LAKE AGMON
A Work of Nature

Maya Duany
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Interviews
The contents of this book are based on extensive interviews with the people involved in the process of developing the Hula Valley and Lake Agmon. We would like to thank all the interviewees who enriched the contents of the book with their knowledge.

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A Few Words from KKL-JNF’s World Chairman

Over the past 80 years, KKL-JNF’s activity in the Hula Valley has been a major factor in shaping the present landscape of the valley, with its characteristic mosaic of agricultural fields, canals and water bodies, meadows and a few groves. In the prevailing spirit of the period before the State of Israel was established, KKL-JNF purchased the Hula Concession with the objective of draining the marshes that covered most of the area, to develop farming areas for new settlers. At the time, the marshes were viewed as an obstruction to settlement and agriculture and as a source of malaria that had stricken many people in the surrounding communities, particularly Yesud HaMa’ala.

After Israel's independence, Prime Minister David Ben Gurion urged KKL-JNF to take on one of the first national projects of the young state – draining the Hula marshes. In those days, wetlands were drained throughout the world as part of the concept of “conquering the wilderness” and harnessing water and soil resources for the benefit of agriculture.

KKL-JNF agreed to fulfill Ben Gurion's wish, and draining the Hula, together with afforestation and land reclamation for new settlements, were the main activities it was involved in during the State of Israel's first decade of existence. We continued to support settlers and farmers over the years, and when it became necessary to rehabilitate the peatlands in the early 1990s, it was once again KKL-JNF, together with the Ministry of Agriculture and the Israel Land Administration, which led the enterprise, intended mainly to solve problems of soil and water conservation and improve agricultural management. As part of this project, Lake Agmon was developed with the purpose of developing nature tourism as an additional source of revenue for the inhabitants of the region.

The rehabilitation of the peatlands restored the profitability of farming and doubled the average income per hectare. The development of the Lake Agmon, which is visited by 350,000 to 400,000 visitors yearly, created an incentive for additional investments in tourism in the region, and there are still many more opportunities open in this field.

Under my leadership, KKL-JNF sees the Lake Agmon project as a means for accelerating the development of the entire Upper Galilee. The model that combines agricultural and tourism development for the benefit of the residents of the region, along with soil and water conservation and caring for the environment is, in my eyes, the optimal approach. KKL-JNF will continue to work with and support the people of the region and their leaders to ensure their continued success.

This book describes the major aspects of the story of the Hula Valley from the time it was drained to this day, and confirms once again the importance of KKL-JNF's activity in service of Israel and its people. Establishing the Visitor Center at the Hula Lake is another link in the chain of KKL-JNF's many achievements.

Warm regards

Daniel Atar
KKL-JNF World Chairman
Foreword

“We will climb up to the Hula and drain its swamps; we have come up to the Galilee, we will take possession of the Hula”. These words, sung enthusiastically by young people after Yehoshua Hankin purchased the concession to the Hula lands in 1934, express the pioneering fervor for conquering the wilderness, characteristic of the Zionist ethos at the time.

Fifty years have passed since the completion of the project to drain the Hula marshes and we are now wiser and more concerned for our environment on a local, national and global scale. KKL-JNF’s development of Lake Agmon, whilst searching for the delicate balance between farming, tourism and the environment is an expression of this conceptual transformation. Olivier Hamerlynck, from the International Union for Nature Conservation (IUCN), who assessed the proposal submitted to declare the Hula Valley a World Heritage Site, praised the ecological restoration of Lake Agmon that contributed significantly to the biodiversity of the site.

One of the unforeseen surprises, which was not anticipated by the people who conceived and prepared the peatland restoration program and the development of Lake Agmon, was the amazing phenomenon of multitudes of wintering cranes in Lake Agmon. The cranes, which were once passage migrants in the Hula Valley, began overwintering in the valley in ever-growing numbers. Herbert Brandt a birder and nature lover said about the crane: “...this long-legged bird brings charm and magic wherever it goes, even to the most distant and isolated places in nature”. Indeed, the cranes became the major attraction and the symbol of Lake Agmon.

KKL-JNF believed the process of decision-making and agreements regarding the rehabilitation of the peatlands and the creation of Lake Agmon should be by means of a broad public administration, in which all the stakeholders would participate. This approach proved to be best in an environment replete with conflicting interests, such as the Hula Valley.

One of the conflicts that arose was between the multitude of visitors and the birds. To resolve this issue KKL-JNF initiated a master plan for tourism and recreation in the Hula Valley that determined that vehicles would be excluded from the Lake Agmon area. The program determined specific routes for visitors on foot, on bicycles and on golf carts as well as special excursions in “safari wagons”. Another conflict that developed as the number of wintering cranes increased was with the local farmers who complained of the damage the cranes did to their crops. This was resolved by a creative solution involving feeding the birds in the Lake Agmon area and chasing them away from seeded fields. This solution required close collaboration between KKL-JNF, Lake Agmon, local farmers, local government, environmental organizations and government agencies.

This book discusses other conflicts related to the Hula drainage project and to the rehabilitation of the peatlands, and the efforts to resolve them. KKL-JNF played and still plays a major role in being a unifying agent that constantly works to advance Lake Agmon and its surroundings, as the flagship project of the organization that has the potential to affect and create change in the entire Galilee region.
Preface

In the early 1990s, Giora Shaham (now head of the Israel Water Authority), who coordinated the initiative to rehabilitate the Hula Lands, called the site “a black hole in the heart of a land of streams”. In 1993, work on rehabilitating the Hula Valley began, extending over an area of 2500 hectares, and included excavating a water body, which was termed the “agmon” (small lake in Hebrew). In 2016 a boutique hotel, the Galilion was opened near the Agmon. Haim Ohayon justified his investment by saying that the half billion birds that migrate over the Hula Valley yearly, and the half million people who come to watch them at the Agmon, cannot be wrong, and if they come, the Agmon must possess a unique attraction that justifies the investment.

How, and thanks to whom, did this site change from an environmental disaster, unfit for agriculture, into a popular tourist attraction? Today’s visitors who walk, cycle or ride golf carts or the safari wagon are usually not aware of the fact that the Agmon was not only intended to be a paradise for birds, but a relatively small element in a broad project with many goals, that was intended mainly to prevent the pollution of Lake Kinneret. The purpose of this book is to broaden the view of visitors to the Agmon who follow the beautiful flight of the cranes in wonder, allowing them to understand the people and organizations behind this initiative and the conditions and factors that allowed this creation of nature to come about.

The materials for this book came from the KKL-JNF and State archives, as well as from comprehensive interviews with 40 men and women who were involved in the enterprise of rehabilitating the peat lands in the Hula Valley. I also used previous studies, newspaper clippings reports and other similar sources. The book is written in simple language and the Hebrew version has detailed footnotes for the benefit of researchers who are interested in information that is more extensive. Both the present and the past are composed of multi-faceted extended meetings between people and themselves and their environment. My academic research focuses on the environmental history of the State of Israel and the Hula wetlands in particular. This is the first time that I am also addressing what is happening in the Hula Valley in the present.

The first chapter on the drainage of the Hula wetlands and its consequences was intended to provide an understanding of the rationale underlying this enterprise, which was carried out by KKL-JNF according to the accepted practices at the time, and to avoid the popular tendency of labeling things according to today’s values. This chapter also focuses on the establishment of the Hula Nature Reserve that encouraged development of a positive attitude to wetland landscapes. Peat is an organic material created in shallow marsh water, whose exposure to air and cultivation created a series of problems. The last section of the chapter focuses on the various issues that arose after the drainage, the most serious of which was the danger of polluting Lake Kinneret, and to the formulation of a program to rehabilitate these soils. The program was implemented by KKL-JNF and financed jointly with the Ministry of Agriculture and the Israel Land Administration.

The second chapter on the rehabilitation of the Hula peat lands and their management describes the enterprise as a whole; the development of Lake Agmon was not a major component of this stage. The Hula peatland project had many goals and was intended to prevent the flow of pollutants into Lake Kinneret, to improve the quality of the soil for growing crops, to restore the wetland habitats
and to create infrastructure for tourism that would provide an alternative source of income for the farmers. This chapter describes how the engineering plan was formulated and how it helped rehabilitate the region in many ways.

The third chapter focuses on one of the aspects of the peatland rehabilitation program that was not implemented – the initiative to build a floating tourist resort on Lake Agmon. The concept of a floating resort was seen as a means of attracting investors who would allocate part of their revenues for the benefit of the landowners who were left with no source of income. Developing the resort required changing the zoning of the land from agriculture to tourism and approval of a new outline plan. The Society for the Protection of Nature in Israel (SPNI) opposed the plan because it would damage the wetland ecosystem that was only now beginning to become rehabilitated. This chapter will focus on the dynamics between the proponents and opponents of the resort, which illustrates the intrinsic tension between tourism and conservation.

For five years, the SPNI and the managers of the initiative argued about the development of the tourist resort. During this time the renewed Lake Agmon ecosystem became established undisturbed. The cranes began changing their migration habits and arriving at the Agmon in ever-growing numbers. The fourth chapter thus focuses on the reasons for the cranes’ arrival (currently about 40,000) and overwintering at the lake instead of continuing south. The cranes became the symbol of Lake Agmon and the best surprise of the Hula Rehabilitation project, which created a natural attraction instead of an artificial one. Nevertheless, as the cranes feed on the farmers’ crops, a new conflict arose, this time between agriculture, and tourism and conservation. The final part of the chapter deals with the search for solutions to resolve the conflict between the cranes and farming.

One of the most impressive sights at Lake Agmon is the daily gathering of the cranes towards evening during autumn and winter, at the feeding point, from where they take off to their roosting sites in the waters of the lake. The word of the appearance of the cranes in the Hula Valley began to spread and people came to the area to watch the sight, but there was no suitable tourist infrastructure to accommodate the public. The inhabitants of the kibbutzim and moshavim, who owned the land rights, did not have the means to invest in developing suitable infrastructure for tourism. Moreover, no private investors were willing to risk the required capital needed to develop the floating resort because of the environmental restrictions on the program. KKL-JNF was faced with the dilemma of whether to allow the peat soil to be cultivated once again. The local farmers were disappointed that the tourism program, which was intended to supply them with an alternative source of revenue, was not coming to fruition, and demanded to cultivate the land.

Omri Bonneh, who was appointed manager of KKL-JNF’s northern district, understood that the phenomenon of the cranes was so unique, that the Agmon could be transformed into an amazing ecotourism site, but until this would happen, it would be necessary to prevent the development of the recreation infrastructure planned on the shores of the Agmon. Bonneh saw the development of Lake Agmon for ecotourism as an enterprise that would bring about change, both from an environmental perspective and from the perspective of KKL-JNF, which would have the opportunity to reverse the effect of its previous drainage enterprise. The fifth chapter of the book is therefore dedicated to the
story of how KKL-JNF took on Lake Agmon as its flagship project, which has become a symbol of the environmental transformation the organization underwent. In this chapter, I explain in detail how the lake was designed to function as an ecotourism site, unlike the Hula Nature Reserve nearby. In addition, I describe how the lake was positioned in the international arena as a leading birding site and the elements that have made it such a popular ecotourism site. KKL-JNF no longer seeks to establish resorts in the center of Lake Agmon and is now working to move them out of the site. At the entrance to Lake Agmon a new visitors center is being built, which will be the final stage in developing the lake and will position KKL-JNF as an environmental organization committed to the sustainable rehabilitation of the Hula Valley.

The final chapter of the book aims to clarify how the entire peatland rehabilitation project and its implementation can serve as a model and inspiration for additional environmental initiatives. In modern times, many stakeholders are usually involved in environmental projects. Thus, one of the decisive factors for their success is developing a dialogue between the various stakeholders, as KKL-JNF did in this case. The concluding section of the chapter is dedicated to describing the future challenges facing the project, such as preserving the natural resources of Lake Agmon, making birdwatching an attraction for tourists and birders from abroad and creating additional wetland landscapes in the Hula Valley based on the experience gained in developing the lake, which is now a paradise for birds and people alike.

Maya Duany
Author
THE DRAINAGE OF THE HULA MARSHES AND ITS CONSEQUENCES
ChAPTEr 1: ThE DrAINAGE OF ThE hULA MArSHES AND ITS CONSEQUENCES

Aerial view of the Hula Lake, 1945

Source: RAF aerial photographs from the PS series sorties, courtesy of the Map Library and Aerial Photograph Archive, the Hebrew University of Jerusalem. The composite was prepared for the "Song of the Lake" exhibition and catalogue, curator, Guy Raz, Beit Uri and Rami Nehushtan Ashdot Ya'akov / Beit Avi Chai (2009-2010).
Marshlands are expanses of soil flooded, permanently or seasonally, by sweet or saline, standing or flowing shallow water. In the early 20th century, in most parts of the world, marshes were considered wasted land of no value, which could even be harmful because of the diseases associated with them, such as malaria, and the fact that they were subject to flooding. Therefore, as a rule, people aimed to control marshes and valued them only when they could be drained and used for farming. The improvement of drainage methods accelerated marsh drainage throughout the world and reinforced the modern view that people can, and should control nature.

The Hula Valley was formed in a depression that is part of the Syrian-African Rift Valley. About one million years ago, a basalt plug created a barrier between the valley and Lake Kinneret (the Sea of Galilee) in the southern Hula Valley. As a result, the depression began filling with water and a broad lake, 150 meters deep, was formed. However due to tectonic activity, a narrow opening began forming in the barrier, near today’s Bnot Ya’akov Bridge, and the Jordan River canyon was formed, along which the water from the Hula Valley drained into Lake Kinneret. Over the years, the lake contracted, until it reached the size it was before the drainage operation — a shallow lake in the southern section of the Hula Valley and the marshes north of it. The pear-shaped lake was 5.3 km long and 4.4 km wide, and the average depth of the water was between 1.5 and 2.5 meters. The marsh was formed because in winter more water flowed into the lake than out of it, and flooded the area around it. In summer, the process was reversed and the marshes shrank. The maximal area covered by the lake and its surrounding marshes in winter reached some 6,000 hectares (1 hectare equals approximately 2.5 acres).

Both the Ottoman and British governments wanted to drain the Hula Lake and its marshes, but the project was only carried out after the establishment of the State of Israel. In 1901, the Turkish Sultan granted the concession for the area of the southern Hula Valley and the lake at its center to private entrepreneurs, in exchange for a commitment to drain at least some of the Hula marshes. Following the First World War, in 1918, the Hula Concession was transferred to the British Mandate. The British wanted to drain the swamps in order to make the valley a healthier place, as it was the area most afflicted by malaria in the Land of Israel. Like the Ottoman authorities, they too did not want to invest personal capital and preferred the concession method. However, the British government demanded complete drainage of the lake and the marshes, even beyond the area of the concession, to succeed in eradicating malaria. In 1934, the Hula Concession was purchased by the Israel Land Development Company and a number of plans to drain the Hula were prepared, but none was implemented.
A. The Hula Valley Drainage Project

After Israel’s War of Independence and the establishment of the state, it became possible to implement the Hula Valley drainage project. On December 6, 1948, the ministries of Agriculture and Industry established a joint committee to prepare a plan for draining the Hula Basin. According to the letter of appointment, the plan was to realize two objectives: firstly, to determine the extent of the drainage for agricultural purposes and secondly to determine, how and if, the drainage would be conducted, to permit exploitation of the peat resources in the concession area. Interestingly, the letter of appointment does not mention the eradication of malaria, which was the main objective of the mandatory drainage project, as at this time, the use of DDT (an insecticide) had already eradicated the disease.

Formulating the Hula Valley Drainage Plan

The drainage plan had to comply with two requirements: lowering the groundwater table to a degree that would allow intensive mechanized agriculture, while still leaving a water table in the deep peat to allow it to be commercially quarried. Peat is composed of plants and organisms that inhabit shallow water, which is sufficiently anoxic, so that they do not “burn” rapidly, but instead decompose slowly and eventually become decaying matter. The decaying plants mix with sediment and together they form peat soil. The quality of the organic material in the water and the amount of sediment that mixes with it, and the quality of the salts and their concentration in the water, the climate and other factors, determine the types of peat soils and their value for agriculture and industry.

The committee held 18 meetings, most of which were dedicated to evaluating various peat quarrying alternatives. Foreign experts were invited to these meetings, as the committee members had little knowledge of the subject. Detailed research was conducted to characterize the Hula peat soil and its effect on plant growth. The study found that the hula peat, in its crude form was not suitable for use in agriculture as a fertilizer. The committee ultimately admitted that there was insufficient information to decide how best to use the peat, and due to problems created by its drying, it was decided to leave the peat as it was, in its wet state, on an area of 1,400 hectares.

Not a single meeting was devoted to the unique biology and wildlife of the Hula Valley nor to the possibility of establishing a nature reserve or hearing an expert opinion on the subject. Nor was any meeting dedicated to discussing the consequences draining the Hula might have on Lake Kinneret. The environmental approach on which the drainage plan, as promoted by the ministries of Agriculture and Industry, was anthropocentric and based on maximal exploitation of natural resources for the benefit of people, creating a completely changed ecosystem. The specific goals of the plan were to prevent malaria, even though in the meantime chemical means of eradication had been developed, to increase water potential by reducing evaporation from the lake and the marshes, to obtain additional land for farming and settlement and to exploit the peat for fertilizer, industry and energy. At this stage, it was not known yet that the peat lands would be used solely for farming.

The project engineer was Dov Kovlanov, whose plan included three stages: the first was intended to broaden and deepen the Jordan River bed, from its outlet south of the Hula Lake, along 4.5 km, to
The peat area that was left undrained (until 1955).
Source: Map Collection, Tel Hai College.
increase the speed of the water flow in it. This stage was based on a test that showed that the main factor in the formation of the marshes was the moderate slope and insufficient width of the Jordan River at its outlet at the southern part of the lake. The second stage of the plan focused on the heart of the marshes north of the lake. In this area, two canals, an eastern and a western one, were to be excavated instead of the original Jordan riverbed, to drain the marshes. The two canals would meet at the center of the Hula Lake and from there convey the water south in a single canal. This stage was based on an examination that showed that the Jordan River does not flow in the lowest section of the valley, but is raised by the accumulation of sediments, and therefore the two main drainage canals would have to be located on both sides of the Hula Valley. Moreover, in order to create a sufficient slope to link the northern drainage canals with the deeper Jordan canyon in the south, the experts decided that it would be necessary for the entire lake to be drained and replaced by a single canal. The third stage involved excavating smaller drainage canals to transfer the remaining water to the two main drainage canals.

Implementing the Drainage
The first stage, which included deepening and broadening the Jordan riverbed at its outlet from the lake, took two years, beginning in early 1951, and reduced the lake area by about 500 hectares (30% of its original area). The lake, which was only about 2.4 meters deep to start with, was now mainly a swampy shallow water expanse. The second stage, which included draining the marshes and lake, began in September 1953, and involved excavating the three main canals (the western, eastern and central canals). This stage required underwater excavations that were conducted by dredgers brought from the United States, and building a dam at the outlet of the lake to the Jordan, which was termed the “plug”. The mud that was excavated was piped out and piled on both banks of the canal and into natural depressions and pools, in order to fill them and bring them to the same level as the valley surface following the drainage.

The third stage included excavations on land that began in mid-1955, and additional excavation in the eastern and western canals on land. In addition, at this stage, a diversion dam was set up in the Jordan River to divert water from the Jordan River to the eastern canal, and bridges were built on both banks of the canals. A system of secondary canals was excavated in the peat area as well, that reached a total length of over 80 kilometers.

Draining the Peat Soil
Although the experts were aware of the potential problems of draining the peat lands, such as sinking and underground fires, in late 1955, it was decided to drain the peat lands for farming. The decision was made by the Ministry of Agriculture and TAHAL (at the time the government water planning authority) based on the expert opinion of Mr. John Zuckerman from the USA, who owned a 1,200-hectare (3,000 acre) farm in Stockton, on peat land in a similar climate. Zuckerman was aware of the fact that draining the peat would lead to significant subsidence over the next five to ten years, but succeeded in convincing the authorities responsible for draining the Hula that the subterranean irrigation method, which he would bring from the United States, would ensure crop profitability.
The problems with cultivating peat soils result from mechanical farming equipment crushing the plowed peat clods, which crumble into thin dust that is blown away by the strong easterly sharkiya winds, removing the topsoil. When the peat soil dries and is exposed to the air it shrinks and subsides. The peat shrinkage process creates horizontal and vertical fissures that can reach a depth of five meters. The greatest threat is when the peat soil oxidizes and emits heat, which is trapped in the subsoil raising its temperature until it exceeds the peat combustion threshold, and spontaneous underground combustion occurs. When this happens, the fire smolders on the soil surface and deep down into it and can only be extinguished by flooding the burning area. Another issue with peat soil is its irrigation — if it is not sufficiently irrigated it dries and is hard to cultivate, but if it is excessively irrigated the tractors are liable to sink.

The lake was drained after the Plug Dam was opened, in a festive ceremony on October 30, 1957. Surprisingly however, even after the basalt plug was removed the lake did not empty, because all the canals, particularly the eastern one, had become blocked during the two and a half years that passed between their excavation and the long-awaited ceremony. Gradually the water receded and after six weeks, with the exception of the area that was left as a nature reserve, only 200 hectares (12.5%) of the lake surface were still covered by a shallow layer of water. When the winter rains came, the water rose and flooded a large expanse in the area of the lake and marshes, and for a moment, it seemed that the marshes had defeated man. However, when the rainy season ended, in March-April 1958, the canals were cleaned with excavators and within two months, the lake was completely dry. Now KKL-JNF could proudly declared that it had conquered the wilderness and drained the marshes.
B. Draining the Hula Valley — KKL-JNF’s Flagship Project

When the State of Israel was established, the government wanted to drain the Hula Marshes but had to determine who would implement the project. On August 2, 1949, the KKL-JNF board of directors decided to purchase the Hula Concession from the Israel Land Development Company. KKL-JNF presented the drainage as its flagship project, in its function as the conqueror of the wilderness, following the establishment of the State of Israel. Up until then its main function had been procuring lands for the Jewish people, but this was no longer necessary following the victory in the War of Independence. In line with the ideology of conquering the wilderness, draining the Hula marshes was presented as a project that would transform useless swamps into a settled, agriculturally and industrially developed area. In addition, the Hula drainage was presented as a battle against the potential diseases swamps bring, such as malaria, although KKL-JNF was aware of the fact that at the time, the issue of malaria was no longer relevant. The Hula drainage project was portrayed as symbolizing the ideology of conquering the wilderness with the help of exhibits, maps, ceremonies, textbooks, films and the like.

Eichanan Brachiyahu, the project engineer, presents clods of peat to the President’s wife, Rachel Yanait Ben-Zvi during a party held at the presidential residence for the participants in the Hula drainage project, November 29, 1955.

Source: The Ofra and Yitzhak Katzir Collection, the Ben-Zvi Institute. Photo: Photo Ross.
Press Coverage of the Hula Valley Drainage

KKL-JNF organized guided excursions at the site to explain the nature and necessity of the drainage project. The journalists who covered the events were impressed by the fact that the excursion was conducted by KKL-JNF and guided by its representatives. This, for example, is how a journalist reported his impression of the project engineer, Elchanan Brachiyahu:

“I don’t know what your feelings are when you face people’s attempts to correct the distortions of history, when you see them battling the forces of nature. For myself, I am filled with awe and respect and humility before the majesty of Man, who knows not only how to build gas chambers and atom bombs, but also how to change the laws of nature”.

The event that received the most enthusiastic press coverage was the beginning of soil cultivation in June 1954, even before the drainage was completed, that was termed the “first plowing festival” by the press. A podium with benches was put up on the plowed soil, and opposite it, Israeli flags on poles used to create ten gates for ten tractors that stood ready for the plowing ceremony. The flags were tied to the poles by ten blue and white ribbons. After the greetings, all the major donors and veteran Galilee settlers approached to cut the ribbons. When they were cut the plows and tractors moved forward through the gates and began plowing. The ceremony received favorable coverage, as described by the journalist Moshe Carmel:

![The dredger.](Source: The KKL-JNF Photo Archive. Photo: Abraham Malavsky.)
“The first Hebrew plowing in the Hula Valley is a victory over nature, a giant step towards economic independence and an expression of our best national project and human aspirations...Indeed, of all the possible victories and of all anticipated conquests — these are the ones our hearts go out to...over the wilderness in the Hula and in any wasteland. For the source and strength of a sustainable culture of truth and progress originate in all generations — in conquering nature and not in conquering people and nations.”

The words of Moshe Carmel were particularly significant because he was a general in the reserves, the commander of the northern front in Israel's War of Independence, who later served as Northern Command commander until 1950. The Hula Valley drainage project had special significance for him as an act that reinforces the existence of Israel.
The Hula Valley Initiative as an Educational and Conceptual Theme

In 1952, as part of transforming the Hula Valley drainage project into the major project in the KKL-JNF jubilee festivities, a book was published, with instructions by David Benvenisti on how to teach the topic of the Hula Valley drainage from kindergarten through high school. In the first lesson, the teacher was instructed to begin the topic with the sentence “In KKL-JNF’s jubilee year we have been notified that it is about to carry out a major project — the drainage of the Hula Valley”. The wording of the lessons repeats itself, first with an explanation of how the Hula Valley and its marshes were formed followed by the problems that arose, and the benefits of the drainage project. DDT was not mentioned a single time. As part of the study of the subject, the teacher was instructed to set up a special section dedicated to the Hula drainage project in the general KKL-JNF exhibit in the classroom, which would remain up throughout the month. The photos describe the benefits of the drainage project, such as peat soil to be used as fuel for factories or to build new settlements, not realizing at the time that this would not come true.

KKL-JNF also filmed the drainage operations. One of the films, produced in English in 1961, was called “The Happy Valley” — happy because finally its marshes were drained. The drainage operation was described in the film from the point of view of Dan, a resident of Yesud HaMa’ala, who discovered bulldozers near his house one day. When he enquiries about them, an authoritative voice explains the benefits of the drainage operation and describes it as the battle of man against nature. The filming of the drainage focused on bulldozers or other similar equipment and robust men in work clothes,
Draining the Hula Valley, as part of the KKL-JNF school exhibit.
toiling and sweating. The only animal mentioned in the text was the Anopheles mosquito. After the drainage scenes, the film focused on the cultivation of fields that replaced the marshes. At the end of the film, Dan is seen sailing in the Hula Nature Reserve to relax after a hard day in the fields. He closes his eyes, hears the voices of animals around him and senses that the marshes still surround him. Then the authoritative voice of the narrator is heard once again saying “Thankfully there are no more marshes and we only have romance and impressive beauty”. Dan then climbs on a tractor, in a scene with fields in the background, and the narrator concludes: “The curse of nature has been removed and has given way to the labor of man”. Indeed, the Hula Nature Reserve was the only remnant of the former landscape, unlike other drainage operations in the world, in which marshes and swamps were drained with no preservation actions taken.

The Hula Lake and its marshes before and after the drainage.
Source: Valery Orlev, MIGAL.
**C. A Small Symbolic Reserve**

Throughout history, swamps and their surroundings were considered places unsuitable for human habitation, as their water was unsuitable for drinking, their soil incompatible with farming and they could not serve as a source of income. The acknowledgement of wetlands as valuable ecosystems by scientists only began in the late 1960s, long after the Hula marshes had been drained. Scientists began to realize that wetlands function as “environmental kidneys”, filtering pollutants from the environment, so that the amount of pollutants flowing out of the wetland is considerably lower than the amount entering it. Moreover, wetlands are habitats that support a tremendous diversity of plants and animals representing all trophic levels. It is now understood more than ever that wetlands are attractive environments, which combine air, water, soil, plants and animals, and should be preserved, not only for their ecological value, but also as sites for enjoying nature outdoors.

Wetlands are found in all climates throughout the world, but their soil and precipitation characteristics differ, and consequently they have been given different names — bogs, swamps or marshes. In the 1950s, ecologists decided to adopt the term wetlands to replace the term swamp. Wetlands include all types of swamps, marshes and other areas where water covers the soil or is present close to the surface for varying periods during the year. In the early 20th century, 18,000 hectares were classified as wetlands in Israel. For thousands of years they were part of the local landscapes and provided essential ecosystem services, such as nutrient filtration, flood control and habitats for diverse species. One of the conditions that facilitated the establishment of the Hula Nature Reserve was the extensive knowledge scientists possessed of the biodiversity in the Hula Valley.

**Discovering the Hidden Secrets of the Hula**

The Hula Lake and its marshes were off the beaten track of most travelers to the Land of Israel, in ancient times as well as in the 18th and 19th centuries. The few people that passed through the area did not attempt to penetrate the marshes or sail the lake, but preferred to cross the Benot Ya’akov Bridge or use the road that traversed the valley at the foot of the Naftali Mountains. The pilgrims that came in search of the sites they had read about in the scriptures did not reach the Hula Valley area, as it is not mentioned in either the Old or New Testament. The first people to reach the region were explorers, who wished to re-discover the land and expose it to their western culture. However, even among these explorers only few dared penetrate the marshes and explore the natural world of the lake and its wetlands. In 1869, the adventurous John MacGregor became the first explorer to penetrate the marshes successfully in a canoe, despite the dense reed thickets. His descriptions of the valley and the accompanying maps help us understand the landscape changes the Hula Valley underwent to this day.

After the Hula Concession was purchased by the Israel Land Development Company in 1934, Jewish explorers began studying the valley even before the drainage began. Their studies were conducted over ten years and the results published in many academic journals. These studies contributed to our understanding of the botanical and zoological uniqueness of the valley.
John MacGregor’s map of the Hula Valley region.
The Botanical and Zoological Uniqueness of the Hula Valley

The Hula Lake and wetland were unique because they represented a meeting of fauna and flora from different continents. Plants and animals of African origin reached their northern limit here, while representatives of European flora and fauna reached their southern limit. The site was a major stopover for birds migrating between Europe and Africa. These birds carried seeds in their legs from the lands they had been in and the conditions in the valley allowed them to grow side by side, creating a unique botanical landscape unlike any other. This unique junction excited many scientists, as expressed by one of Israel’s first zoologists, Professor Shimon Bodenheimer, when he saw a river limpet, a species that originates in northern Europe, and whose southernmost distribution limit was the Hula Valley. He found the snail on a Papyrus plant — a tropical species originating in Africa, whose northern distribution limit is in the Hula Valley.

Two aspects of the plant life in the Hula wetland were unique. Firstly, the hydrophilic plant communities that developed in the Hula, which were a characteristic expression of such plant communities, and secondly the abundance of species whose sole or major habitat in Israel was the Hula Valley. The shallow water areas in the marshes were particularly rich in oxygen as well as containing high concentrations of oxygen excreted by underwater plants. The light and heat from the sun penetrated to the bottom of the shallow lake and together with the carbon dioxide dissolved in the water and the organic matter flowing from the marshes to the lake provided optimal conditions for the development of underwater vegetation, rich plankton and an abundance of nutrients that supported a dense population of plants and animals. Hydrophilic vegetation is more affected by soil conditions than climate, consequently the plants that reached the Hula Lake were not just species adapted to the Mediterranean region, but also hydrophilic plants characteristic of tropical regions as well as plants characteristic of cold regions in Europe and Asia.

In addition to the Hula being a sort of meeting of borders, some of the vegetation was endemic to the Hula Valley. For example, the Dwarf Waterclover, an aquatic fern originating in Africa, was the sole representative of its tropical family in Israel, and grew only in the Hula wetland. The Marsh Buckler Fern and the Eagle Fern originate in Europe and their appearance in the Hula Valley marks the southern limit of their distribution. The White Water-lily is found only in the Hula Valley in Israel and the beauty of its white flowers that grow in the shallow marsh pools astounded everyone who saw them. Another northern plant was the Bladderwort that possesses unique features. It floats on the water with no roots and feeds on tiny animals it traps in small bladders produced along its stems. Other endemic plants included the Water Pennywort, the Kievan Nettle, the Frogbit, the Yellow Iris and more. Nevertheless, there was no specific knowledge regarding the scope of endemism in the Hula wetland, as similar water bodies found in Lebanon, Syria and Turkey have been destroyed and the information on their flora and fauna is lacking.

The dominant plant in the marshes, that covered over 3,000 hectares was the Nile Papyrus. The Hula wetland was the northernmost site where it grew naturally and the largest area in the world outside Africa. Breslavsky describes the papyrus plants flowering in summer and giving the marshes a fresh green appearance with their deep green color, magnificent flowers, long umbel rays and flower spikes at their tips. Yellow water lilies were found in many of the streams. In the marshes proper, there were a number of pools, the crowning glory of the wetland. They were about one meter deep
and did not dry up in summer. The plants that grew there included Watermilfoil, Yellow and White water lilies, Hornwort, Shining Pondweed as well as Bladderwort and Frogbit.

The botanical significance of the Hula wetland was not limited to its unique vegetation, but was also found in the phenomenon of marsh plant communities, which grew in circles around each other, according to the flooding, light and soil conditions. As the bottom of the lake rose gradually from its center, where it was three meters deep, towards its edges, where the water became shallower, the various plant communities were arranged in concentric “zones”. This was particularly significant in light of the dearth of wetlands in Israel, where hydrophilic plants make up only ten percent of Israel's plant species.

The Hula Lake and its marshes were composed of many different habitats. Thus, in the deep part of the lake there were island-like formations, on which diverse water birds nested, such as the Great Crested Grebe, the Common Tern, Black Tern and the Black-winged Stilt. Another habitat was the sheltered coves that were protected from the waves, which differed from the open shores that were affected by the movement of the waves on both sides of the lake. Yet another habitat was the seasonal floodplains that were mostly on the flat area north of the marshes, which were cultivated in the summer. In winter, there were fishes and amphibians here and in the summer crustaceans. Nahal Enan was a unique habitat, mainly thanks to the stable water temperature in its pool and central streambed throughout most of the year, which did not digress from 21–22 degrees centigrade. Thanks to this, the stream acted as a “thermal refuge” for animals sensitive to low temperatures in winter or high temperatures in summer.
The diversity of vegetation in the Hula lake and marshes area before the drainage (1944).

The fauna of the area was unique as well. In the Hula Lake, marshes, and the springs and streams that flowed into them, there were 21 species of fishes. Some were extensively fished and some were already then only of scientific interest. The fishes, like the vegetation, were of different and diverse origins, such as the barbels, the scrapers, the garra and the loaches that originated in southeast Asia; the tilapias and catfish that originated in Africa, and thus suffered from the cold and moved from the lake and the marshes to the streams in the beginning of winter, particularly Nahal Enan that maintained a stable temperature all year. European fishes were represented in the Hula by the Dace. Three species of Hula fishes were endemic to this area alone and could not be found anywhere else in the world. Two species were introduced artificially in the 20th century. The Mosquitofish was introduced in 1924 to feed on mosquito larvae as a means of fighting malaria; the Carp was brought to the lake to be farmed for human consumption in 1940.

There were not many mammals in the Hula Valley in the early 20th century. The water buffalos, which were introduced to the Land of Israel by the Turks, were the most prominent in the field and there were an estimated 5,000 in the Hula area (out of 6,000 in all of Israel). In addition, there were boar, wild cats, otters, mongooses and nutrias. The Nutria is a South American mammal introduced into Israel for its fur. However, in the warm Israeli climate, their fur was of lower quality and they were released, becoming invasive in many parts of Israel. The Hula wetland was believed to be the sole habitat of the Hula Painted Frog, which disappeared from the region following the drainage. However, in 2011 an INPA (Israel Nature and Parks Authority) ranger found a living specimen, proving that the species was not extinct, but had merely been “in hiding” for 50 years.

For birds, the Hula wetlands had a threefold significance. For birds migrating from Europe to Africa and back, it was a major stopover. For other birds it was a wintering area, and for some a breeding area. Before the drainage, 131 bird species were observed in the wetland, close to 20 of which had been observed only in the Hula Valley in Israel. The current count of bird species in the valley is about 300; much of this increase can be attributed to the increase in the number of birdwatchers compared to the period before the drainage, and to the development of ornithological knowledge. Many birds stopped at the Hula wetlands to rest and refuel on the long migration journey from Europe to Africa and back. Thus, pelicans arrived in autumn from the north, around October, spent a day at the Hula, filling their bellies with fish, and then flew on to Africa. Tens of thousands of birds spent the winter in the Hula, including flocks of ducks, coots, seagulls, cormorants and others. The White-fronted Goose, African Darter and Goliath Heron wintered in Israel only in the Hula Valley. Some 30 different bird species bred in the Hula wetlands. These large concentrations of birds were attracted mainly by the abundance of food in the marshes, the natural pools and the lake. These numerous species included 12 species that bred only in the Hula, far south from their other known breeding sites. These included the Great Crested Grebe, Grey Heron, Marsh Harrier, Black Tern and Yellow Wagtail.

This partial review shows that naturalists were well aware of the unique botanical and zoological character of the Hula wetlands, both on a local scale, as the last large wetland in Israel, and on a global scale as a unique junction of continents. This acknowledgment was a precondition for the activity to preserve part of this unique area in its natural state. However, at the time many people believed that nature should be changed for the benefit of man. A considerable portion of the studies on the Hula wetlands before the establishment of the State of Israel focused on mosquitoes, because of
the malaria they transmitted, in order to improve the situation. Nevertheless, the dialogue between people supporting conservation and those supporting development is part of our modern world that is based on scientific and engineering knowledge.

