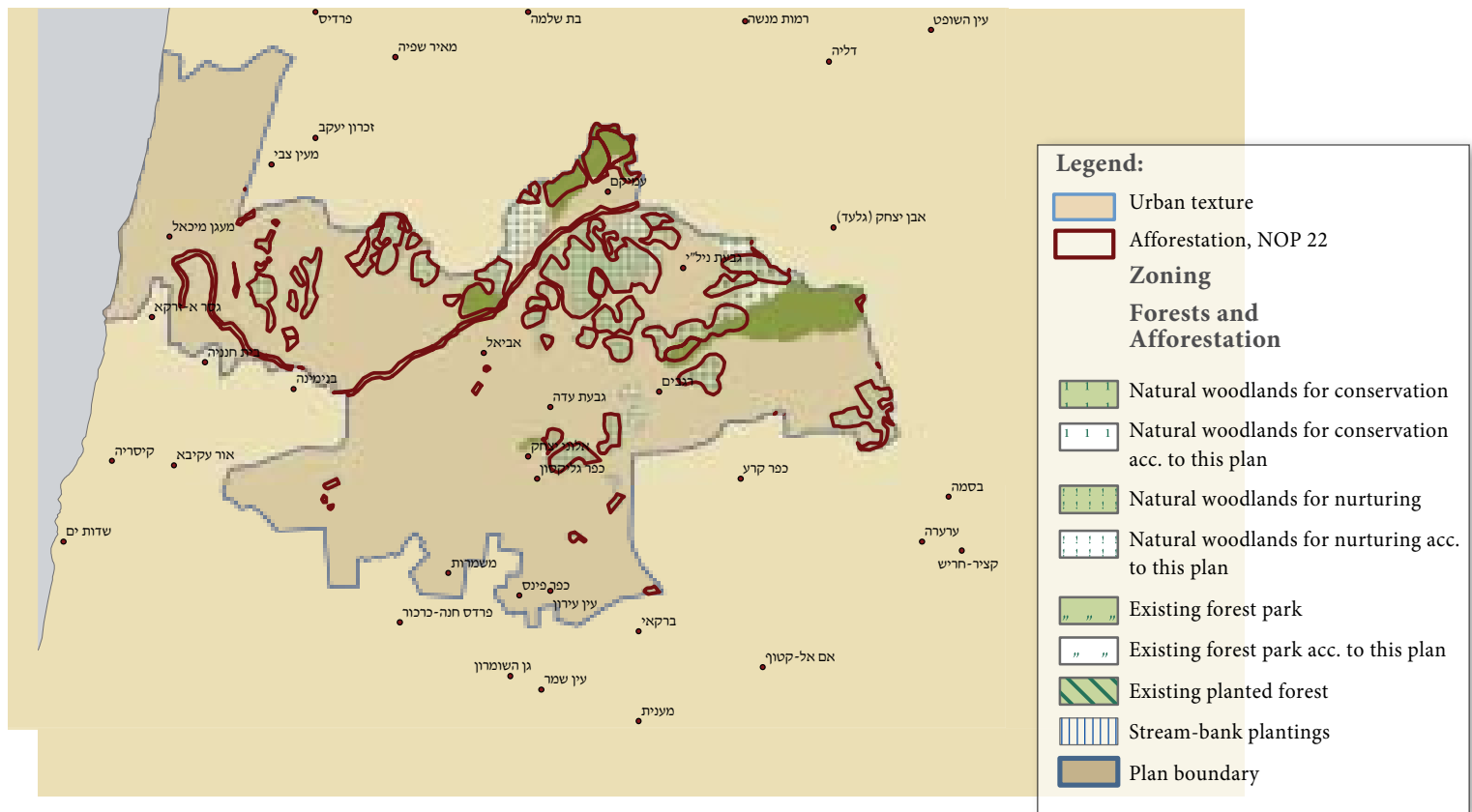
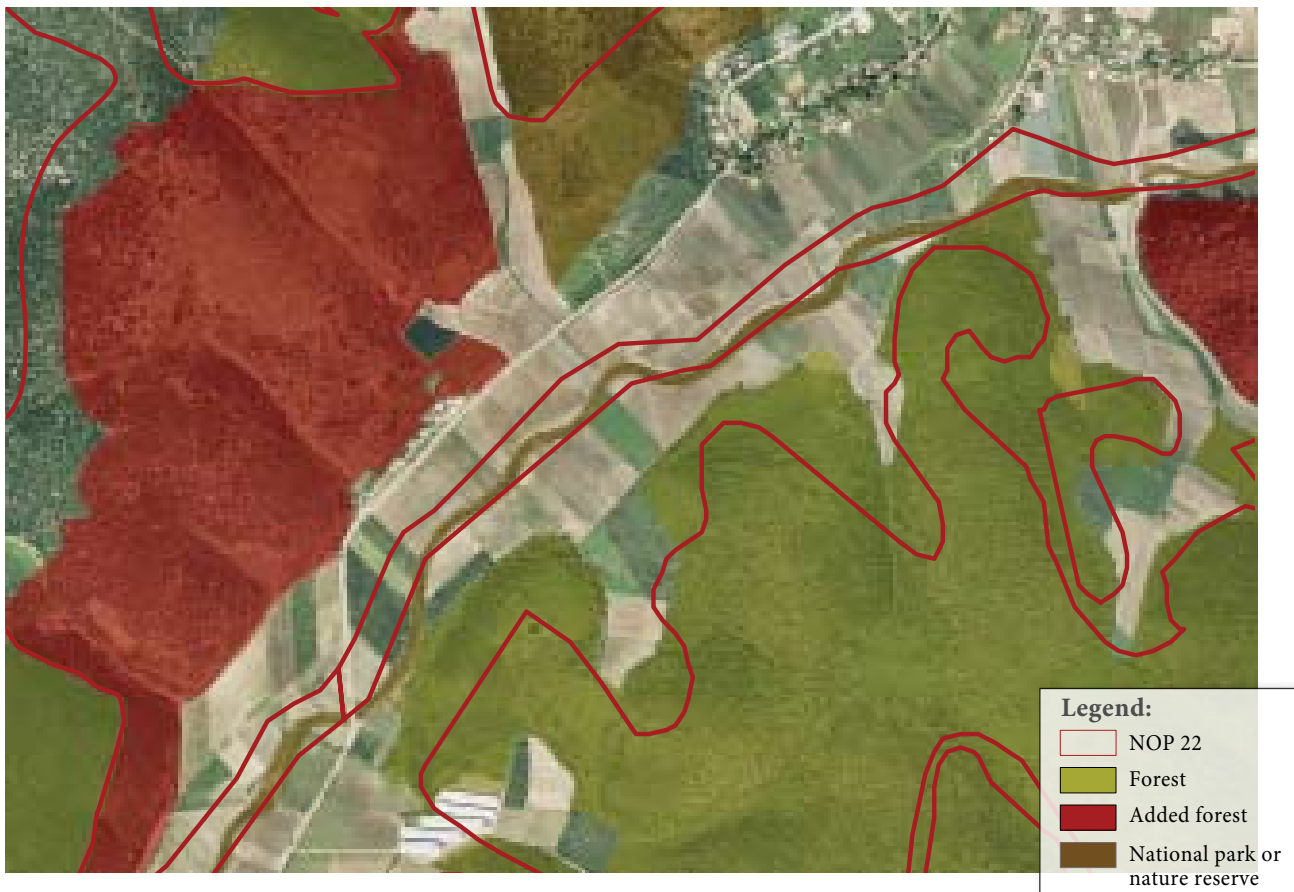


Illustration 19

Added Forest Areas in District Plans not Covered by NOP 22





The Outline Plan for the Central District – DOP 21/3

“The array of forests is based mostly on NOP 22. It constitutes the basis of recreation needs, including intensive recreation. In addition, the forests are of great visual importance.”

Forestland in the district amounts to 110 sq. km. – about 13% of the district territory.

The district plan refers to three main groups of forest, differing in function and in character:

Riverside/Stream-Bank Plantings: The “area of and around a stream” as designated in the district plan encompasses large stretches on both banks. This designation includes various types of open spaces, merging them into a single planning entity centered on the stream axis; essentially, it is a linear system of leisure and recreation areas surrounding and based on the stream. This category includes the “riverside/stream-bank plantings” of NOP 22.

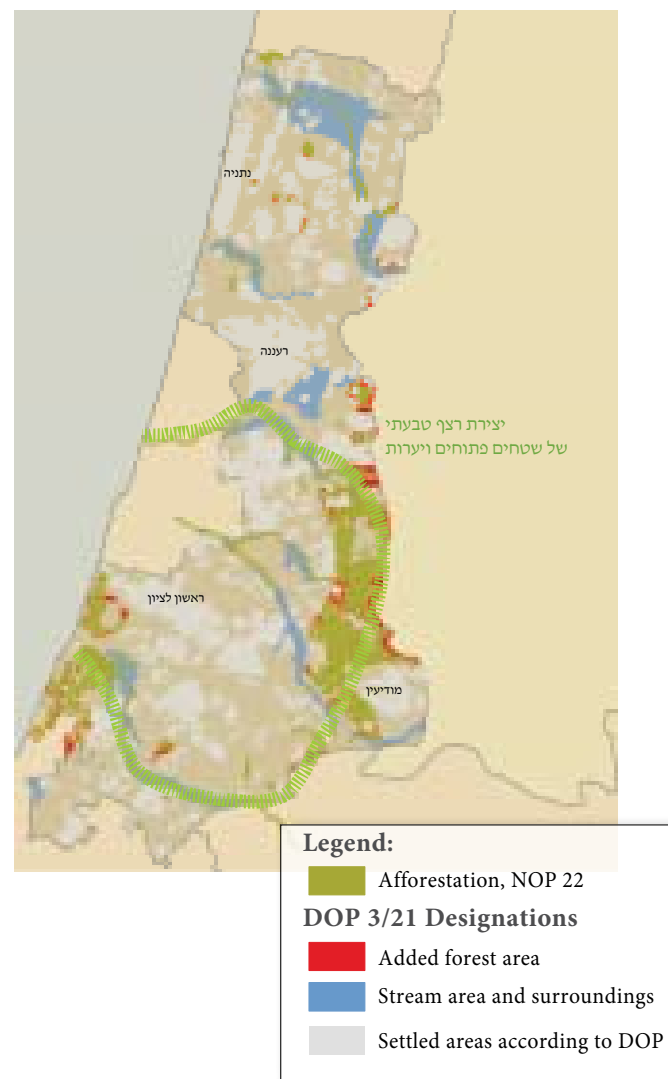
Coastal Forest Areas: “Coastal forest parks” as designated in NOP 22 connect with other open spaces, such as nature reserves, streams and their surroundings, and agricultural land – all together in the district plan forming a large block of high-standard open spaces in the heart of the metropolis, along the coast (most of the area is between Rishon LeZion and Ashdod, and is not open or accessible to the public today).

