

Principal Steps in Establishing a Forest

Gil Siaki, Director, Forestry Division, Southern Region

Human activity has shaped the landscape of Israel's southern arid and semi-arid region for millennia. The long history of human settlement, land use and overexploitation of natural resources, has created cultural landscapes, i.e., modified ecosystems managed by humans that provide and sustain specific ecosystem services. Unregulated land use practices, including overgrazing, vegetation removal, and cultivation, in conjunction with extreme climatic events, such as prolonged drought, have resulted in the desertification of ecosystems. These are evident in the northern Negev, which is characterized by a high level of land degradation, indicated by soil erosion, water loss, and reduced primary productivity.

Keren Kayemeth LeIsrael-Jewish National Fund (KKL-JNF), Israel's forestry service, has accumulated extensive experience and knowledge through years of research and land management and developed a unique set of tools to confront desertification processes. Long-term research on ecosystem processes has revealed how desertification has affected the northern Negev and facilitated the development of a theoretical and practical framework for ecosystem rehabilitation. This framework identifies ecological and anthropogenic drivers in the socioecological process that result in a novel cultural landscape and applies the ecosystem services approach to desertification and rehabilitation processes.



Afforestation in semi-arid region in Israel using watershed management and rainwater harvesting techniques:
Hiran Forest 1998 (left), 2008 (right) | KKL-JNF Photo Archive

The first consideration, regarding any site, including the northern Negev, in determining planting goals, is that of the site's intended function. For example, a site designed for leisure and recreation requires a program for planting trees that provide shade. Where the area is designated for preserving natural values, planting or non-planting can be directed towards preservation and promoting existing or nonexistent natural values. In areas suffering from sand dune migration, due to strong winds and/or overgrazing, the purpose of the intervention through planting trees and shrubs or sowing herbaceous species will be to stabilize the dunes. Even if there is no clear designation for the planting site, it is important to define the site's treatment and intervention regime.

In an area with loess soil, whose surface becomes sealed after a small amount of rainfall, the purpose of the intervention is to delay the flow of water and redirect it via furrows, terraces, limans (water retention pools), canals and roads; planting trees and shrubs; stopping gully head erosion; and facilitate complete control over the area's grazing. These actions will

reduce soil erosion and increase local vegetative coverage.

To the extent that intervention is necessary to achieve the designated goals, it is recommended to start surveying and gathering information on the specific as well as the wider area.



Lahav Forest – Plantings, March 2018 | Einat Bahat



Yatir Forest | Albatross Aerial

(The collection of detailed information over a long period time will contribute towards more accurate planning and better results, accordingly).

A general list of the type of information and data needed:

- Users - ownership, daily utilization, development plans, etc.
- Climate - temperature, humidity, winds, evaporation, precipitation (annual average, dispersion per year, duration of rain events, documentation of flood events).
- Soil - soil type, chemical and physical properties, organic matter, soil/rock ratio, soil depth.
- Topography - size of the drainage basin, slopes, groundwater level, stream flow, detailed scale mapping.
- Flora - Vegetation Survey.
- Fauna - Animal Survey.
- Archaeology - Archaeological Survey.

After gathering the necessary information, the planning phase, plan approval and field preparation can begin:

- General treatment plan.
- Site preparation plan.
- Preparation of site for planting.
- Detailed planting plan (species selection).
- Production of seedlings in the nursery (starting at least a year in advance).

The next stage involves planting seedlings and ongoing care:

- Eradication of competing vegetation.
- Opening planting holes.
- Planting with or without supplementary irrigation, as required.
- Installation of tree shelters and sheet mulch.
- Periodic irrigation during the dry season for the first 3-4 years.
- Pruning and shaping the seedlings.



Shepherding in the Shkharya Forest



Water-filled liman near Yeruham

In the mature forest, continuous ongoing care includes pruning, treatment against diseases and pests, cleaning, road maintenance, grazing management, fire prevention and firefighting, and managing visitors.



Sycamore fig (Yatir). Albatross Aerial



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