**The Initiative to Establish the Hula Nature Reserve**

Most of the people describing the establishment of the Hula Nature Reserve are workers or supporters of the SPNI (Society for the Protection of Nature in Israel). The activity to establish the reserve is described as the battle of a handful of “crusaders” that opposed the Zionist concept as expressed by the ideology of “conquering the wilderness”. Their narrative is based mainly on stories of people who lived at the time, and is not based on archival material or the press at the time. Thus, for example, Ofer Regev, wrote in his book published to commemorate the 40th anniversary of the SPNI’s founding: “The proposal to leave a reserve in the Hula Valley seemed like heresy to some... the idea that thousands of precious dunams (1 dunam = 0.1 hectares, ¼ of an acre) of national land should be wasted to preserve some birds or plants was considered something between cheap romanticism to national recklessness”. Some academics also considered the demand for a nature reserve at the time of the Hula wetland drainage as an anti-Zionist expression to some degree. The geographer, Nurit Kliot, for example, wrote that “the battle to preserve the marshes was considered almost ‘sacrilegious’ at the time and as defying the Zionist ideology whose motto was conquering the wilderness”. The documents of the time, however, depict a situation of cooperation, not conflict, between natural scientists and KKL-JNF.

In January 1951, when the Hula drainage project began, the “Committee for the Protection of Nature”, whose members came from the Hebrew University, officially petitioned the various government offices to leave a “national reserve” or “protected area” in the Hula region. The members of the committee believed that scientists should not just collect and catalogue plant and animal specimens, but should consider conserving animals and plants as one of their major contributions to nature conservation. Their letter gives us a glimpse of the tactics that guided natural scientists to achieve their desired goal — the establishment of the Hula Nature Reserve. The “Committee for the Protection of Nature” did not oppose or question the importance of the drainage project. On the contrary, it accepted the rationale of the project: “We know that there are many good reasons for the drainage project to have reached the operational stage. We understand the economic significance, and in particular the agricultural significance of this project.”

The authors of the proposal explained that their request, to declare a part of the marshes as a nature reserve, would contribute to science and the public at large, who would enjoy a beautiful site, while not affecting economic and agricultural development. In this first proposal, the committee suggested that 400 hectares (1000 acres) of the 6,000 hectares (15,000 acres) to be drained would be set aside for a reserve.

From their proposal we can understand that they did not attempt to work against the consensus, but from within it. The reserve was not intended to stop the drainage, but to be integrated in the development process carried out by Zionist bodies such as KKL-JNF and at a later stage by national institutions. This process created the need to work for preserving at least part of the natural landscape.
The Hula Lake and the Yesud HaMa’ala and Kibbutz Hulata pier.
Source: Hulata Archive.
In other words, the dynamics between the development activists and the conservationists was created as part of the Zionist-Israeli dialogue and at least in the case of the Hula Nature Reserve there was no opposition or objection to the rationale of development by means of draining the Hula Valley, but a modest request to balance it by establishing a relatively small nature reserve.

In December 1953, the scientists in the “Committee for the Protection of Nature” held a meeting to establish a broad public organization that would be called the “Society for the Protection of Nature”. The initiators of this step were Amotz Zahavi and Azaria Alon. In late spring 1954 (at the time of the Jewish festival of Shavuot), the founding assembly was held at the Oranim Seminary. After the assembly the society published a report for its members, according to which until the SPNI had been founded, only a handful of volunteers were involved in protecting nature, and their work was focused mainly on lobbying for legislation to declare nature reserves. According to them there were not many actual achievements, but one of these was the plan to create a nature reserve in the Hula Valley, which in their opinion included a relatively large area, which they supposed would be implemented entirely or at least partially. The initial symbol of the SPNI appeared on the document.

**Dynamics of Cooperation**

KKL-JNF responded positively to this initial initiative in 1951 and the discussions focused mainly on the reserve size, the manner of its establishment, its funding, its exact location and the like. One of the convincing examples of the SPNI’s choice to cooperate was its decision to support KKL-JNF instead of joining the protests against the anticipated small size of the Hula Nature Reserve. Israel’s daily “Haaretz” published an article by a columnist using the name Ron, in which he protested against
LAKE AGMON — A WORK OF NATURE

Source: Hulata Archive.

The initial symbol of the SPNI, 1954.
Source: SPNI.
the destruction of nature caused by the drainage\(^1\). The columnist understood that a reserve was planned but claimed that it was not sufficiently large. Elchanan Brachiyahu, KKL-JNF’s chief engineer for the drainage project immediately responded in the press. According to him, thanks to the canals KKL-JNF had excavated ancient landscapes were uncovered, and it was decided to preserve them, and he went on to enlarge on the plans for the future nature reserve. Ron, the columnist, was not mollified by this answer. In his opinion, an area of 300 hectares (750 acres) was not sufficient, and at least five times that area was required to establish a nature reserve. According to him, the land situation would change in any case, after the establishment of the State of Israel and there would be no more lack of land for farming.

The SPNI’s response to Ron was unexpected — instead of supporting him and demanding to increase the size of the Hula Reserve, it defended KKL-JNF. The SPNI said that it was cooperating with KKL-JNF and an area of 300 hectares (750 acres) was definitely sufficient for a reserve to preserve the fauna and flora of the wetland. This response proves with no shadow of a doubt, that the SPNI chose to cooperate and not oppose KKL-JNF. It is possible the nature activists used the tactic of cooperation because they realized there was no other way to get what they wanted — the establishment of the Hula Nature Reserve. Had they chosen to fight KKL-JNF on the subject they would risk getting nothing. Nevertheless, it is also possible that they were affected by the values of the time and saw themselves as part of the Zionist enterprise that championed “conquering the wilderness” and agricultural settlement, and wanted to be included in it. In any case, the pattern of action of natural scientists for establishing the Hula Reserve was one of cooperation with the establishment by conventional means. No use at all was made of protests, petitions and the like to shape public opinion and create public pressure.

\(^1\) The archive of Haaretz informed me that Ron is a Hebrew acronym for “the invisible” and they do not know who the journalist using the acronym was.
KKL-JNF had acceded to the naturalist’s proposal to establish a nature reserve in the Hula as early as 1951. However, the official decision to establish the reserve was only made at the meeting of the board of directors on April 20, 1955. Weitz, who headed the Soil and Afforestation Department, presented the issue to the board. He did not oppose the proposal but noted that, “The reserve is not a negligible portion of the 5,700 hectares (14,250 acres) that comprise the Hula Concession”. He also added, “It is imperative to consider scientific and other arguments that motivated the Ministry of Agriculture in the proposal being discussed”. Weitz recommended allocating an area of 395 hectares (1000 acres) for the reserve, on condition that developing the embankment and maintaining it would not be financed by KKL-JNF.

Nature lovers, who saw KKL-JNF establishing the nature reserve in the Hula in 1955, had words of praise: “Let it be said in praise of the KKL-JNF who drained the swamps: the demands of nature lovers did not fall on deaf ears. The concept of nature conservation in the Hula was accepted, and more than that, an important step has been taking to making it a reality. “On December 4, 1957, Amotz Zahavi, who was then secretary of the SPNI, held a press conference in which he reported that that same month there would be an announcement in “Reshumot” (the official government gazette) that an area of 300 hectares (750 acres) in the Hula would be declared a nature reserve. He also saw fit to note that all the work in the reserve, such as building the embankment and digging the canals was done by KKL-JNF, which invested tens of thousands of Israeli Pounds in the project. This, despite the board of director’s decision that establishing the Hula Nature Reserve would not be at its expense. KKL-JNF may have had another motive for establishing the reserve, which could serve as a sort of “window” to emphasize the great pioneering achievement of reclaiming land for agricultural settlement. At the time, public opinion supported the drainage project, and the reserve would glorify the environmental change KKL-JNF had carried out through the Hula drainage project, in the manner of “before and after” pictures.

In addition to developing the embankments and the canals, a number of small pools for shallow water were constructed and small islands were developed in the lake, as well as an observation tower. KKL-JNF staff, with the help of the SPNI, transferred unique plants such as the Nile Papyrus, Yellow Water-lilies and others from one site to the other. At the entrance to the reserve, a large island was developed that was intended for establishing a museum and a high observation tower in the future. KKL-JNF also built a boat basin for special boats that would not disturb the birds or pollute the reserve water. In addition, it developed roads in and around the reserve for excursions on foot. According to the KKL-JNF engineer, Haim Sofrin, all the work was coordinated fully with the SPNI staff. According to Zahavi, only two plant species became extinct as a result of the lowered water surface at the edges of the wetland — the Bladderwort and the Frogbit, but with these exceptions nothing changed. In early 1958, the reserve was opened for hiking and sailing, attracting hundreds of people from Israel. This was the first nature reserve in Israel, which was jointly managed by KKL-JNF and the SPNI. Only five years later, in 1963 was the “Nature Reserves and National Parks” law passed in Israel, and the Israel Nature Reserves Authority (NRA) was established.

The activity of natural scientists to promote the establishment of the Hula Nature Reserve was intended to allow nature and development to co-exist. However, development undoubtedly had the upper hand over leaving nature as it was; nature, despite efforts to protect it was affected. The Hula Lake and its marshes were a complex wetland system, whose uniqueness depended on many
Source: Map Collection, Tel Hai College.
variables, such as the depth of the water, the type of soil, light, climate and other factors, which has been massively changed by human development. Most of the people who wrote about the Hula Nature Reserve eventually admitted that it did not fulfill its purpose of preserving the diverse fauna and flora that was so unique to the Hula.

The Decline of the Ecosystem in the Hula Reserve

The nature reserve was established in the northwestern section of the former Hula Lake (150 hectares, 375 acres), in part of the marshes bordering on it and included Nahal Enan (an additional 150 hectares, 375 acres). Before the drainage, this was where the birds, fishes and other animals, including mammals, which were characteristic of the wetland, could be found. The reserve area included different habitats, such as the lake, a marsh, small natural pools, and meadow strips that connected the marsh to dry land. All this, in order to preserve the diverse plant and animal life of the site.

In early 1958, after the water level dropped, it became apparent that flaws in the embankment allowed water to seep out. Organic materials such as tree trunks and papyrus that were mixed in with the embankment soil rotted. As a result, the water level in the reserve went down and Papyrus sprouted in areas intended for the lake and took them over. In addition, areas that were intended for marshes dried up. KKL-JNF did not succeed in controlling the water seepage problem, even though a bulldozer worked annually to remove soil from the canals and used it to plug the cracks that appeared in the embankment. About half of the area of the reserve was dry in the summer and sometimes in winter as well.

Another serious issue was that the Mekorot Water Company used the water from Nahal Enan that once flowed into the Hula for human consumption. In 1953, Mekorot began pumping water from Nahal Enan, but until the early 1960s pumping was only partial and the springs still flowed in summer. In the mid-1960s however pumping intensified, which gradually caused a decrease in flow in winter and complete cessation in summer. This water source was replaced by water from emptied fishponds, which, with its fertilizer, pesticide and fish eggs, became the major water source of the reserve.

The bacteria that decompose the organic material in the fishpond water in the reserve consumed the oxygen in the water. Consequently, plants began disappearing and even the papyrus expanses became smaller from year to year. According to Hanan Dimentman, from the minute Nahal Enan ceased flowing the reserve ceased being a reserve. The first organisms to die were the ones in and on the bottom of the lake, as there was no more oxygen there. Hanan concluded from this that the accusations leveled at KKL-JNF regarding the loss of plants and animals were false, and that hopes for the reserve remained relevant as long as Nahal Enan was its main source of water. Close to 120 animal species were no longer found in the Hula after the drainage. Nevertheless, some of them, particularly invertebrates, may have moved to water sources near the reserve.

Thus, the Hula Reserve did not conform to the concept of its planners. The large lake that was supposed to extend over 200 hectares (500 acres) was reduced to only 20 hectares (50 acres). The water level was a meter lower than had been anticipated. The pools, puddles and shallow shores completely disappeared from the landscape. The flooded papyrus expanses extended over 85 hectares (215
acres), while 150 hectares (375 acres), half of the reserve, had dried out and phragmites reeds grew on about 100 hectares (250 acres) of them. There was almost no vestige of the other hydrophilic plant communities. The unique plants characteristic of the Hula, such as the Dwarf Waterclover, Marsh Buckler Fern, the White Water-lily, the Bladderwort, the Frogbit, the Marsh Pennywort and others, disappeared. The unique plants characteristic of the Hula, such as the Dwarf Waterclover, Marsh Buckler Fern, the White Water-lily, the Bladderwort, the Frogbit, the Marsh Pennywort and others, disappeared. The reduced lake area, and its depth, barely reached one meter (compared to a maximal depth of three to four meters before the drainage). Together with the changes in water quality (doubled salinity, increased hardness and the increase in the proportion of solids in the water), this caused most of the submerged and partially submerged aquatic plants, such as pondweed and watermilfoil species, to disappear. At the same time plants that had previously been restricted to limited areas, such as the Jordan Tamarisk and the Castor-oil Plant, developed and spread.

Wildlife in the Hula deteriorated as well. Of 16 fish species known from the Hula only a few of the more common species remained: catfish, which cause more harm than good as they are predators, carp that had been artificially introduced, and the Galilean and Jordan tilapias. The remaining species either became extinct in the reserve or survived in small numbers. The fishponds were a partial replacement for migrating and wintering birds, but many of the species that once bred in the Hula disappeared forever. Some of them can be found in other parts of Israel, while others, such as the Yellow Wagtail and the Marsh Harrier are no longer breeding species in Israel. Lately there have been a few reports of Yellow Wagtails returning to nest in the valley, but they are extremely rare. The Nutria however, which was introduced by humans, has spread more than other species and gnaws on the bulrushes contributing to their disappearance, and burrows in the embankments and weakens them.

In 1968, the responsibility for the Hula Nature Reserve was transferred to the NRA that began rehabilitating the reserve in 1971. The restoration program included a solution for water seepage, habitat restoration using engineering means and building weirs to regulate the water level in the reserve or excavating water pools. The plan also included the rehabilitation of Nahal Enan by piping in water from the stream to certain pools in which the water was supposed to be kept clean and at a constant temperature throughout the year. The hydrological rehabilitation improved the reserve considerably in a number of ways, such as reducing the water seepage,
Photo: Edgar Hirschbein, KKL-JNF Photo Archive.
improving water quality and diversifying the habitats. This contributed to restoring bird life in the reserve, but less to the rehabilitation of the plants and animals that were dependent on the rehabilitation of Nahal Enan.

Despite the failure of the reserve to preserve the botanical and zoological diversity, for the public at large, a visit to the reserve provided the experience of being in a wetland that combines water expanses and dense vegetation. In autumn, flocks of pelicans arrived together with groups of spoonbills and herons. In winter, hundreds of ducks of different species came along with other birds. In summer, it was possible to see and hear warblers nesting. On the border between the thickets and the open water, moorhens and mallards nested as well as Great Crested Grebes. In addition to the birds, there was an abundance of turtles, minute crustaceans, snails and bivalves and even mammals, such as boar, otters, jungle cats and mongooses. The Hula Nature Reserve was the first reserve established in Israel following a drastic modification of the landscape, and even more so of a wetland, for which even in the world there is little conservation experience. Thus, it is not surprising, that despite all the good intentions the conservation efforts succeeded only partially. However, the Hula Valley was not only the site of Israel’s first nature reserve, but also the first site in Israel in which peat soil was farmed. In this case too, lack of experience and the unique qualities of dried peat led to environmental damage.

D. The Deterioration of the Peat Soil

The decision to drain the peat and cultivate it was based on an American system of underground irrigation, which adapts the water flow to the depth of the crop roots. As there was no previous experience in Israel, neither with the irrigation method, nor with cultivating peat soil, it was decided not to divide the lands between the existing communities, as was done with the other drained lands, but to establish the Hula Development Authority (HDA). It was established in 1956 by the Ministry of Agriculture (50%), the Jewish Agency (30%) and KKL-JNF (20%) and was responsible for cultivating 2,300 hectares of peat soil.

Cultivating the Dried Peatlands

The HDA was responsible for land reclamation, irrigation and intensive cultivation of the entire area according to a program prepared by the Ministry of Agriculture. In summer 1956, after the dam was opened and the water drained from the Hula Lake, the HDA made efforts to take over the land as rapidly as possible to prevent fires in the peat expanses. Internal drainage canals and irrigation canals were excavated and crops were sown to prevent the marsh vegetation from renewing itself. By late 1956, 1,200 hectares were prepared for cultivation and the remaining area was intersected with internal drainage canals.

The HDA was established not only to find the best way to cultivate the peatlands, but also to provide regular employment for the 14,000 inhabitants of Kiryat Shmona. Thus, one of the early HDA guidelines was to attempt to farm as intensively as possible, which would provide abundant employment. The HDA succeeded in employing an average of 600 breadwinners annually, a significant employment boost for Kiryat Shmona.
Installations for dealing with the agricultural produce, such as a sorting and packing shed for peanuts, a garage, a cotton gin and the like were established on the land. The HDA also invested in the Pri HaGalil plant in Hatsor. The authority had equity capital of one million Israeli pounds and the remaining investments were funded by various loans, some of which were short-term, because of which the HDA eventually encountered financial difficulties.

In order to improve the economic situation a number of steps were taken to increase efficiency, including selling the HDA’s part in Pri HaGalil and stopping cultivation of vegetables and flowers, which although they created many jobs also caused losses. The major crops were cotton, peanuts and grains (corn, sorghum, wheat and barley). These three crops comprised 88% of the cultivated area. The grains were the major crop that produced a profit almost every year. There were sharp fluctuations in the profits of cotton and peanuts, on the other hand, and cotton for example, was profitable only in 1959. In the beginning, almost all the crops produced good results, because the soil was rich in organic matter and the peat had not yet begun decomposing.

The cost of the special irrigation equipment, which Zuckerman had recommended importing from the United States, was 200,000 Israeli Pounds. However, it soon became clear that not only was some of the equipment obsolete, it was not suited to conditions in the field. The subterranean irrigation increased soil salinity and damaged the crops. Dan Levanon claims that this irrigation method also caused extensive damage in Florida and California. He remembers, for example, traveling along a road in California and seeing the fields about five meters lower than the road because of peat subsidence. As this equipment was only suited for peat soil it could not be rented or sold and lay all around the HDA land unused.
Israel's State Comptroller examined what had been done in the HDA since its establishment and up to 1962. The comptroller believed that when considering all the functions of the HDA, its deficits should not be considered a total loss to the national economy, because it increased agricultural knowledge in Israel and contributed to absorbing the inhabitants of the region. Thus, he only recommended increasing the efficiency of its management. The fiscal year of 1962 showed improvement and ended in a profit. The next two years were also profitable and fundamentally improved the situation of the company, but it had many debts remaining from its early activity. After the HDA ended both 1965 and the year after with losses, it had difficulties paying its debts and salaries. The Ministry of Agriculture believed that it was not its function to raise crops at a loss and decided to divide the land up between the kibbutzim and moshavim (cooperative farming communities) in the region.

The Issue of Environmental Quality

While the managers of the HDA were debating whether it was justified to keep the company going in light of its financial losses, it became clear that draining the peat soil was seriously harming the environment, which no one had imagined would happen. The damage was caused by the flow of excessive nutrients from the peat soil into Lake Kinneret that threatened the water quality of the essential source of drinking water for Israel's inhabitants. This issue, related to the field of environmental quality, added a new dimension to the dialogue regarding the drainage of the Hula that had focused on using justifications for agricultural development versus nature conservation. From this point on there was a new concern regarding the manner in which the dried peat soil should be treated, which considered not only the agricultural benefits, but also the threat to water quality of Lake Kinneret. Nevertheless, both the 1950s approach of conquering the wilderness that was intended mainly to expand farming areas, and the concern of environmentalists for the quality of the Lake Kinneret water, which arose in the 1970s, originate in the same anthropocentric approach in which people and their livelihood or health and welfare are at the center, and the environment is expected to supply their needs. The conservation approach, represented by the people who worked for the establishment of the Hula Reserve, originated from an ecocentric concern for any and all natural systems.

Before the Hula wetland was drained, the Hula Lake was a significant midway stop in the flow of the Jordan River south to Lake Kinneret. Two thirds of the water from Lake Kinneret came via the Jordan River, which began flowing after it absorbed the water from the streams that fed it: the Hermon, Snir and Dan, which had clean, clear water. As long as the Hula Lake existed the situation was ecologically balanced, and Lake Kinneret was not affected by the soil that the lake occupied nor from the pollution load. Moreover, at the time, Lake Kinneret was not yet the major drinking water source in Israel, and even if there was significant damage to the supply system, its effect on a national level was negligible.

After the National Water Carrier, which conveyed potable freshwater from Lake Kinneret to the entire country, was established, the Kinneret Limnological Laboratory was created in 1966 to monitor the quality of water and the nutrients that flowed into Lake Kinneret. The first results already showed that the water flowing into the lake had very high nitrate concentrations, which were produced in the peat soil mainly during the high summer temperatures and partially washed into the Kinneret
Map of the Hula Development Authority according to crop types.
Source: the Zionist Archives.
with the winter rains. The nitrates provided nutrients for algae, which multiplied and began reducing the concentration of oxygen in the water, to the point where fishes in the lake began to die. The dense layer of algae in the Kinneret prevented optimal use of the water and the lake. Chemical tests of the water flowing out of the Hula showed that every time after the peat was flooded the nitrate concentration increased tenfold and that the peat soil in the Hula was the main source of nitrogen reaching Lake Kinneret. The fear of polluting Lake Kinneret led to the establishment of the Lake Kinneret Administration in 1969, which was appointed as the body responsible for its water quality and monitoring its watershed.

In addition, in the early 1970s the Committee for Research of the Hula was established. Its function was defined as follows: “To study the Hula Valley soils in order to determine what should be grown in Hula soils and what method of cultivation should be used [author’s emphasis, M.D.], in order to do the utmost to prevent pollution of Lake Kinneret by nitrates from the peat soil.” In other words, the issue of whether it would be preferable to flood the area was still not being discussed, although the decision regarding which crops should be grown, was now being considered not from the aspect of economic profit, but from the perspective of reducing the damage to Lake Kinneret. Yisrael Levin, a resident of Kfar Giladi and agricultural expert, headed the research team that recommended growing perennial fodder, which would produce high yields, while reducing the accumulation of nitrates in the soil.
The risk of polluting Lake Kinneret became public knowledge following an extremely gloomy report published in late 1971 by a renowned South African sanitation engineer, Professor Bob Davis. The report stated that if immediate steps to prevent pollution of Lake Kinneret would not be taken, within a few years the oxygen concentration of the water would reach three milligrams per liter, a concentration that is lethal for plants and animals. The Kinneret would then be transformed into a brown-black lake of fishes and plants, whose water stank and was not fit for drinking. The report was commissioned by Menahem Cantor, the water commissioner, who after reading it was shocked by the findings and decided to shelve it. However, the findings of the report were leaked to the press and concern for Lake Kinneret spread like wildfire.

Because of the media fuss, the government decided that the Israel Commission for the Biosphere and Environmental Quality (ICBE) would prepare a report on preventing pollution in the Lake Kinneret watershed. The ICBE was established in 1970 and headed by Professor Michael Evenari to study scientifically, by means of sub-committees, the various aspects of environmental quality in Israel, including the issue of the Kinneret. In most of the cases, the various sub-committees reached practical conclusions regarding necessary actions, but implementing these recommendations was only partially successfully, because the responsibility for environmental quality was divided between different government offices. The journalist Uzi Benziman wrote about the issue and claimed that environmental quality is an “ecological orphan” that should be adopted by a government minister or some other operational government authority. The ICBE sub-committee was active in 1972, which was a rainy year. The oxygen concentration measured in Lake Kinneret was between nine and ten milligrams per liter water, which meant that there was no immediate threat to the Kinneret.

Although the commission did not foresee immediate harm from the peat soil, it still responded negatively to the initiative of Haim Gvati, the Minister of Agriculture, to dismantle the HDA. The commission believed the entire peat area should be controlled by a government authority, whose first task would be to find a regime that would reduce pollution in Lake Kinneret. This report, together with the recommendation of the Hula Commission denotes a change in direction, in which, at least according to the environmentalists, the focus changed from which crops should be cultivated in the drained area and whether they would be profitable, to how to prevent damage to the Lake Kinneret water quality. In short, the agricultural considerations were replaced by environmental considerations.

Despite the recommendations of the ICBE and the concern regarding the pollution of the Kinneret, the Minister of Agriculture did not rescind his decision to dismantle the HDA, but decided that the peat lands would be concentrated in two large frameworks and under joint management. Seven kibbutzim formed an organization called Hula Crops that took on the peat lands for the kibbutzim. Nahalat HaMoshavim, which incorporated 15 moshavim, took on the peat lands for the moshavim. Most of the moshavim, such as Avivim and Dovev, were relatively distant from the Hula Valley, and the peatlands were part of the land allocated by the State of Israel to each family when the communities were established. The Minister of Agriculture also appointed the Hula Commission, whose function was to recommend which crops should be grown and how, as well as how to operate the water and drainage systems. The minister believed that it was possible to balance farming and economic considerations with preserving the water quality of Lake Kinneret. However, Yoram Avnimelech, who headed the Hula
Commission, claimed that the scientists were unable to suggest a profitable agricultural crop to the farming communities, and that this should be done by a government agency. The latter could absorb losses for the sake of preserving water quality in the Kinneret until a suitable crop, which would be economically profitable and not pollute the Kinneret, could be found.

The SPNI joined the battle to prevent the dismantling of the HDA because of the threat of polluting Lake Kinneret and published an expert opinion on the matter. But unlike the Hula commission that was searching for an optimal agricultural solution both economically and environmentally, the SPNI suggested re-flooding the entire peat area: “A radical solution: covering the entire peat area with water, creating a lake that would also serve as a sedimentary basin for water from the north, as the Hula was in the past.” This was one of the first times re-flooding was suggested as a solution, which is why it was presented as a radical solution. In December 1971 a number of scientists, including Dr. Colette Tsuruya, Professor Avnimelech, the director-general of the Ministry of Justice, Dr. Tsvi Terlo, who headed the Environmental Quality sub-committee in the Knesset and others, met with the director-general of the Ministry of Agriculture to object to the decision to distribute the Hula lands.

Gvati, the Minister of Agriculture did not heed their appeals not to dismantle the HDA. His disregard for the recommendations of all the agents involved in environmental conservation in general, and the water quality of Lake Kinneret in particular, were proof of the weakness of these organizations and the lack of influence they had on decision-making processes. It was also evidence of the power the Minister of Agriculture, for whom preserving environmental quality was insignificant, compared to promoting the interests of the agricultural sector. In late 1972, the HDA was dismantled and divided up among the kibbutzim and moshavim that became incorporated in two different companies. From that point on, as the environmentalists predicted, the peat deterioration process was accelerated and the threat to the Kinneret intensified.

The peatlands crisis

Yisrael Levin who investigated which crop would reduce the damage to Lake Kinneret as well as the subsidence of the peat soil, recommended planting alfalfa, which absorbs and fixes large amounts of nitrogen. However, when the price of fuel rose, growing alfalfa was no longer feasible. Another problem were the rodents, particularly voles, which have a great affinity for alfalfa and for whom the crumbly peat soil is ideal for burrowing. The voles succeeded in reducing alfalfa yields by 50% and they were the main reason the farmers stopped growing the crop. One of the means of coping with the vole problem was the use of pesticides that caused collateral damage by killing protected birds of prey in the area, and whose use was subsequently reduced. After pesticide use was reduced, the voles began reproducing uncontrollably and the damage they caused increased.

The Ministry of Agriculture played no small part in the deterioration of the peatland, as it had not transferred sufficient funds for irrigation and even reduced water allotments at a certain point. Reducing the water allotment prevented the lands from being kept green most of the year and weaker farmers began abandoning their plots. Moreover, the Ministry of Agriculture did not invest sufficient means in research and extension services for farmers to teach them how to overcome the growing lack of fertility of the soil.
Division of land plots according to its cultivation by the various kibbutzim and Nahalat HaMoshavim (Lake Agmon and the historic Hula Lake can be seen in the background).

Source: Avri Kadmon, KKL-JNF.
Some of the farmers decided on their own, contrary to the agreement, to cultivate cotton, which was considered more profitable. As the canals made it difficult for mechanical equipment to pass through, the farmers blocked them without requesting permission. The Kinneret Administration, which was supposed to supervise the work in the field, was negligent in fulfilling this function. While the HDA was active, the entire irrigation system was based on transferring water through a controlled system of supply and drainage canals, via which the groundwater level was controlled and monitored in each plot with subterranean irrigation. Eliminating the canals caused the water level control system to collapse, and the water table was lowered, which accelerated soil subsidence and led to fires breaking out, which in turn reduced soil fertility and increased the flow of pollutants into Lake Kinneret.

According to Giora Shaham, who was later responsible for rehabilitating the peat soil, the dismantling of the HDA was the main reason for the deterioration of the water and drainage system that were essential for conserving soil and preventing its accelerated decomposition. Without the HDA, it was no longer possible to coordinate water flow and drainage that were essential to conserving the soil and preventing accelerated decomposition. Ezra Yas'ur from Kibutz Malkiya, who cultivated plots in the peat soil, claims, that no one explained to them that the canals were dug to maintain the water level and what their importance was, and that was one of the reasons they blocked them up.

Although the Minister of Agriculture decided that the area had to be cultivated jointly by the kibbutzim, over time the kibbutz lands were divided into plots, with each kibbutz responsible for its lands, while being committed to the general water regime. The division of the land did not allow for joint operation of the subterranean irrigation system and maintenance of the groundwater level. Nahalat HaMoshavim, on the other hand, maintained joint cultivation of their land, which comprised 1000 hectares (2,500 acres) of land most of which was peat soil with a smaller amount of lake soil. From year to year, revenues decreased, until in 1990, a year that ended in drought, about 700 hectares (1,650 acres) were abandoned. The land belonged both to Nahalat HaMoshavim that filed for bankruptcy, and to the kibbutzim. Abandoning the land intensified the fire damage, wind erosion, flow of pollutants to Lake Kinneret and the vole damage.

According to studies on the effect of the peat on the pollution of Lake Kinneret, it is estimated that the peat contributed 40% of the nitrogen compounds that reached the lake. The burning peat caused accelerated soil erosion and its transformation into sterile dust. Dust storms were a regional environmental issue and damaged agricultural crops. The spread of weeds and proliferation of voles limited the possibilities of agricultural cultivation, and prevented fodder cultivation and irrigated farming. This sorry situation raised the question of whether the drainage of the Hula wetland that had such a significant effect on the environment had been a mistake. As part of coping with the economic, agricultural, environmental and ecological problems practical questions were raised as well, such as how could the situation of Lake Kinneret be improved? Should agricultural areas that do not show a profit be cultivated? Is it possible or feasible to rehabilitate the ecosystem by flooding the area? These issues have still not been resolved, but the more the problems worsened it became obvious that the situation could not stay as it was and it would be necessary to look for new alternatives for farming the peat soils.
2

CONNECTING
THE DROPS
In 1983, the Hula Commission, headed by Yoram Avnimelech from the Technion — the Israel Institute of Technology, initiated a new survey, to evaluate alternative management practices for the peat soil, to slow its projected subsidence and mitigate the resulting potential damage. It was obvious that it would not be possible to halt the peat subsidence completely, and therefore a means of coping with issue had to be found. For the first time, however, the survey instructions included a mandate to examine the possibility of “exploiting the subsidence” that occurred over the years in the peatlands and even using engineering equipment to deepen the subsidence in order to flood the site and evaluate its possible uses for tourism. According to Moshe Gophen, at the time a senior scientist at the Kinneret Limnological Laboratory, until this survey the idea of re-flooding was only mentioned in the framework of conservation discussions. This was the first time the demand to evaluate flooding the peatlands as a means of protecting Lake Kinneret and as a source of income from tourism arose. The site for the proposed plan was the enclosure between the western and eastern Jordan canals that were excavated during the drainage project. The banks of the old Jordan River, from Neot Mordekhai southwards, and the banks of the southern Jordan canal from the canals junction in the north to the Obstacle Bridge in the south were also included in the survey.

A. Formulating the Hula Restoration Plan

Giora Shaham, a young water engineer (who now heads the Israel Water Authority), who worked at the Kinneret Authority and was writing his master's thesis at the Technion, under the supervision of Yoram Avnimelech, in the field of analysis of water source systems, was recruited to conduct the survey. Amos Harpaz, the head of the KKL-JNF's northern afforestation region, who was previously head of the Kinneret Authority, instructed Shaham that the basic premise had to be, that, because of the peat soil subsidence, part of the Hula Valley would be flooded anyway, therefore it would be best to “be prepared” by preventive flooding. Shaham agreed to take on the position, but first asked to evaluate Harpaz's assumption. He conducted 70–80 drilling operations at depths between five and 20 meters, to measure the groundwater level. To his surprise, he found, that in places where the soil had subsided, the groundwater level had also been lowered, which meant that the soil would not be spontaneously flooded because of the subsidence. He concluded, therefore, that, in order to re-flood part of the Hula Valley, it would be necessary to excavate the site.

The objective of the survey was to present engineering alternatives for solving the problems related to the peat soil management and to analyze them from an economic perspective. The survey conductors were also to define criteria for evaluating the consequences of implementing the different alternatives. From the government’s perspective, the optimal alternative would protect Lake Kinneret from nutrient surplus as well as being economically feasible for the residents of the area, thus reducing their dependence on continuous government support. Consequently, it would be necessary to evaluate the economic implications of each alternative. For this purpose, the economic value of potential crops for growing on peatlands was assessed. In addition, the tourism potential of the Upper Galilee, and the proposed area in particular, were analyzed from the perspective of nature conservation and restoration. A number of meetings with people from the SPNI (Society for the Protection of Nature in Israel) and INPA (Israel Nature and Parks Authority) were held to obtain
Map of the borders of the Hula Restoration Project.
their input on the subject, to gain a better understanding of the situation. Nevertheless, it was difficult to analyze the economic consequences due to lack of information, and therefore any alternative that had only a slight economic advantage over the agricultural option, was purely theoretical.

The survey, published in 1989, presented two major alternatives. The agricultural option, proposed raising the groundwater level, but only to a degree that the crops would not be affected; the second option combined agriculture and tourism, proposed flooding the center of the peatlands and creating a marshy wetland. At this location, the soil was worst from an agricultural perspective and the peat degradation and burning had created a topographical depression. The new water body was intended to contribute to preserving the groundwater level in the remaining peatlands. The implication of this proposal was that the tourism alternative was relevant only in sites in which farming was considered not economically feasible. In other words, this alternative also agreed with same rationale, which dated back to the early days of the State of Israel, according to which, nature sites should be established only in areas unsuitable for agricultural development. Indeed, one of the stated guidelines of the restoration program was that any part of the drained areas suitable for agriculture would be farmed, and only the areas not suited for farming would be used for tourism. This was also the reason that the judging committee that evaluated the various alternatives decided that the possibility of flooding additional areas would not be evaluated at this stage.

After the feasibility study was published, Shaham submitted the proposal to KKL-JNF to arouse interest in advancing the project. He believed that KKL-JNF had both the rights to develop the area, as well as the wish to correct the consequences of the Hula drainage. General (res.) Ori Or, the director
general of KKL-JNF at the time, and David Nahamias, the head of the KKL-JNF Land Development Authority, welcomed Shaham’s proposal enthusiastically. Or felt it was important not only to repair the damage the drainage had caused, but also to help the farmers prosper, particularly in view of the fact, that in his former position, as head of the IDF Northern Command he had forged close ties with them. Or’s charisma and the confidence he instilled, helped him communicate with the people from the kibbutzim and moshavim. While KKL-JNF could not compensate them for the land that they contributed for the development of the tourist project, or provide them alternative areas for cultivation, he emphasized that they would enjoy the fruits of the tourist projects to be developed and the revenues from the improved agricultural yields in the peatlands. Most of the farmers that cultivated the lands slated for ecological-tourism development were residents of relatively distant communities, such as Avivim and Dalton, who would not be able to profit from supplying associated services such as lodging and food; their revenues were to come from developing tourist villages and commercial venues in the new project.

In order to select the best alternative for rehabilitating and managing the Hula peatlands, the Hula Administration, headed by Or and Nahamias, was established. The Ministry of Agriculture, then headed by Rafael Eitan, and the Israel Land Administration, headed by Miki Vardi joined the Hula Administration. Additional participants included Dan Perry, director general of the Nature Reserves Authority (Nature and Parks Authority today), the Water Commissioner, representatives of the region’s inhabitants and a representative of the Ministry for Environmental Quality (Ministry of Environmental Protection today), which had been established in 1989. The goals of the Hula Administration were to preserve the water quality of Lake Kinneret, to deal with the economics of the peatland management, to solve environmental problems and to strengthen nature conservation in the region. From these goals, we can learn that the major concern of the administration became preserving the water quality of Lake Kinneret, which was an acknowledged national resource, and not only agricultural development. It was essential that the solution be economically feasible and that the peatlands would not continue to be a burden on the country or on the farmers. Finally, there were also environmental and conservation considerations. Clearly, the alternative that combined farming and tourism was the only one that could contribute to the restoration of the wetland habitat. Nevertheless, it is important to understand that for the proponents of the plan, rehabilitation of natural values was not a goal in itself, but a means of establishing another source of revenue, from tourism, for the farmers. At this stage, it was clear that the different alternatives must be evaluated in light of main objective, which was preserving Lake Kinneret. The major issues discussed were the engineering means for solving the problems triggered by the agricultural cultivation of the peatlands, the agency responsible for maintaining the area and the foreseeable economic profit from the tourism option.