Forests along the Hilly Axis: NOP 22 sets out a variety of forest types and designations along the axis of hills, mostly planted forests and forest parks. These forests are anchored in the district plan, which filled out this chain of hills to create one large block along the entire eastern part of the district, and provide residents of metropolitan Tel Aviv with high-standard venues for extensive and intensive recreation services.

The district plan presents the distribution of forests warranting protection in the Central District. This filling out of the open spaces left in the eastern part of the district, on the edges of the hills towards the west, is meant, at least partially, to create a quasi-green ring from the area of the Ben Shemen forests northward – along Highway No. 6, up to Rosh HaAyin, and westward – along the Yarkon River. Further on, an open stretch has been preserved towards the green block north of Kfar Sava. From the south, the ring may be extended from the Ben Shemen forests along the planned Highway 431 north to the coastal sands. To this end, a broad strip of open rural landscape has been defined, from the Ben Shemen Forest to the Sorek Stream. This ring is meant to seal off the sprawl of the metropolis to the southeast, to ensure the potential for outdoor nature recreation, and to preserve the rural appearance in the southern sector of the metropolis.

Illustration 20

Forests in DOP 3/21 – District Outline Plan for Central District



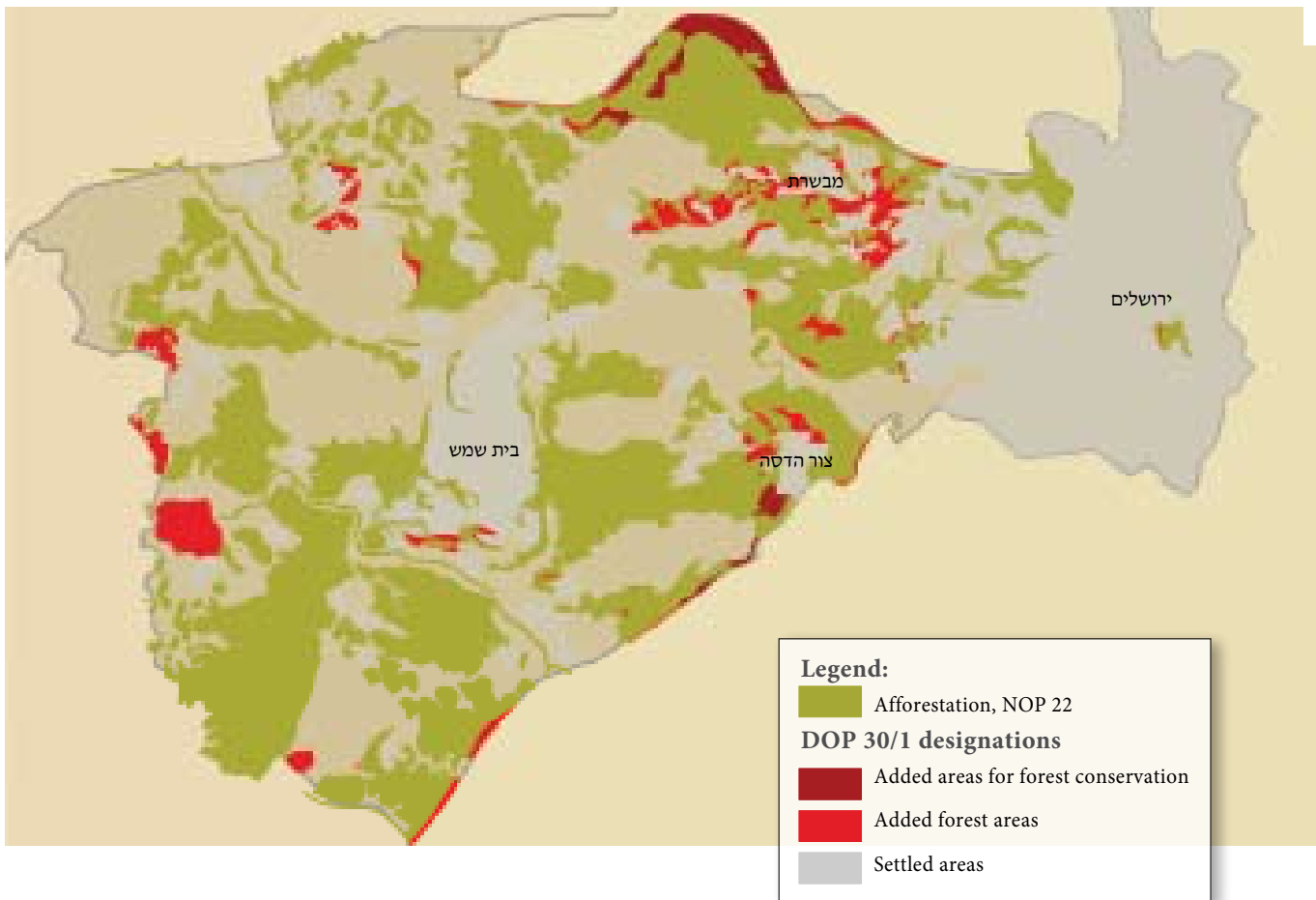
In the instructions of the outline plan for the Central District, forestland that is not anchored in NOP 22 but was added to the district plan is designated “proposed planted forests” according to the instructions of NOP 22.

In summary – forestland anchored in NOP 22 and incorporated in the district plan constitutes a substantial portion of the district leisure and recreation areas. The forestland was fleshed out in the district plan, and serves as the physical and statutory basis for the distribution of open spaces.

The forest areas in the district plan are the backbone of a broader system of open spaces based on two longitudinal strips: in the east – the axis of hills, and in the west – the coast. Between these two systems of opens spaces, there is a horizontal system of linear open spaces in the form of stream axes basically zoned for “riverside/stream-bank plantings” as anchored in NOP 22. This sets up a complete connected system of open spaces based on the forest designations, which are an integral part of it.

Illustration 21

Forests in DOP 30/1 – Jerusalem District Outline Plan



Outline Plan for the District of Jerusalem – DOP 30/1

The district of Jerusalem has the most extensive forestland designations – compared to the area of every other open space. The area of forestland amounts to – 222,780 dunams, distributed over 33% of the total territory.

The forest areas are based mostly on NOP 22, augmented by other zoned open spaces: nature reserves, stream axes and traditional farming areas. The forests of the Judean Hills are a central component of the leisure and recreation system at the country's heart – the two large metropolises, Jerusalem and Tel Aviv – and they function as extensive and intensive open spaces in accordance with their character and proximity to the metropolitan population centers.

The new district plan (which is in advanced stages of planning) includes the areas of NOP 22 and adds to them forestland, particularly in the region of the reserve in the Jerusalem Hills, in the ring around Jerusalem from the west, and around the suburban communities of Mevasseret Zion and Tzur Hadassah. Once the boundaries of Tzur Hadassah are defined in the district plan, the perimeter area will be zoned for forests to delimit a clear boundary.

In the southern part of the district, some 3,000 dunams of planted forests have been added along the Green Line, east of the community of Aderet.

Around Adullam, some 3,500 dunams were added in a large block, north of the community of Luzit, in an area of bustans and natural woodland, ancient caves and wells.

The forest block around Cafira was enlarged by some 5,000 dunams and includes all the open space between it and the district boundary, zoned as natural forests for conservation.

The instructions of NOP 22 will apply to the forestland anchored in it. The instructions for the forestland added by the district plan will be stipulated in local plans. However, the district plan adds forestland classified in NOP 22 as natural forests for conservation – in these forests, the permitted purposes include planting along with nature conservation, based on the character of the area.

The total area of forestland added by DOP 30/1 is some 7,700 dunams.



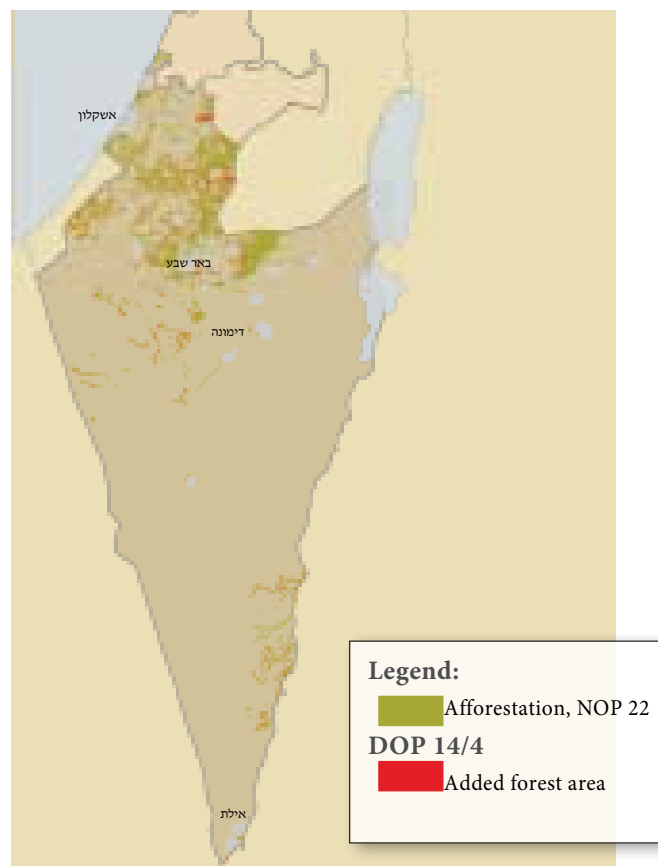
Outline Plan for the Southern District – DOP 14/4

The forest area in the south – some 570,000 dunams – constitutes some 5% of the entire territory, mostly north of Beersheba. The large forest blocks consist of hills covered with natural woodland around Lakhish and Adullam, extensive existing planted forests and natural woodlands around Yatir, Lahav, Adorayim and Kiryat Gat. On the coastal strip, from north of Ashdod to south of Ashkelon – there are coastal forest parks. Little forestland is designated in the desert area and what is designated is primarily along the stream channels.

NOP 22 and the district plan fill in the forests surrounding Beersheba to create a greener milieu for the city as well as leisure and recreation areas near the southern metropolis. To this end, the district plan adds some 40,000 dunams between Beersheba and Lahav, zoned as “afforestation and open spaces,” which, in the district plan are designated as “an area planted with vegetation or slated to be planted with vegetation which will utilize purified sewage water, and to preserve the open spaces ...”