In 1992, the Hula Administration judging committee examined the proposed alternatives. The “business as usual” alternative, which recommended leaving thing as they were, was rejected by the committee. Unlike other soils, that when left fallow, improve, in peat soil the situation is opposite. Leaving unirrigated areas with no green cover because of economic considerations would lead to accelerated erosion and soil degradation and increase the flow of nutrients to Lake Kinneret. Thus, everyone understood that this alternative was not feasible. After it was rejected, a choice had to be made between implementing the agricultural option or the combined agriculture-tourism
alternative in the area slated to be re-flooded. The representatives of the Water Commission (today’s Water Authority) argued, at that same committee, that from the perspective of water quality, the agricultural system is less dependable and that it had failed to prevent degradation of peat soils and the environment. It had not succeeded in preventing soil subsidence, fires and dust storms, and vole proliferation. Moreover, not only had it not prevented pollution of Lake Kinneret, it had, instead, become one of the polluting factors, due to actions such as the use of pesticides. In their opinion, the planners had not succeeded in proving that the agricultural practices they proposed would have the means of coping with these problems adequately and therefore they preferred the alternative that combined tourism with agriculture. Agriculture was declining globally at the time and it seemed sensible to diversify employment possibilities, particularly in view of the fact that bed and breakfast initiatives began appearing in the Galilee, and the tourist industry seemed to be growing and developing.

After deliberating the judging committee chose the alternative that combined agriculture, tourism and nature conservation, but this decision still had to be approved by the farmers and the regional councils. Shaham presented the two alternatives at numerous conferences and met with heads of the regional councils (Upper Galilee, Mevo’ot HaHermon and Merom Galil) and with Aryeh Harmelin, the lawyer representing “Nahalat HaMoshavim”, to persuade the communities that possessed the land rights to the peatlands to support the alternative that included tourism. Shaham termed the proposed solution the “compromise curve”, according to which each party cedes a little, but in return gains many other things. From a planning perspective the advantage of selecting the tourism alternative, was that regulating the water regime in the problem area, would no longer depend on the economic feasibility of farming. Moreover, the agent responsible for tourism in the area would have a stake in strictly implementing the operating regime, which would prevent environmental problems, such as mosquitoes, polluted water and the like.

When ecological restoration was proposed to “Nahalat HaMoshavim” in exchange for ceding some of their lands, they did not have much to lose. They had already abandoned some 700 hectares of peatland because cultivation was no longer profitable, as a result of which Aryeh Harmelin was appointed their liquidator-operator. As the land did not belong to the moshavim, but was leased by them for cultivation, Harmelin could not sell it to pay debts, as is customary in bankruptcy proceedings. Consequently, the Registrar of Cooperative Associations ordered him to operate the property in his possession and use the proceeds to pay debts. Harmelin discovered that according to the last balance sheet from 1990, “Nahalat HaMoshavim” was 16 million NIS in debt. On his first visit to the site, he found that if a lit match or burning cigarette is thrown on the ground it lights a fire. In order to deal with this issue, he employed a young man from Hatsor HaGlilit, whose job was to stand all day with a water hose and put out the fires. At the edge of the site, he found 100 hectares that were suitable for cultivation, but this was not sufficient to repay the extensive debts. So it did not come as a surprise that when Ori Or proposed the Hula Restoration Project, Harmelin regarded it as a gift from heaven. For the project managers, working with Harmelin instead of with the representatives of the 15 moshavim that made up “Nahalat HaMoshavim” was much easier and facilitated the progress of the project.
The project plan had to focus on four main systems: the agricultural system, the national and regional water system, the ecosystem and settlement system. The government institutions were ready to finance the project infrastructure, but expected the operation and maintenance to be the responsibility of the landowners. This was in line with the liberal approach, which believed in minimal government intervention in economic initiatives. The Ministry of Interior supported the program, which included a plan for the establishment of a recreational village to ensure that the landowners received compensation for their agreement to modify the zoning status of the land. This, despite the fact that it was obvious that the landowners would not be able to develop such a project on their own, without an outside partner. Some of the profits from the tourist village were to be allotted for maintenance and some to be diverted to the landowners as compensation for their lost revenue from agriculture. In order to implement the plan, agreements were negotiated with each of the communities involved, and signed by its representatives, expressing their agreement for changing the zoning status and for the implementation of the new plan.

Actually, the alternative that combined tourism with agriculture was more complicated than the one-dimensional concept that characterized the Hula drainage project, which was intended to free land for farming alone. Allocating a small plot of land for a nature reserve was not part of the original plan for draining the Hula Valley, but was done during the process, in response to the initiative of environmentalists. The restoration project, however, was a multifaceted plan, with numerous goals. The plan for modifying the land use was intended to stop pollutants from flowing into Lake Kinneret, to improve the quality of the soil for farming, to rehabilitate natural habitats and to create infrastructure for tourism that would provide the owners of the peatland with an alternative source of income. This was undoubtedly a complex ambitious project from an engineering, economic, ecological and agricultural perspective.

According to Shaham, the success in persuading all the stakeholders to support the alternative that combined agriculture and tourism was not enough on its own to implement the initiative. He believes that what finally set the Hula Restoration Project into motion was the election of Yitzhak Rabin as prime minister, in June 1992, and his decision to increase resources for investing in infrastructure within the Green Line (Israel’s pre-1967 border). The Hula Restoration Project was the right venture at the right time. After Rabin came into power, Ori Or left KKL-JNF for the Knesset and was replaced by Yitzhak Eliashiv. Or disagrees with Shaham, and claims that funding had already been ensured even before Rabin became prime minister.

No name was given to the flooded area, and for a long time it was variously termed the “flooded area” or the “flooded water body”. In 1996, Professor Moshe Gophen asked 70 people, who were fluent in the Hebrew language, and well versed in the history and nature of the Hula Valley, to suggest a name for the new site. Five different names were proposed, and finally the name Agmon was decided on. Agmon is the Hebrew name of one of the marsh plants that grew at the site, but can also mean “small lake” in Hebrew. The official English name of the site is Lake Agmon. Lake Agmon was developed on the peatlands, which were formerly part of the Hula Marshes.
The Hula Restoration Project on the map of the historic Hula Lake and its marshes.
Source: Avri Kadmon, KKL-JNF.
The Components of the Hula Restoration Project

The plan to raise the regional groundwater level was prepared as a master plan for drainage, according to the Drainage and Flood Protection law, and was submitted unopposed, and signed by the Minister of Agriculture. Implementation began in summer 1993 and was planned to continue for three or four years. The estimated cost was 60 million NIS and an additional 20 million NIS for tourism elements. Infrastructure costs were divided between KKL-JNF (33%) and the government (67%). The final cost of the peatlands rehabilitation was 75 million NIS. An additional 2,120,000 NIS are invested annually in maintenance of the peatlands (57% from the Water Authority, 33% from KKL-JNF and 10% from the region's farmers). One of the guidelines of the engineering plan to rehabilitate the Hula peat soils was to raise the groundwater level and maintain it at a height of about 1 meter below the surface. Another guideline was to assure surface irrigation with moving sprinkler systems, which would ensure wetting the unsaturated upper soil layer in a controlled and precise manner, with no need of manual labor. Both these actions, coupled with intensive agricultural management of two to three crops a year that maintained the peat soil wet most of the time, were intended to significantly retard the peat soil subsidence, which occurred at an average rate of seven to ten centimeters annually. Another aim of this management method was to prevent the development of spontaneous underground peat fires that had occurred formerly, and to prevent soil salinization. The disadvantage of this solution was that when the water level descended, it was sometimes necessary to irrigate beyond the needs of the crop, in order to preserve water quality in Lake Kinneret, which conflicted with the immediate economic interest.

The entire project was planned at TAHAL, headed by the engineer Nahum Minzker, and carried out by the KKL-JNF Northern Region Land Reclamation unit. At the peak of the work, in summer 1993, about 70 units of large heavy mechanical equipment were in use. The work was done together with the settlements and regional councils and was approved by the farmers. The project was closely supervised in the field by a steering and planning committee composed of representatives of the stakeholders, including the Nature Reserves Authority, the Ministry of Environmental Quality, the Water Authority, regional representatives and others. On a higher level, a broad public administration, headed by David Nahamias from KKL-JNF, oversaw the implementation and operation of the budget and determined the budget framework and organization on an annual basis. In 1993, the ministries of Tourism and the Interior became involved in the project in order to advance the touristic aspect of the project. The major water body, Lake Agmon, was excavated on an area of 110 hectares. During the excavation, 1.1 million cubic meters of soil were removed and were used to build two artificial islands in the center of the flooded area. The new water body was intended for impounding the peat water to transfer it outside the Lake Kinneret watershed and to take in freshwater from the Jordan River in order to transform the site into a birding and nature site that would attract ecotourism. The flow of water from the Jordan to Lake Agmon was possible thanks to the sophisticated dam and diversion system near Kfar Blum, which is located close to the meeting point of the three branches of the Jordan River: the Banias, the Hatsbani and the Dan. From this point the historical flow route of the Jordan River, which was deeper than the canals, was restored, allowing water to flow downstream by natural gravitation. In addition, 90 kilometers of drainage canals were dug to preserve the high groundwater level, as well as structures and installations for diverting water and preserving the groundwater level in the canals. In retrospect, it became clear that the water did not flow exclusively in the restored Jordan flow channel, but in other ducts as well, which continue to carry water that floods adjacent areas and creates various agro-technical problems.
According to a study conducted by TAHAL, raising the water level in the new water body could have caused great amounts of water to be lost to the subsoil, because of pores and crevices one to four meters deep that were formed in the soil. Seeing as part of the project was intended to prevent polluted water from flowing into Lake Kinneret, a vertical plastic sheet going down to a depth of 4.5 meters, was inserted along 2.8 kilometers, south of Lake Agmon, cutting off the nutrient source in the Hula Valley from Lake Kinneret. Nutrient-rich water was pumped in for irrigating the fruit tree groves in the mountain communities and did not flow into Lake Kinneret. Minzker, the head engineer in the TAHAL project, viewed placing the plastic separator as one of the main elements in the project and refused to begin the project without it. We now know that there is water that circumvents the partition and reaches the canals junction, but it is not clear if it causes any damage. Nevertheless, only after the separator was inserted and most of the hydraulic structures to direct and regulate the water at canal junctions were completed, did the filling of Lake Agmon begin.

After the project, which included flooding part of the land, began, the Pest Control Division at the Ministry of Environmental Quality, decided to check whether the re-flooding would lead to the return of the Anopheles mosquitoes, which would bring malaria with them. Avnimelech, who was at the time the chief scientist at the Ministry of Environmental Quality, was amused: “Some say that malaria will return, and after it Trumpeldor, the illegal immigrants, the pioneers, etc. too, and then perhaps we can prevent some of the mistakes we made later on”. Uri Shalem, however, who headed the Pest Control Division, was not amused and used the most stringent legal weapon he had: he got an injunction to stop re-flooding the Hula Valley, based on the “Health of the People” law, which dated back to the British Mandate. This cautious approach, more than 40 years after malaria had been eradicated, was
a sign of how sharply the dangers of malaria as a major cause of death in communities bordering on the marshes were still etched in people's memory. Anyone visiting the Dubrovin House in Yesud HaMa'ala can learn about the numerous families of the early settlers that tragically lost some of their loved ones, particularly children to malaria, and understand why this was such a sensitive subject. Efi Naim, who is now responsible for maintaining the peatlands for KKL-JNF, and previously did it for the Kinneret Authority, remembers that the work was delayed because of this injunction from the Pest Control Division, which caused considerable economic losses. Minzker, however, is adamant that the work did not stop for even a minute. There is no doubt that had there been the slightest chance that malaria could return, the flooding would have been stopped. Studies, however, found that in the historic Hula Valley, the water was cleaner, and suitable for the development of Anopheles sacharovi (the Anopheles species that is a major malaria vector), unlike the nitrate-rich water that was found in the nature reserve and the canals after the drainage of the Hula. This was at least one positive aspect of the water pollution in the valley, as the mosquitoes that could carry malaria avoided the water. To be on the safe side the banks of Lake Agmon were built with steep slopes, to reduce potential mosquito habitats, even though they could also appear in the restored Jordan River channel. In addition, it was decided to monitor the mosquitoes on a regular basis. From the beginning, it was decided that the project would be combined with research and monitoring of various parameters, such as animal and plant diversity, chemical composition of the water and soil, the effect of tourism on the ecosystem and other factors. A research center was established near the water body for this purpose, and KKL-JNF was responsible for supervising the studies, which were carried out by the Northern Region R&D Station and MIGAL, the Galilee Research Institute, a regional research institute located in Kiryat Shmona. In this manner, the project also supported academic employment and research in a peripheral region. One of these studies found, for example, that perennial grassy vegetation, which is also irrigated in summer, is effective in stabilizing the soil and reducing erosion, as well as taking up nitrates, thus preserving water quality as well as serving as fodder for the ungulates inhabiting the area, such as water buffalo and donkeys. In other words, the research examined the effect of one element of perennial grassy vegetation according to the multi-objective project approach, and found that at least in this case, there was no conflict between the different objectives. On the contrary, it benefitted soil conservation, helped protect Lake Kinneret from nitrate leaching and attracted tourists who came to watch the water buffalo and donkeys at the lake.

At a later stage, after the work on the engineering infrastructure in the peatlands was completed, work began on preventing treated sewage effluents from flowing down from Kiryat Shmona to Lake Kinneret. KKL-JNF laid a 12-kilometer underground gravity pipeline, which was termed the “western carrier” and cost some 15 million NIS. The western carrier transported the treated wastewater to three installations, termed “edge installations”, because they are located at the end of the peatlands collecting system and the Kiryat Shmona pipeline. These installations included an operational reservoir, a pumping station to pump the carrier water up to the Enan Reservoir, and pipes to transport the water up from the Enan Reservoir, via the Zemer B plant, to irrigate fruit tree groves in the eastern Upper Galilee. This water had previously flowed in the western canal. After the western carrier was completed and became operational, the sediments that had accumulated in the western canal over the years, because of the low quality of the water flowing through it, were removed and the canal was now used for freshwater only.
The issue of canal maintenance was debated in many of the discussions regarding the Hula restoration, in order to avoid the problems created by the original drainage, which were related to faulty maintenance of the canals. One of the project mottos became “the final outcome begins with maintenance”. Preserving the high groundwater level, one of the main elements in rehabilitating the peatlands, was done by means of numerous canals, and one careless action in a canal could negatively affect the entire system. It was therefore essential that the entire canal system be maintained and operated by a single agent, and not be left to the responsibility of the landowner. At first, the Kinneret Authority was responsible for canal maintenance, as the canals were intended to preserve the peatlands in order to prevent pollutants reaching Lake Kinneret. However, the source of funding for canal maintenance had still not been decided, because it would not be reasonable to place the sole responsibility for maintenance on the farming communities in the area. Eventually it was decided that the main canals and the hydraulic structures would be maintained and financed entirely by the national government, while the water-level canals of all types, which extended over 90 kilometers, would be financed partially by the users: the farmers and the future tourism association. Nevertheless, no decision was made regarding how the financing for maintaining the water-level canals would be divided between the landowners or stakeholders and the government. In 1994, the Kinneret Authority completed a detailed plan of the maintenance requirements and an analysis of the costs involved, and entered into a partnership with KKL-JNF for carrying out the maintenance. This consisted mainly of mechanical mowing of the vegetation in the canals and along the banks, and at this stage the landowners would not be required to participate in the funding.

On April 25, 1994, the Hula Restoration Project was officially inaugurated and the re-flooding of 110 hectares of peatland (later named Lake Agmon) began. The Minister of Agriculture, Yaacov Tsur and the KKL-JNF World Chairman, Moshe Rivlin, jointly opened the dam near Kfar Blum, and water began flowing along the historic channel of the Jordan River that was restored as part of the development of the new water body. The ceremony was reminiscent of the ceremony in 1957, in which the dam was opened as well, but for a different purpose — to drain the lake and the marshes. Tsur, made the connection, and admitted in his speech: “Draining the Hula was a mistake and it is good that over the years we have learned to work with nature and not against it. Re-flooding the lake area corrects the mistake”. One of the newspaper columnists described the ceremony as drowning the “sacred cow”, obviously referring to the drainage of the Hula marshes. This critical attitude marked the beginning of a process of change in the way the public related to the Hula drainage. Aharon Valensi, head of the Upper Galilee Regional Council, preferred to look ahead instead of back, and congratulated KKL-JNF on the new combination that it was promoting between agriculture, tourism, water, peat and quality of life. In truth, the challenge facing the project planners was to create a different system, in which reclaiming land for farming is not the only option. We will now see in detail, how the drops of water in the Hula Valley were used, via the engineering infrastructure, to promote diverse goals. We will try to understand whether these goals were attained and the compromises or conflicts resulting from this combination of diverse goals in a single system.

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2 This was a play on words of a Jewish prayer in which one verse is “the final deed begins with thought”, or in other words, plan before you execute.
From an engineering perspective, the separator and the water diversion system successfully prevented peat soil runoff from flowing into Lake Kinneret and reduced the amount of nitrates reaching it. In view of this success, it was only natural to hope that the water quality of Lake Kinneret would improve from 1995 onwards, as this was the major reason for the efforts invested in the rehabilitation program. However, it soon became obvious that reality is far more complex than we can foresee, and unfortunately, the situation of Lake Kinneret did indeed change from 1995 onwards, but not necessarily for the better. Until the rehabilitation project was implemented, the Lake Kinneret ecosystem seemed stable, with seasonal algal blooms of *Peridinium* in winter and spring that served as food for fish. In summer, the algae sunk to the bottom of the lake until the next bloom. There was concern that the nitrates from the peat soil runoff would cause eutrophication (over-enrichment of aquatic ecosystems with nutrients) that would accelerate the *Peridinium* bloom in Lake Kinneret, which could in turn prevent oxygen from reaching the water, creating a dead zone where no organisms could survive. After the project was completed, from 1995 onwards, the density of *Peridinium* was reduced, but it was replaced by cyanobacteria. Cyanobacteria are capable of fixing atmospheric nitrogen and can consequently grow in low nitrogen concentrations and compete with other algae. These changes took place at the same time as the Hula Restoration Project, and although there is no proven causal relation between the two processes, it probably exists.

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3 Cyanobacteria (also called blue-green algae, although they are not algae) are aquatic photosynthetic bacteria.
At the beginning of the project, in April 1994, a series of studies were initiated, which continued through the first stage until 1997. One of the prominent studies was a bio-geochemical study conducted by Doron Markel from the Hebrew University, which eventually became his PhD thesis. Markel related that as early as 1993, when he heard about the plans for re-flooding some of the peatlands, he became excited and began gathering background material for his study. When it turned out that, the Hula peat soil was rich in sulfur and this sulfur could reach the water in Lake Agmon and trigger a process that would reduce sulfur to produce sulfide, with its characteristic smell, and which is toxic to plants and people, he realized that his research would focus on sulfur processes in the lake. During the early years, it became clear that the iron found in the eroded peat soil at the bottom of Lake Agmon stabilizes the sulfur and maintains it as oxidized sulfur (sulfate). However, in the summer of 1996, in a relatively rapid process, bulrushes began dying in the southern section of the lake and a smell of sulfide was given off by the lake bottom. Markel believes that the reason for the collapse of the protective iron system in 1996 was related to the level of Lake Agmon, which was planned and implemented as a lake with a water level between 62.50 and 62.70 cm. He suggested keeping the water level lower (62.20–62.30 cm), which would allow oxygen to reach the lake bottom, oxidize the reduced iron and reinstate iron domination in the oxidation-reduction system in the lake.

The chemical monitoring of the lake showed that peat emits nitrogen mainly in the winter, while in the summer the amount of phosphorus emitted from the peat and Lake Agmon increases. Moreover, in summer, internal processes in the lake cause the amount of phosphorus emitted to be greater than the amount absorbed, while with nitrogen the process is reversed, and more nitrogen is absorbed than is emitted. In other words, the mere presence of water in the lake increases its phosphorus concentration and decreases its nitrogen concentration. As a rule, excess phosphorus is not a good thing, as it is the main factor leading to eutrophication. The process is usually a result of nutrient enrichment, which in turn accelerates algae growth, which can eventually destroy living organisms in the water and create turbidity.

As freshwater is almost the only source of water in northern Israel, drought years there are felt much more than in central or southern Israel. The water allotment for settlements in northeastern Israel is 200 million cubic meters, of which 190 million are freshwater and only 10 million cubic meters are recycled water. Even if it were possible to increase the amount of recycled water, it would be limited, as the population in this region is smaller than in the center of the country, and consequently produce less sewage. Therefore, whenever there is a drought, and it is necessary to reduce freshwater quotas, the northern region is the hardest hit. In 1999, for example, surface water quotas were cut by about 36% on average, and in 2017 by about 25%. The small amount of precipitation and the water cuts in these drought years, created a unique situation in the Hula Valley system in general, and in the Hula project in particular. In addition to the rise in phosphorus and the decrease in nitrogen, the groundwater level receded as well. However the separator proved its efficiency and maintained the high water level in the area north of it (the majority of the peatlands), while south of it (in the marl area) the levels were significantly lower. Other changes included increases in the vole population and patches of dry vegetation. In general, the cuts in water supply (1999–2001) had a negative impact on the peat, such as an increase in cracks and crevices and other means of subterranean water flow, increase in nitrates, sulfates, ammonia and other parameters that negatively affected soil fertility.
The drought years of 1999–2001, were followed by a particularly rainy year (2003), in which the precipitation in the area was almost 50% above the annual average. Extensive areas in the Hula Valley were flooded for periods of several months. Because of the heavy floods, some of the effluents from Kiryat Shmona, which were usually removed via the western carrier, did not reach the Enan Reservoir and flowed to Lake Agmon and from there to Lake Kinneret. The floods had a positive effect on the phosphorus, less of which was released into the runoff compared to 2002.

Another factor affecting the water quality in Lake Agmon was the vegetation biomass in the lake. The people who conducted the monitoring process measured the biomass, its composition and characteristics. The found, for example, that some species, such as Brittle Waternymph, London Pondweed and thread algae disappear completely in some seasons, as a result of which all the plant material in the water decomposes. The Lesser Bulrush also decomposes and decays, and in general, there is extensive turnover of plant biomass. The process peaks in summer, so that in 2001 for example, 740 tons of biomass were measured, most of which was composed of Lesser Bulrush and Brittle Waternymph. The effect of the existing and shifting biomass on water quality can be significant, as the plants function as a sort of nutrient pump, pumping nutrients from the bottom and back into the water as dissolved material. Floating annual vascular plants and thread algae are the organisms that return most of the nutrients to the water. Rooted vascular plants, on the other hand, remain in the water as partially decomposed organic matter, which is the basis for renewing the peat. The recommendation for coping with the negative impact the plant biomass had on the water quality was to cut and remove the plant species that added large amounts of nutrients to the water.

In 1977, the studies conducted during the establishment of the Hula Restoration project ended. The conclusion of this period of intensive research brought with it a feeling of pride for the results that were obtained within such a short period. From this year onward, KKL-JNF began monitoring the peatlands together with the Water Authority and the farmers. The monitoring project had several purposes: to evaluate the ecological components of the projects, such as vegetation and birds, to ensure the ecological functioning of Lake Agmon and the tourist zone around it, in a manner that would not interfere with agriculture, and to evaluate the effect of the project on the nutrient load on Lake Kinneret. The monitoring, which continues, includes elements such as measuring water discharge, sampling water for chemical analysis, seasonal ecological surveys of plants, spatial data gathering by mapping, bird and wildlife censuses, and aerial photography to monitor changes on the lake bottom, the level of the peatlands and the like.

In order to protect Lake Kinneret and the agricultural fields, it was necessary to maintain the principal and secondary canals constantly, as they provide favorable habitats for plants that interfere with and retard water flow in the canals, and pose a risk for contaminating fields. Removing the vegetation from the canals could be done mechanically (mowing and cutting), chemically (spraying herbicides), biologically (introducing natural enemies) and ecologically (encouraging preferred plant species to displace unwanted plant species). The main method used in the project area was mowing, done five times a year along the canal banks, in the canals and in Lake Agmon, by various mechanical means. Despite the expense involved, it is still the preferred method because it produces immediate results and there is no fear of damage from pesticides that can reach the water, and most of the plants are collected and thus do not decompose in the water. Nevertheless, the ecological method of treatment
was also integrated by encouraging the growth of Bermuda grass, after it was found to contribute to stabilizing the canal walls.

Efi Naim who is responsible for project maintenance on behalf of KKL-JNF, tries to coordinate with the farmers and help whenever possible. Thus, he returns the soil collected from cleaning the sediment to the cultivated fields wherever the farmers need it. At first, the canals were maintained to preserve water quality in Lake Kinneret and to benefit agriculture, with no special concern for the surrounding ecosystem. At a certain point the workers became aware of the fact that the vegetation they were mowing included unique species and plants that served as nesting sites for birds. Gradually Efi understood the need to implement adaptive management, which is not necessarily identical for all the canals. In the main canals, maintenance was done mostly according to the requirements of agricultural irrigation. However, in some of the other canals, which were not essential for field irrigation, such as the water-level canals, the vegetation was mowed in winter in order to prevent harm to nesting birds. In other words, there was a transition from routine management, to management that also considered canal function from an ecological perspective. Efi described his work, which tried to benefit water and soil resources as well as meeting the needs of the farmers and considering the environment as “walking a tightrope” (walking between the drops in Hebrew). In this case, it would probably be more appropriate to describe it as an attempt to connect the drops, in the spirit of the Hula Restoration Project, which has many purposes, although Lake Kinneret and agriculture head the list.

Disagreement regarding the factors responsible for the lack of success in rehabilitating Lake Kinneret

As mentioned above, from the mid-1990s, the Kinneret ecosystem began changing, and one of the more obvious changes was the increase in cyanobacteria and the decrease in the algae *Peridinium*. Some of the experts believed that the changes brought about by the project caused the changes in the Kinneret ecosystem, and others explained it otherwise. Professor Moshe Gophen is one of the scientists that claim there is a causal relation between the changes. He believes that the changes in the algae population were due to changes in the nitrogen-phosphorus ratio (N: P ratio) in the Lake Kinneret water. According to this hypothesis, when there is less nitrogen relative to phosphorus, the cyanobacteria, which are capable of fixing atmospheric nitrogen, have an advantage over algae that require mineral nitrogen from the water. Most cyanobacteria can fix molecular nitrogen and can therefore compete more successfully than algae that lack this ability. The Hula Restoration Project reduced the amount of nitrogen entering Lake Kinneret, and was therefore, responsible for the change. The solution to the problem is to modify the Lake Agmon management, to increase nitrogen outflow and reduce phosphorus outflow. Dan Levanon, who worked with Gophen, humorously summed up the situation by saying, “they were too successful, because some nitrogen nevertheless has to reach the Kinneret”.

Gophen proposed modifying the water flow into Lake Kinneret. Instead of the water flowing from Lake Agmon, which adds phosphorus to the water, the water to Lake Kinneret should come from canal G that carries runoff to Lake Agmon, in which there is an inverse relation between nitrogen and phosphorus, (more nitrogen and less phosphorus). This solution would still not create much...
of a change, since according to Gophen, the calculations, which were based on the concept that peat soil contributed about 40% of the nitrates that reached Lake Kinneret were exaggerated. In his opinion, one of the significant discoveries of the project was that the Lake Agmon system only marginally prevents flow of nutrients into Lake Kinneret, merely about 5% according to the surface runoff monitoring. In addition to surface runoff, it was discovered that there is also underground runoff of pollutants that circumvent the separator, but there is still insufficient data about it. Gophen emphasized that the planners and scientists should not be blamed because their solution was ideal for the situation that existed previously. Since then the Kinneret changed, as has the way it is used as a water source, because of the increase in desalination.

Dr. Tamar Zohary, a senior research scientist at the Kinneret Limnological Laboratory, on the other hand, believes that the factor modifying the Lake Kinneret ecosystem is not related to the Hula Restoration Project, but to the sharp changes in the level of Lake Kinneret. The lake is adapted to coping with level changes of one or two meters, however, since the late 1990s, there have been water level changes of up to six meters. Strangely, the extreme rises in the water level, after a series of years with low water levels, which pleased the people involved in Israel’s water economy, seems to have disturbed the ecological stability of the lake. The bream population increased, zooplankton decreased and this may have been the reason for the growth of the cyanobacteria population. Dr. Yoram Avnimelech and Dr. Ami Nesher claim, that there are still no significant data regarding the change in the nitrogen and phosphorus concentrations and their ratio in the Kinneret since the completion of the Hula project. Moreover, even if it is true that there have been changes in the nitrogen-phosphorus ratio, Gophen’s theory can only explain the increase of cyanobacteria that reproduce in early summer when the level of mineral nitrogen is almost zero. However, it cannot explain why the Peridinium bloom, which occurs in winter, when there is nitrogen in the water that is brought in by rain and floods, disappeared almost completely. Therefore, they suggest looking for additional factors to explain the changes. Thus, it is possible that the dust, which is transported to Lake Kinneret by the wind, whose prevention was one of the goals of the project, contained organic matter that affected biological processes in Lake Kinneret, or possibly global climate changes contributed to the changes as well. The major difference in the situation before the rehabilitation project and the situation today, is that the system is managed and it is possible to regulate its components. Water from Lake Agmon may either be carried to Lake Kinneret through the Agmon or not, according to expert’s opinion that have to decide how to rehabilitate Lake Kinneret. One of the obvious advantages of the Hula Restoration Project is that it was planned as a controlled engineering system that allows for operational flexibility.

For exactly this reason, Dr. Doron Markel, who is responsible for operating the Hula and the Kinneret watershed in the Water Authority, is, in a manner of speaking, trying to turn the clock back. Since 2008, Lake Agmon has been managed differently in light of the data from the scientists studying Lake Kinneret, which supports the claim that preventing the flow of peat water to Lake Kinneret has a negative effect to some extent. In winter, when the peat discharges nitrogen and organic matters into Lake Agmon, the zero canal is closed, and water from Lake Agmon is diverted via canal 312 to the Jordan River and Lake Kinneret. In the summer, when the nitrogen concentration decreases and phosphorus concentration increases, the water from Lake Agmon flows in the zero canal to the Enan
Reservoir and to be used for irrigation in the Ayun-Zemer plant. In this manner, Lake Kinneret receives the nitrogen and organic materials required for the *Peridinium*, while in summer, the phosphorus, which could boost the cyanobacteria bloom, is diverted. This action has already improved the nitrogen-phosphorus ratio that reaches Lake Kinneret and helps preserve the balance in the lake, despite the drastic decrease in the amount of water flowing into the lake during the last decade. Markel believes that the combination of the “intelligent operation” of the peat system and Lake Agmon since 2008, together with the renewed increase in the amount of water entering Lake Kinneret (which if it will not happen naturally, would probably be done artificially by introducing desalinated water from the system into Lake Kinneret), will eventually stabilize the Lake Kinneret ecosystem.

In conclusion, according to all the data available now, although the management of the Lake Kinneret watershed in the Hula Valley is successful, the lake is still "ill" and the underlying reasons are complex. Hydrologically the project succeeded beyond all expectations. The groundwater level in the peatlands is stable, the soil erosion process has stopped, and the uncontrolled polluting water flow from the peatlands into Lake Kinneret was stopped by engineering means and is today managed intelligently, so that in winter the "good drops" flow into Lake Kinneret and in summer "bad drops" are kept out of it. Unlike Lake Kinneret that benefitted only marginally from the rehabilitation of the peatlands and today is in need mainly of more water, Lake Agmon, the artificial wetland created by engineering means, was surprisingly successful in restoring plants and wildlife to the region.

C. A drop for nature conservation

The Hula Valley Rehabilitation Plan had three main goals that included preserving three resources: water, soil and the environment. However, the details of the goals related mainly to preventing damage such as polluting Lake Kinneret, peat fires, weeds, wind erosion and the like. The objective of restoring the ecosystem that existed in the Hula Marshes before the drainage, was vague from the start, and it was not clear how, if and to what extent it could be attained. The water body before the drainage covered an extensive area, very heterogeneous as far as the depth and quality of the water were concerned, which was the basis for a diverse plant and animal ecosystem. The drainage destroyed the environment that supported this unique botanical and zoological system. The Hula Nature Reserve is small, was established in an unsuitable location and failed in its attempt to fully preserve the habitats that existed previously.

When Giora Shaham deliberated how to restore the natural system, he consulted with Dan Perry, Director General of Nature Reserves Authority. Perry explained that there was no need to build natural system, but that instead he should create an environment that would recreate the previous living conditions, so that the plants, the birds and other animals would return on their own. According to him, the basic elements that had to be recreated were the water regime and quality. In other words, as soon as the project would create a topographic depression continuously filled with water, supplied with clean water from the Jordan River on a regular basis, instead of polluted fishpond water, nature would be restored completely. Dan Perry willingly agreed to be part of the steering and planning committee of the restoration project, which he considered an addition to the Hula Reserve and not as a competing venture.
The ecological restoration of the peatlands in the Hula Project that was implemented in what were once the Hula marshes could not completely recreate the heterogeneous habitat conditions that prevailed in the past. The re-flooded area receives mainly water from the Jordan tributaries, whereas floodwater is supposed to be diverted to the eastern canal and does not flow into the flooded area as it had in the past. There is also no hydraulic connection between the flooded area and the springs on the eastern and western banks of the Hula Valley, as there was in the past. Thus, for example, the Malha (Enan) spring that was an important water source for the historic Hula marshes is today controlled by the Mekorot Water Company that pumps drinking water from it to adjacent communities. Moreover, in the re-flooded area the habitat composed of clear ponds, described by historian Yosef Breslavski as the most scenic highlight of the historic marshes, no longer exists. The chemical composition of the water in Lake Agmon is also completely different from that of the historic marshes, which had been controlled mainly by the Jordan River. The chemical composition of the water now is determined mainly by bio-geochemical processes, most of which are a result of peat oxidation during the drainage period. Thus, in the upper peat layer, the concentration of organic matter is lower, and the concentration of gypsum and iron oxides higher, than it was before the drainage.

Despite the different initial circumstances, many of the plant species that once populated the area were successfully reintroduced. These include the Yellow Iris, the White Water Lily, the Yellow Pond Lily, and the Nile Papyrus, which had been the symbol of the marshes, and was of major importance not just as a species but also as a habitat for birds. In 1994, some 7,000 papyrus seedlings were planted around Lake Agmon. The saplings were prepared at the KKL-JNF nurseries from seeds collected from the Hula Nature Reserve, and were planted by KKL-JNF workers together with schoolchildren from the region. The seedlings became established, but they faced strong competition from the common reeds, and in order to prevent the reeds from completely dominating the vegetation there was need of occasional mowing to control their growth. An additional recommendation was to plant the Nile Papyrus in large continuous blocks and thus to reduce competition with the reeds. Another marsh species that initially developed abundantly in the water was the Lesser Bulrush, whose stands collapsed for some unknown reason in 1996.

Restoring vegetation in the re-flooded area was particularly important, as plants are primary producers in the ecosystem, and will thus essentially determine the animal diversity at a later stage. Dr. Didi Kaplan from the INPA, who monitored the vegetation at Lake Agmon, noted that within a year of the re-flooding, six species of pondweed, which had not been seen in a long time, re-appeared in the area. One concern was, that in the new water body, problems similar to those found in the reserve, such as invasive species and Common Reed domination, would crop up. The INPA suggested implementing the conclusions from the reserve in the management of the flooded area. One of the initial recommendations was to create moderate slopes at the edge of the lake to allow a variety of habitats to become established. However, the Pest Control Division agreed to the project only on condition that the banks be steep, to prevent them becoming a habitat for Anopheles mosquitoes that could carry malaria. Therefore, this recommendation was not implemented. According to Kaplan, the waves in Lake Agmon that are formed by the wind, would have in any case have made the banks steep, even if they had started out with moderate slopes, therefore there is no cause for regret. Today, we know that Anopheles mosquitoes have not returned to breed in the Hula, and there are again thoughts of creating stable moderately sloped banks, to allow for greater habitat variety.
Lake Agmon was not just intended to recreate the previous habitat, as had been attempted in the Hula Reserve, but also to be a tourist attraction, which would provide revenues for the farmers who contributed their agricultural land to the project. The project proponents believed that introducing exotic wildlife to the site would attract visitors. The project management financed studies conducted by the INPA to examine the possibility of acclimating animals such as water buffalo, donkeys, roe deer and fallow deer, Cretan goats, zebras and wildebeest in Lake Agmon and the carrying capacity of the site. In other words, how many of these animals could be introduced without affecting the green cover. Talia Oron, the biologist of the Hula Reserve, concluded from the study that it would be possible to establish a commercial safari model inhabited by attractive animals from the tourism aspect. The name suggested for the model was “Hai-Hula” (Hula wildlife in Hebrew) and it was supposed to include some 25 species.

The project planners knew that the restored site would attract many visitors, so they wanted to create shady areas, but were unsure if trees could be grown at Lake Agmon and if so, which species. One of the ideas to overcome the problem of tree stability in peat soil was to replace the soil, or as it was termed to create “soil planters”. The 2x2-meter “planters” were excavated to a depth of 1.5 meters by the excavators working on Lake Agmon and the canals. The peat in the planters was replaced with alluvial soil from the restored Jordan River channel. The researchers recommended growing willow, plane, ash, fig, Black Mulberry, European Hackberry and Field Elm in the planters. At first exotic tree species, suited to the Hula conditions, were also planted and an arboretum was established to examine the suitability of different species. However, when the Hula Master Plan was prepared it was decided to plant only native species, characteristic of streams and moist habitats.

The botanical garden at Lake Agmon.
Photo: Omri Bonneh, KKL-JNF.
Another reason for attempting to plant trees was to diversify the environment, as trees are used by some bird species for nesting, perching and roosting, and trees were planted along some of the streams for this purpose. In addition, they were used to create windbreaks to cope with the strong easterly winds that eroded the soil. A single tree can thus, fulfill many functions, providing shade for birders, nesting sites for birds and protection for agricultural soil.

At a later stage, KKL-JNF developed a botanical garden at the entrance to Lake Agmon. Ezra Yas’ur, a member of Kibbutz Malkiyah, was the driving force behind the initiative. He began his work as the agricultural coordinator, whose job it was to inform the farmers about the changes to be made as part of the project. Yas’ur was a self-taught man and his involvement with the restored nature at Lake Agmon made him want to understand the ecosystem and restore vegetation from the past. The botanical garden extends over 3 hectares and includes close to 90 plant species. Its purpose is to preserve what existed in the past for future generations, as well as to provide visitors with the opportunity to become acquainted with the plants that they would probably see along the way. Another objective of the garden was to serve as an educational tool. The botanical garden includes study ponds in which processes of plant development and adaptation can be seen, studies and observations can be conducted and the like.

The research and monitoring system implemented by KKL-JNF in the project assumed that excavating Lake Agmon in the peatlands and bringing in clean water to flow in the restored Jordan River would create, in a short time, a beautiful landscape of water and plants that would provide a habitat for diverse birds to forage, nest, rest and roost. As early as 1995 a breeding colony of different heron species

The arboretum.
Photo: Omri Bonneh, KKL-JNF.
developed in the southern section of the lake. The herons used the bulrush leaves as a substrate on which they built their nests in a dense cluster. The excitement of this sight encouraged thoughts of creating comfortable observation points for visitors, which would not disturb the nesting birds. Dr. Eyal Shy, who was responsible for the bird restoration survey, considered the establishment of this colony of water birds one of the most important events since the re-flooding. However, in the summer of 1996 the Lesser Bulrush mass, which comprised the unique heron habitat in the southern part of the lake, collapsed. In addition, in time, as had happened before in the Hula Reserve, the catfish and carps, which can reach weights of several kilograms, overcame the other fish species. This reduced the heron population that feeds on small fish, which weigh 200 grams at the most.

The return of the birds to the Hula Valley is undoubtedly the most impressive success in the process of creating new habitats in Lake Agmon. In surveys conducted in 1994, over 160 bird species were seen, 35 of which were breeding species. The crowning glory was the arrival of the cranes that became the major tourist attraction and the symbol of Lake Agmon, and to whom we will dedicate a chapter in this book. It is important to note that there were no cranes in the Hula Valley before the drainage or before the re-flooding; consequently the restoration plans did not include them in the tourism development program. Instead, alternative attractions, such as the wildlife safari, a village on poles in the water, boat rides and other ideas that would set Lake Agmon apart from the Hula Reserve were evaluated. In 1996, only two years after Lake Agmon was created there were already 15,000 cranes, 8,000 cormorants and some 10,000 mallards that gathered to roost in the water and its nearby surroundings.

Although restoring the vegetation had been rapid, for some of the species success was short-lived because of the rapid succession process that occurred in Lake Agmon after the re-flooding, unlike
natural succession that usually is more gradual. As a result, plant species appeared and disappeared once again, whether because of the activity of nutrias and competition with aggressive vegetation such as common reeds, Stranglevine and the like, or because of changes in the chemical composition of the water. The species that became more dominant in this process were mainly London Pondweed, Lesser Bulrush, Holly-leaved Naiad, Brittle Waternymph and Hornwort. The Nile Papyrus, which was planted on the shores of Lake Agmon and along the canals, developed only a bit and until 2004 did not penetrate the water body. The number of bird species is still rising despite the changes in the vegetation composition. There are now 300 species of resident, wintering and migrant species in the Hula, up from 160 at the beginning of the project. Of all the species observed in the Hula, 66 are endangered. Some returned on a regular basis, such as the Imperial Eagle, the Spotted Eagle and the Pallid Harrier. Other species, which had almost completely disappeared from the Hula Valley, such as the Collared Pratincole and the Yellow Wagtail have also returned.

At the time Lake Agmon was planned, the normal surface water level was 62.50 m above sea level and could rise to 62.70 m at the most. Water level management is controlled by the Water Authority and KKL-JNF, based on hydrological and agricultural considerations. The KKL-JNF staff, headed by Efi Naim, lowers the water level in winter and drain the agricultural areas; in summer, the workers raise the levels to allow water to infiltrate the agricultural areas and elevate the groundwater table. Yas’ur, originally a farmer, terms this a “management anomaly”, because in nature, the process is exactly opposite — the water level rises in winter and descends in summer. In 1997, following a recommendation by Doron Markel, the Lake Agmon water level was lowered to from 62.50 m to 62.20–62.30 m, in order to improve water quality and prevent inundation of agricultural lands north of the lake. This difference, which seems small and trivial, is extremely significant for the cranes that

Eurasian Wigeon (*Anas Penelope*) and a Eurasian Coot (*Fulica atra*).
Photo: Yossi Eshbol.
Cranes in Lake Agmon.
Photo: Yossi Eshbol.
came to the lake at night for protection from predators. Until the level was reduced, they roosted in the Hula Reserve, because Lake Agmon was too deep. Lowering the water level allowed them to stand in the shallow water and roost there without being threatened by predation. Thus, Lake Agmon unintentionally became a night refuge for the cranes and the sight of thousands of cranes flying together from their foraging grounds to their roost in Lake Agmon is an amazingly beautiful sight.

In order to foster suitable habitats for wader foraging and breeding, the summer water level in Lake Agmon had to be even lower. However, as noted earlier, maintenance considerations required the water level in summer be raised for farming, which could flood nests. Some of the moving sprinkler systems get their water from Lake Agmon. When the irrigation is stopped, there is sometimes surplus water that flows into the lake and raises the water level. This conflict is supposed to be solved by complete separation between the system for maintaining the water level required for irrigation and the system required for maintaining the optimal water level for birds, particularly waders.

Moshe Gophen, the limnologist who heads the Hula Committee, the expert committee that supervises the implementation of the management plan for the agricultural areas in the master plan for the Hula lands (8923/gimel), developed the approach of separating the water level management programs for agriculture and for ecology in the committee. He believes that this example shows that the fact that the Hula Peatlands Restoration Project was defined as a multipurpose plan, created dynamics between the participants who came from different disciplines that led to changes in attitudes and even to finding creative solutions.

One of the species that was rehabilitated when Lake Agmon was created was the Marbled Duck (*Marmaronetta angustirostris*) that breeds mainly around the Mediterranean Sea. Over the last decades, its populations have declined sharply and rapidly throughout its range. Most of the habitats in which it
once flourished have been destroyed and it is classified as an endangered species. In Israel, it breeds only in the north, mainly in the Hula Valley, but in the Yizre'el Valley as well. The Marbled Duck nests in shallow water and is extremely sensitive to sharp rises in the water level, both because of nest flooding and because its ability to forage is reduced in deep water. Until the Hula was drained, there was a large breeding population in Israel that comprised hundreds of pairs. After the drainage, the population decreased sharply and only a few dozen pairs remained. Since 2003, the population has stabilized and even increased somewhat. In 2013, for example, six Marbled Duck families were seen in the Hula Reserve and two in Lake Agmon, which were closely monitored due to their rarity. Generally they are found in mixed flocks with other duck species that are not protected and can be hunted, which exposes them to the risk of hunting, whether accidental or not. Thus, it is important to preserve a uniform, shallow water level in April-June and prevent human disturbance at their nesting sites.

The Jungle Cat is the most common carnivore in Lake Agmon area, and apparently feeds on voles, nutria cubs and occasionally on a careless crane. Other predators include foxes and jackals. Mammals are sampled at night, from vehicles, along five regular transects, using a spotlight to identify the animals and GPS to record the location. Martens are surveyed by checking ten spots, with spoor as a sign of activity at the site. Nutrias are surveyed by counting individuals along regular sites. All the observations are conducted four times a year. Nevertheless, most of the research effort in the Hula Restoration Project is invested studying and monitoring bird populations. All the birds are counted, some are ringed (banded) and some rare species, such as the Marbled Duck, are tracked individually. The national waterbird census is held annually, every January, since 1965. During the census, teams are spread around the various water sources to record the species observed, and the numbers of each species. The waterbird census is conducted at the same time in all the aquatic habitats in Israel and is coordinated with similar censuses conducted in Europe and Asia. Raptors are counted from vehicles,
along a regular route in the valley, every few years. Bird ringing (banding) provides information on various passerine species, most of which cannot be surveyed effectively by other methods, as they hide in thickets. It also contributes to monitoring breeding birds. Three ringing sites, closed to the public, have been selected in the valley, two in the Lake Agmon area and one in the Hula Reserve.

Attempts were made to build nesting walls for European Bee-eaters, a colorful bird that summers in Israel and feeds on bees and other insects. When the head of the Israel Honey Association, Herzl Avidor, heard about the plan he protested strongly. He described the damage that bee-eaters do to beehives when large flocks hunt the bees in flight as they leave the hive. Occasionally they succeed in hunting young queens in their nuptial flight, which eliminates the hive. Avidor wrote to Yael Shealtiel, the director-general of KKL-JNF, saying that they had expected KKL-JNF to support agriculture and not increase damages. This is just one example of the complexities of developing an ecological site, involved in restoring plants and animals, surrounded by farmers trying to make a living. The situation is not simple and creates conflicts, of which we will hear more subsequently.

One of the major issues that concerned the people involved in implementing the restoration plan was that as time went by, the lake became blocked, and grew constantly shallower. This occurred because the lake bottom rose as a result of sediment and plant material that accumulated. Since the lake became operational in 1994 it lost 60% of its impoundment capacity, and every year the bottom rises by an average of 0.4 cm. The water surface area has also decreased from about 100 hectares at the time Lake Agmon became operational to about 90 hectares in 2007. This process, however, did not lead to the complete drying of Lake Agmon, but to its gradual conversion from a shallow lake to a marsh. Avri Kadmon, who coordinated the information systems in the peatland rehabilitation project for KKL-JNF, and Ezra Yas’ur, tried to understand what was the main factor causing this process. According to their findings, the main reason for blockage in Lake Agmon is the decomposition of the vegetation growing along the banks or in the shallow areas, and not the sediment carried into the lake by the water flowing into it.

As time went by, riverine vegetation such as reeds, bulrushes, Creeping Ludwigia and other plants, grew on the islands, shoals and in the shallow water, and trapped sediment in their roots, but also decomposed on the lake bottom and contributed additional organic matter to the sediment on the bottom. Floating water plants, such as London Pondweed and Soft Hornwort also added to the accumulation of sediments. Seeing as some of the plants germinated on the shallow bottom, the bottom around the islands began to rise, as did the islands, causing entire portions of Lake Agmon to dry up. Monitoring from 2007 onwards found that on average, 5,000 cubic meters of sediment is added to the lake every year. According to Doron Markel, water bodies in other parts of the world stabilize, even though they too fill with sediment. He believes that the 1996 decision to preserve a shallower water level in Lake Agmon was responsible for the conversion of the water body from a lake to a marsh.

In addition to the blockage of Lake Agmon, it became clear that the species richness of plants and animals in the lake area was declining compared to the initial stage of the restoration project. The ecosystem services in the Lake Agmon area are decreasing for many reasons, such as the lack of diversity of the water body, which has led to domination of predatory fish, for instance catfish. Therefore, some of the plans for the future include creating thermal traps adjacent to springs whose
Purple Heron (*Ardea purpurea*)
Photo: Yossi Eshbol.
water temperature is higher than that of Lake Agmon to attract Catfish in wintertime and reduce the predatory fish population. Another reason is the large number of cranes gathering in a relatively small space, whose numbers are constantly growing, mainly thanks to the feeding activity and the conditions that protect them from predators during the night. There is concern that if the lake will continue to become shallower the cranes will no longer roost there and the number of tourists will decrease. The assumption of most of the people responsible for operating Lake Agmon is that the state of the lake is not as it should be, but there are disagreements regarding the best method to deal with the situation.

One possible solution to the situation is removing the sediments from the bottom of the lake with mechanical engineering equipment. In other words, just as Lake Agmon was created artificially it should continue to be managed. However, this would require stopping all activity in the close vicinity of the lake for three to four months. If it is decided to deepen the lake, it must be understood that these excavations might have to be repeated every 20–30 years, and would involve expenses and damage to nature. Hanan Dimentman, whose specialty is invertebrates, believes that introducing heavy mechanical equipment into Lake Agmon again, would convert the site into a reservoir and not a marsh. Ecologist Didi Kaplan, on the other hand, supports artificial excavation, but only in a small section of Lake Agmon, to a depth of two meters, in order to add a lake habitat to the project. He believes that there should be no intervention in the remaining area, and it should be left as a shallow marsh habitat. The alternative of not introducing heavy mechanical equipment will still require a plan for controlling the elevation of the lake bottom so that the water level in Lake Agmon can be maintained, even if shallow.

The ecological restoration undoubtedly succeeded beyond all expectations, because beyond the technical actions of excavating Lake Agmon and conveying water from the Jordan River into it, it was
not clear what the water quality would be, or which plants and animals would return. In other words, unlike the rehabilitation of Lake Kinneret, whose purpose was to reduce pollutants and the means of fulfilling that purpose were clearer, the ecological restoration raised many questions. However, by creating the habitats and transferring water from the Jordan River to the lake, nature restored itself with minimal intervention. Moreover, the cranes changed their migration behavior, for reasons we will discuss later, filled the lake and became the symbol of the project and its main attraction, which nobody had predicted. There is no doubt that the presence of a variety of birds is the most prominent success of the ecological restoration. Proof of this success is the fact that the Beautiful Israel Council awarded the “Beautiful Israel Achiever Award” to the Hula Restoration Project in 2002. Shaham, who headed the project, was selected in 2012 to light a beacon in the Independence Day ceremony that focused on “Water — a Source of Life” that year, thanks to his work in leading the project to re-flood the Hula lands and create Lake Agmon.

As noted above Lake Agmon is being blocked and there is still no decision on how to cope with the matter. Nevertheless, the fact that all the stakeholders involved in the project, including farmers and the public, are concerned about the issue, is an indication of the change that has occurred in the way people regard wetlands, and the plant and wildlife inhabiting them. After the Hula was drained, when the soil subsidence increased from year to year, attempts were made to slow down the process, out of concern that the land would be flooded and the marshes would return. Now, however, after part of the marsh has been intentionally flooded, there is concern for the fate of the marsh. The mere definition of the project as multi-purpose created dynamics between the various stakeholders that occasionally led to a conceptual change and greater sensitivity to nature. One of the main objectives of the project was to enable the farmers to make a decent living off their land, and from the stakeholder perspective, this was the main indicator for the success of the project.
D. A Drop for the Farmers

Both nature lovers and the people concerned for the Lake Kinneret water quality could only benefit from the Hula Restoration Project. The only ones that had something to lose were the farmers who were required to contribute some of their farming lands for developing Lake Agmon and the tourist ventures related to it, and for building the canals and the roads in the area. For some of the farmers, particularly the veteran ones, the mere idea of converting farming land into a tourist venture was heresy. Yisrael Levine, and agricultural expert from Kibbutz Kfar Giladi, represented the rather simplistic conception that the only fitting use for land was farming: “What did we come to Israel for — to preserve its wild beauty, its birds and plants, or to live of the fruits of its land?” He opposed the idea of tourist development both rationally, claiming that it would involve financial risk and that it is possible to farm the peatlands profitably, but also because he shunned the mere idea that people would come to enjoy the scenery instead of living on the land and living off it. He considered himself part of the founding generation that established the State of Israel, for whom farming was the true realization of Zionism: “Cultivating the soil of our homeland is the justification for our existence here, and the essence of continuing the tradition of the existence of the Jewish People in the Land of Israel”. In the 1950s, this was the mainstream approach and draining the Hula was its ultimate achievement. However, in the late 1980s it was merely a faint echo, as current environmental and Zionist perceptions are far more complex.

Unlike Levine, Dr. Haim Zaban, who headed the KKL-JNF Land Development Authority, at the time the feasibility of flooding the peatlands was evaluated, believed that the discussion regarding the future of the Hula Valley should be liberated from the burden of Zionism. He believed that Zionism meant the return of the people to their land, and was not concerned with what exactly they would do on that piece of land. Thus, if KKL-JNF changed nature, it could also change the modifications it had made. In his opinion, there was no difference between the two. The discussion should be practical and focus on the issue of whether the value of the land, its quality and resources, would increase if it would be re-flooded. If the answer is positive, then re-flooding the land is no different from any other development activity in which humans intervene in the environment to increase its value. As the awareness of the importance of leisure and recreation as a source of revenue, from both local and foreign tourists, has increased, and as the difficulties in cultivating the peatlands became even more evident, the answer became simpler. Morally, according to Zaban, Israel may have overstepped a boundary by exploiting so many water sources for practical purposes at the expense of most of the aquatic landscapes in the country. From this perspective, re-flooding the peatlands is a type of reparation for nature.

Farming is a major economic branch in the Hula Valley. There are 12,000 hectares of agricultural land, of which 7,000 are used for field crops and the remainder for orchards. The area of the Hula Restoration Project was estimated at about 3,570 hectares, of which 80% are cultivated by about 20 kibbutzim and by the “Nahalat HaMoshavim” association, which includes 15 moshavim. The water body extends over 110 hectares and the area of the tourist zone surrounding it is about 450 hectares. Most of the lands allocated for developing tourist projects belong to “Nahalat HaMoshavim” and the minority to the kibbutzim Snir, Yir’on and Bar'am.
One of the major elements of the agricultural rehabilitation program was the transition to moving sprinkler systems that would ensure continuous wetting of the upper soil layers. The advantage of these systems was their ability to spray small, precise amounts of water over the entire area, at high frequencies, to preserve moisture for long periods. This method prevents desiccation damage to the plants and reduces the occurrence of dust storms. The government understood the importance of this factor and agreed to finance 40% of the purchase cost of the moving sprinkler systems, their installation and the adaptation of the water system to the sprinklers. This agreement allowed KKL-JNF to reach an arrangement with the farmers, that in exchange for help with the purchase, they agree to preserve a high water table, to ensure that their plots are covered with vegetation most of the year and to implement surface irrigation by means of moving sprinkler systems. They would also be responsible for regular maintenance of the drainage canals and hydraulic systems needed for preserving the water level that were in the boundaries of their plots. The farmers were also required to sign an agreement to implement environmentally friendly agricultural management, mainly in the field of pest control and to participate in the new management system of the project land. Giora Shaham termed this commitment “accepting the burden of the Hula torah and its commandments”. According to Yas'ur, who coordinated the project with the kibbutzim, introducing the moving sprinkler systems facilitated his task of convincing the farmers to accept the project. The farming communities purchased 25 moving sprinkler systems, most of which receive piped water directly and some of which receive water pumped from the drainage canals.

The assortment of farmed crops changed significantly compared to previous years and their composition was diversified. Cotton was no longer part of the landscape because of its high irrigation
requirements, the decrease in profitability and the intensive pesticide regime it required, which negatively affected the environment. Instead, field crops such as peanuts, corn, potatoes, carrots, garlic and sweet potatoes, are cultivated, in a manner that increases profits from agriculture in the area. Orchards are less suited for growing in peat soil because of its instability, and therefore they are spread around the margins. Wheat comprises 65% of the winter crops. The land can usually be cultivated throughout the year and about 90% of area is double-cropped. One of the crops that was successful in attracting the cranes was peanuts. A study that was conducted found that peanuts in the Hula peatlands produce higher yields than in other soils in Israel.

The fires that were one of the most serious problems in the peatlands, have ceased since the new crop management system was implemented, including crop rotation, mowing vegetation throughout most of the year, irrigation with moving sprinkler systems and maintaining a high water table with the help of water-level canals. The transport of peat grains by the strong easterly winds (sharkiyas) coming down from the Golan Heights, particularly in transitional seasons (spring and fall) also decreased. In the past, these winds caused great damage to crops that had just been sown and caused soil subsidence, because when the peat soil was dry, large quantities of peat grains flew in the wind over great distances. Now that the soil is kept moist, the grains are heavier and fly less in the wind. Previously dust carried in the wind was so severe, that Yossi Shreiber, the project engineer, remembers how when they dug canals in the peat soil the easterly winds prevented them from seeing ten meters ahead and within two days everything they had dug would be filled again with peat soil. In general, the farmers implement the recommendations of the agricultural research conducted in the peatlands and use recommended crop varieties. The pest control regime is also implemented according to the results of relevant research.

One of the problems in the peat soil before the restoration project was the presence of voles, which severely damaged crops, particularly alfalfa. The voles spend the day in underground burrows and are active at night when they feed on the vegetation around their burrows. Their populations multiply rapidly (60 young annually) and their density can reach thousands of individuals per hectare. The voles eat sprouts and roots, creating clearings around their burrows and damaging crop yields and quality by eating the fruits (corn kernels, wheat, and the like). The damage to field crops can reach a magnitude of one tenth of the yields or more. The voles favor the peat soil as it is easy to burrow in and the soil temperature is favorable in winter too. The natural enemies of voles include predatory mammals, snakes, raptors and other birds. In the 1960s, attempts were made to eradicate the voles with pesticides. The mass poisonings led to secondary poisoning in birds of prey, the natural enemies of the voles. Consequently, the predator populations decreased significantly and the balance between the vole populations and those of their predators was disturbed for many years, because of the differences in reproductive rates. In addition to the harm caused to birds of prey there was concern that the runoff would carry the pesticides to Lake Kinneret, so that some of the farmers were required to reduce the amount of pesticides they applied. Pesticides and herbicides not only affect Israel’s nature and water quality; they are also expensive. From the perspective of the farmers, a solution to the vole problem that would be more effective, environmentally friendly and cost less, would be preferable.

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4 Multiple cropping is a form of agriculture in which two or more crops are grown at the same time or in a sequence.
Biological pest control, using barn owls, was one of the solutions adopted at Lake Agmon to reduce the vole population. Studies have shown that a pair of barn owls or kestrels can consume about 2,000 voles a year. To encourage barn owl breeding, dozens of nest boxes have been put up in the Lake Agmon area. Biological pest control of voles using barn owls was first tried in Israel in the Bet She'an Valley in the 1980s. At first, the ornithologists Yossi Leshem and Heinrich Mendelsssohn acclimated barn owl pairs in captivity and released them in the fields, but in time, they found that it is sufficient to set up empty nest boxes, which the barn owls will populate. The moving sprinkler systems were also recruited for the task, because they are used to flood the vole burrows, which makes it easier for the raptors perched on the sprinklers to catch them. Some of the farmers modified the sprinkler system to dripping, which allows larger amounts of water to be discharged, and thus cope more effectively with the voles. One of the disadvantages of this method is that it is intended to regulate and prevent the vole population from growing, but not to completely eradicate the voles, because then the barn owls would not have what to eat. The pest-control method used in the field is integrated pest management that combines chemical pesticides, biological pest control and agro-technical pest control by means of the sprinklers.

As part of the deliberations regarding how to implement long-term protection of the agricultural land and Lake Kinneret, a unique covenant was established between the government and the farmers, the “peat covenant”. This covenant complements the project from the perspective of soil preservation by agricultural cultivation and ensuring the livelihood of the landowners. The covenant was signed in 2007, after extensive negotiations between the landowners, the Upper Galilee Regional Council, the Upper Galilee Agricultural Company and the Water Authority. It stipulates that the farmers must cultivate the lands most of the year, use the sprinkler systems solely for irrigating the peat soil and commit to allotting 3000 cubic meters of water per hectare. The government, on its part, will allot an identical amount of water in dry years and a larger amount in rainy years. The government will also significantly reduce the water production tax. The farmers will not be permitted to move water from the peatlands to the hill area or to any other site. The amount of irrigation to which the farmers are committed will be implemented even if there are no crops in the soil, to prevent subsidence, fires and capillary rise of minerals that increase soil salinity. The annual water quota for sprinkler irrigation will be a minimum of 6000 cubic meters per hectare, which is defined as the essential minimum. Although irrigated crops consume large amounts of water in summer, they also prevent water loss in winter, because if they were not irrigated in summer, the peat soil would become dried and cracked and the subsoil would absorb large amounts of water in winter. The groundwater table in the Hula peatlands is measured once monthly in about 30 bores. The results of the monitoring show, that even in dry years, the groundwater table in the Lake Agmon area remains high and stable relative to the groundwater south of the separator. This is evidence of the achievement of at least one of the objectives of the Hula Restoration Project, which was stabilization and control of the groundwater table.

The profit from agriculture in the peatlands was assessed in 2010 and compared to a similar assessment conducted in 1990. To the delight of all the people involved in the peatland rehabilitation, after 20 years the yield per hectare was found to have doubled. The most significant change was in summer crops.
Comparative summary of agricultural revenues: 1990–2010

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1990</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>Total revenue, winter, summer</td>
<td>33,895,695 NIS</td>
<td>68,602,603 NIS</td>
</tr>
<tr>
<td>Total cultivated — hectares (calculated)</td>
<td>2,900</td>
<td>2,860</td>
</tr>
<tr>
<td>Total annual revenue per hectare cultivated</td>
<td>11,690 NIS</td>
<td>23,990 NIS</td>
</tr>
</tbody>
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This table clearly shows, beyond any doubt, that farming significantly benefited from the project and revenues doubled. The manager of the Northern R&D Station, Elkana Ben Yashar explains that the significant rise in farming revenues is not just related to improved agricultural management of peatlands, but also to global trends of increased consumption and therefore to prices of agricultural commodities such as grains and livestock.

However, not just the farmers cultivating the peatlands were meant to profit from the Hula restoration, but also those who contributed their land for the purpose of developing Lake Agmon and its surrounding area, who were removed from the agricultural cultivation cycle and were promised a livelihood from the revenues of the tourist venture that would open at the site. The management of the Hula Restoration Project funded studies to understand the economic potential of the tourist venture, and to see which tourist attractions should be developed at Lake Agmon. The study was conducted in 1995 and 1996 by scientists from the Center for the Study of Natural and Environmental Resources at Haifa University, before the massive migrating and wintering phenomenon of cranes in Lake Agmon began. The study assumed that it would be possible to predict the demand for the park, which was still in planning stages, based on visitor surveys in existing parks in the Upper Galilee. According to the questionnaires prepared by the researchers, the responders preferred attractions...
that could not be found in other sites in the Upper Galilee, such as a safari, a bird park and sailing on the lake. 87% of the responders expressed a desire to visit this type of a park and 63.5% said they would be willing to pay an entrance fee. According to the predictions of the study, the entrepreneurs would be able to bring in an income of 11.4 million NIS annually. The researchers assumed that within 10 years they tourist venture would attract between 464,000 and 682,000 visitors annually.

From an economic perspective the proponents of the plan did not stop at creating a paying nature park, they also wanted to develop attractive accommodation by means of a village on stilts in the water. The planner, Avner Drori, described the touristic experience to journalists on the day the dam was opened and water began filling the new lake. According to his description, tourists would be able to rent boats and drift through the dense vegetation along six and a half kilometers, in a pastoral romantic atmosphere. Along the route, they would be able to watch birds, or just disappear between the papyrus plants and even stop at a number of sites, from where they could go on a short stroll. In addition to sailing the canals, it would be possible to sail on the lake and stop at small islands on which there would be restaurants where they could enjoy a good meal or stop to fish. Those wishing to spend the night could sail to their room on stilts in the lake and go to sleep with the plants and animals, similar to villages in the large nature reserves in Kenya.

The farmers that had contributed the land for an ecological-touristic venture did not plan to become tour operators, but hoped that an outside entrepreneur would put in the initial capital and they would enjoy the royalties. According to the plan of the program proponents, the entrepreneur would allocate part of the revenues not just to the farmers and the investors but for maintenance as well. The objective was to reduce the economic involvement of government agencies, the Water Authority
and KKL-JNF, which had invested heavily in building infrastructure, to a minimum, and that they would have only to help maintain the main canals and the hydraulic structures. However, unlike the farmers, who began working when they received the sprinkler systems, the potential entrepreneur would not be able to begin building the village the next day, as the land was zoned for agriculture. Thus, the first condition for establishing the tourist venture was to obtain statutory approval for changing the land use designation from agriculture to tourism, and obtaining approval for the building plan.

As mentioned above, the Hula Restoration Plan was conceived as a multi-purpose plan, in which each party would concede a bit, in order to receive a great deal eventually, or as Shaham termed it, the “compromise curve”. Thus, the water representatives, for example, were willing to accept the fact that the Hula had been drained more than it should have been and it was now necessary to allocate some of the water taken in the drainage project to the lake, so that the water economy could benefit from the improvement in the water quality in Lake Kinneret. The farmers in the area agreed to cede some of their land for tourist development and habitat restoration in exchange for water quotas and farming equipment. The representatives of the INPA understood that they could not transform the project into a standard nature reserve, but had to support a program that would include commercial elements in the new landscape that would be created at the site. The SPNI, however, that had not been involved in the project as the INPA had, opposed some of the tourism elements, particularly the idea of overnight lodging in the lake. Modifying land use designation from agriculture to tourism requires a statutory process, so the SPNI could oppose the plan in the various planning committees and even petitioned the Supreme Court in 1996. The tourism plan is the only element that was modified and delayed for many years, to the disappointment of the farmers and other stakeholders. Studying the dynamics between the proponents and opponents of the tourist village allows us to understand how the ecotourism experience in Lake Agmon was finally shaped, and comprehend the intrinsic tension between nature conservation and tourism.
3 Sleeping on Lake Agmon

Cranes at sunrise.
Photo: Yossi Eshbol.
The Initial Tourist Development Option That Did Not Include a Recreational Village

Source: Giora Shaham et al., Options for Using the Peatlands: Feasibility Study, 1989
Integrating recreational villages on the water was not part of the initial tourist development plan for the new lake. On the contrary, the first feasibility study, conducted in 1989, specifically stated, “developing lodging facilities on the site is not recommended”, mainly out of economic considerations, because of limitations of climate, winds and mosquitoes. In this initial plan, there was still no mention of flooding at the canals junction and developing a lodging and recreation center at the Nutera ridge. The goal of the site was to provide a diversity of recreational options that would optimally satisfy a broad sector of the public, such as boating and sailing, fishing, gliding, birdwatching, horseback riding, sporting activity and the like. For this purpose, it was necessary to establish, in addition to the water body, a wharf for boats, water skiing and fishing equipment, a horse stable and the like. From the start, the intention was to develop the site intensively for tourism by creating attractions for the general public, to distinguish it from its “older sister”, the Hula Nature Reserve, however, without lodging in the Lake Agmon vicinity. One of the tourist projects proposed to the Hula Administration, was called the “Safari Project” or “Hula Wildlife”. The proponents, who also included Yossi Lev Ari, from the SPNI, emphasized that this area was not a nature reserve, and if needed would include agricultural and tourist interventions to develop the desired fauna and flora.

A. A Village on the Water

The architect of the plan, Avner Drori, claims that he proposed the idea of adding a village on the water to the plan. In a document that preceded the master plan, which Drori prepared together with Nahum Minzer from TAHAL (Water Planning Company for Israel L.T.D), there is mention of a plan for a “unique lodging site on the lake and adjacent to it”. The site was to be developed together with the Safari Park and the Water Park at the springs on the eastern side of the valley, at the foot of the Golan Heights. There were plans to excavate a small lake for the village on the water, adjacent to Lake Agmon, which would extend over only 15 hectares and be located in the center of the area between the western canal and the restored Jordan River bed. The excavation would expose the groundwater, by the same method that created Lake Agmon, and the facilities would be bungalows on poles, which would be reached by small boats. The first stage would comprise of 150 units, eventually attaining a capacity 500 units. A swimming pool was also planned at the center of the village.

Simulation of the 150-room Village on the Water on a separate water body adjacent to Lake Agmon.
Source: Avner Drori.
After Lake Agmon was filled, a volunteer forum of representatives from the kibbutzim and moshavim met with potential investors to promote the tourism program. At the same time, the Israel Government Tourist Corporation, together with KKL-JNF and the Upper Galilee Regional Council Economic Development Company, requested an economic expert opinion. The expert opinion estimated that the number of annual visitors would be between 350,000 and 400,000. The total estimated initial investment in tourism development, which would include a variety of attractions, not including recreational villages, was 8.5 million dollars. For example, there were plans to purchase 140 water buffaloes, 120 wild horses, 120 Persian fallow deer and 200 spotted deer for the safari, at a cost of 680,000 dollars. The return on the investment was estimated at 10.71%, with the operational breakeven point at 210,000 visitors yearly, who would each pay an entrance fee of 6.5 dollars. The report, prepared by Avner Drori, Emmanuel Alon and Eyal Friedman, recommended proceeding with the economic-tourist evaluation of the recreation village, which they believed would contribute significantly to the economic activity and touristic value of the site.

Additional reports, at later dates, determined that developing the lodging element was essential for the success of the tourist initiative. From this point on the investors insisted on including the village on the water, a unique lodging element, as a condition for proceeding with business negotiations. Consequently, the Ministry of Tourism, explicitly supported the inclusion of a unique lodging element in the complex, to make it economically feasible, and even allotted 2.5 million NIS for developing infrastructure in the Hula Restoration Project, contingent on the implementation of the business initiative. The project's steering committee considered tourism development based on private investment an essential condition for success, both from the aspect of providing an alternative source of income for the farmers, as well as from the perspective of financing canal maintenance. The committee saw the ecological rehabilitation, first and foremost as a means of creating alternative income and not as a goal in itself, which justified including the village in the master plan for most of the members of the committee members. Only a few members of the tourism steering committee opposed, for various reasons, the development of the recreation village at the site. Dan Rozenzweig, the head of the Soil Conservation and Drainage Unit in the Ministry of Agriculture, believed that it would not be possible to build effective accommodations that would provide protection from winds and dust storms, while blending into the surroundings. The late Avraham Wachman, from the Technion Faculty of Agriculture, considered that developing tourist accommodations would cause irreparable damage to the landscape, while not being clearly profitable.

The environmental representative in the planning steering committee was Dan Perry, head of the Israel Nature Reserves Authority. He would have been expected to prioritize rehabilitating the ecosystem, and accordingly support the option of building a small number of units in the planned recreational villages. Surprisingly, however, Perry supported maximizing tourism to allow the site to cover the expenses of its maintenance, including agriculture. In his eyes, this was a “tax” worth paying in order to provide a strong economic base for the program. In other words, his position adopted the rationale of the program planners, that the ecosystem was only a means of creating a source of revenue for the local inhabitants and for maintaining the canals, and not a goal with its own merits. Perry had spent part of his life in Kibbutz Malkiya, which may have created empathy for the local inhabitants, who had to make a living from the change in their surroundings. From an
environmental perspective, Perry recommended establishing the village on the northwestern section of Lake Agmon instead of in the center of the lake. The SPNI was the only organization that kept ecosystem rehabilitation as the major goal of the program, which it believed should be protected from massive tourist development.

Isolating the SPNI from the process of tourism development in Lake Agmon

On April 25, 1994, a ceremony was held in which the dam near Kfar Blum was opened to allow water to flow into the new lake. The CEO of the SPNI at the time, Yossi Leshem, expressed his disappointment at the fact that the SPNI was not invited to speak at the ceremony, despite its historic role in the rehabilitation of natural values in the Hula Valley and its activity for the establishment of the nature reserve. As this was the case, the SPNI just published a communiqué in which it commended the “flooding”, but cautioned that the lake should not become an “aquatic amusement park”. The SPNI requested a place on the nature tourism development steering committee of the new lake. At first its involvement was in an advisory capacity, via Yossi Lev Ari, who was on the safari team, but it was not included in the planning steering committee or in the broader administration of the project.