Illustration 22

Forests in DOP 14/4 – Southern District Outline Plan



20.

Forest Plans – Local Outline Plans with Detailed Instructions

In 2001, a comprehensive process began of preparing outline plans on the detailed level for forests falling within NOP 22 and beyond. Detailed planning consistent with forest boundaries and functions helps create forestland integrated with the overall local planning system, and based on an understanding of development needs. Detailed planning reinforces the statutory status of forests and helps develop them from a broad, system-wide perspective.

The preparation of detailed plans is a large-scale countrywide process embracing dozens of plans in each of the planning regions – the north, the center and the south. It is based on the instruction of NOP 22 to draft local outline plans for forests anchored in NOP 22, which will include zoning, land uses and divisions, access roads to forests, internal forest roads and exact details of an area's boundaries (according to the instructions of clauses 5 and 13 of NOP 22).

The forest plans precisely define the boundaries of the forests designated in NOP 22 and add forests and areas that do not appear there. The boundaries of the plans are determined in coordination with nearby communities, regional councils and government bodies – according to the approved statutory situation.

Formulating the Overall Planning Approach

The plans are based on an overall planning approach in the format of a master plan. This plan reflects the forest's qualities: the physical, botanical, social and tourism characteristics, and the relationship of the forest boundary to the entire expanse and surrounding communities.

A KKL-JNF professional team in cooperation with forest planners formulates the planning approach, determining the contour lines and the plan's basic policy, from which the plan's designation and the permitted purposes derive.

Work Format

Constructing a database and surveys:

a. Background Data

- » Collecting and analyzing general environmental background data, and physical and social data affecting and affected by forests;
- » Collecting studies and publications on the area being planned;
- » Creating a physical planning base, including morphological and topographical layers and maps, dividing the areas into units of landscape, geology, soil, vegetation, rare plants, existing planted forests, forest management maps and cultures;
- » A survey of the communities around the forest, checking the needs of potential users in the region and the attractiveness for the distant population

b. Statutory Situation – Survey of the state of a forest and the areas bounding it, based on the existing approved plans

- » Local, detailed outline plans
- » District outline plans
- » National outline plans
- » Delimited farming tracts of nearby rural villages
- » Other plans that may impact a forest
- » Base of forest reserves

Collecting the relevant plans, creating a compilation map describing the existing situation statutorily, and maps of the area describing the land zoning of national and district plans with respect to the area being planned; verbal description of the relationship between the local plan and the designations of plans for neighboring areas to make sure that they conform.

c. Land Information

Collecting and collating information on ownerships, leasing rights, liens etc. Creating maps of blocks and parcels; identifying ownerships and dividing them into types: public-state, KKL-JNF, private.

d. Existing and Planned Forest Inventory

- » System of roads and paths
- » Various infrastructures, such as electricity, fuel, gas
- » Facilities: recreation areas, lookouts, watchtowers
- » National, archeological and other sites of interest for development and preservation
- » Tourism foci and visitor centers

KKL-JNF and the INNPA reached an agreement which is anchored in the forest plans: the areas of NOP 22 that should be conserved because of high natural and environmental values will be defined as nature reserves (particularly natural forests for conservation); existing forestland in nature reserves and national parks in NOP 8 (National Parks, Nature Reserves and Scenic Reserves) will mostly be transferred to NOP 22 (Forests and Afforestation); all the existing forestland in declared nature reserves and national parks will be managed by KKL-JNF.

Forest plans generally permit pasture management and sometimes include agricultural areas in their boundaries. These topics find expression in the instructions facilitating grazing and the installation of permanent and temporary facilities for herds, and permitted purposes for agricultural land included in the forest plan.

The Components of the Plan and the Statutory Process

Detailed forest outline plans for forests under the jurisdiction of district committees are submitted to local committees; in some cases, based on Amendment 43 to the Planning and Construction Law, the plans are submitted simultaneously to the local and district committees. The plans include blueprints of the existing and proposed situation and relevant sketches of the environment, instructions and explanations or an appendix about the landscape.

The plans emphasize the following topics: forest boundaries, main roads and secondary roads, forest entrances, visitor centers (existing and planned), recreation areas, lookouts, watchtowers and sites of interest, as well as subjects such as forest management, economic enterprises and various building instructions.

The local outline plan is drafted, as required by law, on the basis of the Planning and Construction Law and the stipulations of the committee to which the plan is submitted. Maps are produced on a scale of 1:10,000 as called for by NOP 22 or in greater detail according to the procedures of the Ministry of the Interior.

The Precision of NOP 22 – The local plans precisely define the forest boundaries drawn in NOP 22. The national outline plan was prepared in the early 1990s with the computer technology available then, and forest

areas were identified through aerial photography and in field work – increasing the danger of inaccurate border delineation.

Moreover, the national outline plan was drawn on a scale of 1:50,000 and does not match the local plans, which have a more detailed scale.

The differences in the level of detail between national and local plans and the advances in computer technology both facilitate and even oblige greater precision in the demarcation of the national plan. The forests of NOP 22 are meant to include areas of forests, hills and rocky areas that are not fit for cultivation. Based on this principle, the local plans are accurate in differentiating forests and natural woodlands from cultivated land, introducing distinctions between them, and adapting the designations to the character of the area.

Added Forest Areas – These detailed forest plans investigate the possibility of adding new forest areas that do not appear in NOP 22, but are of a high standard: exiting forestland not anchored in NOP 22, open spaces with natural attributes or natural open spaces forming a succession with existing forest areas. Some forests near communities were not demarcated because there was no information on the direction of the community's expansion.

Examples from Local Plans in Preparation

1. Local Plans for Forests North of Netivot, near the Community of Shibulim

The boundary of this local plan is based on the designations of NOP 22. The forest boundaries were refined and precisely delineated:

Precision in defining the designation – in NOP 22, a distinction was made between a natural area, an area zoned for forests in a local plan, and cultivated farmland – on a more detailed scale than the national plan. A natural or forested area retains the designation of NOP 22 while cultivated farmland is zoned in the local plan for agriculture.

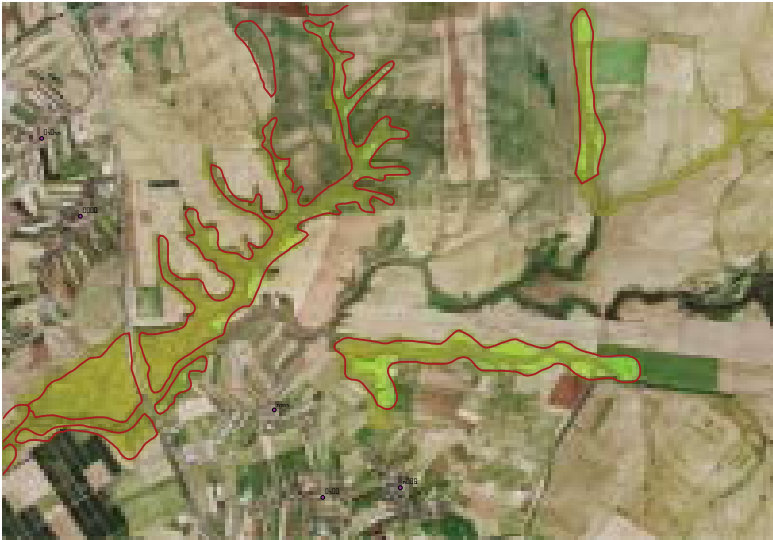
Refining the lines – The scale of the local plan and updated technology facilitate greater precision in delimiting forests along the winding course of stream channels.

2. Local Plan for Forests in the Gullied Region of Ruhama

In this gullied area, dozens of stream channels undermine an extensive cultivated area. The whole area is a quasi-jigsaw puzzle of natural lands alongside streams and agricultural fields. The local plan precisely distinguishes between the natural lands, which will continue to be zoned as forestland, and the cultivated farmland, which will be rezoned from forestland to agriculture according to NOP 22.

Illustration 23

Streambed Plantings North of Netivot



Legend:





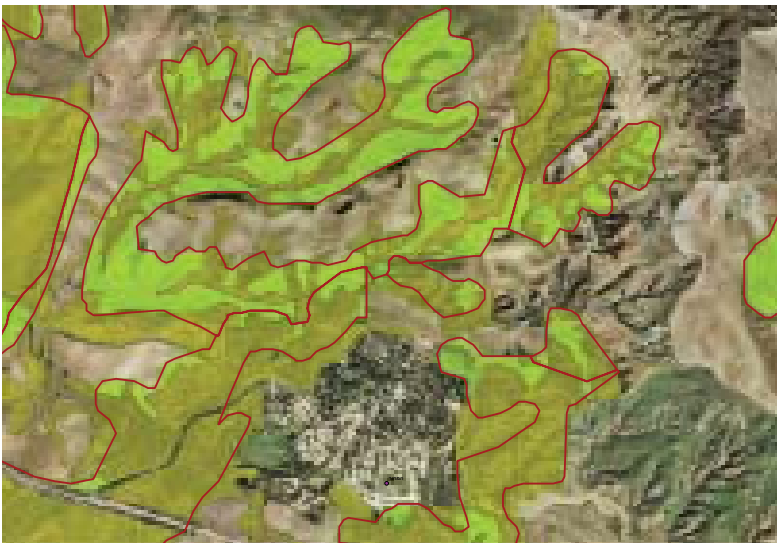
-  NOP 22
-  Forest
-  Farmland
-  National park or nature reserve

Illustration 24

Forests and Farmland around Gullies of Ruhama



Legend:





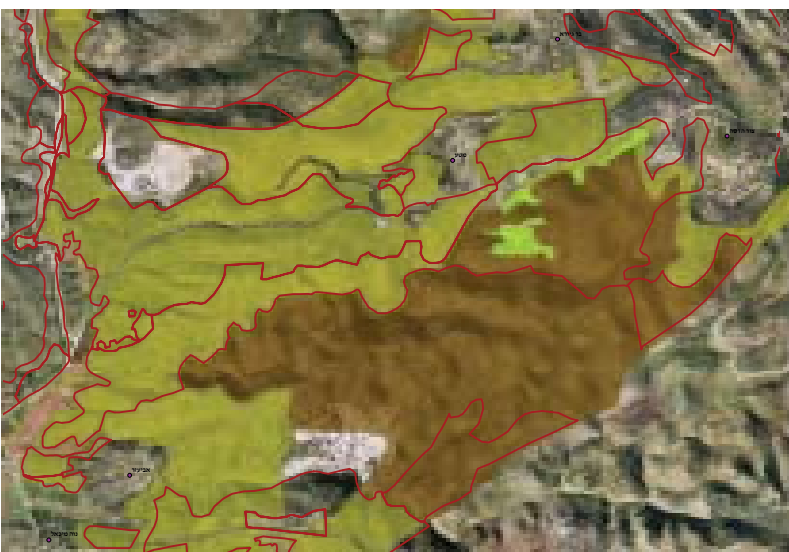




-  NOP 22
-  Forest
-  Farmland
-  National park or nature reserve

Illustration 25

Forests and Nature Reserves in Southern Judean Hills



Legend:

-  NOP 22
-  Forest
-  Farmland
-  National park or nature reserve



3. Local Plan for Forests and the Nature Reserve of the South Judean Hills, between the communities of Tzur Hadassah and Aviezer

This local plan classifies the forest areas by character and location. The areas designated as natural forests for conservation in NOP 22, which are of a natural character and situated next to – and extending into – an existing nature reserve, are rezoned in the local plan as a nature reserve. A special provision of NOP 22 allows the rezoning of natural forests for conservation as nature reserves.