Some of the SPNI staff saw fit to approach Yossi Sarid, the Minister for Environmental Quality, directly, with various ideas on how they believed tourism at the site should be developed. Yossi Sarid supported the involvement of representatives of environmental organizations in the planning team of the project, so that they could present their ideas in this framework. He approached Moshe Rivlin, the KKL-JNF chairman, and requested that the steering committee include Professor Amotz Zahavi as an ornithological expert, Professor Avital Gazit as an aquatic expert and Mordechai Ben Porat, head of the National Parks Authority. Following this request KKL-JNF sent out a letter to all three informing them that they had been accepted as participants of the Hula Restoration Project public steering committee. Giora Shaham, asked Nahamias, who had signed the letter in KKL-JNF’s name, to delay the invitation so that the topic could be formally approved by the Hula Administration at its next meeting. According to the protocol of this meeting, there were “serious disagreements”, which were not specified, between the members of the project management, and the majority decided to add only a single representative from the SPNI. Despite the decision, there was no SPNI representative in the next planning steering committee, nor in any of the following meetings.

Most of the interviewees who were part of the planning team, confirmed that the SPNI was not welcome at the offices of the project management. Dan Perry, who was head of the Nature Reserves Authority and was a member of the Hula Administration and of the project steering committee admitted, that in his opinion there was no reason to include the SPNI, which is a “voluntary association with no official standing, just like any other citizens who can freely express their views”. In his opinion, part of the SPNI’s objection to the project was personal, because they had not been included in it. Others noted that they opposed including the SPNI, because their people were considered troublemakers and “extremists who were not willing to compromise”. Harmelin, the lawyer who represented “Nahalat HaMoshavim” in the venture, claimed that the SPNI was not included in the steering committee because of the rivalry between the various environmental organizations. Looking back, he believes that this was their major mistake in managing the venture. He naively believed that if so many organizations
were cooperating, who could possibly oppose them. If he had known that the SPNI would delay the project for eight years, from 1991, when the process began, until 1999, he would have insisted they be included in the project leadership. In hindsight, it is difficult to know whether including the SPNI in the project steering committee would have led to a compromise or if the differences were so fundamental that they could not be bridged.

B. Opposition by Environmentalists

The SPNI commended the creation of the new water body and reconciled with it becoming a nature tourism park, different from the Hula Reserve, despite the fact that it felt that this was not ideal. The only element that the SPNI opposed vehemently, was placing recreational villages in the heart of the project, or in other words, adjacent to or very close to the flooded area. The planners on the other hand, considered placing the village at the center of the project, precisely what would determine whether the plan would succeed economically and support its maintenance, or if everything that had been done up to this point would collapse. Shaham, the manager of the project, was convinced there was no such risk: “The nature, scenery and environmental quality are the focus of the planned tourism program for the region, and the plan would not ‘shoot itself in the foot’. Nature conservation is inherent to the plan. Consequently, the number of rooms, their location and the development around them, considered first and foremost the need to integrate in the surroundings”. The SPNI, on the other hand, was convinced that the village would lead to the degradation of the ecosystem. Yohanan Darom, who led the opposition to the recreational villages on behalf of the SPNI, considered the plan as intended for “massive tourism” and could not understand how a built-up project of this size could be integrated into an area that was just beginning to become ecologically re-established.

Possible negative impact of tourism development on wildlife in the Hula Restoration Project
A concrete, and humorous, example of the negative impact that massive tourism development could have on animal life, is portrayed in the cartoons published in a 1994 issue of “Ecology and Environment” dedicated to the Hula Restoration Project. In the first sketch, the animals arrive happily at their new home in the Hula, while in the second one they are at a loss and wonder how exactly are they to settle down in their new home.

The cartoon does not show a recreation village, but only recreational activity at an aquatic site that includes motorized boating, swimming, sunbathing and barbecuing. Most of the opposition of the SPNI was directed not at what recreation would take place in Lake Agmon, but against building lodging facilities.

As mentioned before, under Perry’s influence, the concept of building a village on the water was exchanged for building villages around the lake. The plan submitted to the committees included three centers of recreational villages. Two sites were planned north and west of the flooded area and near it, each extending over 12 hectares, totaling 300 rooms and all the associated infrastructure, such as parking, electricity, food services, play structures and the like. Another recreational village, also with a capacity of 300 rooms, was planned in the area of the canals junction, which was to be flooded at the next stage and create a lacustrine habitat. The third village was marked on the Nutera Ridge, located at the edge of the plan, in the area of the springs at the foot of the Golan Heights slopes, east of the eastern canal. According to the regulations of the initial Hula Lands plan published in 1996, the restored marsh was to be a “nature and tourism site” and tourism development included boating, swimming, fishing and various types of accommodation: hotels, health spas, a youth hostel, a recreation village and a camping site. The plan included a variety of recreational services, such as swimming pools, sports fields, playgrounds and the like.
The SPNI representatives believed that there were sufficient accommodations in the neighboring communities and there was no need for additional facilities. However, in order to reach a compromise, they did not oppose developing the recreational village on the Nutera Ridge, which would serve as a center for accommodations for the entire project, and as an integral part of the Hula Restoration Project. Subsequently they suggested building recreational villages outside the borders of the project on the Ramot Naftali slopes. However, the planners did not like the SPNI’s idea of relocating the recreation village to the edges of Ramot Naftali as it did not agree with the goals of the proposed plan. The lands belonged to other settlements, and would thus not fulfill the purpose of providing an alternative source of income for the communities contributing their land for the benefit of environmental restoration.

The dispute between the SPNI and the project planners was not just regarding the recreational villages in the plan, but concerning the principle of privatization that was the foundation of a tourist venture with accommodation. The interest of the project planners in transferring the lands to private entrepreneurs was not just as a means of providing an alternative source of revenue for the farmers. They also wanted to reduce the expenditure in the national budget for the day-to-day operation.
of the project and for compensation to the farmers for ceding some of their lands for developing Lake Agmon. From the perspective of the SPNI the very idea of using real estate in the restoration plan as a means of financing maintenance, was fundamentally flawed. This rationale would focus on the issue of how much real estate would cover the expense of maintaining the canals instead of what the social, ecological and physical carrying capacity of the site was. The SPNI believed that the government had to be responsible for the maintenance budget, and at the most, raise the drainage taxes, but not introduce irrelevant considerations into the tourism development program. The SPNI believed, when considering public and environmental considerations, that the management and maintenance of the area should be the responsibility of public organizations such as KKL-JNF or the National Parks Authority, even if this meant compensating the farmers.

Shaham believed that the local inhabitants should be preferred over environmental restoration, from both a moral and practical point of view. Tourism development was to serve as an alternative that would provide the farmers with a livelihood in a peripheral region. According to Drori, the project planner, the economic-touristic vision of developing recreational villages on the water on the land belonging to Nahalat HaMoshavim is what convinced their representatives to sign away their land. Shaham understood that the government institutions were not interested in expropriating land and compensating the farmers, which made the option of private enterprise the only viable option, one that he considered a fair compromise. Shaham assumed that private entrepreneurs would undoubtedly find the right balance between the needs of people and the environment, because nature would be their source of income.

Both the SPNI and the project planners created a black and white picture by using terrifying rhetoric. The SPNI repeatedly stated that if the villages would be implemented the wildlife and birds in the area would disappear. The project planners, on the other hand, repeatedly claimed that if the entrepreneurial development would not succeed there would be insufficient funding for maintaining the project and the peat fires would return, Lake Kinneret would once again become polluted and the entire rehabilitation project would come to nothing. Darom remembers that the greatest difficulty was the dialogue with Shaham, who repeatedly told them that they were “harming Lake Kinneret and they would transform the valley into a valley of suffering”. Drori, on the other hand, remembers mainly the confrontations with Darom and Yoav Sagi, who was at the time Chairman of the SPNI Board of Directors, which involved shouting and demonstrations against the project at Lake Agmon. David Maayan, who studied the creation of the plan in 1996, when the conflict was at its peak, wrote that he could feel the tension in the air when he interviewed people from the SPNI or the plan’s proponents.

However, in addition to each side’s entrenchment in their views, the question arises, how it could be known, as objectively as possible, if building the village would drive out the wildlife and birds, for whose observation the village was being developed. The planning method used to evaluate such issues is the “environmental impact assessment”, a document that reviews the relation of a proposed plan to the environment in which it is to be implemented, including assessing possible effects of the plan on the environment and specifying the means required to avoid or reduce negative effects. According to the law, an environmental impact assessment is voluntary and not compulsory. It could be requested by the representative of a government minister in the planning authority, or by the planning authority to whom the plan was submitted.
The project planners wished to avoid preparing an environmental impact assessment, in order not to postpone the establishment of the villages, and argued that the research that was part of the project was equivalent to an environmental impact assessment. Perry, the director general of the Nature Reserves Authority, who was the representative of the environmentalists in the project steering committee, believed, surprisingly, that there was no need for the assessment. He argued that such an assessment is necessary only when it is obvious that the environment will be negatively affected, such as when a power station is established, and it is necessary to evaluate its impact regarding soil and air pollution, noise nuisance and the like. The Hula project, on the other hand, could not negatively affect the environment, which was already degraded, and the project was aimed at remedying the situation. In the worst case, the solution would not succeed. Even if the impact assessment would be prepared, according to Perry's line of thought, it would be necessary to evaluate the impact of the village in relation to the state of the ecosystem before the project began. The SPNI, of course, believed that the fact that the new wetland habitat was rehabilitated artificially, and that the situation before the rehabilitation had been worse, did not mean that it was acceptable to harm it by introducing lodging. The SPNI believed that preparing the environmental impact assessment was the minimum that could be done before commencing the development of a recreational village of any size in the center of the project.

In 1995, the plan, named the “Partial Local Outline Plan for the Hula Lands Gimel/8923”, was completed and approved by the representatives of the local inhabitants, and submitted to the planning authorities. The first stop in the process was the Upper Galilee Local Planning and Building Committee that approved the plan and submitted it for public review. The next step was the Northern District Planning and Building Committee, which after two meetings decided to submit the plan to the Committee for Preservation of Agricultural Land and Open Spaces (CPALOS). Israel’s National Planning and Building Law (1965) determines that in addition to the National Planning and Building Council, a national committee that would be responsible for the preservation of agricultural land and implementing this preservation policy should be established. The function of this committee, which was at the time under the jurisdiction of the Ministry of the Interior, was to approve any land use change in agricultural lands, as was being proposed in plan Gimel/8923 for the Hula lands. On January 1, 1996, before the plan was brought before the committee, the law was expanded (amendment 43) to include the preservation of open spaces as well. As part of the amendment, three additional members were added to the CPALOS, one of which was a representative of the Ministry for Environmental Quality, whose representatives already participated in district planning committees since 1990. This change was a result of increased public awareness to environmental quality and the need to deal with environmental issues as part of the deliberations and decisions of planning institutions. The submission of the Hula plan to the CPALOS gave both the Ministry for Environmental Quality and the SPNI the opportunity to elaborate their position on the subject.

Modifications to the Recreational Villages Plan in the Planning Committees

The Ministry for Environmental Quality requested the opinion of a number of experts to formulate its position in the deliberations of the CPALOS. One of these experts was Professor Uriel Safriel,
who stated that the most negative aspect of the concept of establishing a village on the water was the space taken up by development and other elements, which would reduce the amount of land available to the restoration project. Safriel explained that wetland habitats have a high species richness and diversity, as they combine features of both terrestrial and aquatic ecosystems. In other words, wetlands are dynamic systems, because of frequent spatial and seasonal changes at the boundary between water and land. In his opinion, even the smallest reduction in area could be critical for some species, and it would not be possible to foresee what the effect of the eradication of those species would have on the ecosystem as a whole. Establishing a village in a wetland area is an irreversible action, whereas ecological management of this habitat requires the ability to respond rapidly to changes in the ecosystem, which as mentioned above is not stable. Consequently, Safriel suggested moving the lodgings away from the water, deep into the terrestrial area. The Ministry of Environmental Quality submitted a position paper similar to Safriel’s recommendations, saying that it would be preferable not to hand over the management of Lake Agmon to a private-commercial agent. The expert opinion opposed tourism and recreation in the wetland or adjacent to it. Its recommendation was to operate a nature park with tourist services outside the park, and to examine the issue of who would be capable of managing these lands with the interest of preserving these ecological values at heart.

Avraham Wachman, who participated in the plan’s steering committee and was the fiercest opponent to this issue, wrote to the Ministry for Environmental Quality against the option of introducing accommodations into the heart of the project. He argued that the concept of a village on the water was feasible only if the area extended over thousands of hectares. In his opinion, the ideal site for accommodation was overlooking the valley, because it would enhance the recreational experience from a climatic and scenic point of view. The argument that the planners put forth, that without private entrepreneurs it would not be possible to cover the expenses of maintaining the drainage system was not convincing. He believed that the KKL-JNF and other government agents should be responsible for the maintenance budget, thus allowing the site to exist for the benefit of the public at large. As an architect, Wachman understood that the damage from building villages on the water would be irreversible. Unlike the flooding process, in which the lands involved were publicly owned, which allowed the government to intervene and inundate, transferring ownership to entrepreneurs would not allow the process to be reversed if it turned out that the environmental damage mandated it. Uri Shalem, from the Ministry of Agriculture’s pest control unit, opposed developing accommodation near the water, because it would create pressure to use strong pesticides for mosquito control, which would have a negative effect on plants and animals and harm both nature and tourism.

The SPNI also prepared for the discussion at the CPALOS and submitted a long, detailed document summarizing its objections to the plan. It argued that the touristic conception presented in the plan conflicted with the principles of ecotourism. From a touristic-environmental perspective, it would be preferable to allow visitors to enter the flooded area only on foot or by electrical vehicles, and to develop accommodation facilities on the edge of the Hula or in existing communities. The lake area should be available only for ecotourism development. The SPNI opposed all the proposals that placed the recreation village in the core of the project. It argued that on the northern bank of the flooded area construction would look like an alien element and would hinder the possibility of expanding
The Environmental Tourism Alternative

The flooded area to the north. Another option, which proposed establishing lodgings on the water line from the west, would close off the lake, because it would disturb the rehabilitation of natural values. The third option of building a village on poles over the water would reduce the flooded area and drive away wildlife, particularly at night.

The SPNI did not just stop at criticizing the proposed plan but also suggested an alternative option of tourism development and even brought in an outside consulting company, headed by Aliza Rappaport-Rotman and Ilan Bar-Yosef. The consultants were supposed to give objective validation, at least allegedly, to the SPNI's demand for an alternative plan for tourism development. From an economic perspective, they proposed purchasing the land from the farmers, for compensation, which they estimated would initially cost 12–16 million dollars, or alternatively giving them rights for developing tourist accommodations on other sites. The cost of operating the site would be covered, according to the consulting company's estimate, by revenue from entrance fees, with no goal of increasing revenues as would be the case in a private business. The consultants termed this the "environmental-tourism alternative". The SPNI attached a map to their proposal in which there are no commercial and recreational areas in the core of the project, but only on the Nutera Ridge. They also left a boating route, but reduced in scope.
The heads of the Merom HaGalil, Upper Galilee and Mevo'ot HaHermon regional councils attempted to put pressure on the CPALOS members to approve intensive tourism development and threatened that if they would not receive what they had been promised, which was financial remuneration for ceding the agricultural lands, they would prefer the agricultural option, or in other words re-drainage of Lake Agmon. The restoration project managers supported this line of action: “The local management of the project has unanimously decided to take all necessary steps to drain the lake and use the land for farming as was done in the past”. It is reasonable to assume that neither the project planners nor the local residents seriously considered this option. This is supported by the fact that together with the threat of restoring agriculture, the heads of the regional councils petitioned the Water Authority and KKL-JNF to continue maintaining the project. Moreover, the heads of the regional councils sent an internal memorandum to David Nahamias, the head of the KKL-JNF Land Development Authority and Meir Ben Meir, the Water Commissioner, expressing their support for the tourism option: “We, heads of the authorities in the Upper Galilee... express our unconditional support for the tourism project, including all its elements... tourism is only a partial and uncertain compensation in return for hundreds of hectares of farming land. This clarification is necessary in light of the rumors as if there we are having thoughts of withdrawing our support from the tourism plan. Converting the tourism area to agriculture is an option that should be considered only if the SPNI will succeed in thwarting the tourism plan when it is brought up for consideration in the National Planning Council”.

On 19 August 1996, the CPALOS decided to approve the Plan for the Hula Lands Gimel/8923, with the following amendments and conditions: The western recreation village was approved for immediate execution, but only 150 rooms instead of 300, in the initial stage. The detailed plan would have to include operational regulations, and an environmental impact assessment. The detailed plan for the second development stage would be submitted only after the first stage was operational for two years. The site for an additional village would be determined according to the recommendations of the environmental impact assessment, which would examine three alternatives, as well as other effects, for four consecutive seasons. This site would also include only 150 rooms. It was also decided to remove completely from the plan both the area intended for flooding at the canals junction and the adjacent accommodation site on its northern banks. On the other hand, the committee included the lodging area on the Nutera Ridge, located on the eastern edges of the valley, in the plan, and did not require submission of an environmental impact assessment. Another important decision of the committee was to ensure financing for implementing the water management program unconditionally, and the establishment of a committee that would be responsible for operating and maintaining the site. In other words, the committee formalized the request of the environmental organizations not to link the project maintenance to the Hula rehabilitation as a whole, which required a budget to maintain the canals in order to preserve the water quality of Lake Kinneret, and the tourism development on Lake Agmon by private entrepreneurs.

The goal of the CPALOS was to create an environmental-planning compromise, which on one hand, would allow the recreational villages to be established in the core of the project, as the project planner wished, but would also ensure precautionary measures so as not to affect the Lake Agmon ecosystem, as the SPNI wished. The major precautionary measures were reducing the number of rooms, the inclusion of an environmental impact assessment and dividing the development
of the recreational villages into stages. This seemed like a solution that would satisfy both sides, the SPNI and the planners, but that was not the case. The SPNI opposed the establishment of any accommodations on the lake, whereas the planners tried to avoid preparation of an environmental impact assessment, and were concerned that reducing the size of the villages and developing them in stages would frighten off potential investors. In this manner the battle inside and outside the planning “hallways” between the SPNI and the project administration regarding the dimensions of the tourism development continued.

The KKL-JNF and the SPNI against the Planning Compromise

Shaham believed that the CPALOS decision significantly modified the plan that had been submitted. He considered this a threat to the future of tourism development, which also meant hurting the Galilee settlers, who had been promised that they could make a living off tourism, as well as a blow to the national budget, which would have to cover the expenses of maintaining the project on its own. Zvi Ortenberg, head of the Lake Kinneret Administration, approached Dina Rachevski, chair of the CPALOS, in an attempt to change the verdict. He used dramatic language to emphasize the urgency of the issue and said: “I am calling to you as head of the CPALOS, and asking you to help stop the runaway horses”. Ortenberg used terrifying rhetoric and warned that if the economic-touristic project would not be implemented, the entire project would collapse, the fires would return and the water to put the out would lead to waste of water and flow of contaminated water to Lake Kinneret. This, despite the fact that in the CPALOS decision it was specifically stated that the financing for water management would be ensured in any case. In October 1996, the CPALOS conveyed its decision to the head of the Northern Region Planning and Building Committee, so they could continue with the process of approving the plan.

Following the CPALOS’s decision, the planners succeeded in influencing the Ministry of Environmental Quality to minimize the assessment requirements. Thus, Valerie Bracha, head of the planning division at the Ministry of Environmental Quality, told the planners that the environmental impact assessment for the first stage of the recreational village could be prepared only when the detailed plan would be submitted to the planning agencies. Moreover, it could be based on existing data and results of studies that had already been conducted. The objective of the assessment is to specify the required steps to prevent water pollution, to treat wastewater and trash, prevent damage to the landscape and damage to ecosystems, for the natural flora and fauna to survive in the flooded area and the park around it. The project planners estimated that preparing the impact assessment would take no longer than a year, and could be prepared during the time it would take to prepare the detailed plan. The second impact assessment, which was to begin when the first operational stage of the recreational village began, would also take a year. The planners thus decided to convey the CPALOS’s decision to Avner Drori, the project planner, so he could include the required modifications in the plan before its deposit for public review.

The plenum of the Northern Region Planning and Building Committee that discussed depositing the plan for public review decided to approach the Ministry for Environmental Protection to consider if they wanted to request the assessment at this stage, despite the fact that the CPALOS had required its submission only after the detailed plan for the recreation village was submitted. Rafael Eitan (Raful)
who had replaced Yossi Sarid as Minister for Environmental Quality, as well as being Minister of Agriculture, decided there was no need for this. The SPNI was concerned that depositing the outline plan for public review would lead to the establishment of the village, as this step was equivalent to declaring that the planning authorities supported the plan as it was, and would create reasonable expectations with the entrepreneurs that the project would be executed. In order to delay the deposit of the plan, the SPNI appealed to the Israel Supreme Court on December 5, 1996, for an injunction against depositing the outline plan. The SPNI claimed that Raful, who was both Minister of Agriculture and Environmental Protection, favored the farmers and therefore instructed his representatives not to request an environmental impact assessment. According to the law, the representative of the minister could request submission of an environmental impact assessment at any stage of the processing of the plan. The petition demanded the minister explain why he had forbidden his representatives to request the assessment and also to justify why the representatives of the Minister of Environmental Protection in the various committees had not required the submission of such an assessment.

Rachesvki, who chaired the CPALOS, argued that the SPNI should not be concerned that depositing the plan would make the establishment of the village irreversible, as the planning authorities could choose the alternative of non-implemention subsequent to an environmental impact assessment at the stage of detailed planning as well. Approving the outline plan, without an assessment, did not, in her opinion, threaten or reduce the scope of the alternatives that would be examined in the framework of discussing the detailed plans. Valerie Bracha, from the Ministry of Environmental Protection, denied having received instructions from the minister to forego preparation of an environmental impact assessment, and stated that the SPNI had no evidence to support their petition. Bracha admitted that the issue had not yet been expressed in the plan documents or in studies held on the effect of touristic and recreational activity on natural and scenic values, which are dependent on the level of development and its extent in the field. She claimed that it was justified to prepare the environmental impact assessment only at the detailed planning stage, as there are no similar recreational projects that Lake Agmon can be compared to, as the lake, with its diverse populations is a new scenic element and it is difficult to know how it will be affected. Preparing the assessment at this planning stage, which still had significant elements of uncertainty, would make its value and ability to provide reliable planning guidance questionable. One of the defense arguments was that the petition was not the concern of the Supreme Court. The SPNI requested the court accept its expert opinion instead of that of the planning agencies, and compel the representatives of the Ministry of Environmental Protection, who are permitted to, but not obligated to request an assessment, to oppose the plan.

In March 1997, the Israel Supreme Court refused the request for an injunction to halt the process of depositing the plan for public review. Nevertheless, the court did not cancel the interim injunction instructing the Minister of Agriculture to declare his non-intervention in the professional considerations of his staff. Therefore, the regional planning committee continued its work and decided to deposit the plan, which adopted the opinion of the CPALOS, that the environmental impact assessment should be prepared at the stage of detailed plans submission. In May 1997, the Supreme Court, headed by then Chief Justice Aharon Barak, rejected the petition, arguing that the district court and not in the High Court

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5 The Supreme Court in Israel fulfills two functions: it is the highest Court of Appeal in the State of Israel, and also sits as a High Court of Justice (Bagatz), hearing petitions against various governmental authorities at first instance as well as against rulings of Appeals Tribunals.
of Justice had the authority to discuss the petition. Meanwhile the SPNI informed the environmental journalists regarding the petition, in order to create public pressure against establishing the village. Zafrir Rinat, the environmental journalist of the Israeli daily “Haaretz”, who supported the SPNI, wrote a column “The Two Hats of Minister Eitan”, in which he specified the SPNI arguments against Raful. The SPNI also published a petition signed by 2,500 people supporting its position to preserve the agricultural character of the Hula Valley, its aquatic landscapes and the wetland, and against building for commerce and accommodations to the heart of the valley. The petition was also submitted with the documents specifying the SPNI’s opposition to the program, which it presented to various forums.

KKL-JNF also considered a publicity campaign to clarify that implementing tourism development in the Hula was done for the benefit of the communities in the region and to safeguard the general interests of the plan, such as preventing pollution in Lake Kinneret. Meir Alfiya, KKL-JNF’s legal counsel, disagreed with the move, out of concern that if the program would not be implemented, the farmers would sue KKL-JNF. Moreover, Alfiya believed, KKL-JNF should consider whether it would be right to enter into a public conflict with the “environmentalists” led by the SPNI, at a time that KKL-JNF was also identified with environmental issues. He also believed that KKL-JNF should not join, or more correctly not be carried away by the actions of the local communities, and should maintain an independent, responsible position that takes into account the possibility that the outcome of the planning processes would not succeed in fulfilling the vision for tourism development. His consideration was public and not specific to the case, in which he supported KKL-JNF’s position that the tourism initiative should be advanced to support the local communities.

The SPNI was not discouraged by the rejection of its petition to the High Court of Justice and the district planning committee’s decision to deposit the plan and in 1997 approached the secretariat of the sub-committee for objections, which discussed the SPNI’s objection to the deposit of Plan for the Hula Lands Gimel/8923. The sub-committee had accepted, in principle, the arguments of Valerie Bracha, as presented at the High Court of Justice, that the outline plan did not have sufficient details for conducting and environmental impact assessment and that only when the specific detailed plans would be prepared, would it be possible to examine alternatives for situating lodging venues, their size and shape. Thus, the sub-committee decided to reject the SPNI’s objection on the subject of the preparation of an environmental impact assessment. Nevertheless, the sub-committee agreed with some of the demands of the SPNI, and decided to cancel the locations of the optional sites for the second stage of the recreational village, defining them as “sites for future plans”, contingent on an environmental impact assessment and implementation in stages. The sub-committee accepted the arguments of the SPNI that the commercial ventures, and not just tourist lodgings, could affect the return of birds, and therefore there was need of an assessment for the commercial areas as well. The assessment was to examine the types of commerce proposed and the maximal building capacity. The sub-committee was convinced that detailed plans that would be accompanied by an environmental impact assessment, would determine the correct placement, capacity and character of the buildings, to prevent the tourism area from converting the site into an “urban area” and that the plan would not conflict with national master plans. The sub-committee concluded by saying that if detailed plans would be submitted they would be deposited for public review and be open to additional inspection by the public. Under these conditions, the sub-committee agreed to approve the plan.
Drori, the architect of the plan, considered the decision of the sub-committee on objections a breach of the delicate balance created in the decision of the CPALOS, between the demands of the entrepreneurs and those of the “environmentalists”, which would put in doubt the possibility of tourism development. The balance was upset by the fact that it allowed the plan to be re-examined to see whether it complied with the National Master Plan for Tourist Projects and Recreational Areas (NMP 12) after its approval. Moreover, the future detailed plans would be subjected to the objection process in the same manner as the approval process of the current outline plan, which would create a situation of uncertainty for the entrepreneurs and possibly discourage them for undertaking the project at all. The environmental impact assessment was now expanded to include the commercial areas as well. In his opinion, in this situation, the entire project was at risk and his recommendation was to appeal the decision. Harmelin, the representative of Nahalat HaMoshavim, considered the decision to be a significant change and setback to the plan recommended for deposit by the district planning committee and the CPALOS. This would make the possibility of finding a serious investor who would be willing to invest in a project whose future was uncertain, very doubtful. Both KKL-JNF and the SPNI approached the last instance available, the appeals committee of the National Planning Committee. KKL-JNF submitted an appeal in which it demanded that the Hula Rehabilitation Plan be approved in the format in which it was deposited by the district planning committee, without the contingencies and restriction imposed by the sub-committee for objections. A number of people appeared before committee on behalf of KKL-JNF, including Meir ben Meir, the Water Commissioner, Drori, the plan’s architect and Dan Perry. In the appeal the previous arguments were specified, including once again the threat that if the tourism development would not be implemented the entire project would collapse. The SPNI, on the other hand, demanded the outline plan be approved only after an environmental impact assessment had been submitted. It also noted that the petition to the High Court of Justice against Minister Raful, had been transferred to the district court and was still pending.

The Hula project administration attempted to influence the appeals committee’s decision by taking it to the public, and published a communiqué, while awaiting the decision, according to which at the end of November 1977, the Hula Administration would complete the rehabilitation work and abandon the project. The administration warned that if no one would maintain it, the project would be destined to fail. Nevertheless, in closed discussions a new maintenance agreement was signed between KKL-JNF and the Kinneret Drainage authority. The maintenance participation component distinguished between those that gained the most from the project, the farmers, and those that were hurt by the inability to implement the economic options in the tourism areas at this stage. Although the project management did not intend to abandon it completely, it seriously examined the possibility of draining Lake Agmon in favor of agriculture. Nahamias, the head of the KKL-JNF Land Development Authority, wanted to prepare financially in advance, for a move to convert to the farming option alone in 1998, which would require, in his estimate, between three and four million NIS more than the budget for maintenance alone. The project management even ordered an engineering plan and budget estimate for returning most of the area to agricultural management, without affecting the goals related to preventing pollution of Lake Kinneret and peat soil conservation. Work on the infrastructure was planned to end by late May 1998, after which only maintenance teams were to remain in the field.
Zafrir Rinat, the environmental journalist of “Haaretz”, who supported the battle of the SPNI against the tourism development plan, wrote a column titled “Divided over the Lake Banks” just before the decision of the appeals committee. According to him, two organizations, KKL-JNF and the SPNI, were conflicted regarding the issue of tourism development on Lake Agmon. Rinat supported the SPNI’s demand for an environmental impact assessment, and noted the International Union for the Conservation of Nature (IUCN) had lately emphasized the importance of such an assessment, that examines what the major biodiversity is in each area, how development would affect it, and whether there are development alternatives that will impact biodiversity less. Shaham responded to the column in an article titled “Not an Ownerless Area”. In his view, the column created the mistaken impression that the land was intended for nature conservation, whereas it was a means of production that the government provided the inhabitants of the area, for which, as it was no longer suitable for farming, an alternative tourism venture has been planned. Shaham explained that the disagreements were not just between KKL-JNF and the SPNI, but were between the latter alone, against KKL-JNF, the Water Commissioner, the Ministry of Agriculture, the Ministry of Tourism and the regional councils.

In June 1998, the National Planning Committee’s sub-committee for appeals discussed the appeals of both KKL-JNF and the SPNI. The committee rejected both appeals, on the grounds that neither of the appeals provided arguments that justified accepting them. The committee members objected forcefully to the threatening rhetoric of the project planners: “We do not believe that fear should be used, threatening that if the program will not be approved as is, the Hula will be drained once again. We wish to believe that this argument was intended only for demagogic purposes and was not proposed seriously”. The committee members also opposed taking into consideration the argument regarding the compensation the government would have to pay the landowners if the position of the appellants would not be accepted. The committee argued that requiring an impact assessment for the commercial area would not set back the entire plan, precisely because so many studies were already being conducted, which would shorten the process. The committee members agreed with the decision of the district planning committee to put off the implementation of the second recreational village, and considered it a sign of the caution required when examining the environmental impact of the first village. In their opinion, the decision of the district planning committee did not significantly change the decision of the CPALOS.

About four years passed since the project management had submitted the plans to the first planning committee until it was finally approved with significant changes. However, the conflict with the SPNI in the planning “hallways” was not the only element that delayed the plan. The Israel Land Administration (ILA) that had to determine the cost of leasing the land for tourism instead of farming also delayed the plan. The project managers demanded that the ILA make a special decision that would adapt the existing leases of the inhabitants with land rights to the new land use, without levying heavy taxes. Since the ILA financed a third of the cost of developing the infrastructure for rehabilitating the Hula peatlands, which exceeded 20 million NIS, the project management could request it go easier on the landowners, so that the money it had already invested would not be lost. However, in June 1998, after the plan was deposited as required by law, it was still not clear what amount the ILA would demand for capitalizing the land value after its zoning was changed. The project managers, local inhabitants and potential investors were concerned that a decision that would not benefit the farmers would not allow them to keep the land.
The zoning plan for Partial Local Outline Plan 8923/gimel.
Source: Avri Kadmon, KKL-JNF.
In May 1999 the ILA, headed by Ariel Sharon, finally published its decision regarding the lease of the lands intended for tourism instead of farming. The decision applied to both the core areas in Lake Agmon (530 hectares) and the Netura area — the eastern valley edge springs (40 hectares), for which the settlements did not have cultivation rights. The agreement was to be signed with a corporation that would include all the communities in the project area, and it distinguished between open areas not to be used for commerce and those for commerce. The open areas not intended for farming would be leased for only a token amount and a permit would be given to the lessors to charge an entrance fee from visitors that would not exceed the fee taken from visitors to the Hula Nature Reserve. The lands to be used for commerce within the 530-hectare area, would be leased to the farmers for cultivation at no cost, and the landowners would pay 16% of the value of the land for the 40 hectares in the area of the springs, based on the valuation of the government appraiser. The ILA included several conditions in the agreement, one of which was that the corporation would participate in the maintenance costs at a rate to be determined by the Water Commissioner. The decision was a victory for the Hula Administration that had succeeded in convincing the ILA to charge only a token fee for leasing the lands in the heart of the project.

In September 1999, the Minister of the Interior, Natan Sharansky, approved the plan and the regulations of Partial Local Outline Plan 8923/gimel were published.

Up to now, at the time these lines are being written, not a single entrepreneur has expressed an interest in building the recreational village in the heart of the project, although it was legally possible. Today, most of the people who supported establishing the village agree that it is neither practical nor desirable. Harmelin, the representative of Nahalat HaMoshavim says that by the end of the process he had become an environmentalist, “not as dark green as the SPNI, but green”. Today he would not attempt to establish a village in the heart of the Hula, but only on its edges, such as on the Nutera Ridge, as in the approved plan. Drori, the project planner says that in hindsight he believes that the fact that development was more restricted than their plan was for the best. Valensi, the head of the Upper Galilee Regional Council admits, that with time he has become more and more environmentally minded, to the point that he does not want to see any building for tourism, not even on the edges of the site. Unlike them, Perry still believes that a recreational village would not have harmed the project, even though he too is not sorry it was never developed. Shaham believes that their failure resulted, paradoxically, from their unexpected success in rehabilitating the natural environment, which is no longer considered an artificial creation that was only intended to provide an alternative source of revenue for the landowners and he still believes that a village can be developed at the site. He believes that the main difficulty was moral, because he took land from the inhabitants and promised them a living, but did not succeed in keeping his promise. Darom concluded that the SPNI lost the battle because it believed the plan should not include even a single room in the heart of the project, but won the war, because eventually the villages were not developed. Apparently, the reduction in the number of rooms, the constraint of establishing the second village in stages, the demand for an environmental impact assessment and the knowledge that the SPNI would oppose the detailed plan, all led entrepreneurs to avoid getting involved in this environmental “mess”.

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The struggle between the SPNI and the Hula Restoration planners is a fascinating example of the intrinsic conflict between tourism and nature conservation. We will now try to fly up, above the Hula marshes and get a birds eye view how tourism became a threat to nature, and how the State of Israel is coping with this conflict.

C. The Conflict between Tourism and Nature Conservation

Nature is a concept that brings up diverse associations. It can be perceived as frightening and threatening, or as exalted, romantic and pastoral, a pleasant place to spend time. Tourism is a type of recreational activity that has become a popular pastime in modern times. Surprisingly the first holiday deal based on aerial transport was organized in 1950 by a British company called Horizon Holidays. Since then tourism has become a part, not only of the life of the upper classes, but of the middle classes as well, and has gradually became more and more popular. Today tourism is one of the largest industries in the world, and apparently also the largest employer in the world. In the 1950s in Israel, there was almost no foreign tourism and local tourism involved mainly holidays at simple venues for the purpose of relaxation. Few tourists looked for nature and outdoors recreation. Mass tourism developed because of various factors: continued prosperity, increased income in large parts of the population, the monotony of work and life, the increase in paid vacation days by employers, the increase in people's anticipations from life, improvement in health, the decrease in the average number of family members, development of transportation means and more. Mass tourism is based on standard package deals, with fixed prices, available to anyone who so desires. Lodging is in giant hotels or large recreation areas, mainly along beaches, such as found in Eilat. The tourists on these vacations can enjoy their stay without getting to know the language, food, local customs and even the surroundings of the recreation venue. The profits of these ventures benefit large tourism companies and not the local inhabitants.

Since around the 1980s a demand developed for “alternative tourism”, tourism that is concerned about the environment and local inhabitants. Unlike mass tourism, alternative tourism emphasizes both the needs of local communities and a more active touristic experience that aims at not affecting the environment in which it occurs. This sort of tourism includes many types of recreation, such as rural tourism, agritourism, nature tourism, heritage tourism, ecotourism and the like. Rural tourism, for example, developed extensively in Britain. Before the 19th century, rural living was considered boring and inferior, but with the onset of the industrial revolution and urban expansion, traveling in the country became a nostalgic experience. In the 1970s and 1980s when the central government supported this type of tourism it became a popular pastime. Rural attractions include a variety of topics, such as fox hunting and sailing in the narrow canals in Britain, lake fishing in Finland and the like. The quality of accommodations became a secondary consideration, as the tourist purchases an environmental experience and not just a room. On the other hand, routine rural activity of working in a village was found to be attractive to city dwellers who had never seen a cow, a chicken or a sheep.

Israelis live a crowded, intensive life, mainly in cities in the center of the country, where climate is humid and the topography is level. Thus, it is not surprising that they are not satisfied just with
mass coastal tourism along the Mediterranean, but look for the peace and quiet found in natural sites in more distant locations in Israel. The Upper Galilee has abundant freshwater sources that have many recreational advantages particularly for local tourism. Moreover, the region has Mt. Hermon that attracts winter tourism. The natural attractions of the Upper Galilee, together with the decrease in the profits from farming as a source of income, led local inhabitants to focus on tourism from 1987 onwards. The first step was converting thousands of rooms, which had not originally been developed for accommodations into guest lodgings. Despite the concerns of the existing hotels and guest houses in the Galilee, the new lodgings did not glut the market, but instead created a new option of local low-price accommodation. The Upper Galilee Association was the focus of the growth of this branch that then spread throughout the country. In 1993, for example, 37% of rural lodging was arranged through it. The new industry did not replace agriculture, but became a new source of income.

In view of the fact that tourism is constantly developing in Israel and throughout the world, the subject of how to develop nature sites and increase the supply of accommodation without harming nature, became an issue. The development of rural accommodation in existing settlements agrees with some of the principles of sustainable tourism development that believes in using natural resources in a manner that will not hurt their ability to renew themselves, so that future generations can enjoy them as well. This, because they use existing infrastructure and advance the economic welfare of the family and its employment diversity. Nevertheless, intensive tourism can be a nuisance to the local inhabitants, their traditions and even to the agricultural and natural environment which are part of the attraction of the area. Uncontrolled tourism exploitation can damage natural systems as happened in Yellowstone National Park in the United States, where for a while management focused mainly on creating tourist attractions at the expense of natural values.

Aliza Fleischer conducted a survey of recreational habits of tourists in the Upper Galilee that found that the main reason for vacationing in the Upper Galilee was to enjoy nature in its original state. In its recommendations for development, the survey warns that tourism planning that will transform the Upper Galilee into a mass tourism site with massive building would be a mistake. According to the survey, most of the vacationers in the Upper Galilee are well-educated families with above average incomes that prefer rural accommodations, even when they can afford hotels that are more expensive. The SPNI saw this as additional evidence that from a tourist-economic perspective it is better to avoid investing in hotel accommodation at Lake Agmon, and at the most expand the supply of rooms in existing communities. The planning tool to achieve balance between preserving the ecosystem and attracting tourists is to define the site intended for development by sensitivity. Thus, in the lake, the water area, the banks and the isles on which water birds rest, eat and nest should be defined as the most sensitive. At a reasonable distance from the lake, on the other hand, traffic routes and observation points can be developed.

One of the methods that the government uses to formulate planning policy are master plans that focus on specific topics. In the 1990s the Planning Administration in the Ministry of Interior, the Ministry of tourism and the ILA created a master plan for tourism and recreation termed NMP 12.
Its objective was to deal with conflict between tourism development and nature conservation and to develop a mechanism for creating the correct balance between nature and the environment. Sustainable tourism development is not defined as a type of tourism, but as a perception of correct resource management. The guideline emphasized in the master plan is to create moderate tourism development that consciously renounces the possibility of exploiting the full tourism potential in favor of long-term environmental and social goals, which transcend local planning considerations and narrow economic interests. The required planning has to forego specific sectorial considerations and take into account effects on global systems. Developing this type of tourism will be controlled and directed by the highest planning system that is under the auspices of the national government.

Israel's major tourism potential has always been its cultural-religious heritage and not its impressive natural values. The innovation was that from the perspective of developing sustainable tourism NMP12 recommends, to continue and encourage foreign tourism, which would focus on a specific number of urban religious sites in Jerusalem, Nazareth, Tiberias and the like. This, because as long as foreign tourism focuses on urban sites there will be no undue pressure on natural sites. The master plan also recommends that the Mediterranean coast, nature reserves and other natural open spaces in Israel should be prioritized for the local population both as a living space and as a target for internal tourism only.

NMP12 includes specific guidelines for developing tourist regions in Israel and the inclusion of guidelines in local and regional outline plans, including tourism development in the Galilee panhandle. The authors of the master plan noted that natural values are the major attraction for people who choose to vacation in the Galilee panhandle. Therefore, they recommend avoiding over development of areas of high natural value and concentrating efforts for increasing tourist accommodation in existing settlements. One of the issues noted, was that in the summer there is intense human pressure on natural environments, as cools streams are a favored tourist destination only at the height of the summer. Thus, one of the recommendations of the plan was to develop complementary attractions for the winter, such as special restaurants or high-level commercial centers. The concept of birding tourism during migration seasons was not mentioned at all.

The authors of the plan referred to the Hula Restoration Project, which was at the time being implemented, and considered it a major tourism initiative in the Upper Galilee, of national and even international importance. The master plan included a map in which Lake Agmon was referred to as the “Hula Marsh Park”, and connected to the planned restoration of the Hula Lake at the canals junction. A half a year later, the CPALOS cancelled this plan, which also included establishing a recreational village on the northern bank that would include 300 rooms. According to the map, the site was intended for coastal tourism, leisure and recreation and there was no mention of the concept of nature tourism or birding. The proposed venue for tourism and accommodation was east of the western canal as the planners had proposed. In other words, although NMP12 took a clear stand for adding lodging facilities in existing communities, it still supported, as an exception, building accommodations in the heart of the Hula Restoration Project, to the disappointment of the SPNI.
Lake Agmon began to fill with water in April 1994. For five years, the SPNI and the project management argued on the issue of establishing a recreational village, which was considered an attraction that would entice multitudes of Israelis to the lake, from which they could watch exotic safari animals and birds. However, even after the master plan was approved, there was no entrepreneur willing to take on tourist development on Lake Agmon, to the disappointment of the farmers. During these years, the Lake Agmon ecosystem became established and stable without being disturbed by mass tourism. The cranes, who had not been mentioned in any of the plans, began to modify their mode of migration and arrive and stay at Lake Agmon in ever-growing numbers, together with a variety of other birds. Today the cranes are the symbol of Lake Agmon site and its main attraction, drawing multitudes of visitors. The cranes were the best surprise of Lake Agmon, creating a natural attraction in an artificial site, but also a new conflict, this time between tourism and agriculture.
4 THE CRANE ENCOUNTER – AN UNEXPECTED SURPRISE
Israel has always been on the migration route of the Eurasian Crane, and large flocks numbering thousands of birds fly over the country every year. Crane migration occurs at night, as well as in the daytime, therefore it was not always observed and the public was largely unaware of it. Before the drainage of the Hula Lake, the cranes were not part of the landscape and the Hula Valley was neither a crane stopover nor a wintering habitat. In the 1950s and 1960s, there were reports from the Be'er Sheva Valley and the northern valleys of a few wintering cranes. In the 1960s, Azaria Alon, who founded the SPNI, received a post card from Kfar Ruppin in the Bet She'an Valley requesting he come immediately, as a pair of cranes had arrived at the kibbutz. Azaria was sure the cranes would continue on their way in a day or two and did not bother to come. Surprisingly, he continued to receive messages about the cranes in the Bet She'an Valley even a month later, so that he finally came to see them. He was able to approach the pair from a distance of about 20 meters, and followed them for over a half an hour, watching them from all sides and noting that “it was an amazing sight to get so close to such a large bird, walking around freely in nature”. The sight that became particularly etched in his memory was that of the cranes in flight, as he was standing on the ground watching their large black wings from below.

From the mid-1970s, several thousand cranes began overwintering in Israel, mainly in the Yizre'el and Hefer valleys. In the late 1980s, cranes began arriving to the Hula Valley as well, but still in small numbers, that received no mention in the media. In the winter of 1988–1989, a total of 1,100 cranes were counted in the Hula Valley. Ezra Yas'ur remembers the excitement at the SPNI’s Ornithological Center when he would inform the birders that he had spotted two cranes. The Hula Valley Peatland Rehabilitation program made no mention of the cranes, because they were not part of the local ecosystem in the past. The fact, that the cranes, of all birds, became the symbol of the site and its major tourist attraction, was a completely unexpected surprise.
A. Unexpected Guests

Israel is located at the junction of three continents (Asia, Europe and Africa), between the Great Rift Valley and the Mediterranean coast. One of the major bird migration routes, from Western Asia and Eastern Europe to Africa and back, passes through our area, because of the thermals (rising currents of hot air needed by large soaring birds), which develop only over land, and the abundance of stopover sites. Thanks to its location, Israel has one of the highest avian species richness relative to its area. The factors contributing to this species richness are the proximity to the coast, to the edge of the global desert zone and to the Great Rift Valley. From a global perspective, Israel is undoubtedly located in an area of great significance for preserving avian biodiversity. Bird migration occurs regularly, twice a year, in spring and autumn, and requires extensive resources. Stopover sites are essential for the migrants, to recover and renew energy stores during migration. Lake Agmon and the surrounding fields provide suitable conditions to serve as a significant stopover site for migrating birds, and a wintering site for some of them.

Two of the 15 crane species found in the world can be seen in Israel. The Eurasian Crane is the most familiar one, as well as being the commonest crane in Europe and Western Asia. The second species is the Demoiselle Crane, which is rare in Israel. The Eurasian Crane breeds from Germany in the west to eastern Russia in the east. The cranes overwintering in Israel belong to the eastern population in Europe, whose major breeding grounds are in Russia and eastern Russia. At the end of summer, the cranes begin migrating south from Russia to Africa, via Turkey and the Middle East. The increase in the number of wintering cranes in the Hula Valley is apparently, at the expense of the populations wintering in Ethiopia, however since there are no methodical records from Ethiopia, this is still only an assumption. It is interesting to note that a similar change has occurred in the western Crane migration route, which extends from Germany to North Africa. Previously a considerable number of cranes overwintered in North Africa, while today most of them overwinter in Spain and southern France.

Eurasian Cranes are large terrestrial birds, with long legs and necks. They are territorial, monogamous and have a rich intra-specific communication system that includes ceremonial movements, prominent color patches, calls and even dances. The family unit is usually composed of a pair of parents and a pair of chicks. Cranes nest in forested areas, flooded with shallow water. After the breeding season, and once the young have learned how to fly, the families begin to gather and form large flocks comprising hundreds and sometimes thousands of birds. The flock is joined by immature birds or single adult birds. Migration begins at the end of summer, when the flocks fly to their wintering grounds, thousands of kilometers from their breeding grounds, flying at an average speed of 50 kilometers per hour. The Eurasian Crane is an omnivorous bird, feeding on both plants and small animals, but in Israel, its preferred food includes peanuts, corn and wheat. Unlike other migrating species, cranes keep their family structure, during the autumn migration and during the first winter after the young have hatched, and family members can be seen foraging together. Nevertheless, most of the crane population in the flock is not composed of families but of immature cranes or non-breeding individuals. Eurasian Cranes are not endangered, and their populations are even increasing.
Dan Alon, who heads the SPNI’s Ornithological Center, studied the wintering cranes in the Hula Valley, focusing on their ecology and on characterizing the damage they caused to the crops. He studied the cranes in the autumn and winter months in 1996–1999, at the time the SPNI and the Hula Restoration Project Steering Committee were arguing about the establishment of the recreational villages. During these years, the maximal number of cranes in the Hula Valley in autumn was 20,000, but as winter advanced, the population decreased to about 10,000 cranes, who remained in the valley until February. Alon’s study found that the factor determining the length of time the cranes spent in the Hula Valley was the availability of peanuts, their main source of food. The winter rains cause the peanuts to rot slowly, until eventually, the cranes stop feeding on them and look for a different habitat. Alon found that 100 mm of rain, was the cranes’ cutoff point, after which they abandon the peanut fields. At this stage, half of the cranes continue migrating south and the other half remain in the valley and search for another habitat. The study found that in Spain and France as well, the main reason for changes in crane behavior is the significant increase in agricultural crops as a result of improved technology in farm management.

The Hula Restoration Project allowed the intensive cultivation of land and introduction of new crop species. Until the second half of the 1990s, the main field crop was cotton and other crops were grown only on a small portion of the land. Cotton did not serve as a food resource for the migrating birds, and after it was picked in autumn the fields were left fallow and no other crop was grown. From the late 1980s, following the decline of cotton farming in Israel, numerous and diverse crops were introduced that could be grown throughout the year, and they included peanuts, corn and other crops. In 1990, peanuts were cultivated on an area of 220 hectares in the Hula Valley, and by 1995, it had increased to 880 hectares. Peanut cultivation continued throughout the summer. At the end of the summer and beginning of autumn a special harvester, harvests the shrub from its bottom, and turns it on its head to dry. It is followed by another harvester that harvests the peanuts. After the harvest, many peanuts remain on the ground, and this is exactly the time that the cranes fly over the region. Moshe Gophen described the discovery of the peanuts by the cranes in a picturesque
manner: “One crane flew over, came down, saw a five-star restaurant, told his friends, and the next year there were 10,000 cranes here”.

After the cranes feed, they need a shallow lake that can provide drinking water, as well as a safe roosting site. Between 1992 and 1993, tens of drainage canals were excavated as part of the Peatland Restoration Project, which unintentionally created convenient watering points for the cranes. The Hula Nature Reserve provided them with a place to roost, and eventually Lake Agmon did so as well. Thus, the combination of an available source of food and water and a protected roosting spot, made the Hula Valley a significant crane migration stopover, and a wintering ground for many of them as well. The return of the birds to the Hula Valley was mainly a result of the rehabilitation of the Hula wetland. People are usually blamed for reducing animal habitats, removing wildlife from their vicinity and reducing their populations. The story of the arrival of the cranes to the Hula Valley shows that the opposite can be true as well.

The crane census showed that between 1990 and 1995 the number of wintering cranes in the valley grew from 1,100 to 13,000. Counting such a large number of cranes can be a difficult and complex task. The customary method is to count the birds as they arrive at their roosts in the evening or leave it in the early morning hours. The census participants are spread between different sectors, and count the cranes in their sectors in groups of ten. As they become more skilled, they count them in groups of 50 or 100, which they “frame” with their hands. Obviously, there is a margin of error in this type of counting. Another means of estimating the number of cranes is according to the amount of food they eat.

Peanuts are optimal food for migrating birds: they are very rich in fats (50%), protein (30%) and carbohydrates (16%) and have a high caloric value of 564 calories per 100 grams. During migration fat is very important for the birds. The long time the cranes spend in the Hula Valley, allows them to accumulate fat, which provides the energy for them to continue on their journey. However, half of the cranes decided not to continue on to Africa, but to stay instead in the Hula Valley and feed on something different after the winter rains rotted the peanuts. The cranes moved on to two other habitats — alfalfa fields, mainly in February, and fallow fields, mainly in January and March. In the fallow fields, the cranes feed on Nut Grass (*Cyperus rotundus*), which is considered a noxious weed, thus benefitting the farmers. In some of the peanut fields, which are a summer crop, wheat, which serves as the major winter crop in the Hula area, is sowed from December. Unfortunately, the cranes like feeding on wheat as well. As long as the cranes consumed remnants of summer crops, they caused no financial harm to the farmers. However, the wintering cranes fed and trampled on winter crops while foraging, which included, in addition to wheat, peas, chickpeas and potatoes. The damage to the farmers was estimated at about one million NIS. The farmers who were finally making a living from their fields after the peat soil rehabilitation were not willing to accept this new problem.
B. A Few Farmers against Multitudes of Cranes

Conflicts between people and wildlife are as old as time. As culture developed, agriculture occupied ever-growing areas, which led to the intensification of conflicts between people and wildlife populations. Today we are aware of the importance of every living species to the environment and the interactions between the different species, and therefore try to avoid excessive harm to the pest species. Moreover, we know that harming the species does not necessarily solve the conflict or prevent the damage. There are many methods for solving conflicts between humans and wildlife, and they include culling or repressing reproduction, removing individuals, creating buffers to separate the resource and the wildlife population, scaring pests away, using methods, such as controlled feeding that will change the animal’s behavior, and abandoning the land or changing its use.

Cranes are large birds that damage agriculture during their migration and in their wintering grounds, as do other birds such as pelicans and cormorants. These species do not store sufficient fat as an energy source for their entire migration route and therefore need stopovers for rest and feeding, during which they renew their energy reserves for the remainder of their journey. Thus, food availability at their stopover sites is essential for their survival. Cranes, which migrate in large flocks, forage in flocks and favor nutritious easily gathered food in their wintering grounds, become potential agricultural pests in autumn and winter. The damage to fields can be devastating and oblige farmers to reseed entire fields. There is almost no possibility of creating a buffer between the fields and the birds as a means of preventing damage. This leaves only methods such as scaring the birds off, chasing them away or culling their populations. As the cranes are not just agricultural pests, but have positive ecological, touristic and economic value, methods were developed to deal with the crane damage that did not include harassment or culling.

Alon, who heads the SPNI’s Ornithological Center, studied the reasons the cranes overwinter in the Hula Valley in order to find a management method that would minimize the damage to farmers, while not harming the cranes. During the study, he became attached to the cranes as well as to the farmers, which motivated him to find a solution for the problem created by the birds. Alon was familiar with the method of diversionary feeding of cranes from other parts of the world. In 1992, Alon, Eli Galilee, who coordinated the regional farming committee and Ezra Yas’ur, who was the intermediary between the farmers and the Hula Restoration Project management, visited Sweden, where the authorities had established a feeding station for Eurasian Cranes. The station was operated from late March for six weeks, and attracted thousands of migrating cranes flying to their breeding grounds in northern Scandinavia. The station was opened to deal with the damage caused by the cranes to potato and barley fields, which were sown in spring, but also for purposes of tourism. After they returned from Sweden, they requested permission from the INPA, which has to approve any wildlife feeding in Israel, to feed the cranes. The request was approved, although the INPA was not enthusiastic about the idea. A “crane team”, made up of the SPNI, KKL-JNF, the INPA and the farmers was established to implement the project, a cooperative venture that was not trivial in light of the ongoing battle between the SPNI and KKL-JNF at the time regarding the development of lodging facilities in the heart of the restoration project.
The feeding station was only one of the elements of crane management in the Hula Valley, which also included activity to chase the cranes away and protect seeded fields. The management plan was based on the insights from Alon's study, which divided the year into periods and characterized each period regarding the damage to agriculture. In autumn, the cranes are allowed to wander the fields freely, with no supplemental feeding and no attempts at harassment, because the birds feed on remains of peanuts and cause no economic damage. Towards winter, when rainwater accumulates on the ground and rots the peanuts, there is an active effort to harass the cranes so that they do not overwinter in the valley. As part of the project, people were brought in for a week to prevent the cranes from feeding in all the fields in the valley. After some of the fields were sown with winter crops these fields were guarded to keep the cranes out. Eli Galilee developed diverse methods to harass the cranes. The conclusion was that the most effective way of keeping the cranes out was ensuring human presence in the field in the early morning hours, to prevent the cranes from landing in seeded fields. Guarding was done by a special team on vehicles equipped with various harassment means such as fireworks, rifles, flags and mirrors. After the harassment effort was complete, the feeding station was opened for those cranes that had decided to remain. The feeding station was established in the tourism area west of Lake Agmon, where according to the original tourism development plan the safari (“Hai-Hula”) was to be located. According to the initial plan, the station was to open every year in early January and to close in spring, when most of the crane population migrated back to their breeding grounds in the north and the threat to agriculture no longer existed.
Any agricultural management that takes wildlife into consideration, must have the cooperation of the farmers, who are a key element in its success. The farmers in the crane project participated partially in funding the food at the feeding station, guarding the fields and chasing out the cranes. Zamir Carmi, who was responsible for field crops in the Hula Valley, said in a lecture, that the crane management project benefitted the farmers. Thanks to the project, they knew where the cranes were and could control their dispersal in the field. Controlled supplemental feeding reduced the need to chase them out of the fields. Galilee, who himself was a farmer, and coordinated the crane harassment when the project began, believes that the farmers slowly understood that the cranes were a fact of life that had to be dealt with, and which in some cases could even be beneficial. Thus, they did not rush to reseed fields used for growing peanuts, so that the cranes would clean up the remains and then leave without damaging the new seeds, so that the farmers gained twice. In the first case because they did not have to guard the fields, and in the second case because the cranes cleaned the field and ameliorated the soil. Lindman used a questionnaire to examine the attitude of the farmers to the project in the winter of 2002–2003. Most of the farmers agreed with the statement that cranes damage agriculture, but most of them (91.7%) also noted that the crane project had a positive effect. Moreover, most of them accepted the fact that in winter, they shared their fields with the cranes, and half of them did not even want to chase them away.

The crane project is managed by the “crane team” composed of representatives of the farmers, KKL-JNF, the SPNI, the INPA and the Upper Galilee Regional Council. The project was first implemented in the winter of 1999–2000 and has been operational ever since. In some years, there are digressions from the original plan, such as renouncing harassment and opening the feeding station early. The project succeeded in the two tasks it had set: preventing damage to agriculture in the Hula Valley and safeguarding the crane population. Guarding the fields, which is part of the crane management program, turned out to be effective, to the satisfaction of all those involved. Since the project began, the cranes avoid fields where there is effective guarding, even if they contain food they favor. The team members tried to harass the cranes with scarecrows and fireworks, but found that although these methods help, they are not as effective as human presence, which requires more resources. The harassment at the end of autumn caused some of the cranes to continue migrating south and reduced the wintering populations. However, after each expulsion, there is a sharp decrease and then a gradual increase in the number of cranes, which is believed to be a result of some of the cranes flying south, but then deciding to return. Over the years, it has become clear that massive expulsion raises the harassment threshold of the cranes remaining in the valley, in other words they only react to higher levels of harassment, which requires more guards and more equipment. Thus in 2010, no expulsion was conducted in autumn, and the project was still considered a success from the perspective of preventing damage to farmers.

Management programs to prevent wildlife damage, particularly those that include supplemental feeding, raise concerns regarding negative ecological effects on the population being fed, such as changes in behavior and way of life. Yifat Artsi (Davidson), who was the Hula Nature Reserve biologist, conducted a study, supported by KKL-JNF and the SPNI, on the management of the crane-agriculture encounter in the Hula Valley in order to increase its effectiveness and reduce the damage agricultural crops. The study was conducted in autumn and winter during the years 2002–2004. Artsi, who compared the
number of cranes before the feeding initiative and after it, noted two significant differences: the first was that during most of the months the average number of cranes was higher in the period after feeding began (2001–2004) than before it (1996–1999). The second difference she found was that there was an increasing trend in the number of cranes between January and February since the feeding station became operational, while in the period before that there was a continuous decreasing trend in the number of cranes from December onwards.

The study concluded that the feeding station had extended the stay of the migrating and wintering cranes and increased their population in the valley. As indicated above, the feeding station was opened earlier, in December, before the 100 mm precipitation threshold in the valley, which Alon had found was the catalyst for peanut decomposition and the departure of the cranes from the valley. Opening the station at this stage annulled the natural pressure of food reduction as a factor in the cranes’ departure. The feeding station was opened earlier also out of financial considerations, because guarding the fields was costlier than operating the feeding station. In addition, the feeding station’s operation was extended until late February–early March, which delayed the departure of the wintering cranes from the valley.

Sasha Pekarsky conducted a study on the movement ecology of wintering and migrating Eurasian Cranes in the Hula Valley, supervised by Professor Ran Nathan from the Hebrew University of Jerusalem, and funded by KKL-JNF. In the study, transmitters were attached to 62 cranes, of which 55 were in the Oka State Reserve, in the Spassi region, about 200 kilometers southeast of Moscow, together with a Russian research team, headed by Dr. Yuri Markin.
CHAPTER 4: THE CRANE ENCOUNTER — AN UNEXPECTED SURPRISE

This study allowed the migration routes of Eurasian Cranes and their behavior in the Hula Valley to be studied for the first time. This undeniably pioneering study modified many of the existing conceptions on these topics. The results of the study show that the migrating and wintering cranes in Israel use mainly the Russia-Pontic migration route, migrating through Ukraine, across the Black Sea and Turkey towards Israel and the southern wintering sites in Ethiopia. A small percentage of the cranes used the eastern migration route that crosses the Caucasus Mountains. In general, the cranes used three main stopover sites during migration: the Syvash region in the northeastern Crimean Peninsula and the nearby Askania-Nova biosphere reserve in South Ukraine, the Adana region in southeastern Turkey, and the Hula Valley. The two latter sites were also used for wintering. Among the radio-marked cranes in 2017–2018, about 14 percent wintered in southern Turkey, 62 in Israel and 20 wintered in the southernmost wintering grounds known for cranes along this route, Lake Tana in Ethiopia (the remaining birds overwintered in other sites, such as Croatia).

Moreover, there were no differences in the migration patterns and routes between passage migrant cranes and wintering cranes. The juvenile cranes overwintered at different sites than where they had previously overwintered with their parents. Thus, two sub-adult brothers that overwintered with their parents in Ethiopia in 2017–2018, spent the next winters at separate sites, one in Ethiopia and the other in Israel. This suggests that wintering site preference is a learned and assimilated only at a later stage in the bird's life.
The main migration routes, stopovers and wintering grounds of Eurasian Cranes with transmitters attached in 2017-2018.

Source: Sasha Pekarsky and Ran Nathan, Movement ecology of the Eurasian Crane migrating and wintering in the Hula Valley.
Crane tracking results in autumn 2017–2018 showed that the first individuals left the autumn flocking sites, about 200 kilometers southeast of Moscow, between September 17–22 and the last ones between October 12 and 20. The passage migrants arrived at the Hula Valley between October 21 and November 16 and stayed an average of 11.5 days, with the last individual with a transmitter attached leaving the Valley on November 26.

During autumn and winter, cranes were found to use additional wintering sites besides the main site in the Hula Valley. The movement patterns of radio-marked cranes showed some connectivity between the various sites that suggested the start of supplementary feeding in the Hula Valley is not what affects the timing of movements between the different sites, but the conditions at the alternative wintering sites.

During the time the feeding station is operational the average size of the core activity area decreases significantly in 82% of the radio-marked cranes, as does the time spent in fields with sensitive crops. Nevertheless, this reaction was seen only when the amount of food at the feeding station exceeded 5 tons a day and remained relatively stable; in other cases, the percent of time the cranes spent in the vicinity of the station decreased to about 40%. Seventeen percent of the individuals wintering in the valley exhibited a different behavior pattern, which was independent of the feeding station activity. The flight distances of these cranes were longer throughout the entire season and they foraged mainly in the almond and pecan groves (where they cause no damage), but were also found in seeded fields 47% of the time. Analyzing the interactions between the radio-marked birds and the teams guarding the fields showed that in 66% of the cases the cranes did not return to the fields.
from which they had been expelled that day. When the cranes did return, sometimes repeatedly, it happened mainly within the first two hours after they were chased away. Moreover, there was a greater chance of them returning to alfalfa fields than to other fields, which might mean that this crop could be suited for creating additional “refuge” areas, in addition to the feeding station, in which the cranes can spend time and forage.

Operating the feeding station not only affected the life cycle and behavior of the cranes, but of other animals as well. Artsi found, that in addition to the cranes, the feeding station was frequented by ducks, doves, birds of prey, coots, ibises, starlings and other species. She compared the number of these birds to those in the agricultural fields and found that the greatest difference was in the numbers of ducks and doves. In the beginning, food was put out towards evening and in the early morning hours, but a considerable part of the food put out at night was eaten by many “freeloaders”, including wild boar. Therefore it was decided that the additional feeding would be at noon instead of in the evening. The change made a significant difference: before the change, the percentage of cranes in the birds found in the feeding area was 69% and after it, their percentage rose to 90%.

Another effect of crane feeding on the ecosystem is related to the source of the food put out for them. For financial reasons, the corn that was used was imported from the USA. This corn contained seeds of an invasive noxious weed Common Ragweed (Ambrosia artemisiifolia). In order to avoid its expansion it was decided to stop importing corn and use only local produce, which provided the farmers with an additional source of income.
The growth in the number of cranes as a result of the feeding station was seen as a negative effect by some of the INPA staff. Artsi’s conclusion was that the crane project exemplifies damage prevention management that would eventually intensify the problem. According to Didi Kaplan, the project transformed the feeding area into something that was not nature. Some of them compared feeding the crane flocks to chicken farming. According to Artsi, if sustainability was one of the goals of the project, there was need of a long-term plan that would reduce the number of wintering cranes in the Hula Valley. Despite the fact that in the Hula Reserve cranes had never been fed, the INPA also use supplemental feeding management by populating the water pools with fish for the pelicans, in order to prevent damage to fishponds. Truth be told, both the farmers and the agents financing the crane project would be happy to see less cranes wintering in the valley, just as the INPA would. However, to this day, research has not provided an explanation for why some cranes decide to winter in the Hula Valley, while others fly on to Africa and how this decision can be changed without harming the cranes. As long as the feeding station continues to operate, the probability of reducing the number of cranes seems very slight. On the other hand, stopping the crane feeding would increase the damage to farmers and create chaos, a textbook “catch-22” situation.

The growth of the wintering crane population has not only unwanted ecological consequences, but also serious economic consequences. The amount of food needed for the cranes is a significant factor in managing the project, both as the main component in the cost of the project and as a factor
affecting the behavior of the crane population. Lack of food can lead to the movement of cranes into the agricultural fields, while surplus food leads to waste of money, “free food” for other birds and animals, and could affect the increase in the crane population in the future. Lindman calculated food quantities according to energy values (millions of kilocalories, Mkcal) required by the cranes compared to the amount of food actually provided in the winter of 2002–2003. According to her, the amount estimated in the feeding area and in the agricultural fields together was between 2.5 and 5 times the amount needed by the 15,000 cranes wintering in Lake Agmon at the time.

Lindman estimated the damage caused by the cranes to agriculture during the 2002–2003 season at 6 NIS per hectare, a significantly lower amount compared to the estimated financial cost in 2000, which testifies to the success of the management program. She believed that some of the responsibility for financing the feeding project should be taken from the farmers, as the feeding was done in the tourism area and as a tourist attraction, and the tourists should be charged for watching the cranes and thus cover some of the costs of preventing damage to the farmers.

Pogorelov (2016), performed a cost-benefit analysis on the crane project for the stakeholders, and concluded that in fact, the farmers were the ones who should increase their part in financing the project. Her analysis, however, was performed at a time when the number of cranes were almost three times the number at the time of Lindman’s study, and the costs of the project were far higher. When the crane project began, it was financed by the farmers, KKL-JNF, the SPNI, the Upper Galilee Regional Council and a number of government ministries and agencies (Environmental Protection, Agriculture, Tourism and the Galilee Development Authority). Its budget at the time was several hundred thousand NIS and today it is three million NIS. By 2017, the project was financed only by KKL-JNF and the Lake Agmon site (50%), and the farmers and the Upper Galilee Regional Council (50%). There is still no organized arrangement for the crane project budget, nor is there a single agency responsible for it. In the Manitoba province in Canada, for example, there is also a restored marsh, Oak Hammock Marsh, which includes a project to drive Canada Geese out of cultivated fields to designated feeding areas. The project is very similar to the one ongoing in the Hula Valley. The cost of the Manitoba project is covered by the Ministry of Agriculture, the Federal Ministry of Environment and Climate Change and the Manitoba Province Ministry of Conservation. It would be fitting that in Israel too, government agencies would support the project on a regular basis, due to both its economic and ecological significance. From time to time, there is a demand, particularly from the farmers, that the project costs be covered mainly by the tourism agencies. However, the tourism elements in the Hula Valley who benefit from the many visitors to Lake Agmon are numerous and not organized, so there is no one element that can be addressed. Moreover, thanks to the Hula Peatland Restoration Project, which was financed by the Israeli government, the farmer’s revenue from field crops doubled between 1990 and 2010, so that they are capable of contributing their part to the Crane Project. Those landowners, on the other hand, who agreed to change their land’s designation from agriculture to tourism, have still had no significant revenue from it, as they have still not been able to realize the possibility of developing accommodation and commerce for tourists, which was intended to provide them with an alternative to their income from farming.
Cranes are bird that interest and attract many birders and nature lovers, to the point that some of them have established associations in Germany and the USA, focusing specifically on cranes, such as the International Crane Foundation, which publish special journals focusing on cranes, exchange information and organize public activities to help cranes. Crane watching is very popular among people who are not necessarily expert birders, probably due to the fact the cranes are large, easily identified birds that form giant, impressive flocks. Aldo Leopold, one of the founders of modern environmental ethics wrote: “Our ability to perceive quality in nature, begins, as in art, with the pretty. It expands through successive stages of the beautiful to values as yet uncaptured by language”. That is, thanks to their beauty, watching cranes develops feelings of admiration for nature, which does not need words.

Developing tourism infrastructure so people can watch cranes at their gathering sites, can serve both as a source of income for the local population and as a tool for environmental education by environmental organizations. This can be seen in the conflict that arose around the issue of declaring the Platte River in central Nebraska, in the USA, as a key area for preserving the Sandhill Crane. The declaration created a conflict between water consumers in the three states through which the river flowed and environmentalists. Thanks to public pressure, the environmentalists and representatives of the local population agreed to meet and find a solution, in the form of an ecotourism site that would both provide the inhabitants with a source of income and not harm the cranes. The site now attracts some 35,000 people from the world over that enriches the coffers of the local tourist industry by 20 million dollars each spring. In addition, the local inhabitants are now proud to declare that they are the global capital of Sandhill Cranes.

Crane feeding in the Hula Valley.

Photo: Yossi Eshbol.
The Eurasian Crane population modified its behavior both along the migration route that passes over the Hula Valley and along the western migration route over Spain, where the number of cranes that overwinter in Europe and do not continue south to Africa is constantly increasing. There is a possibility that shortened migration reduces the proportion of deaths and consequently leads to an increase in the Eurasian Crane population. The increased number of cranes in Europe has also created numerous conflicts with farmers. In some German provinces there are management programs based on artificial feeding of cranes, which were found to be effective and are supported by a number of agencies that include local government, NGOs, international nature conservation organizations and the German airline Lufthansa, whose logo is a crane. At the same time, there is also an increase in the number of people who come to watch the cranes. In one site in northeastern Germany, a national park was established to allow the cranes to be watched from the land and from boats, and a crane festival is held every year.

Azaria Alon notes that cranes are not popular in their homeland in Europe, and in some places are even despised. Some consider the crane a bad omen, possibly because of its size and screeching call, which is not particularly pleasant. In Japan, on the other hand, the crane is considered the “bird of happiness” and the Chinese considered the crane a symbol of wisdom. Over time, cranes have become part of the Japanese art of paper folding (origami). Popular belief has it that cranes live a thousand years, and whoever succeeds in folding one thousand paper cranes, will have their wish fulfilled. After the Second World War, the popular belief symbolized the hope for peace through the sad story of a little girl called Sadako Sasaki. Sasaki was born in Hiroshima, and exposed to radiation from the atom bomb. At the age of 12, she contracted leukemia. Sasaki decided to fold 1000 paper cranes in order to fulfill her wish, which was, surprisingly, not to regain her health, but world peace. Sadly, she died after folding only 644 cranes, but her classmates folded an additional 356 cranes, to honor her memory. The story of her life became public and a children’s book, Sadako Wants to Live, was published in a number of languages, including Hebrew. The distribution of the book started a tradition of crane paper folding as a symbol of peace movements throughout the world. After the twin towers disaster in New York on September 11, 2001, her brother sent one of the last original paper cranes to the country that had dropped the atom bomb that had caused his sister’s death. Migrating birds are not subject to political borders and many times symbolize yearning for peace. Transboundary projects involving migrating birds, can create bridges of dialogue and understanding, which are very significant for Israel that is located in an area that endangers its existence.

One of the most impressive sights in wintering cranes is their gathering, every night to fly off together to their roosting site. In the first years after the cranes arrived in the Hula Valley they would gather to roost in the Hula Nature Reserve. Gradually, it seems the cranes began to fear predation in the reserve and began searching for a new site. Cranes are not water birds and therefore cannot roost in deep water, but need shallow water, which allows them to stand in the water and thus occupy a habitat that protects them from predators, such as foxes and jackals. In December 1997 there were 20,000 cranes roosting in the Hula Reserve. From this year onwards, Lake Agmon was maintained with low summer-autumn water levels, in order to improve the water quality and prevent winter flooding of agricultural areas north of Lake Agmon. Although no one had predicted it, this change allowed the cranes to spend the night in Lake Agmon instead of in the reserve. After the feeding
station was opened, the cranes would gather there and fly out together to roost on Lake Agmon. In new crane sites established in Spain, France and at the Platte River in Nebraska, the attraction lasts for less time, because the cranes only migrate through and do not overwinter. In the Hula Valley, on the other hand, the cranes can be seen for five months from late September to early March. In New Mexico, in the southwestern United States, 14,000 Sandhill Cranes overwinter at the Bosque Del Apache National Wildlife Refuge, during the same months as at Lake Agmon, from November to the end of February. There is a Festival of the Cranes every year on the weekend before Thanksgiving, which includes a photo contest. The most impressive sight is the sight of the cranes landing at sunset in their roosting grounds or taking off at sunrise. Around the marsh are designated feeding sites, as at Lake Agmon, and tourist accommodations outside the refuge.