4. Local Plan for forests and a nature Reserve on the Yavne'el Ridge and around Kfar Kisch

This local plan unites several small forest blocks in a stretch of forests of planning significance. NOP 22 designated a number of streams along the Yavne'el promontory for afforestation; the local plan adds forestland and designated the promontory – an area of high scenic and natural sensitivity – as a forest park, which suits the bare area. The addition of forestland to form a forest sequence instead of patches helps preserve the typical landscape of the region, the landscape of a forest park, and facilitates management of the area.

In the southern part of the plan area, some of the small forest patches are rezoned and joined to form a large, continuous nature reserve, a designation that matches the natural, undisturbed character of the Tabor tributaries.

5. Local Plan for the Tzora, Tzalfon and Yishai Forests, near the Community of Tzalfon

This is an example of how a local plan accurately delimits the hills of a forest park according to the topography. The plan designates the elevated natural area as a forest, excluding the cultivated farmland and cultivated stream channels between the carob hills.

Illustration 26

Forests and Nature Reserves in on Yavne'el Range and around Kfar Kisch

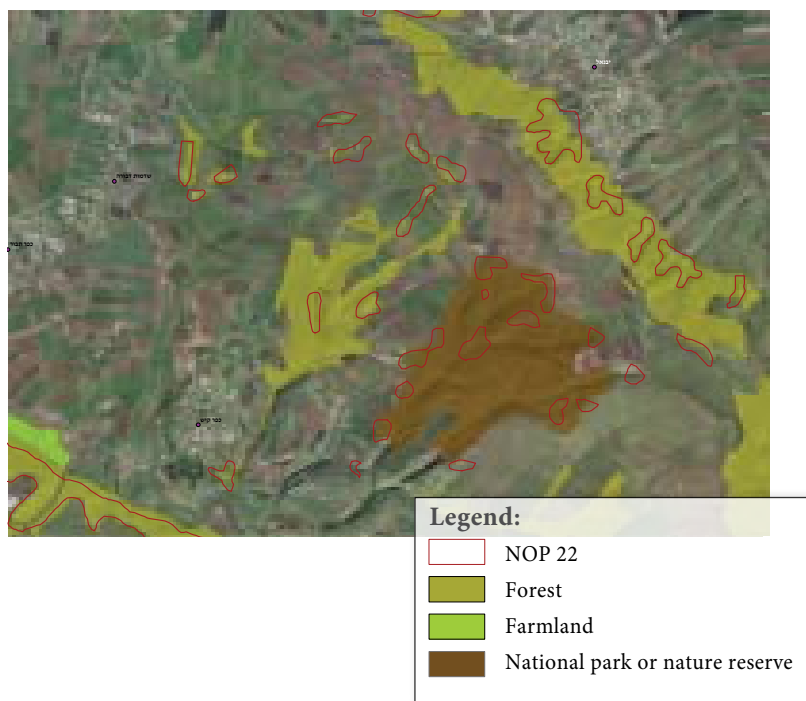
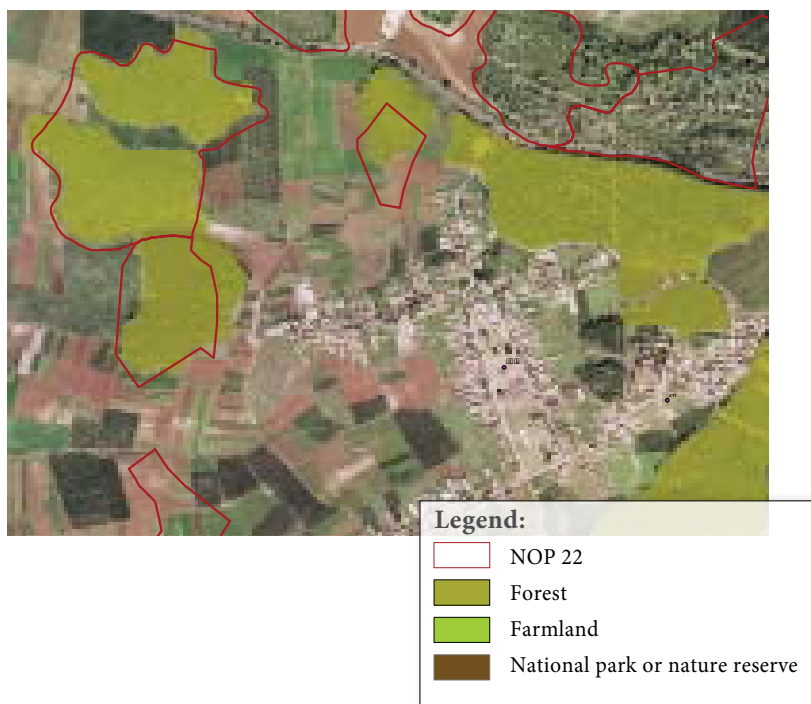


Illustration 27

Hills of a Forest Park near Zalafon



21.

NOP 22 – Monitoring and Control Program

Introduction

The intention of NOP 22 was to encompass as many areas as possible in order to protect open spaces, even if unplanted – so long as, potentially, they could be afforested or nurtured as natural woodlands. This conception made it necessary to incorporate mechanisms of flexibility in the instructions of NOP 22, which would allow for local constraints and make it possible to **include in the plan the largest possible area with extensive natural traits**, allowing a **limited number of concessions and with proper control by the planning institutions**.

This approach was certainly borne out: NOP 22 encompasses 1.62 million dunams, far beyond the existing area of planted forests and natural woodlands, mostly in northern Israel (entire state territory minus the Beersheba district). The additional areas were designated for afforestation based on the format of proposed forests, natural woodlands, coastal forest parks and stream-bank plantings. The flexibility mechanisms will allow for concessions where necessary, thereby enabling the inclusion in the plan of extensive areas for afforestation.

KKL-JNF is responsible for the preservation and development of Israel's forests, including various types of planted forests and natural woodlands/scrub. After NOP 22 went into effect, this responsibility received a binding statutory framework devolving on KKL-JNF's Planning Division and covering all forestland; planning committees at every level all function on this basis.

Much effort has been invested in recent years in reviewing the concessions accorded by invoking the flexibility mechanisms of NOP 22. The mechanisms made it possible to examine the extent of resistance of NOP 22 to development pressures, planning procedures, control and reaction of the different district planning systems to appeals for concessions.

The results of the review show a relatively low rate of concessions accorded since the government's approval of NOP 22. An examination of the committee procedures involved found that every request for concessions was properly discussed; often, a request was downsized, alternatives to the rezoning of NOP 22 designations in the new plan were investigated, or the request was rejected.

The data of the monitoring and control system show that zoning changes according to Clause 9 (see below) have been relatively few and amount to less than one per cent of all the territory covered by NOP 22. The plan has faithfully performed its role of protecting the areas within its purview. This chapter seeks to examine the effect of the plan's flexibility mechanisms – a decade after its approval (from December 1995 to the start of 2006), and to propose a policy of control and ongoing management of these mechanisms from an overall perspective of national afforestation.

Mechanisms of flexibility in NOP 22

The instructions of NOP 22 allow for the possibility of conceding forestland. A mechanism of flexibility allows forestland to be deducted at a considerable rate, according to clauses 9a and 9b:

“In a planted forest or existing forest park or coastal park or natural woodland for conservation, it will be possible to change the designation for no more than 5% of the area, according to a plan to be approved by the District Planning and Construction Committee and on condition that the size of the said continuous rezoned area shall not exceed 30 dunams and that the total of the rezoned areas shall not exceed 100 dunams.

“It will also be possible to change the designation of a said forest beyond the said 5% and not exceeding a tenth of the area according to a plan to be approved by the District Planning and Construction Committee with the agreement of the National Planning and Construction Committee or of a subcommittee appointed for the purpose.

“In the areas designated as proposed planted forests or natural woodlands for conservation or proposed forest parks or riverside/stream-bank plantings, rezoning will be allowed for a maximum of a tenth of the area of the said forests according to a plan to be approved by the District Planning and Construction Committee. Rezoning for an area larger than a tenth of the above and not exceeding a quarter of the area of the said forest is subject to the approval of the National Planning and Construction Council or of a subcommittee appointed for the purpose.”

NOP 22 incorporated the mechanism of flexibility in its instructions to allow for the inclusion of large forest and afforestation areas yet not to entirely block future development plans on these lands. The work was preceded by careful mapping in cooperation with the planning committee at the Ministry of the Interior, the Israel Lands Administration, and local and regional councils to make sure that there was no intent to develop the areas designated for forests in the foreseeable future. (Note that existing planted forests that cover some 200,000 dunams, as well as natural woodlands and other areas that appeared suitable for forest zoning were excluded from the plan from the start due to conflicts with development plans.)

This mechanism of flexibility enables the District Committee or the National Planning and Construction Council to approve exceptional cases without having to change the national outline plan affected by the decision.

In the decade since the approval of NOP 22, these clauses have been invoked frequently. Hundreds of proposals have been submitted to the planning committees, leading to concessions, which rezoned forestland for building and development.

Analysis of Concession Plans vis-à-vis NOP 22

An analysis of the procedures adopted by the planning institutions was conducted with the help of comprehensive material, which was processed from two main databases: one – the files of plans at the Division of Outline Plans at KKL-JNF; the other – the collation of plans at the Division of National Outline Plans at the Planning Administration of the Ministry of the Interior. The data were collated in a monitoring and control table.

Quantitative Effect of the Concessions

The quantitative effect of the concessions was examined in two ways:

- » One presents the total area of concessions vis-à-vis the designations of NOP 22, in dunams, by districts of the Ministry of the Interior, and the proportion of the area rezoned out of the total area of NOP 22 per district (Table 10).
- » The other presents the number of plans that constitute concessions from the designations of NOP 22, by districts of the Ministry of the Interior (Table 11).