When the feeding station became operational in 1999 there were no arrangements at all for tourism activity, because the tourism development program was still in the process of approval. However, the news of the cranes in the Hula Valley spread and people began coming to Lake Agmon to enjoy the sight. Efi Naim, who was responsible for the site maintenance for KKL-JNF, described how, on weekends, mainly in the afternoon and evening hours, many vehicles would come to Lake Agmon to watch the wonderful sight of the cranes arriving to roost at the lake. When it became dark, people would turn their car headlights on, creating a ring of light around Lake Agmon. Naim remembers several occasions on which the cranes would circle Lake Agmon a few times and finally head off somewhere else to roost. It is possible that the cranes thought the light from the cars was fire or some other frightening thing and therefore chose not to roost at the site. According to Artsi’s study, the more vehicles that came to Lake Agmon, the more cranes that chose to roost at the reserve instead of at the lake. In addition to the disturbance to the cranes and other wildlife, driving through the area at night, was unsafe because of the many canals crisscrossing the area. The visitors disturbed the cranes and were a safety hazard. In order to deal with the visitors, estimated at about 60,000 a year, KKL-JNF set up a temporary booth and gave out flyers with information on the crane project and a map of the site.

The Crane Project was established in 1999 and that same year NOP 8923/gimel, which permitted the development of recreational villages, was approved by the Minister of the Interior. The plan restricted the number of rooms, and determined the development stages and the required environmental impact assessments. These restrictions alarmed potential investors who were wary of taking on the preparation of detailed plans of the recreational villages. At this stage, KKL-JNF was at a crossroads. On one hand, the potential for tourism was obvious, but on the other hand, it was unclear how it could be implemented. The possibility of abandoning the site or restoring it to farming or compensating the farmers and expropriating the land was rejected by KKL-JNF that had invested tremendous resources in the ecological restoration of the site. Omri Bonneh who was appointed Director of KKL-JNF’s Northern Region in 1999, remembers that the first time he visited the site and saw the cranes’ roost he understood that Lake Agmon could become a significant ecotourism site, without needing a recreational village nearby the lake’s shore. Bonneh considered developing the site for ecotourism as a transformative project, both from the perspective of the environment and of the organization, allowing KKL-JNF to restore nature to its former glory, which it had changed by draining the Hula Valley.
LAKE AGMON – KKL-JNF’S FLAGSHIP PROJECT
After the Outline Plan for the Hula Lands (Gimel/8923) was approved in December 1999, the Ministry of the Interior established the “Hula Committee” to set management guidelines for the lands included in the plan. Yig’al Shahar, who headed the Ministry of Interior’s Northern District, emphasized that the commission had statutory authority, and would be the only agent responsible for solving the Hula problems. Moshe Gophen was chosen to head the committee, which included representatives of the region’s settlements, farmers, KKL-JNF, the INPA, the Lake Kinneret Authority and the Water Commission. The committee did not include a representative of the SPNI or of the Ministry of the Environment. Gophen supported appointing KKL-JNF as the major entity responsible for implementing the program, as he believed it to be the only organization that could advance tourism development, in the absence of private entrepreneurs. Ezra Yas’ur who represented the Hula farmers also asked KKL-JNF to establish a new system that would unite all the agents involved in the field, pool budgets and determine priorities in solving the problems and in preserving the region’s property. Harmelin testified that he had met Omri Bonneh by chance at a conference and proposed that KKL-JNF once again take on the management of the site together with the farmer’s tourism consortium. The lands that were designated nature and tourism areas with Lake Agmon at their core had been allotted by the Israel Land Administration (ILA) to tourism consortiums belonging to the moshavim and kibbutzim for development. As neither, Nahalat HaMoshavim nor the Kibbutzim Tourism Consortium had found a private entrepreneur (as implicit in decision 865 of the ILA council) willing to undertake the tourism development, and themselves lacked the necessary resources, they asked KKL-JNF to become involved again.

A. KKL-JNF Adopts Lake Agmon

Bonneh considered the Lake Agmon development project the highlight of KKL-JNF’s Northern Region activity. The Northern Region had been established in 1999 as part of the structural reorganization in KKL-JNF, and Bonneh had been appointed to head it. Bonneh aimed to use this activity to anchor KKL-JNF’s status as an inclusive organization, which represented a broad consensus and worked for the benefit of the environment and the inhabitants by creating a mechanism of cooperation between the various stakeholders. In his opinion, KKL-JNF had the ability to cope with the great challenge of a national project that would make a significant change from the perspective of creating a vision, planning, implementation and management. The project area, although owned by KKL-JNF (the Hula concession had been purchased by KKL-JNF from the Israel Land Development Company for draining the marshes in the 1950s) had been leased to the farmers by the ILA, according to the covenant between KKL-JNF and the state of Israel, for agricultural cultivation. Therefore, it made sense for KKL-JNF to cooperate with the moshavim and kibbutzim who had the rights to farm the land. KKL-JNF would serve as the coordinating agent between all the other organizations, in order to lead the implementation of the plan, representing the broadest common denominator of all the partners, and out of commitment to the existing agreements and plans. The other partners knew that KKL-JNF had the financial and professional capability required, and considered it an organization that could advance the project. For Bonneh, the project to develop the birding site at Lake Agmon had a personal angle, as since childhood he had been an ardent birdwatcher in home on Mt. Carmel. KKL-JNF’s management agreed to take on the challenge, it was decided to establish a working team which KKL-JNF together with the Northern R&D Station, the Kinneret Drainage Authority, and the farmers, would develop a conceptual plan for scenic-tourism development.
In 2001 the “Hula Valley — Conceptual Plan for Development” was submitted. The plan did not restrict itself to the lake itself, but proposed ideas for developing tourism throughout the Hula Valley. Expanding tourism development was justified by the expected water shortage for farming and the need to create alternative sources of revenue for the agricultural communities. The plan was based on the option chosen for the Hula peatlands rehabilitation project, because that was where the concept of developing tourism as a partial alternative source of revenue instead of agriculture was first broached. The two first chapters focused on the strategic plan for agriculture in view of the water crisis that began in 1998 and mandated a cut in water quotas for farming. The last two chapters focused on the creation of guidelines for ecotourism and for educational activity and guiding in the valley. In the introduction to the plan, it was noted that the plan was a result of joint work by KKL-JNF staff and the Northern R&D Station with representatives from the regional councils, the Water Commission, the Kinneret Drainage Authority, the Ministry of Agriculture and other agents.

The plan was welcomed warmly by the KKL-JNF management, as well as by the representatives of the region’s residents and by the Hula Committee headed by Gophen. The year 2001, during which the plan was submitted, was symbolic because it was the 100th anniversary of KKL-JNF’s founding, and the 50th anniversary of the Hula drainage. KKL-JNF organized a study day to mark the 50th anniversary of the drainage in memory of David Nahamias, who had headed the KKL-JNF Land Development Administration and was among the initiators and leaders of the program to rehabilitate the peatlands. On this day, KKL-JNF publicly announced that it would invest 100 million NIS over the coming ten years to develop tourism infrastructure in the Hula Valley. The head of the Upper Galilee Regional Council, Aharon Valensi, praised KKL-JNF: “We thank you, KKL-JNF for your admirable work. The signs of your work can be seen throughout the Galilee and you will continue to make site after site bloom, in the future as in the past”.

In order to realize the conceptual plan KKL-JNF management decided to establish a broad public management board. The representatives of 24 different entities participated, including representatives of regional councils, Kiryat Shmona and Yesud HaMa’ala, government ministries: Agriculture, Environmental Protection, Tourism and Development of the Negev and the Galilee, the Galilee Development Authority, the Water Commission, the Kinneret Drainage Authority, the Government Tourism Company, the INPA, the SPNI, Nahalat HaMoshavim, the Kibbutzim Tourism Consortium and others. The function of the broad management board was to determine goals and the steps necessary to attain them.

The first meeting of the broad public management board took place on November 18, 2001. At this meeting Dan Levanon, one of the founders of MIGAL, who was at the time the Chief Scientist of the Ministry of Agriculture, was appointed to head the broad public management board. It was also decided to establish an executive management committee, headed by Omri Bonneh, the director of KKL-JNF’s Northern Region, to initiate and evaluate detailed plans for developing tourism on Lake Agmon. During the meeting, Ilan Ben Yosef, who had been selected by KKL-JNF to head the team that would prepare the “master plan for leisure and recreation in the Hula Valley”, presented the touristic vision of the plan. An ecological-agricultural-touristic park would be established in which natural processes, agricultural production, and tourism activity would coexist, in a balanced and sustainable manner. Bonneh believed that it is possible to implement “extensive tourism development” in his
terms, that is, moderate development that tries to maintain balance between nature and tourism, without introducing building elements in the heart of the project. The private entrepreneurs would still be able to develop tourism infrastructure, which he termed “intensive development” that includes accommodation outside the core area. This would involve modifying the Hula lands program and moving the recreational villages in the plan, west of the western canal. It was also agreed at that same meeting that a planning committee would be established by the public management that would serve as a steering committee to prepare the master plan.

The term that defines the type of tourism planned for Lake Agmon is ecotourism. This term was first coined in 1983 by Hector Ceballos-Lascurain, a Mexican architect, environmental activist and tourism consultant. His definition of the term was general and referred to a type of tourism focusing on the natural environment. To this day, there is no consensus on the definition of the term, possibly because it is a still-developing tourism niche. In 1996, the International Union for the Conservation of Nature (IUCN) suggested a broader, more specific definition: “Environmentally responsible visiting of relatively unspoilt natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features — both past and present), that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations”. If so, one of the indicators for assessing ecotourism is its contribution to the community and society. From this aspect, Lake Agmon is true ecotouristic project, because beyond the fact that it aspires to balance between tourism, farming and ecology, the very fact of its existence aims to contribute to the subsistence of the landowners and to the economy of the region’s inhabitants. The management of the adjacent Hula Nature Reserve, whose main purpose is nature conservation, does not include goals of contributing to the region’s economy or involving the local population in its management. Ecotourism at its best is also concerned with educating the tourists regarding the importance of the ecosystem they are visiting and involving them in the effort to conserve nature.

KKL-JNF was accustomed to develop projects for the inhabitants of peripheral regional councils, which when complete were given over to the management of local agents, while KKL-JNF progressed to the next project. Thus, for example, KKL-JNF developed Gane Huga, a water park and recreation area in nature, north of Nahal Harod, together with the Bet She’an Valley (Valley of Springs today) Regional Council. When its development was complete, management was transferred to the regional council. KKL-JNF had connections to the Hula Valley for many years, from the time of the drainage, which had been its flagship project in the 1950s. In the 1990s, KKL-JNF returned to the region in the wake of the project to rehabilitate the Hula Valley peatlands. According to the original plan, KKL-JNF was to invest resources only in establishing hydrological, agricultural and ecological infrastructures, intended for improving the Lake Kinneret water quality, agriculture in the valley and to create an alternative source of revenue for the residents of the area from tourism. The disparity created because the tourist project was not developed led KKL-JNF to decide to change direction and invest in the development of Lake Agmon as an ecotourism site. The only example that could serve as a model of managing a tourism park together with the landowners at the time was the Jordan Park. This park was a forest recreation area at first, developed and maintained by KKL-JNF until 1992. Since then, the arrangement was that the park is managed jointly with the Golan Regional Council, vehicles entering the park pay a fee, but visitors on foot can enter free of charge.
The decision of KKL-JNF's management to adopt Lake Agmon as its flagship project, and transform it into a globally important ecotourism site, conformed with the shift towards environmentalism that KKL-JNF was undergoing at the time and its aspirations to position itself in the public mind as a leading environmental organization.

**B. KKL-JNF’s Environmental Transition**

In 1961, KKL-JNF signed an agreement with the Israeli government that all land reclamation and afforestation in Israel would be in its hands. Consequently, KKL-JNF established the Land Development Administration (LDA), whose function was to reclaim lands for farming, afforestation and agricultural drainage. The KKL-JNF Forestry Division was now professionally and administratively under the LDA. During preceding decades, establishment of new agricultural settlements and land reclamation for farming decreased, and afforestation became KKL-JNF’s main activity, with which the public identified the organization. In the wake of the waves of immigration from the Soviet Union in the late 1980s and early 1990s, the government cancelled many of the restrictions imposed by the planning process to create new housing possibilities that led to the destruction of open spaces, particularly forests. At the same time, the public importance of open recreational spaces grew and with it, the awareness of the need to protect them from development pressures. In these circumstances, the National Planning and Building Council requested KKL-JNF prepare a national master plan (NMP) for forests and afforestation. The plan was intended to determine the extent of existing forests and native woodlands, the lands designated for afforestation and the suitable management policy for the different forest types.

One of the innovations in the plan was, that it designated, in addition to planted forests, which comprise only 42% of the area covered by the plan, other types of woodland as well, to provide maximal representation for all the vegetation communities and landscape formations in Israel. These included native woodland for preservation, existing and proposed open woodland (low-density forest), riparian plantings and coastal forest parks. Earlier, in 1990, KKL-JNF had already published an updated plan for managing planted forests in Israel, which officially recommended planting and tending multi-species, less dense forest plantations, with a greater emphasis on native woodland species. The aim was to create a robust forest, highly resilient to disturbances resulting from climate change such as, wildfires prolonged droughts and pests. NMP 22, which determined the final boundaries of afforestation in Israel (a total of 162,000 hectares), was approved on November 1, 1995, by the government of Yitzhak Rabin, only a few days before his assassination. The approval of NMP 22 was another step in the direction of KKL-JNF’s transition to becoming an environmentally oriented organization, because most of its afforestation work now focused on fostering native species and processes in existing forests and planting new forests composed primarily of natural species, the approach known as “close to nature” forestry.

NMP 22 was significant not only because of its different approach to the features that should be focused on in forests, and because it acknowledged the importance of forests in providing leisure and recreation services to the public at large, but also because of how it regarded riparian habitats. The program determined that plantings along streambanks would also be considered a type of
afforestation in order to transform them into recreation areas, which are particularly important in large population concentrations. In the past, water was used for the benefit of agriculture and human settlement, with no consideration of the ecological and environmental functions of the flow system, which provides people with additional services, such as open recreation areas. The drainage authorities were established by law, when streams were viewed as channels, whose purpose was promote effective drainage of rainwater, without damaging built up or agricultural areas. The streams and springs, whose water was suited for drinking, were usually diverted at the head of the stream catchment. The flow routes, which once had abundant water, vegetation and animals, became waterless and lifeless. In time trash, sewage and wastewater began to flow in the streambeds, transferred there by private entities and local governments. When a stream becomes polluted at a certain point, it affects its function over its entire route downstream and affects the entire ecosystem. Most of Israel's streams and rivers have been very impacted by this combination of diverting natural water sources and polluting the remainder with domestic and industrial waste.

Inspired by NMP 22, KKL-JNF prepared a program for river rehabilitation that was submitted in 1994 to the Minister of the Environment, Yosi Sarid, who in turn established the "Israel River Rehabilitation Administration". David Nahamias, who headed the LDA, declared in 1996, that KKL-JNF considers rehabilitating Israel's rivers a national mission to offset urban development pressures on open spaces. The Israel River Rehabilitation Administration included representatives of the following bodies: the ministries of the Interior, Tourism, Agriculture, Environmental Protection and the Water Commission, KKL-JNF, the INPA and the SPNI. The administration focused on determining river rehabilitation policy, including preparing master plans, in prioritizing rehabilitation tasks and in pooling budgets. KKL-JNF was appointed the coordinating agency between the numerous agencies involved with streams, to promote their rehabilitation from the aspect of water quality, and as a major habitat for plants, animals and birds. In addition, the administration strove to ensure the functioning of streams as drainage arteries to prevent floods and to develop their banks for tourism and recreation.

Stream rehabilitation was welcomed by the public as it yearns for such recreation venues. The sound of water flowing in a stream, the possibility of wading in it, or having a picnic under a shady tree on a streambank, the plants and animals around it, all these are the source of enjoying nature, particularly in Israel's hot summers. Thus, it is no wonder that KKL-JNF, as part of its transition to environmentalism, chose to invest knowledge and resources in stream rehabilitation. The peatland restoration project in the Hula Valley, which began in 1993, included rehabilitating the historic Jordan River flow channel, by restoring and regulating it, rehabilitating the riparian vegetation and developing scenic routes along it. This restoration was also conducted to create venues for recreation in nature and to become part of the environmental transition KKL-JNF was going through. The River Rehabilitation Administration encouraged local entrepreneurs to develop sustainable recreational activities along the streams and near them. These projects were intended to rouse the interest of the public at large that would visit the streams and to provide the inhabitants of the region with additional sources of income.

In the late 1990s, KKL-JNF defined its strategic goals for the 21st century, one of which was the rehabilitation of Israel's streams. KKL-JNF decided to take on this mission in order to become associated with it as it was with afforestation. Regarding afforestation, a new strategic objective was...
set, which focused on broadening the concept of forest management from managing the forest as a habitat to transforming it into a vital interesting encounter between people and nature. For most of the 20th century, forests were intended to occupy land and convert it from wilderness; the trend for the new century was to bring forests closer to people. As part of this concept, a new position was created in the KKL-JNF forestry system — a Community and Visitor Coordinator, who would be responsible for tourist and visitor infrastructure and for promoting events, such as concerts, hikes, and the like and for strengthening the connections with local communities.

The decision by the KKL-JNF board to adopt Lake Agmon as its flagship project in the north and to transform it into a globally recognized ecological tourism site was based on the same environmental transition KKL-JNF had undergone. It was expressed mainly in the change in how KKL-JNF forests were managed, so that they should be optimally adapted to the local ecosystem, and in their development as recreation venues for the public at large. Nevertheless, KKL-JNF had no source for learning how to develop an ecotourism site, which would focus mainly on watching birds, by as many people as possible, without affecting the ecosystem and behavior of the birds. From this aspect, although KKL-JNF was returning to the Hula Valley 50 years after the drainage, the valley was in many ways, still a “wilderness” in its eyes.

C. Developing Lake Agmon as an Ecotourism Site

The “Hula Valley — Conceptual Plan for Development” that was, as mentioned above, approved in 2001, 50 years after the Hula marshes were drained, focused on developing public infrastructure to encourage tourism in the Hula Valley. The reference to Lake Agmon is very general, and notes, that KKL-JNF would continue to strengthen the re-flooding project with research and monitoring, and would ecologically enrich the wetland and other habitats in the project. There is no any detailed reference in the plan to the development of Lake Agmon as an ecotourism site. Tourism development at Lake Agmon required referring to questions, which included, among others, how would the entrance to the site be implemented? How would it be possible to move around it? Would an entrance fee be charged? What could be seen at the site? How would it be managed? What would be the target public?

At the end of that year, Ben Yosef, together with Aliza Rappaport and Hana Livne, began to prepare the “Master Plan for Tourism and Recreation in the Hula Valley”, according to the instructions of the broad public management board of the Hula, and at the request of KKL-JNF. It was intended, among other things, to outline the plan for ecotouristic development of Lake Agmon.

In July 2002, KKL-JNF published the “Master Plan for Tourism and Recreation in the Hula Valley”, which expanded the vision of the Hula Restoration Project to the entire Hula Valley. The authors of the plan based themselves on various surveys, to understand the demands and preferences of the visitors to the site and of local residents. They defined the central objective of tourism development in the valley, in a similar manner to the concept of Lake Agmon. On one hand, development of additional public infrastructure for recreation and tourism in the Hula Valley, for the benefit of visitors from Israel and abroad, and on the other hand preserving the water quality of Lake Kinneret and adapting the tourism
Canal Junction – Conceptual Plan.
Source: Hula Valley – Conceptual Plan for Development.
management to the needs of farming and the environment. The master plan proposed 14 planning sites in the valley, of which Lake Agmon was only one, which was termed the "core of the Hula".

As with Lake Agmon, a number of additional sites were proposed for creating wetlands by targeted excavations, one of which was the junction between the western canal and the eastern canal. This site was on the land where the Hula Lake had originally existed, unlike Lake Agmon that was established on peat soil in the center of the site of the ancient Hula Marsh. The plan proposed creating a water body at the canal junction, which would reconstruct the Hula Lake habitat and thus increase the habitat diversity in the valley. In addition, this water body was to serve as the reservoir for the water flowing in the western and eastern canals during floods, thus preventing damage to agriculture.

The proposed tourism development for the core area did not include a recreational village as permitted by the Hula peatland plan. The recreational village was to be moved outside the core, west of the western canal, in land belonging to Kibbutz Manara. This required modifying the Hula peatland plan. Yohanan Darom, from the SPNI, commended the plan and its goals, but was sorry that it did not suggest modifying the Outline Plan for the Hula Lands (Gimel/8923).

The master plan, as mentioned above, included 14 planning sites, of which the Hula core was only one, although it was the most important, both because of its great tourism potential and because it was the most sensitive to the conflicts between the managements of tourism-agriculture-ecology. According to the master plan, private vehicles would not be allowed to enter the core area and travel around the area would be by public transport, on foot or on bicycles, which would be rented out by concessionaires. Most of the planning specifications for the core area focused on the future function and content of the visitor center, which also included a botanical garden around it, and...
even a landing platform for a hot air balloon. The main additional infrastructures proposed by the plan were observation points for watching birds. The tourism development was intended to create the feeling of an untouched natural area and open spaces.

In September 2002 the broad public management board, which included 24 stakeholders, approved the master plan and authorized KKL-JNF to implement it in the framework of the executive management it headed. The total public investment for KKL-JNF implementation of the plan was estimated at 150 million NIS, which was estimated to allow the number of visitors to the valley and its surroundings to increase significantly. In the winter of 2001–2002, even before the Lake Agmon site was opened to visitors only by special transport and on foot, and the number of visitors to the site was estimated at 60,000–70,000, a survey was conducted to assess the effect of birding on the tourism economy in the Galilee area. The survey revealed that the main reason for visiting was birdwatching and almost all the people interviewed said that they would visit the site again. The survey also showed that from a financial perspective, the revenue to the area from the visitors, who came specifically to the site, was estimated at about 4.5 million NIS, not including additional expenditures by visitors on accommodation and food in Lake Agmon vicinity.

The “Crane Lookout” that overlooked the field where the Eurasian Cranes were grazing, was built in late 2001, before the master plan was approved. The lookout was clearly visible, because it was built on an artificial hill that stood five meters above its surroundings. The structure was 10 meters long and 2.5 meters wide, and built of wooden planks, with six windows that provide views to the east in the direction of Lake Agmon and southwest to the crane feeding field. It has three benches that allow children to climb up and look out, and two windows with a movable lower pane, for the benefit of people with disabilities. The lookout site was enclosed with reed mats, with apertures to allow visitors to watch the birds without being seen. The various visitor installations were planned

Pelicans on Lake Agmon, against the background of the Pelican Lookout.

The map given out to visitors who came to watch the cranes before there was regulated entrance to Lake Agmon.
Source: Pas HaYerek, KKL-JNF Northern District.

The first visitor leaflet handed out by KKL-JNF.
Source: Pas HaYerek, KKL-JNF Northern District.
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by the KKL-JNF Northern District planner, Hanna Yoffe and were built by KKL-JNF’s building teams headed by Ya’akov Danino.

The Crane Lookout was inaugurated in November 2001, and provided visitors with a convenient view of the cranes and other birds in the valley. The opening ceremony included a tour and observation of about 20,000 cranes as well as congratulatory speeches. The media was invited to the event to help promote visits to the valley in the birding season. The KKL-JNF publicity department began publicizing the site and the Lake Agmon administration arranged for guides at the Crane Lookout and other spots around the lake. At this stage, there was still no regulated entrance to the site and private vehicles could drive freely around the peripheral road. This increased the number of visitors to Lake Agmon dramatically, from 70,000 in the winter of 2001–2002 to 120,000 the following year. The visitors received maps of the area that showed that along the peripheral road two lookouts had been developed: the Crane Lookout in the north and the Mahanayim Lookout in the south (because it was at the edge of a field that belonged to Kibbutz Mahanayim) that was in the shape of a raised round embankment.

The addition of the lookouts, the presence of guides in the field, free entrance for anyone in their own vehicle and KKL-JNF explanatory activity created a situation in which more than 1,000 vehicles a day came to the site on weekends. This, in turn, affected the behavior of the cranes. Some of them began roosting in the Hula Reserve or outside Lake Agmon, and instead of concentrating in the lake, they began to scatter in the fields and cause damage to the farmers. Consequently, there was concern that the delicate balance created between tourism, agriculture and the environment would be disturbed. Moreover, there were safety concerns, because many of the visitors left the site in the dark, after they watched the cranes gathering to roost, along a road bordered by water canals, into which they could
accidentally roll down. Therefore, Bonneh requested that the transition to regulated entrance should be arranged as fast as possible to solve the problems created.

A joint tourism administration of the kibbutzim and Nahalat HaMoschavim (that represented the farmers) and KKL-JNF was established to solve visitor-related issues. According to the master plan, a multi-purpose visitor center was planned at the site, through which visitors to Lake Agmon would enter, and decide how they wished to move around the area. However, since the need for regulated entrance was pressing, it was decided to make do with a temporary solution. Yossi Schreiber, the Northern District engineer and Tsvika Ayalon, the head of the Forestry and Visitor Department in the district, visited Agritech, the international agricultural technology exhibition, and noticed that the exhibition booths were greenhouses. They suggested employing a similar solution as a temporary substitute for the new visitor center. To help manage the flow of visitors, a system of electric gates was added, enclosing an area of 2,000 hectares in the heart of the valley. It was based on the system of private roads marked in the Outline Plan for the Hula Lands and allowed only authorized vehicles to enter the complex.

In December 2003, the regulated entrance to Lake Agmon became operational. KKL-JNF’s spokesperson informed the visitors that a regulated entrance system is now implemented at the site, which would prevent private vehicles from entering, so as not to disturb the birds, avoid damage to crops and for the safety of visitors. From the entrance to the site, there would be a special shuttle to transport visitors, for a small fee of 15 NIS per person, which included guiding on the shuttle and at the observatories. The spokesperson specified that KKL-JNF had invested some 100 million NIS in developing the site, to which new lookouts, a water buffalo acclimation site, lavatories, trails and parking had been added, as well as initial infrastructure, which would eventually allow bicycle trails to be paved. KKL-JNF also planted tree groves, added canals and small water bodies to diversify the environment, restored
aquatic marsh plants, such as the Nile Papyrus, Yellow Pond Lily and the White Water Lily. The site was developed to be fully accessible to people with special needs. The lookouts were planned with low observation slats suited both for children and for people with physical disabilities, who are the only ones permitted to enter Lake Agmon with their vehicles after presenting proper authorization.

At first, there were three ways to move around the Lake Agmon complex: on foot, by bicycle and with the shuttle. The 45-minute shuttle route extended along 9.2 kilometers, and the passengers enjoyed recorded guiding along the way. There were stops at which they could leave the shuttle, spend time outside and then board another shuttle. After the site became operational, the site tourism administration authorized concessioners to rent bicycles for single riders and families, and golf-carts. KKL-JNF also began handing out an explanatory leaflet titled “Come take a Peek”. The leaflet was designed as a wooden window that could be opened, resembling the lookouts at the site. When the window was opened, a Eurasian Crane was revealed. The leaflet focused mainly on the crane project and noted that on weekends ornithologists guided the visitors and took care that the public should not disturb the cranes.

Eli Galilee, a farmer from Kibbutz Ayelet HaShahar, who later coordinated the Eurasian Crane project, formulated a unique project focusing on the cranes, based on his experience as a farmer and a nature lover. As a farmer, he noticed that when he plowed the chickpea and peanut fields, the cranes not frightened by the sounds of the tractor; on the contrary, they followed the plow as if they were waiting for something, and when the plowing ended, they descended into the
furrows. Galilee understood that for the cranes plowing time was ideal for gathering remains of peanuts and chickpeas. Afterwards, when he began providing the cranes with supplemental food, the wonderful sights he saw led him to think of a way that would allow more people to enjoy the sight. He developed the idea of approaching the cranes with a safari wagon hitched to a tractor, constructed in a manner to hide the people in the wagon from the birds. In what may seem paradoxical, the noisy tractor allowed the people to come up close to the cranes, without frightening them. The safari wagon that has been operational since 2004 is an unparalleled crane-watching experience, and an excellent example of ecotourism initiated by a local inhabitant. In the first Safari Wagon model, visitors sat behind jute partitioning sheets with viewing slits that hid them from the cranes. Gradually it became obvious that cranes could be successfully viewed from relatively open Safari Wagons.

Yifat Artsi (Davidson), the INPA biologist, who observed the cranes when the wagons were first put into use, did not find they had an adverse effect on the number of cranes or their behavior at the feeding station. The cranes usually ignored the wagon, and even approached it, and there was no observed desertion of the feeding station. Undoubtedly, the most impressive sight, as far as the tourists are concerned, is to watch how the cranes gather in the feeding areas as night approaches, and then they fly off, almost all together, to roost in Lake Agmon. The evening safari wagon excursions are very much in demand at the lake.

The entrance to the site was simple and functional and the transport options were varied and exciting. The “scenery” that welcomed the visitors included the sight of the water with water birds surrounded by thousands of cranes walking around or flying by. Every once in a while a nutria (water rat), wild boar, jackal or jungle cat will appear from the reeds. Visitors are surrounded by pastoral fields and wide open spaces, with various stopover possibilities in the form of lookouts, in which experienced guides await the visitors to provide information and explanations on the rich bird life. All these create an unusually powerful ecotouristic experience that has attracted many people and is different from any existing nature reserve or birding site. Ecotourism, unlike nature tourism, is supposed to create an opportunity to learn about nature in addition to enjoying it. According to a study conducted by Noga Collins-Kreiner and Hezi Israeli, Lake Agmon falls into the category of a soft ecotourism site. In other words, the site is not only intended for expert birdwatchers or people with existing environmental awareness, but for the public at large, and it therefore includes a high level of services and installations and a large number of visitors.

The great number of visitors raised the expectations of the farmers that tourism might indeed be an alternative source of revenue. One of the main objectives of the Hula plan and subsequently of the master plan was that tourism would provide an alternative source of income for the farmers who had contributed their lands for the ecological restoration. The ILA permitted the local tourism consortia to charge an entrance fee that would not exceed the entrance fee to the Hula Nature Reserve. However, KKL-JNF has a policy of free entry to all its sites, therefore the board of directors, headed by Yehiel Leket, decided to allow free entry on foot and to charge a fee only for services that included the shuttle, golf carts and various types of bicycles, and for guided tours on various types of transport.
During the first year in which the tourism complex was operational with regulated entry, the number of visitors who purchased services at the site decreased by 4% compared to the total number of free visitors during the previous year and totaled 115,000 visitors. Despite the expectations that the first season would end in the black, the 2003–2004 winter season ended in a deficit, which was covered by KKL-JNF. The representatives of the farmers, headed by Aryeh Harmelin, who were partners in the tourism management of Lake Agmon, and sought ways to increase their revenues, once again petitioned KKL-JNF to allow them to charge an entrance fee, as ILA resolution 865 allowed them to do. However, KKL-JNF’s interest at that time, as a non-profit organization, was to continue with its policy of not charging entrance fees to KKL-JNF sites. Thus, the different interests of the stakeholders in the joint tourism management of Lake Agmon, created conflicts and a challenging management situation.

Managing Lake Agmon between private and public interests

KKL-JNF sought to secure the cooperation with the local communities who were allocated land for tourism development in an official agreement, similar to the one it had with the Lake Kinneret Drainage Authority regarding the project maintenance. KKL-JNF was concerned, that without an agreement, its financial investments would not be protected, as the consortium of the local communities would be able to take over sole management of the site if it so desired. KKL-JNF consented, in a draft agreement, that in exchange for its permanent involvement in the site management, it would transfer any profits to the consortium, and would cover any deficits as needed. It would receive half the profits only from the eighth year on, while committing to reinvesting all the profits in the development of Lake Agmon. For various reasons the agreement was signed only with Nahalat HaMoshavim in 2015, and has still not been signed with the tourism consortium of the kibbutzim, although in fact, KKL-JNF and the local tourism consortiums honored the agreement even before it was signed.

Harmelin tried to influence Yehiel Leket, KKL-JNF board chair, to change the policy of not charging entry from visitors on foot or on their own bicycles. He argued that there was an ethical issue, that residents from outside the area enjoy the land owned by the farmers, most of whom live in communities far from Lake Agmon, but receive no remuneration, despite the fact that the land is meant to provide them with a source of income. If these same farmers had lived near the lake, they would at least be able to enjoy from the income associated with the arrival of visitors to the site, such as renting accommodation or providing food. Harmelin requested that Leket consider, before the 2005 birding season began, the possibility of charging an entrance fee from everyone visiting the site. Despite the request, Leket preferred to adhere to KKL-JNF’s stated policy, that allows the public to enjoy the sites it manages for free.

One of the ways in which the tourism administration at Lake Agmon tried to increase the revenues of the site was by means of attractions that would draw visitors throughout the year, even during seasons in which the cranes were absent. The activities proposed for spring and summer included evening tours, night safaris, sunrise tours and bird ringing, at special prices. As part of the marketing activity, members of the media were invited to a night safari that followed animals active in the dark. One of the journalists that joined the tour noted that a few jungle cats and the beating wings of barn owls were the highlights of the tour. She believed that anyone who had been at a similar tour
in Costa Rica or the Brazilian rain forests, would not be enthusiastic, but on the other hand it was definitely and attraction for children. The journalist noted the possibility of purchasing sunrise tours to watch nature awakening and the morning rituals of birds and a special tour to watch bird ringing. 

Another method was integrating entertainment events, particularly on Passover. On Passover 2004, for example, there were various events and one of the radio stations broadcast two programs from Lake Agmon. One of the entrepreneurs suggested summer attractions such as a trampoline, petting farm, mud pool, water omega and small remote-controlled electric boats.

According to Ben Yosef, from an ecotourism perspective it would be preferable to admit that Lake Agmon is a seasonal attraction, and allow it to “rest” in the summer. In summer, the Hula Valley is very warm, and visitors to the area head mainly in the direction of the cool Jordan River. Nevertheless, expert birders can find things of interest at Lake Agmon in the summer as well, as there are birds summering and nesting there. However, there are not many birders, and the danger to nesting birds from humans is great. Non-birders will find it difficult to observe these birds, which are usually hidden from the eye. The challenge facing the Lake Agmon management is finding ways to keep the site attractive to visitors throughout the year. In time, however, it became clear that not only the birds attracted visitors. The experience of riding around in varied modes of transport is fun throughout the year. In fact, during the warm summer months, Israelis go on vacation and there was a demand for visiting Lake Agmon particularly in the season when only resident birds, which are not always easily seen, are found at the site. One of the topics that the management attempted to promote in the summer months was boating in the perimeter canal around the lake, but until now, the project has been unsuccessful.

In 2005, the Lake Agmon operational budget was still not balanced. One of the solutions KKL-JNF agreed to from the beginning, was charging a parking fee from vehicles visiting the site, instead of charging for the entrance of each visitor. The payment for parking was to be reimbursed to visitors renting transport at the site. This solution would allow all the visitors to pay something, with those wishing to, paying extra for transport. According to the estimate Ben Yosef prepared with tourism experts from the University of Haifa, this would increase the net revenue of the site by an additional 280,000 NIS. The reason the Tourism Administration decided not to charge for parking was technical and not fundamental. In order to try to increase the site’s revenues, Kobi Samrano was appointed tourism manager. He began working in 2005, when the Lake Agmon site was still losing money. According to Samrano it was difficult to manage the site because it involved conflicting interests, and to himself he called the site the “Conflict Lake”. Despite the difficulties he faced, he succeeded in reducing the deficit and increasing the revenues of the site, and 2006 was the first year the Lake Agmon site ended with an operating profit.

KKL-JNF took only the extensive tourism development upon itself, with no elements of intensive tourism, such as building accommodations. Bonneh wanted to help the farmers realize the plans for recreational villages, by transferring building rights, which had been received from the ILA according to the Outline Plan for the Hula Lands, to another area in the plan, located at the edges of the lake. This would have benefitted both the landowners who would enjoy an additional source of income and KKL-JNF that wanted to mitigate as much as possible development in the project core. The site that was chosen as the ideal alternative site for accommodation was west of the western canal
and extended over 70 hectares, which were cultivated by Kibbutz Manara south of the entrance to Lake Agmon. KKL-JNF suggested that Manara place the village in their land and join the tourism consortium. The kibbutz agreed, and initially the ILA supported the idea of transferring the land rights. Later, however, the ILA had second thoughts, and claimed that the land belonged to Manara only temporarily and was not part of its permanent allocation. This concept is still valid, and if the ILA would modify its stand, it could be implemented for the benefit of all the parties.

From 2006 and onwards, Lake Agmon has been a profitable enterprise. As the cranes were the major attraction of the site, and since the crane project was very costly, the farmers and the government requested that Lake Agmon should also participate in the financing. However, the project became profitable only many years after the farmers contributed their land for rehabilitation. Therefore, the Lake Agmon tourism administration decided that from 2007 onwards the crane project would be financed by the visitors to the site. In the first year, a representative of the site requested each visitor donate a single NIS from, for the benefit of the project. The payment was not compulsory, but in 2008–2009, 85% of the visitors contributed to the crane feeding project.