Table 10

Total Concession Areas from NOP 22

District	Total Area NOP 22	Total Rezoned Area	Rate of Change Percent of total
North	518,000	7,074	1.37%
Haifa	119,000	711	0.6%
Center	102,000	1,271	1.25%
Jerusalem	205,000	1,612	0.79%
South	660,000	3,625	0.55%
Total	1,604,000	14,293	0.89%

Table 11

Number of Plans Constituting Concessions

District	Number of Plans	Percent of total
North	129	54%
Haifa	8	3%
Center	22	9%
Jerusalem	26	11%
South	54	23%
Percent of total	239	100%

Analysis of the Results

The proportion of the area for which concessions were granted from the designations of NOP 22, since its approval (i.e., in the decade between December 1995 and the start of 2006) is some 0.9% of the total forest area anchored in NOP 22.

The Northern District – contains the largest number of plans that constitute concessions from the lands of NOP 22 and the largest area of concession in both absolute and relative terms. In this district, the forestland is large relative to the district territory and included within the limits of many plans.

The Southern District – contains the largest areas anchored in NOP 22, for two main reasons:

- » The physical conditions – the south is sparsely populated and its open spaces are extensive at the national level. It is thus possible to concentrate large, continuous forest areas there.
- » The intent of NOP 22 is to improve the quality of life in this arid region with the help of planted forests near communities to create green, high-standard environs.

The southern district has the largest forest areas. This may be the reason that many plans included in their limits forestland that is anchored in NOP 22.

The Central District – contains the highest rate of concessions granted for forestland. This may be attributed to the great building pressures in the center, which pose a threat to open spaces, including forest areas anchored in NOP 22.

The Jerusalem District – contains numerous forest areas, constituting about a third of the district territory. These serve as leisure and recreation areas on the national level, due to their location between the two large metropolises and the numerous natural and heritage assets they incorporate. The main concessions were granted around rural communities.

The Haifa District – has lowest areal rate of granted concessions. However, the average plan area is significantly larger than in all the other districts, twice the average plan area in the other districts.

Summary of Conceded Areas over Time

Table 12 summarizes the areas conceded over time, by districts of the Ministry of the Interior and years. The time frame examined in the present work is 10 years, from the approval of NOP 22 – the start of 1996, immediately after its approval, and up to 2005.

Table 12

Total Concession Areas over the Decade, 5-Year Subtotals (in Dunams)

Year	Total Concession Areas from NOP 22, by District					
	North	Haifa	Center	Jerusalem	South	Total
1996	1,041	0	12	139	86	1,278
1997	1,230	63	93	12	137	1,535
1998	1,297	127	71	435	245	2,175
1999	694	0	440	337	487	1,958
2000	382	0	76	12	846	1,316
Subtotal	4,644	190	692	935	1,801	8,262
2001	7	0	0	98	102	207
2002	1,013	7	268	68	712	2,068
2003	622	11	123	273	75	1,104
2004	300	0	32	238	699	1,269
2005	488	503	156	0	236	1,383
Subtotal	2,430	521	579	677	1,824	6,031
Total	7,074	711	1,271	1,612	3,625	14,293

Analysis of Results

An analysis of the plans constituting concessions vis-à-vis NOP 22, over time, reveals a bell-shaped curve. From the early years immediately after the plan's approval, one sees a rise in the number of concessions. This trend peaks in 1998-2002, and drops in 2003-05.

In the first years, 1996-97, concessions were granted for a relatively small area. Since most of the areas for which there were plans or future intent were omitted from the purview of NOP 22, there was perhaps no real need for concessions. In all districts, the area of concessions for forestland peaked in 1998-2002. From 2003 onward, the areas of concession dropped in all districts. Two factors were presumably responsible for the decline:

- » Heightened entrepreneurial awareness of the statutory implications regarding areas anchored in NOP 22;
- » Improved handling by KKL-JNF's Division of Outline Plans of planning initiatives and an ensuing reduction of conceded areas.

Rezoning Departures from NOP 22

Tables 13a and 13b present the alternative zonings to NOP 22 designations for which concessions were requested, by areas size and district of the Ministry of the Interior.

Designations that Served as Concessions from NOP 22 (Tables 13a-13c)

Table 13a, 1996-2001

Reason for Concession	North	Haifa	Center	Jerusalem	South	Total (dunams)
Urban construction	825		358	201	201	1,585
Rural construction	2,586	63	137	453	1,020	4,241
Industry	560		192	274	208	1,234
Tourism	270		5		47	322
Institution	94			31	78	203
Infrastructure	90			74	158	322
Quarry		127			192	319
Nature reserve and national park	244					244
Total	4,651	190	692	1,033	1,904	8,470

Table 13b, 2002-2005

Reason for Concession	North	Haifa	Center	Jerusalem	South	Total (dunams)
Urban construction	404	5	97	265	886	1,657
Rural construction	868	14	301	277	225	1,685
Industry	68	2	27	6	183	286
Tourism	14	0	0	31	0	45
Institution	0	0	0	0	0	0
Infrastructure	137	0	2	0	198	337
Quarry	424	0	0	0	0	424
Nature reserve and national park	30	0	0	0	0	30
Total	1,945		427	579	1,492	4,443

Table 13c, Summary of Decade of 1996-2005

Reason for Concession	North	Haifa	Center	Jerusalem	South	Total (dunams)
Urban construction	1,229	5	455	466	1,087	3,242
Rural construction	3,436	77	438	730	1,245	5,926
Industry	628	2	219	280	391	1,520
Tourism	284	0	5	31	47	367
Institution	94	0	0	31	78	203
Infrastructure	227	0	2	74	356	659
Quarry	424	127	0	0	192	743
Nature reserve and national park	274	0	0	0	0	274
Total	6,596	190	1,119	1,612	3,396	12,913



Analysis of Results

Rural Construction – The table summarizing the decade since the approval of NOP 22 shows that rural construction accounts for the largest areas conceded – about half – and poses the greatest threat to NOP 22 forestland. In the first six years after the plan’s approval, it was the main factor for concessions and caused the highest rate of damage to NOP 22 areas, in terms of the quantity of plans and of conceded areas, totaling 50% of all the areas and plans of concession. In the four years of 2002-05, the weight of this designation appears to have dropped considerably and, in scope, it is now more in line with zoning for urban construction.

Urban Construction - In the first six years after the plan’s approval, this designation took second place in the size of NOP 22 areas conceded. Table 13b shows that rural and urban construction compare in scope and together account for most of the factors of concessions from NOP 22.

Industry – In Table 13a, describing the first six years after the plan’s approval, the area zoned for industry was similar to that of other designations, such as infrastructures and quarries. According to Table 13b, however, it dropped relative to other designations. In all districts in which concessions were granted for regional industrial plans, forested, high-standard areas were rezoned for land uses generally harmful to the environment.

Nature Reserves and National Parks – According to the instructions of NOP 22 (Clause 9d), its zoned “natural woodlands for conservation” may be changed to nature reserves and national parks in local plans without any need to invoke the concession procedure. Only other types of forests (such as natural forests for nurturing or forest parks), which are zoned for nature reserves, require the granting of a concession from NOP 22. Table 13a shows that the area designated as nature reserves is ten times that of Table 13b, reflecting the latter half of the decade. Amendment 4 to NOP 22 makes it possible to rezone all types of forests for nature reserves or national parks.

Infrastructures – The reference is mostly to specific infrastructures that constitute a concession, such as water reservoirs or engineering installations. In terms of areal scope, the designation is negligible. However, the topic of infrastructure is not fully reflected by areal size and number of plans: Clause 11 of the plan’s instructions permits linear infrastructure to be laid through forests with no need for either a plan or rezoning. Thus, despite the rather small changes from forestland to infrastructure, linear infrastructures did in fact occupy considerable forest area, yet were not reflected in the calculation of areas deducted from NOP 22.

Quarries – Extensive quarry areas are detrimental to the zoned forestland of NOP 22, but according to Clause 7a, the quarry areas appearing in NOP 14 are not in the realm of concessions. It may be seen from tables 13a and 13b that no real change took place in the area allocated for quarries.

Table 14
Types of Forests for which Concessions were Made (dunams)

Type of forest	North	Haifa	Center	Jerusalem	South	Total (dunams)
Existing planted forest	3,737	419	400	637	1,174	6,367
Existing forest park	86		223	18	238	565
Natural forest for conservation	1,349	290	175	293	693	2,800
Coastal forest park			5		149	154
Proposed planted forest	323		118	62	383	886
Proposed forest park	751		408	4	298	1,461
Natural forest for nurturing	866	2		534	224	1,626
Stream-bank plantings			62		84	146
Total	7,112	711	1,391	1,548	3,243	14,005

Concessions by Type of Forest and Districts of the Ministry of the Interior

Table 14 presents the types of forest to which concessions have applied and the areal size for each designation in the different districts of the Ministry of the Interior.

Analysis of Results

The Northern District – Most of the rezoned forestland was in the category of “existing planted forests”; more than half the area included forests conceded from NOP 22. “Natural woodlands for conservation” were the second category for which considerable concessions were granted – some 20% of all the district concessions.

The District of Haifa – The data include concessions in the categories of “existing planted forests” and “natural woodlands for conservation.”

The Central District – Most of the concession area in the district are proposed and existing forest parks. “Existing planted forests” make up the second largest category of concessions.

The District of Jerusalem – “Existing planted forests” and “Natural woodlands for nurturing” make up most of the areas of concession; the category of “natural woodlands for conservation” makes up some 20% of the district concession areas.

The Southern District – Concessions were granted for all types of forests, though about half the area is designated as “existing planted forests,” followed by some 20% of “natural forests for conservation.”

Summary

Planted forests make up a considerable proportion of the total area conceded from NOP 22 in most districts, and some 50% of the total area of concession. In comparison, relatively few natural forests for conservation were conceded; this sort of concession was granted mostly in the north, where rezoning was generally as nature reserves. The Group B designations of NOP 22, where there is more leniency for concessions (proposed planted forests, natural woodlands for nurturing and proposed forest parks), the proportion of concessions per designation ranged from 5% to 10%. In other words, the NOP 22 group that allows less leniency – Group A, which includes various types of existing forests and natural forests for conservation – had the largest areas of concession, whereas all the Group B designations, some of which are not actually forests, together comprise only about a third of the area of concession.

Most of the forest areas planted by KKL-JNF were included in NOP 22 during its preparation. Alongside these, proposed forestland of natural and scenic value or high social value was identified, taking into account the planning system and avoidance of future conflict with

development plans. The NOP 22 category of “existing planted forests” was a quasi-snapshot of the situation in the field, and it included most existing KKL-JNF forests. This, presumably, caused the designation of “existing planted forests” to encounter the most conflict and it is the most prominent designation regarding the scope of concessions.

KKL-JNF annually carries out assessment procedures for concessions and criteria. These include the concession dimensions, rezoning of forestland, deductions by forest type and so forth. The annual report gives the results of the assessment process for both the cumulative concessions since the approval of NOP 22 and the concessions made that year.

Conclusions and Charting Policy

The management policy for the mechanism of flexibility is conducted in two ways:

- » First – examining the area for which a concession was requested – proposing criteria that take into account the character of the requested area: its location, size, natural sensitivity and social value
- » Second – the mechanism of exchanging areas – Amendment 1 to NOP 22

These two methods will be discussed below.

Criteria for Evaluating Forestland

Sensitivity of Open Spaces and Forest Quality

A distinction should be made between areas of high environmental and ecological value – e.g., with natural assets, percolation to the water table, and important cultural and visual assets – and areas of high value for uses of outdoor leisure and recreation. These areas should be strictly protected to avoid rezoning and concessions as much as possible.

Specific tools should be created to assess the forest and afforestation areas of NOP 22 and help district planners



Ruhama Hills – view from KKL-JNF Lookout.
Photo: SPNI Open Landscape Institute



Aminadav Forest and Saadim ruins in the Jerusalem Hills.
Photo: Flash 90, KKL-JNF

reach practical decisions affecting their importance and sensitivity. These tools would include such means as visual assessments, simulation, specific sensitivity maps for given regions and assessments of leisure demands in regions served by forests.

Recommendations for a system of tools and criteria to assess the sensitivity of forests and open spaces follow.

1. Criteria of Forest Sensitivity

Species Composition – Natural woodlands are more sensitive than other forests, with a low carrying capacity. Planted forests have a high carrying capacity.

Forest Size – The larger the forest, the larger the carrying capacity.

Internal Forest Area – The larger the surface area, the greater the forest's contact with its surroundings, the greater its impact and sensitivity.

Degree of Observation – The more observable a forest, the more sensitive it is.

Extent of Disturbance – Roads, paths, quarries, nuisances, forest infrastructure – the more disturbances, the less the sensitivity.

Historic and Archeological Values of the Forest and its Environs – Multiple sites raise a forest's sensitivity and value.

Unique Points in and around the Forest – Flower patches, springs, rare plants etc. raise a forest's sensitivity.

2. Forest Quality, Leisure and Recreation Uses, and Social Functions

Proximity to Population Centers – The nearer a forest is to a population center, the greater its importance for tourism and recreation development.

Forest Type – Planted forests are suitable for tourism development; natural woodlands in a pristine state – dense low thickets – are less suitable. Planted forests mixed with developed natural woodland trees are attractive and more suitable than mono-cultural planted forests.

Access – The better the roads, the greater the development potential.

Forest Size – Large forests are the preferred standard and more suitable for tourism development.

Internal Forest Area – The larger the forest, the greater its contact with its surroundings and its ability to meet recreation needs.

Infrastructure within Forests – Roads, paths, recreation areas, power and water lines raise the development potential.

Physical Condition – Healthy, developed mature trees raise the quality of a forest for development.

Historic and Archeological Assets in and around a Forest – The more such assets, the greater the potential for tourism development.

Natural Assets – Flowers, springs, rare trees and streams raise the area's potential.

Observation Points in Forests – Sites from which to look out onto the surroundings and observe attractive scenery raise a forest’s recreational potential.

Proximity of a Forest to Tourism Services – Especially to rural hosting facilities, raises the potential for users and recreationists.

Forest Integration with other Attractions in the Area – Historic sites, national parks, hiking routes, nature sites and recreation/vacation points all raise a forest’s recreation potential.

3. Contiguous Open Spaces

One leading criterion in assessing the importance of open spaces is the contiguity of open spaces. Contiguous open spaces sustain natural processes, allow passage of plant and animal populations and the possibility of strolling in nature without physical and visual disturbances. The term “forest thicket” took root in the planning frameworks of KKL-JNF and in this manner, constant effort has been made to preserve maximum forest contiguity and continuity on the largest scale possible.

4. Adaptation to National Planning Policy

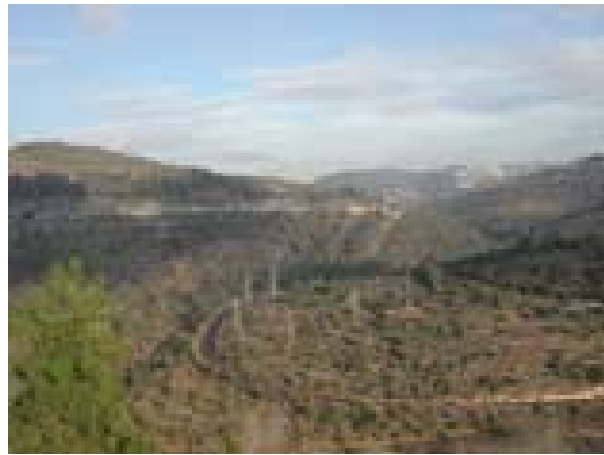
Clause 9f of the instructions of NOP 22 stipulates:

“In addressing the rezoning of the above-mentioned forestland, a planning institution will take into account, among other considerations, the impact of rezoning on the goals of the national plan and the rest of the area.”

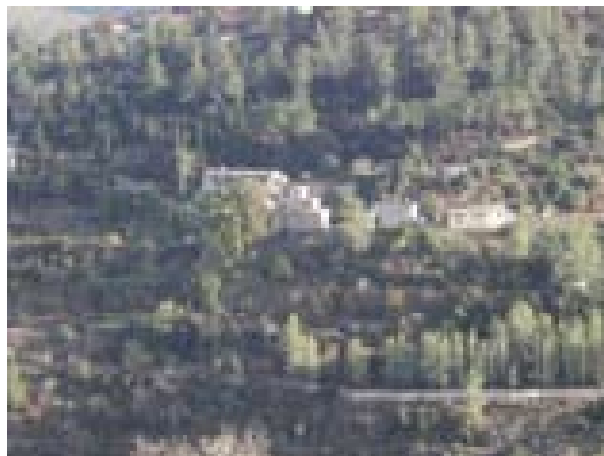
The national planning institutions regard the southern part of the country as the preferred target of development and settlement, and less so – the northern part of the country, which is sensitive in terms of nature and environmental values. This preference is reflected in the plan for 2020, which considers the difference between the northern and southern peripheries:

“Accelerated development of the northern region will largely rest on processes of natural growth but, on the other hand, may take its toll in damage to unique nature and landscape resources. In contrast, accelerated development of the southern periphery does not involve significant damage to the environment since it uses available land resources of relatively low environmental sensitivity” (Plan 2020, the picture of the future).

It is also worth mentioning the importance of the “green boulevard” of NOP 35, particularly in the country’s center where forests and natural woodland form a sequence and connection between natural and forested areas. The green boulevard defined in NOP 35 as an “integrated conserved area” and a “national conserved area,” is part of the ecological corridor defined by the INNPA (Shkedi and Sadot, 2000). These concepts are meant to guide the planning institutions to adopt a stricter stance in the center of the country and the Galilee, and to show lenience in the southern Israel while taking into consideration the terrain conditions there.



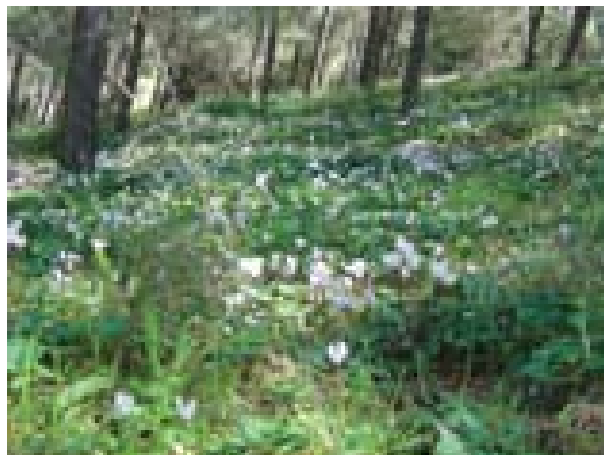
Roads and Infrastructure, Sorek Streambed.
Photo: Uri Ramon



John the Baptist Monastery, Even Sapir.
Photo: Uri Ramon



Zippori – The flourmill near Mt. Tabor, historic site raising the forest’s sensitivity and value.
Photo: KKL-JNF Photo Archive



Cyclamens in the forest.
Photo: KKL-JNF Photo Archive



The National Outline Plan for Tourism, NOP 12, emphasizes leisure demands, notably in the center of the country, and thereby stipulates leisure areas around stream axes connecting the hill axis with the seashore. These areas will receive special attention in terms of social functions and adaptation to uses of leisure and recreation.

5. Social Aspects

NOP 22 determined that the social aspect is an important goal – one of the plan's two overall goals:

“The maintenance of a quality environment, serving as an open green hinterland for the population, for purposes of wellbeing, leisure and recreation.”

A number of secondary objectives were set for this overall goal:

- » Cultivating rest and recreation areas at a short distance from home, with good access for all residents of Israel, especially the urban population
- » Maintaining proper infrastructure for internal tourism: developing recreation areas, areas of active recreation, hiking trails, camping and field-craft sites
- » Connecting the forest network to the country's general tourism infrastructure: national parks, antiquity sites, hiking trails

- » Creating a series of east-west horizontal recreation axes to be integrated with the courses of streams and linear parks, and connecting the high hills with community hubs in the lowlands

These principles may serve as litmus tests for the social and tourism impact of conceded forestland. Note that the topic should be examined using totally different criteria from those determining the physical aspects of an area and its sensitivity grading. Here, the examination will relate to a forest's leisure functions, the response to the leisure needs of the nearby population, access and availability, extent of use, whether the forest is the only one in a congested area and thereby meets leisure needs or whether it has an alternative option in the vicinity. Surveys of leisure and recreation uses of forests should reflect the public leisure patterns in different parts of the country. An example of one such comprehensive survey was the leisure and recreation survey conducted in the Judean Hills (Zalutsky, 2001), which presents the distribution of recreationists in the Judean Hills, the recreation habits and the preferred of driving routes and locations. Studies of this type will be used in the future to assess the importance of forested areas serving nature recreationists.

Photo: KKL-JNF Photo Archive



22.

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Acknowledgments

Many professionals took part in the planning work, from varied and various fields. The plan as a whole was designed and followed from the start by David Nahmias, Director of the Land Development Authority of KKL-JNF. Architect Dina Rachevsky, as Director of the Division of National and District Outline Plans at the Ministry of the Interior, guided the steering committee and the planners in their work. The planning team was headed by Moti Kaplan and its members consisted of Architect Shlomo Aronson, who drafted the first version of the plan in 1980-82 and Ilan Beeri of the Planning Unit of the Afforestation Division of KKL-JNF, who coordinated all the topics relating to the plan's management and liaised between the authorities in the field and KKL-JNF. Attorney Meir Alfia was in charge of the legal aspects and constructing the instructions of the law, with the participation of Attorney Avi Fortan and Attorney Sarit Dana of the Planning Administration of the Ministry of the Interior. The director of the Afforestation Division, Mordechai Ruach, and the regional directors, Amos Harpaz, Gershon Avni and Dr. Menachem Sachs, all contributed to the plan, each according to their own expertise. Moshe Ben-Shneour and David Broide of the Land Development Authority closely followed the plan and offered important input. Regional planners Ronit Shermeister, Hannah Jaffe, Nina Amir, Iris Bernstein, Dr. Yaacov Golan and Israel Zwick actively participated in the preparation of the plan in the relevant localities. Nathan Sass contributed to the plan's conceptual formulation and new directions of thought. Oded Salmon, Yitzhak Moshe and Gil Sapir of the Afforestation Division contributed greatly in the professional and planning fields. Vered Olomotzky coordinated the planning team and was responsible for mapping and the plan's production. Mira Chen and Attorney David Skolnick took part in designing the cartographic format of the plan. The planning team consulted a great deal with members of the field authorities: Dror Crispin and Attorney Fanny Finkelman of the Israel Lands Administration; Zvi Mintz and Attorney Rahel Merhav of the National Parks Authority; Yossi Cohen, Jasmine Talmon and Menachem Marcus of the Nature Reserves Authority; Yoav Sagi, Mickey Lifschitz and Michelle Porat of the Society for the Protection of Nature in Israel; Valerie Brachia of the Ministry of the Environment helped with environmental aspects and questions related to coastal afforestation; Ilana Shpern, Ran Semel and Moshe Gartner of the Planning Administration of the Ministry of the Interior helped in the preparation of the plan and the process of its approval; Dr. Avi Perevolotzky and Rama Hefetz read the manuscript and helped formulate the final version of the plan.

Computerization, Mapping and Production

The construction of a computerized system for the outline plan was done by Yitzhak Capular of Tahal Consultant Engineers, and Eli Porat and Oded Beeri of Datamap Tel Aviv. Sharing in the work of sketching, mapping and computerization were Natalie Levine, Raissa Gezunterman, Yair Shapira, Yarden Feder, Hava Salzman and Eilat Elcart. The Hebrew version was edited and proofread by Varda Ben-Joseph. Further editing and preparing this version for print – by Nirit Whitman and Anat Horovitz. Photography research: Pnina Livni, KKL-JNF Photo Archives; production coordination: Mimi Kovner, Division of Communications and Public Affairs, KKL-JNF.

23.

The Instructions of the National Council for Planning and Construction

National Outline Plan for Forests and Afforestation


Decision No. 48-76 of the National Council at its Session No. 123 of 7.12.76

1. The National Council for Planning and Construction perceives a need to draft a national outline plan for forests and afforestation.
2. The Council, by its authority according to Clause 50 of the Planning and Construction Law 1965, hereby instructs that the said plan be drafted and submitted to the Council no later than one year from the day of issue of the order of execution.

After six months from the day of issue of the order of execution to the draftsmen of the plan, a progress report on the status of the plan shall be submitted to the Council.

3. The Council, by its authority according to Clause 5 of the Law, hereby issues the following instructions for the drafting of the plan:
 - a. The plan shall stipulate the functions for which each existing forest is designated – planted forests and natural forests – from the following main functions:
 - Forests to improve the landscape
 - Forests for intensive and extensive recreation
 - Forests to improve the quality of the environment and regulate environmental nuisances (quarries, industry, roads, erosion, wandering sand dunes etc.)
 - Forests for pasture
 - Forests to ensure reserves for settling the land
 - Commercial forests for wood production

The plan shall identify and designate additional areas for afforestation according to the said functions in order to ensure forestry reserves.
 - b. The plan shall designate existing forest areas and additional (new) forests in such a way as to ensure environmental conservation, for the wellbeing of the existing population and that projected for the year 2000, in consideration of the need to ensure land reserves for the above-mentioned needs.
 - c. The plan shall set criteria for the main forest recreation needs, various rest areas, recreation facilities, observation points etc.
 - d. The plan shall recommend the character of the new forests and the regenerated mature forests.
 - e. The plan shall set priorities and determine stages of execution.
 - f. In the drafting of the plan, the following shall be taken into account: national summaries of the Planning Division of the Ministry of the Interior, national outline plans that have been approved and are in the process of preparation, and especially national outline plans for national parks, nature and tourism reserves, in coordination with district planning offices.



g. In the drafting of the plan, attention shall be paid to district and local outline plans and to the proposed plans of bodies and organizations interested in conserving landscape assets and assets of nature and historical heritage, such as the following stakeholders in tourism and recreation:

- National Parks Authority
- Nature Reserves Authority
- Ministry of Agriculture
- The Settlement Department of the Jewish Agency
- Ministry of Defense
- Ministry of Tourism
- Sports Authority of the Ministry of Education
- Environmental Service
- Local and district authorities
- Regional and local environmental bodies
- Ministry of Education and Culture and the Antiquities Division
- Israel Police

4. The plan shall include the following documents:

- a. Plan data on maps of a scale of 1:250,000 and 1:100,000.
- b. Instructions stipulating permissions and restrictions on forest use and maintenance needs.
- c. Explanations, including background maps and a description of every existing and proposed forest (such as geographical location, natural data, special assets, level of development)

5. The Council recommends that the Minister of the Interior, by his authority according to Clause 51 of the Law, appoint the Afforestation Division of the Land Development Authority of Keren Kayemeth LeIsrael, the Israel Lands Administration and the Planning Division of the Ministry of the Interior to draft the plan.

A steering committee shall be established to follow the drafting of the plan and include the participation of: the representative of the settlement bodies on the Council – chairperson; the representative of the Ministry of Tourism; the representative of the Organization of Regional Councils; the representative of the Environmental Service; the representative of Israel Police; the representative of the Union of Local Authorities; the representative of the umbrella organization on the Council of public environmental bodies.

6. The Council shall promulgate the subject matter of the plan in official records.

Appendix



Appendix 1

Instructions of NOP 22

The Planning and Building Law - 1965

National Outline Plan for Forests and Afforestation, NOP 22

Name of Plan The plan shall be called the National Outline Plan for Forests and Afforestation – NOP 22 (hereafter “the plan”)

Plan Documents The plan contains: 7 pages of plan instructions. It also contains as an integral part of the plan:

- a. A map on a scale of 1:50,000 consisting of 52 sheets
- b. Appendix 1, consisting of a glossary
- c. Appendix 2, consisting of a list of forests and areas

The Goals of the Plan The goals of the plan are:

- a. To define and determine forest areas: existing forests and areas zoned for forests, including planted forests, natural woodlands, forest parks, coastal forest parks and riverside plantings
- b. To determine that forestry activity will be carried out while at the same time conserving the country’s scenic diversity and in consideration of the various landscape units and open spaces
- c. To set guidelines and instructions for the planning and approval of detailed plans for proposed forests
- d. To set permissions, limitations and prohibitions regarding land uses in forested areas or areas designated for forests
- e. To establish the relationship between the plan and other plans and land uses

Definitions In this plan, the following terms shall have the meaning that is stipulated next to them.

- a. “Road” – As stipulated in the National Planning and Building Law
- b. “Subcommittee” – A subcommittee to be formed according to Clause 6 of the Law
- c. “Forest” – including existing planted forests, proposed planted forests, natural woodlands for nurturing, natural woodlands for conservation, existing forest parks, proposed forest parks, coastal forest parks, riverside/stream-bank plantings
- d. “Natural woodland – with maquis, bustans, dwarf shrubland and vegetative formations for nurturing”; other natural areas– comprising native plant species of Israel, which has been disturbed but has potential for renewal as defined and delimited in the map
- e. “Natural woodland – with maquis, fruit gardens, dwarf shrubland and vegetative formations for conservation”; other natural areas of high value consisting of native Israeli plant species, as defined and delimited in the map
- f. “Proposed planted forests” – area designated for planting trees and shrubs to create a forest, as defined and delimited in the map
- g. “Existing planted forests” – area planted with forest trees, as defined and delimited in the map
- h. “Proposed forest park” – area designated for sparse planting of trees and shrubs and characterized by grassy plants of grazing quality, preserving at the same time the area’s typical natural characteristics, as defined and delimited in the map
- i. “Existing forest park” – forest area sparsely planted and characterized by existing grassy vegetation, as defined and delimited in the map

- j. "Riverside/Stream-bank plantings" – The planting of areas alongside (dry) streams so zoned for the planting of trees and shrubs on the banks preserving at the same time the natural characteristics of the area defined as "dry streambeds" (Heb. *nahal*) and delimited in the map.
- k. "Plan" – A plan according to its meaning in the Planning and Building Law 1965.
- l. "Map" – A map prepared on a scale of 1:50,000.

Boundaries of Forests in the Plan


- a. The boundaries in this plan are marked on maps of the Israel Survey
- b. For planted forests, proposed forest parks, natural woodlands for nurturing, natural woodlands for conservation, coastal forest parks and stream-bank plantings, detailed plans will be prepared setting the land designations, uses and divisions according to this plan, the planned forestry activity, forest access roads, internal forest roads and the exact details of the boundaries of the area.
- c. Deviations stemming from the scale of this plan, which does not allow for real precision in terms of identifying both an area and its size, and deviations stemming from the topographical conditions of the area will be permitted and are not to be regarded as departures from this plan, on condition that no essential change ensues in the characteristics of the area. An area's exact location, size and boundaries will be fixed in local plans.
- d. Local maps or detailed outline plans will be prepared on a scale of at least 1:10,000.
- e. In district outline plans or in the absence of these, in local outline plans and with the approval of the National Council and in the absence of a district and local plan, in a detailed outline plan with the approval of the National Council, there may be stipulations that mark departures from NOP 22 in order to adapt the boundaries of NOP 22 to local conditions, to an extent deemed reasonable by the District Planning Committee and the National Planning and Building Council. No departures from NOP 22 will be stipulated without prior consultation with KKL-JNF and subject to the instructions of clauses 7 and 9.

Planning Proposed Planted Forests, Proposed Forest Parks, Stream-Bank Plantings, Coastal Parks

- a. Detailed planning of forests for these areas will be executed on the basis of the natural data of every area with attention to the conservation of the landscape and environmental and visual characteristics
- b. The detailed planning will take into account preventing harm to agricultural areas
- c. Forest planning for the areas of stream banks will be executed in coordination with the Drainage Authority and the River Authority
- d. Detailed planning of forests will be executed in coordination with the Chief Firefighting Supervisor

Relationship to other Plans

- a. In the case of conflict between the instructions of NOP 22 and the instructions of other national outline plans approved prior to the approval of this plan, the instructions of the other plans shall prevail. Should conflict arise between NOP 22 and the instructions of a district outline plan, a local outline plan or a detailed plan, the stipulations of NOP 22 shall take precedence. However, lawful use made on the eve of the approval of NOP 22 shall not be deemed unlawful because of the approval of NOP 22, but shall be considered a permitted departure. To remove all doubt, all changes in grazing or agricultural uses shall be made in coordination with the Minister of Agriculture or a representative thereof.
- b. A District Committee has the right to submit for approval to the National Council or a subcommittee appointed for the purpose, instructions of a local outline plan or a detailed plan that were approved prior to the approval of NOP 22 and stipulating different designations from those stipulated in NOP 22.

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- c. Notwithstanding the aforesaid in Clause a. above, NOP 22 may include areas of scenic reserves that are included in NOP 8 without affecting their zoning or status as scenic reserves. The said areas will be zoned in NOP 22 as natural forests for conservation.
 - d. In addition to and notwithstanding the aforesaid in sub-Clause a. above, the areas of nature reserves included in a district outline plan or a local outline plan or a detailed plan, may be included in the areas of NOP 22 as natural woodlands for conservation without affecting their zoning or status as scenic reserves.
 - e. In addition to and notwithstanding the aforesaid in sub-Clause a. above, the areas of national parks included in a district outline plan or a local outline plan or a detailed plan, may be included in the areas of NOP 22 without affecting their zoning or status as national parks
 - f. Should conflict arise between NOP 22 and the instructions of a national outline plan designating areas for mining or quarrying, permitted activity will comply with NOP 22 and on condition that it is coordinated with the director of the Israel Lands Administration or a representative thereof.

Military Zones

- a. In this clause, the definition of “military zone” is as defined in Clause 159 of the Planning and Building Law 1965 (hereafter, “The Law”) and a closed area is as defined in the (emergency) defense regulations, 1945.
- b. The map of NOP 22 does not mark all the military zones or their exact boundaries. The instructions of this clause shall apply to all existing military areas at any point in time.
- c. Notwithstanding the stipulations of this clause on military zones to which NOP 22 applies, the following instructions shall be in force:
 - 1) All use or action by the defense forces or a representative thereof shall be permitted, whether by their sole approval or the approval serving the interests of the defense forces or a representative thereof, and this, without any permit or approval in accordance with NOP 22 and contrary to the designation it stipulates for an area;
 - 2) To remove all doubt, the aforesaid in sub-Clause 1 cannot detract from the application of the instructions of Clause 6 of The Law (security installations and flight obstacles);
 - 3) The deposit of any plan on the basis of NOP 22, including a detailed plan, is subject to the prior written approval of a representative of the Minister of Defense at the District Planning and Building Committee – the head of the Planning and Development Branch, Planning Division, and shall be executed solely subject to the conditions and restrictions set by a representative of the Minister of Defense at the District Planning and Building Committees – the head of the Planning and Development Branch, Planning Division.
 - 4) Every use, including the granting of building permission according to NOP 22, is subject to the prior written approval of a representative of the Minister of Defense and shall be executed solely subject to the conditions and restrictions set by a representative of the Minister of Defense at the District Planning and Building Committees - the head of the Planning and Development Branch, Planning Division.
 - 5) Every plan submitted according to sub-Clause 3 shall include the instructions of sub-Clause 4.
- d. The instructions of NOP 22 cannot change agreements affecting military zones, the use of which by the defense forces was granted permission, and the conditions of the permission and agreements shall remain in force so long as the area continues to serve as a military zone.
- e. The instructions of NOP 22 cannot cancel or change military zones and the instructions applying to them, nor can they revoke or change the instructions, including instructions concerning change and limited use affecting every area to which the plan applies, which were imposed by the authority of the Military Installations Committee on the basis of

clauses 160, 175 and 177 of the Law, nor can they detract from the instructions applying to military installations as stipulated in chapter 6 of the Law.

- f. The powers of the Military Installations Committee will be fully maintained and the stipulations of NOP 22 cannot detract from them, change or qualify them, including with regard to lands for which designations were set in NOP 22.
- g. To remove all doubt, it is hereby clarified that the instructions of NOP 22 cannot obligate the Defense forces to undertake any action on the basis of NOP 22 and/or establish new forest areas and/or undertake any activity on existing forest areas, on existing or future military zones; and any areal designation according to NOP 22 will not in any way detract from the discretion of the Defense Forces to designate or preserve said area for use by the Defense Forces. NOP 22 cannot prevent the issue of a declaration, determination and/or approval for the establishment of new military zones by the bodies so authorized, according to the instructions of The Law.
- h. The use of military zones to which Clause c (1) does not apply shall abide by the instructions of NOP 22, following agreement by a representative of the Minister of Defense at the District Planning and Building Committees – the head of Planning and Development Branch, Planning Division, as stipulated in Clause c above regarding the conditions and restrictions set by a representative of the Minister of Defense at the District Planning and Building Committees – the head of Planning and Development Branch, Planning Division.
- i. To remove all doubt, it is hereby clarified that should approval or permission by the Defense Forces be granted for afforestation or other action, the said permission or approval and/or action carried out on that basis, cannot change the legal status of the military zones and they will remain military zones until such time as the Defense Forces decide otherwise.
- j. Should an area cease to be a military zone, the instructions of NOP 22 shall apply to it in full.

Rezoning Forestland

- a. Rezoning of existing planted forests or existing forest parks or coastal forest parks or natural woodlands for conservation shall be permitted for up to only 5% of the area and on condition that the size of the continuous area rezoned shall not be larger than 30 dunams, and that the total areas rezoned in the forest shall not be larger than 100 dunams.
- b. For areas designated as proposed planted forests, or natural forests for nurturing or proposed forest parks or riverside plantings, rezoning shall be permitted for up to a tenth of the area of the said forest, according to a plan to be approved by the District Planning and Building Committee. Rezoning on an area larger than the above tenth, and no more than a quarter of the area of a said forest, will be subject to the approval of the National Planning and Building Council or a subcommittee appointed for the purpose.
- c. The calculation of the permitted rezoning areas as stipulated in sub-clauses a and b and performed thus: the permitted rezoning area will be calculated from the total area of forest types mentioned in Clause 9a, or from the total area of forest types mentioned in Clause 9b. The calculation, as outlined above, will be made separately for each delimited area defined for the purpose in Appendix 2.
- d. It will be permitted to rezone natural forests for conservation as nature reserves and/or national parks, according to a plan to be approved by the District Planning and Building Committee, and in consultation with the INNPA, including for an area larger than a tenth of its size.
- e. The zoning of forestland in NOP 22 shall not be changed without consultation with KKL-JNF.
- f. Should a planning institution seek to change the designation of a said forest area, it will take into consideration, among other things, the impact of rezoning on the goals of the national plan and the rest of the area.

Additional Designated Forestland

NOP 22 cannot prevent the zoning of additional areas for forests and afforestation according to the instructions of the Planning and Building Law 1965.

Permitted Infrastructure

- a. Infrastructure lines will be permitted in forests, including roads, water lines, sewage, drainage channels, electricity, communications etc. according to the instructions of law.
- b. Notwithstanding sub-Clause 9a and sub-Clause 9b, it shall be possible to designate within forests, by a detailed plan, areas for switching and transformation stations, telephone switchboards and water plants, including artificial water channels if the overall size of the areas shall not exceed a quarter of the area in dunams of every bounded forest, according to Appendix 2 of NOP 22 and with the approval of the National Planning and Building Council or a subcommittee appointed for the purpose.
- c. The detailed planning of uses as stipulated in sub-Clause a and b above shall be executed in coordination with KKL-JNF and the Chief Firefighting Supervisor, in a way that will preserve the character of the areas designated in NOP 22 as forests.

Agricultural Land Uses Declared agricultural land shall not be rezoned on the force of NOP 22 and no permissions shall be granted in respect of same for building or non-agricultural purposes, except with the approval of the Agricultural Land Preservation Committee, as stipulated in the first addendum to the National Planning and Building Law 1965.

Permitted Forest Activities

- a. Activities in forests shall be permitted for maintenance, development, rehabilitation, preservation and uses of outdoor recreation and tourism in nature, including the planting, treatment and felling of trees, forest roads, rest and recreation areas, campsites, sports and recreation facilities, playgrounds, as well as agricultural use and grazing permitted by law, in accordance with the instructions of NOP 22.
- b. All forest uses and activities according to sub-Clause a above are subject to coordination with KKL-JNF.
- c. In natural woodlands for nurturing, the only permissible forestry activity is woodland rehabilitation and only if it does not essentially change the character of the existing woodland.
- d. Natural woodlands for conservation will remain in their natural state without external intervention, to preserve their attributes and characteristics, with the exception of management required for conservation and maintenance of the area.
- e. In natural woodlands for nurturing and natural woodlands for conservation that are lawfully used for grazing, activities to encourage pasture will be allowed. These activities will be executed in cooperation with KKL-JNF and the Minister of Agriculture or a representative thereof.
- f. Existing or proposed forest parks will be characterized by sparse plantings while allowing grassy plant families to develop and thereby permit grazing. Planting and cultivation activities will be executed in coordination with the Minister of Agriculture or a representative thereof.
- g. In coastal forest parks, bustans and natural sandy vegetation will be nurtured and strengthened.
- h. Regarding riverside/stream-bank plantings, a stream's restoration will be allowed and the area developed for outdoor nature recreation, preserving the natural elements.

Protection against Forest Fires

Fire-prevention activities are permitted in forests, i.e., determining safety ranges from building lines, installing firebreaks, access roads for firefighting vehicles and separation lines, water lines and taps for firefighting, installing watchtowers and firefighting stations subject to NOP 22 and all lawful instructions and in coordination with the chief Fire Superintendent.

Forestry Ordinance The instructions of NOP 22 may not detrimentally affect the Forestry Ordinance 1926.