Yosef Avi Yair Angel, nicknamed Juha, a senior advisor for the development of the Negev and Galilee in the office of the vice-prime minister, took it upon himself to check how the crane project could be most effectively operated. His basis was that the Israeli government would not continue supporting the crane project much longer; therefore, KKL-JNF had to change its policy of not charging an entrance fee, in order to increase the revenues for feeding the cranes. He also recommended creating an additional source of funding by establishing a tourism consortium that would charge a surcharge for financing the crane feeding from the fees paid by tourists in the crane season for accommodation, because Lake Agmon increased the revenues of the tourist industry considerably. The broad public management board discussed Juha's recommendations. Bonneh made it clear that KKL-JNF would not change its policy of not charging money at the entrance to Lake Agmon. Nevertheless, he supported Juha's approach regarding the need to involve the tour operators in financing the project, but argued that it would not be possible to create a mechanism that would enable this. Therefore, he requested that the Ministry of Tourism show the necessary leadership and cover the tour operator's participation from its budget. To support his position, Bonneh brought the example of a similar project to prevent damage caused by Canadian Geese, which is implemented in Manitoba in Canada, where the government offices support the project and consider it part of their job.

This discussion raised the basic question whether the crane project is a local project or a national asset. The non-governmental organizations involved in the financing understood that the project would not succeed if it were viewed only on a local scale, and that the cranes had to be recognized as a national asset to be developed. Consequently, the broad public management board of the Hula pushed for pooling the government resources, via the Ministry of Agriculture, to create a budget resembling the one for maintaining and monitoring the peatlands. Dan Levanon who headed the public management board, spoke to agents in the Ministry of Agriculture in order to convince them to pool budgets of the Ministry of Environmental Protection, the Ministry of Tourism and the Ministry for the Development of the Negev and the Galilee for the benefit of the project. These government offices supported the project over the years, but not continuously. Consequently, there was no regular budget nor a regular
pattern of dividing the financing between the various organizations participating in the project, and every year it was necessary to “reinvent the wheel”. As a temporary solution, every so often, the Lake Agmon management raised the contribution for feeding the cranes requested from visitors, and in 2012, it reached the amount of 5 NIS per person.

Since the regulated entrance to Lake Agmon was implemented by KKL-JNF in 2004, there are data regarding the number of visitors and how much money they spent for renting vehicles and other attractions. The number of visitors entering the site on foot has also been estimated. The data indicate that the number of visitors, which was 70,000 in 2002, before the site was officially opened, reached 420,000 in 2017. The increase in the number of visitors to the site was very rapid during the first decade after it opened and eventually levelled off. The opening of the new visitor center will probably lead to another rapid increase in the annual number of visitors. In the first years after Lake Agmon opened, most of the visitors came, as expected, during the crane season, between October and April. Later on, between May and September, and particularly in June and July the number of visitors decreased sharply, and there were assertions that the site should be closed at this time. In the years since, the visitor curve did not change significantly, but the number of visitors in June-July rose somewhat, as did the total number of visitors, so that the average number of daily visitors is 400–500, and Lake Agmon has kept its attractiveness outside the crane season as well.
Increasing the number of visitors is a legitimate interest of the farmers, who are trying to earn a living from the land. Nevertheless, the goal of tourism at the site is watching birds, and it is important not to disturb them. Truth be told, any tourism activity affects the environment, one way or another. Studies have shown that the just about the greatest disturbance to birds from tourism occurs in aquatic habitats. Migrating birds gather at water bodies to rest and store energy by eating, to continue successfully on their migratory journey. The need to renew energy resources is critical, and tourist activity must allow them to do this. In light of this, one of KKL-JNF’s main functions, as a non-profit organization that manages an ecotourism site, is to see to it that the ever-growing number of tourists will not interfere with the birds.

**Seeking the correct balance between the welfare of the birds and the needs of tourism**

The major ecotourism activity at Lake Agmon is birdwatching that provides enjoyment from an amazing natural phenomenon. Birdwatching does not require much equipment, with the exception of a good camera or pair of binoculars, and does not even require physical fitness. In other words, almost anyone can be at least an amateur birder. Birdwatching developed from a local niche to a niche that includes international tourism as well. In the United States, for example, the number of birders has increased by 225% in the late 1990s and the first decade of the 21st century, becoming the most significantly increasing outdoor activity in the USA. In the United Kingdom, 1.1 million households are members of the Royal Society for the Protection of Birds, which is the largest public organization in Britain. New birdwatching sites are opening up all the time and attract millions of visitors. In Israel, there are no data on the number of birders, but they are not many. This can be seen from the fact that the bilingual publication for birders, the TORGOS, had only 1,000 subscribers before its publication ceased.

![Graph showing the average number of visitors at observation points relative to the number of birds at Lake Agmon, according to months of the year.](image)

Source: Shtainvarz et al.
Lake Agmon is the first ecotourism site with whose routine management KKL-JNF was involved. This was probably the reason that it made sure to create a support system for decision-making, which was based on field research and was even supported by the United States Forest Service. Ben Yosef, together with Dr. Hezi Israeli and Dr. Noga Collins-Kreiner, conducted a three-year tourism study in order to provide tools for decision making regarding the management, operation, maintenance, marketing, planning and development of Lake Agmon. One of these studies focused specifically on the optimal bicycle management at the Agmon.

The authors of the study also calculated that the loss of revenue due to the entrance of private bicycles was about one-half a million NIS per year. In addition, they found that most of the incursions into restricted areas were caused by private bikers who did not receive directions at the entrance. In light of these findings, they recommended closing Lake Agmon to private cyclists throughout the year, because the harm to the ecological-agricultural management system is not related to the peak weekend visitor loads, but to the unregulated entrance itself. The increase in the number of bicycles could also create a safety problem, particularly as there was not yet a separate route for cyclists. However, in December 2005, the Lake Agmon management decided to allow a limited number of private bikers to enter the site on days with high visitation pressures, following early registration, and not to limit entry in other days. At the same time, KKL-JNF fast-tracked the development of the bicycle trail project, which was financed by the Ministry of Tourism and by donations. On Hol HaMoed Sukkot 2007, a separate path for bicycles and golf carts, financed by KKL-JNF and the Ministry of Tourism, was inaugurated at Lake Agmon. The separate path significantly reduced the safety hazards involved in bicycle riding.

KKL-JNF initiated another study to assess visitor pressure impact on the behavior of birds at Lake Agmon, to ensure sustainable tourism at the site. Roy Shtainvarz, along with several other researchers, conducted a study that observed both people and birds at Lake Agmon. The study was conducted between 2008 and 2010 and included 48 observation days at four different sites (the Crane Lookout, Mahanayim Lookout, Pelican Lookout and a control site). The control site was an area with no visitors or tourism activity that was kept for the purpose of the research project and was located on an island in the eastern section of Lake Agmon. Observations were conducted from a tall tower, to ensure disturbance would be minimal. There was a birdwatcher and tourism surveyor at each site, who moved in an orderly fashion from site to site. Only the birdwatcher surveyed the control site. The birdwatcher recorded the location of the birds according to species, and at the same time completed an observation sheet with their activity and behavior. The tourism surveyor mapped the location of tourists and completed a form recording their activity and behavior. The data regarding the number of visitors and birds indicated that the data should be divided according to seasons, because both visitors and birds displayed seasonal differences in their behavior.

The results indicated that visitor presence affects the birds and the presence of birds affects the quality of the tourist experience like a chain reaction. On one hand, the number of birds and physical proximity to them intensifies the tourist experience, but on the other hand, proximity of people affects bird behavior, such as roosting and feeding, and they prefer to move away from visitors. This requires controlled management that will benefit tourists but not hurt the birds. For every 100-bird increase, there was an increase of nine minutes in the time spent in the lookout. The results indicate
that the safety distance birds keep from the visitors grows linearly with the number of visitors. The argument that the greater the number of birds that safer they feel was also supported, therefore, in winter and autumn, there are more birds and they feel more secure. Another finding was that areas with no riparian vegetation are the most susceptible to disturbance.

Birds are wary of people approaching because they consider them predators. Therefore, they will occasionally stop feeding to survey their surroundings to identify approaching predators. They can also keep at a distance that allows them to flee danger effectively, which is termed the escape distance. Birds tend to flock for roosting and feeding because they seem to feel safer in flocks. Some bird species feel safer in vegetation thickets that provides them with cover, while other birds prefer the open water. When people approach water birds they increase the risk perceived by the birds and stimulate a corresponding response. The greater the perceived danger the more extreme the response, such as flying or swimming off. This causes the water bird to expend unnecessary energy, and the more frequent the disturbance the greater the danger to the birds.

The carrying capacity of a site relates to the issue of how many tourists can visit the same site before negative effects are felt. In the case of Lake Agmon, the question is what is the equilibrium point between the welfare of the birds and the fulfillment of tourism needs? The tourism carrying capacity of a site is composed of its physical carrying capacity, e.g. the number of parking spots at the site, its ecological carrying capacity — the effect of tourism on the ecosystem, and the social carrying capacity — what is the maximum number of visitors that will not adversely affect a visit experience, in which the encounter with nature is the focal point. The researchers concluded that there is no single clear method to measure and assess the carrying capacity threshold of a given site, and therefore it would be more effective to relate to a range of minimum versus maximum visitors, which would allow for management flexibility. In other words, the goal is not just to determine the ideal status of the site, regarding the natural environment and the number of visitors, but also to determine what the accepted variation from this status is. This system, developed by the U.S. Forestry Service, is termed the Limits of Acceptable Change (LAC). It is an inclusive approach, which relates to broad planning processes, where there is stakeholder and local community involvement in determining planning goals. This model was used by the research team in order to determine the range of acceptable tourism activities that would not reduce the intensity of the experience on one hand, or create unreasonable disturbance for the tourism resource, i.e. the birds themselves, on the other.

The results of the study on the impact of visitors on the birds led the research team to conclude that a general carrying capacity indicator for the observation area was not feasible, as there were significant differences between sites, seasons and even between the different hours of the day. Thus, instead of an invariable threshold the study suggested a flexible management framework that divides the time and space for different tourism uses, according to the degree of sensitivity of the birds. The team recommended dividing Lake Agmon into three sub-areas. The first in which reed stands would be cultivated, with no option for birdwatching or observation points. The second area would be freely accessible, and the third area would include natural riparian vegetation, such as common reeds, to separate between visitors and the birds, combined with a few observation points in hides, with openings for observation. The hides were supposed to be modest, intimate and partially roofed to allow observation on rainy days or when the sun was hot.
Although the researchers found that people can adversely affect the routine of the birds, they believed that some of the area could be “sacrificed” for the benefit of creating the experience of a direct visual experience that includes the water, the open landscape and the birds, because, among other things the site is an economic-tourism project. Their operational recommendation to improve the interface between the tourists and the birds did not just involve limitations on the character of the visit, but also on improving the behavior of visitors to the site by means of preparatory instructions, information sheets, appropriate signage and the like. They believed that explanations to visitors should emphasize that the best sites for birdwatching are the lookouts, at which they can also receive free guiding.

Part of the desired ecotourism experience is precisely the possibility of spending time in nature tranquilly, enjoying the sight of the birds and not running from lookout to lookout to succeed in seeing as many lookouts as possible in the limited time available with the rental vehicle. In fact, the site management received complaints that the time limits spoil the Lake Agmon experience. The function of the site management is to improve the experience by directing the visitors to days and hours when there are lower visitor pressures, and it is possible to extend the time available for the various transport methods. At peak pressure times, this is not possible, as it would inevitably increase the waiting times for rental vehicles and disappoint the families that made the long journey to enjoy the Lake Agmon experience. When the site was opened to regulated visits in 2004, the shuttle was expected to be the most popular transport method due to its low price (15 NIS per person) and because it included guiding. During the first year the various transport methods were put into operation, 31% of all visitors preferred the shuttle, 35% chose the golf carts and 13% chose bicycles. A year later, there was a distinct 45% decrease in the number of people choosing the shuttle, but there was an increase in the number of people choosing rented golf carts or bicycles, despite their rental being more expensive. Ben Yosef believed that riding in the shuttle (a bus or mini-bus), was not sufficiently exciting, and even “cheapened” the visit experience or made it “duller”, as it was unrelated to the atmosphere of ecology, nature and KKL-JNF. In 2007 a separate route for bicycles and golf carts was developed, which was closer to Lake Agmon than the perimeter road. In 2006, the shuttle option was cancelled due to lack of demand. Ben Yosef’s working assumption in developing Lake Agmon as an ecotourism site was, that the birds alone were not a sufficient attraction. Therefore, a fun means of transport would increase the site’s revenue by intensifying the tourism experience beyond the encounter with the birds. He believed that children’s insistence to return to Lake Agmon was related to the experience of riding in golf carts or bicycles and not to watching birds. Nature is the excuse for the visit, but without adding a lighter and more adventurous experience the public would not come. With a touch of irony, he said that the topic was not necessarily ecotourism, but riding-tourism. The fact that the golf carts were such a popular mode of transport, despite the high rental fee and the limited time, was evidence that there may be some truth to his claims.

The varied transport options at Lake Agmon were intended to create a carefree adventurous ecotourism experience, and to differentiate the site from the Hula Reserve where visitors can move around only on foot. Nevertheless, the proximity between the two nature sites afforded the option of cooperation in the area of visitor management, marketing initiatives and the like. The issue of two adjacent nature sites, both focusing on birding, but managed by two different organizations, was part of the Lake Agmon project from its inception (more on that in the next chapter).
D. The Relationship between Lake Agmon and the Hula Nature Reserve

The Hula Reserve is managed by the Israel Nature and Parks Authority (INPA), which was created by the union of two government agencies that were independent until 1998: the Nature Reserves Authority and the National Parks Authority. Nature reserves are intended to preserve natural assets and landscapes, but also to provide people with sites where they can enjoy the natural environment. The INPA is responsible for 230 nature reserves, about 20 of which charge entrance fees. In nature reserves that charge an entrance fee, such as the Hula Reserve, the INPA manages both environmental and tourism aspects. Revenues from entrance fees comprise a significant portion of INPA budget and are used to advance nature, landscape and heritage conservation in Israel. The INPA considers the Hula Reserve one of its flagship projects, because it was the first nature reserve declared in Israel, and consequently invests economic and management resources to promote tourism at the site. The Hula Reserve is a human creation, which was established on the western edges of the drained Hula Lake, by building embankments. After the land around it subsided, the reserve became something of a raised tub, dependent on a regular supply of water to subsist.

At the time of the Hula peatland rehabilitation and later, when the master plan for developing Lake Agmon was prepared, KKL-JNF and the INPA had serious disagreements regarding the planning and management of open landscapes in Israel. This did not prevent the two organizations from cooperating on issues related to the Hula Valley. Dan Perry, who headed the Nature Reserves Authority before the unification, was part of the planning and steering committee of the peatland rehabilitation project. In the early 2000s, when KKL-JNF adopted Lake Agmon as its flagship project and planned to develop it as an ecotourism site, it included a representative of the INPA in the broad public management board. Moreover, the organizations cooperated in monitoring the crane project in the Hula Valley. Since the regulated entrance complex to Lake Agmon was opened in 2003, which includes diverse transport options, there have been attempts to develop touristic cooperation between Lake Agmon and the Hula Reserve on issues such as visitor management, joint marketing and planning a path to connect the two sites, but these have not matured into sustainable collaboration.

Although both the reserve and Lake Agmon are nature sites focusing on birding, the two sites offer different visitor experiences. The Hula Nature Reserve is largely a closed reserve, with only 5% of its total area intended for use by visitors. At the entrance to the reserve, visitors receive a pamphlet and inside there is only a single, 1.5-km long trail along which it is possible to walk, part of which is a floating trail. The two busiest sites along the route are the floating bridge, whose covered section is made of wood, and the observation tower. Visitors coming to these sites do not have guiding by people as there is in the various lookouts at Lake Agmon. Most of the visitors come during bird migration seasons, in autumn and spring; in winter, there are almost no cranes, as they spend time mainly in Lake Agmon and its surrounding fields. The reserve is managed only by the INPA with no involvement of the local population, which does not benefit significantly from its existence. There are also no joint projects with farmers in the area.
Hadar Barkai conducted a study that compares the reserve and Lake Agmon from the perspective of site management, design and its function as a tourist site obliged to manage visitors. According to the results, both sites convey a similar educational message, e.g. the consequences of the Hula drainage, bird migration, fauna and flora, the re-flooding project and information regarding the managing agencies. Lake Agmon however, offers more diverse encounter options. The main difference Barkai found was that Lake Agmon is primarily managed as a tourist site and therefore is more focused on visitor management. This difference is also obvious from the fact that Lake Agmon was managed for many years by Kobi Samrano, whose background is in tourism marketing. The reserve, on the other hand, is managed by the INPA staff, who have only environmental training.

The number of visitors at Lake Agmon was already greater than the number of visitors at the reserve when the site opened, and increased steadily every year. The Lake Agmon management, in which the tourism consortiums participate, focused on running the site as a profitable tourism venture and creating an attractive tourist product. The largest increase in the number of visitors to Lake Agmon was between 2001 and 2002 (50,000 additional visitors), when the tourism development began, but the regulated entrance system was still not operational. The increase in the number of visitors to Lake Agmon would have been expected to reduce the number of visitors to the reserve, but the opposite occurred. Since visitors began coming to Lake Agmon, the number of visitors to the Hula Reserve increased as well, except in 2001 (when the number of visitors decreased by 4,000). Apparently, the increased interest in the Hula Valley because of Lake Agmon also led to an increase in the number of visitors to the reserve. There are claims that a considerable portion of the people coming to Lake Agmon from the south enter the reserve by mistake, as the reserve is a bit south of...
Lake Agmon. In light of this, it would be expected that the INPA management would be happy with the fact that the reserve “enjoys” an increase in the number of visitors following the opening of Lake Agmon and would not try to compete with the site in the tourism context.

The Hula Reserve management did not focus on the tourism aspect, but the management of the INPA, particularly in the years in which it was led by brigadier general (res.) Eli Amitai (2002–2011), formulated a different policy and put pressure on the field workers to develop the reserve to attract more visitors and increase the INPA’s revenue. The tension between the management and the local staff resulted in three reserve managers being replaced between 2005 and 2007. The main project, through which the INPA tried to compete with Lake Agmon, was the new visitor center it developed, the Euphoria Visitors Center, which replaced the previous exhibits at the reserve. The Euphoria includes a closed darkened screening room, in which the story of bird migration is related via a three-dimensional exhibit that includes moving chairs that provide viewers with the sensation of being birds. During the film, water is splashed from the ceiling and the feeling of voles running between the chairs is created. After the film there is a stuffed animal exhibit, and from there visitors continue to an auditorium where they participate in a trivia contest. The cost of the project was about seven million NIS and it was officially opened on Passover 2005.

Although it had been clear from the start that the production costs would not be covered by the visitors, the proponents of the project hoped that Euphoria would attract more visitors, which would increase the revenues of the reserve to finance nature conservation. During the first years, the number of visitors did indeed increase, but they also created operational problems, such as a bottleneck at the entrance during peak seasons. The critics of the project, both within and outside the INPA argued that it is not the agency's function to invest such great sums of money in tourism development, even more so in an indoor structure. Tourist attractions should be developed outdoors, in the open air, without harming protected natural assets. Furthermore, they argued, the reserve itself was neglected, while money was invested in the tourism project. Some people were even more critical, describing Euphoria as a typical example of Israeli inefficiency, as at the time Euphoria was established, it was already known that KKL-JNF was planning to establish a large visitor center adjacent to Lake Agmon. According to Ben Yosef, the Euphoria was a sort of Disneyland, which should have been at the entrance to Lake Agmon and not at the nature reserve. The supporters of the Euphoria argued that it was developed to avoid additional tourist development inside the reserve. Furthermore, it allowed the educational dimension to be expanded, to make up for the lack of human guidance as well as providing a closed climate-controlled environment for rainy or hot days.

After its establishment, Euphoria was marketed without mentioning the reserve. Thus, the marketing flyer for the reserve invites visitors to fly with the birds at Euphoria, which is a 3-D stereoscopic movie. A person viewing the flyer, who has never heard of the Hula Nature Reserve, cannot understand from it that there is also a nature reserve worth visiting. Didi Kaplan, a former INPA ecologist, who teaches at the Tel-Hai College, occasionally takes his students to the Hula Reserve. He begins the visit with Euphoria and then tells them “that's it, we've seen it, let's go”. Although he says it jokingly, there are always students who take him seriously and get ready to leave. This anecdote expresses his concern that people will come to the reserve, visit the Euphoria and return home, without experiencing their natural surroundings. The marketing effort and the experience it provided increased the number of
visitors significantly by 50,000 during the first year (2006) after it became operational. However, in 2007, the following year, the number of visitors to the reserve stabilized and even decreased a bit. Apparently, if an artificial project, as invested and exciting as it may be, provides the same experience repeatedly, it cannot attract visitors for return visits. The ecotourism experience at Lake Agmon, on the other hand successfully attracts repeat visitors and the number of visitors is constantly rising.

The INPA did not calculate the carrying capacity threshold of the Hula Reserve. The capacity of the site on peak days was determined by the capacity of the parking lot, as occurs in other nature sites in Israel and the world over. On peak days, the number of visitors can reach about 4,000 an amount of people that could negatively impact the ecosystem. The visitor density on peak days is felt throughout the visit, as all the people concentrate on the same narrow path. In addition, there is only one central attraction, the Euphoria, and on peak days, visitors are forced to wait in long lines or forego the show, to their disappointment. In Lake Agmon, on the other hand, traffic at the site flows with no bottlenecks, and crowding is felt only in the lines for transport rentals. Actually, the reserve cannot, or is not supposed to compete for tourism with Lake Agmon. The number of visitors following the opening of the Euphoria, which totals about 150,000 visitors annually, is more than enough, unless new paths will be developed in the reserve. Uzi Barzilai who was the marketing director of the INPA and the head of its Public and Community Division, believes in hindsight, that 100,000 visitors to the reserve annually is sufficient. The remainder should preferably go to Lake Agmon, and if this results in increased awareness to nature conservation, everyone profits.

A study conducted after the Euphoria was opened showed that only between 30 and 40% of the visitors to the reserve visited the exhibit. Most of them were excited by the experience and their response was very favorable. On the other hand, visitors to the reserve who walked along the unguided path and did not visit the Euphoria were usually disappointed at the end of the visit, and did not assimilate the educational message the INPA wished to convey. A study conducted by Eyal Mitrani, who manages the field of visitors and community at the NPA, showed that the most effective method of conveying messages is human interpretation. The second most effective method is focused signage, without too many details. The explanatory pamphlet handed out at the entrance was found to be the least effective method of conveying information and concepts.

At Lake Agmon, there are more options for encounters between the public and educational themes. In the early days, there was the shuttle, which included guiding at fixed stops along the route. Now, there are three organized observation points: the waterbird lookout, the pelican lookout and the crane lookout, at each of which there is an interpreter to meet and guide visitors during migration seasons. The interpreter adjusts the telescope, explains to visitors what they see and answers questions. In addition there is an electronic guide that can be purchased, or a cellphone app which can be used from the bicycles, the golf carts or while walking. Visitors who choose to ride the safari wagon are guided by the driver or the guide accompanying him. According to a questionnaire visitors filled out, they felt that they received a higher value from a visit to Lake Agmon than from a visit to the reserve. Among the visitors to Lake Agmon, those that rented one of the transport means felt they received the most out of their visit. The site is considered attractive mainly because of the varied transport options available, and most of the visitors (80%) chose to purchase tickets to enjoy one of the attractions offered at the site. Complaints related mainly to the cost of these attractions,
and even so, satisfaction from the visit to Lake Agmon was found to be higher than from the visit to the reserve, which is less expensive. Ben Yosef, Israeli and Collins-Kreiner conducted a study for the Lake Agmon Tourist Administration between March 2005 and March 2006, intended to characterize the visitors to the site. In this study too, the visitors mostly preferred visiting Lake Agmon to visiting the Hula Reserve, and said that they returned repeatedly to visit Lake Agmon. Interestingly, neither in this study, nor in the one conducted by Barkai, were the visitors asked whether they would want to combine a visit to both the reserve and Lake Agmon during the time they had in the Hula Valley.

In reality, there is no cooperation in tourism between Lake Agmon and the reserve, although there have been short-lived attempts to market a ticket for a combined visit to both sites. Nevertheless, many of the people from the INPA, KKL-JNF and the SPNI involved in managing the sites, believe that there should be cooperation between the two sites. Bonneh, who was the director of KKL-JNF’s northern district still believes, that despite the difficulty in convincing visitors to visit both the reserve and Lake Agmon, because the two sites provide similar visitor experiences, it is possible to create cooperation between the two sites by creating a connecting path or a combination ticket. Perry, the former head of the Nature Reserves Authority, would also be happy to see a combination ticket that would provide visitors with different perspectives on the same region, with both the reserve and Lake Agmon focusing on the differences between them. He believes that the attempts at cooperation have failed because of petty differences and possessiveness, on the side of both parties, the INPA and KKL-JNF. Barzilai, the INPA marketing director also believes in cooperation by means of a combined ticket or connecting path. In his opinion, this did not come about mainly due to organizational chauvinism, that is, each organization focusing only on itself, and fearing to cooperate with the other organization. The SPNI supports creating a connecting path between the reserve and Lake Agmon, which would reveal hidden areas in the reserve, by including a walk along the embankment west of the reserve. Kaplan, from the INPA, also supports creating the connecting path, which would include an observation point from the Enan Reservoir. Nevertheless, he opposes the SPNI’s suggestion regarding the addition of a walk on the embankment, because it might damage the embankment, which is already now difficult to maintain. Kobi Samrano, who previously managed the Lake Agmon site, believes in cooperation between the sites. He does not consider the Euphoria to be a competition to Lake Agmon, and always instructed his staff to recommend a follow-up visit to the reserve.

In the summer of 2015, 40 hectares of land in the northwestern part of the Hula Reserve were flooded. This area was a seasonal marsh, which dried up each summer. There is currently a permanent water body at the site, which it is hoped will support a varied ecosystem of riparian vegetation, mud, invertebrates and ground-nesting birds. In addition, as at Lake Agmon, it was decided to develop a tourism complex in the field, which will include, for the first time in the history of the reserve management, financial support for developing a bicycle path. The newly flooded area in the reserve is at its edge adjacent to Lake Agmon. Developing the bicycle trail may promote the implementation of the plan to create a connecting path between the two nature sites.

On the other hand, quite a few people believe, that from a tourism perspective, separating between the two sites is for the best. Hanan Dimentman, an invertebrate biologist from the Hebrew University,
considers it an advantage that there are two sites with different emphases. According to Ben Yosef, who was involved in planning the ecotourism experience at Lake Agmon, there is no need to connect the two sites; on the contrary, the differences between them should be emphasized. He believes that the reserve should be an “untouched” area closed to visitors, managed by the INPA, based on purely environmental criteria and that creating a path to connect the two sites will not attract more visitors. He feels that if a part of the valley would be dedicated only to nature conservation, and not to farming or tourism, it would have a special, unique effect. According to ecologist Emmanuelle Cohen-Shacham, the reserve should mostly be closed, because the main ecosystem service it provides is preserving species diversity and not providing cultural benefits to visitors. Therefore, no trails should be added to the reserve; however, the existing floating path should remain open to visitors, as it allows the number of visitors and their movements to be regulated.

KKL-JNF has successfully transformed Lake Agmon into a popular ecotourism site, which contributes significantly to the economy of the region and provides a different experience than its “older sister”, the Hula Nature Reserve. In the future, there could be cooperation between the two sites in the form of a connecting trail or a combined ticket. However, KKL-JNF had an additional objective, which was that Lake Agmon be recognized internationally as a birding site, with a modern visitor center at its entrance that would tell the story of bird migration while also positioning KKL-JNF in the public mind as an environmental organization that contributes to the environment in general and to the Hula Valley specifically.

E. Positioning Lake Agmon as an International Birding Site

Lake Agmon is located in the northern part of the Great Rift Valley, which is a major global migration route. The large valley is one of the largest geological rifts in the world, extending over 7,100 kilometers from the Taurus Mountains in Turkey to Mozambique, in southern Africa. Along the way, it crosses 22 countries in the Middle East and Africa. Each fall and spring migration, over 500 million birds fly over Israel (over a billion birds annually). A total about 300 different bird species have been observed in the Hula Valley. Many of them overwinter in Lake Agmon and others choose to breed there in spring and summer. Lake Agmon serves as a stopover site and food source. Many wetlands in the Mediterranean region have been drained, which makes Lake Agmon a globally important site for preserving water birds, in particular those that require shallow water and peatlands as a habitat.

In order to position the Hula Valley from the perspective of its global importance for bird migration, KKL-JNF, together with the SPNI, INPA and the Israel National Commission for UNESCO, initiated an application to UNESCO to declare Lake Agmon and the Hula Nature Reserve a World Heritage Site. In other words, it was agreed that the reserve and Lake Agmon should cooperate, at least regarding international recognition, because both sites contribute to bird migration. Nevertheless, it was necessary to decide whether to present the Hula Valley as a nature site, or as a site combining nature and culture, in which the agriculture and tourism play a significant role. Gophen preferred focusing the effort only on Lake Agmon and the reserve, without including the agricultural land. He
was concerned that if the proposal would be expanded to the agricultural areas UNESCO would demand restrictions on the agricultural management. Yossi Leshem, from the SPNI, also preferred focusing only on ornithology at Lake Agmon and the reserve, without including the agricultural land. The main objective of the declaration was to obtain global recognition and prestige, which would help raise funds, without creating operational changes at the site. In order to advance the recognition of the Hula Valley as a UNESCO World Heritage Site, a partnership was formed between KKL-JNF, the SPNI and the INPA, under the direction of the Israel National Commission for UNESCO, which still exists at the time this is being written.

Bonneh headed the steering committee that prepared the proposal for UNESCO. KKL-JNF financed the preparation of the proposal, and Zev Labinger from the SPNI was chosen to prepare the proposal submission, which was titled “The Great Rift Valley — migratory routes — the Hula”. The vision of the proposal proponents was to have the Hula Valley, together with other sites along the Rift Valley, declared a world heritage site. The ultimate objective of the plan was to involve 22 countries located along the Great Rift Valley, to create a network of protected stopover and resting sites for migrating birds along the ecological corridor formed by the Rift Valley. After deliberations, it was decided that the proposal would include the reserve and Lake Agmon as a core zone, and the tourism zone around Lake Agmon and the agricultural land as a buffer zone based on the zoning principles of UNESCO Biosphere Reserves. The proposal emphasized three reasons for inscribing the Hula Valley as a World Heritage Site. The first reason was that the valley was an outstanding example of long-term biological and ecological processes, which are related to bird evolution. The second reason was that bird migration passing through the Hula Valley, which serves as a bottleneck on their migration route, is a natural process unparalleled in the world. The third reason was that the Syrian-African Rift, used as a migration route by a great variety of birds, is of major importance in protecting endangered species.

After the proposal was prepared, it was presented to the Hula Committee headed by Gophen, who protested that the farmers had not been involved in preparing the proposal and was concerned that adopting the plan would have consequences on the agricultural management. He believed that the role of agriculture in the document was downplayed too much, when in fact 90% of the land in the proposal was farmland. Furthermore, the proposal regarded the farmland as only a “buffer zone” between natural areas, having no intrinsic value, and presenting the farmers as agents that could disturb the existing situation, which the proposal wanted to protect. He argued that the proponents had to convince the farmers that declaring the area a World Heritage Site would benefit them, and not obligate them to things that they could not cope with. Gophen considered the proposal an example of KKL-JNF’s environmental transformation. When KKL-JNF initiated the peatland restoration project in the Hula, its major goals were preserving the Lake Kinneret water quality and creating infrastructure that would support agriculture. The ecological restoration of Lake Agmon was carried out to provide an alternative source of revenue for the farmers, who could no longer make a living off agriculture. Gophen warned the proponents of the UNESCO proposal that the Hula Valley could not become a nature reserve or a national park, because the desire of the farmers for maintaining profitable agriculture would not allow it.

Following the tense meeting at the Hula Committee, that discussed the proposal for UNESCO, Mike Turner, who headed the Israel National Commission for UNESCO, met with the members of the Hula
Committee to further clarify the issues. Turner explained that World Heritage status did not involve obligations and that the system continues to function as usual. The significance of the nomination involves mainly the right to be inscribed on the map, with by-products of tourism branding. The only commitment is to preserve the status of the site as it is at the time of declaration, or in other words, preserving the site is a basic tenet of the plan. Danny Harit, who represented farmers and inhabitants of the valley, said that the valley residents want to progress beyond just preserving the existing state, and want to move forward on issues of infrastructure, farming, tourism and the like. Moshe Meron from MIGAL explained that the Hula Peatland Rehabilitation and the Crane project are completely artificial projects that require costly maintenance every year. Thus, if it did not include financial support from UNESCO, what was the point of the declaration? Turner emphasized that although UNESCO does not provide financial support, the declaration creates the possibility of receiving research grants. Bonneh promised that if UNESCO would demand changes at the site, the project would be delayed until all the stakeholders understood the issue and reached an agreement. Nevertheless, he explained, the World Heritage brand would intensify the commitment of the Israeli government and other agencies to maintain the site, including financial support for the goals of the project.

In February 2005, despite the reservations and concerns of the farmers, the proposal was submitted to UNESCO. The proposal was accepted by the World Heritage Center and transferred to the IUCN (International Union for Conservation of Nature) for expert evaluation. The process of evaluating a proposal for inscription as a World Heritage Site includes sending an IUCN representative to the site to validate the information in the proposal and to evaluate the site in a global context. The three environmental organizations, KKL-JNF, the SPNI and the INPA prepared for the visit of the IUCN evaluating agent together. According to the UNESCO process, following the visit the IUCN representative prepares a comprehensive report for UNESCO in which he/she recommends or not inscribing the site as a World Heritage Site. Thus, making a good impression on the evaluating agent is critical in the process to approve the nomination proposal.

Olivier Harmelink, the IUCN representative visited the Hula Valley for seven days in November 2005, when the crane season began. His visit was organized by KKL-JNF, the Israel National Commission for UNESCO and the project steering committee. KKL-JNF hosted the visit during which Harmelink met with various stakeholders. Throughout his visit, his hosts emphasized the great diversity of birds (300 species), some of which are globally endangered, such as the Marbled Duck and the Whittailed Eagle, as well as the fact that a considerable part of the global population of the Eurasian Crane and the White Pelican migrate through and stopover in the Hula Valley. The hosts also emphasized that the fact that this is a “fueling” stop before and after crossing the desert zone along the migration route, and that such sites are decreasing in the Middle East. The weak point in the proposal from the perspective of the IUCN criteria was that the site is relatively small, and that both the Hula Reserve and Lake Agmon are restored natural ecosystems. Another issue that was evaluated was the suitability of the support system at the site for sustainable management. Bonneh estimated that the fact that the Hula Valley was submitted for inscription as a UNESCO World Heritage Site contributed to positioning KKL-JNF as a leading agent in the regional development of the Hula Valley in all fields, and in the environmental field in particular.
Although Olivier’s visit went well in the opinion of the project steering committee, to its disappointment he recommended the IUCN not declare the Hula Valley as a World Heritage stand-alone site, but as one of a series of sites along the Rift Valley migration route (transnational serial nomination). In March 2006, the final proposal was submitted to UNESCO, with Olivier’s modified recommendation, according to which the Hula Valley would be declared a World Heritage Site belonging to a series of sites along the Great Rift Valley. The UNESCO World Heritage Committee met two months later to decide whether to approve the proposal. Following a struggle, and with the support of the United States and New Zealand, the committee decided not to accept the IUCN’s recommendation, but to defer the Israeli proposal indefinitely. This meant that after suitable modifications, corresponding to the comments heard at the discussion, the proposal could be re-submitted. The proponents were requested to prepare a new proposal for a world heritage site “in the Great Rift Valley that crosses national boundaries, because of its function as a bird migration route”, together with other countries, such as Kenya, Ethiopia and Turkey that are also located along the rift valley.

UNESCO’s request for a proposal to declare the entire Syrian-African Rift Valley a World Heritage Site is innovative, because it focuses on the concept of the importance of global links, which add significance to an isolated site and its ecological and cultural potential. In other words, the project could be a pioneering effort that would become a model for additional serial transboundary sites, which would include inter-regional cooperation and sustainable management of natural resources. Moreover, this approach could contribute to strengthening cultural ties between countries, development of economic opportunities in tourism, improving the sense of security, and the like.

In 2011, the Kenya Lake System was the first site successfully included in the list of UNESCO World Heritage sites, in the context of the Great Rift Valley and bird migration. The declaration of the Kenya Lake System was supposed to be the first step in the declaration of a series of sites in the Great Rift Valley. Five other countries (Ethiopia, Botswana, Kenya, Israel and Turkey) were to submit proposals for other sites. For various reasons the attempts to promote the declaration in cooperation with African sites, have not advanced at this stage.

KKL-JNF promoted international cooperation with other agents besides UNESCO. It cooperated with the US Forest Service that supported research in tourism and monitoring, which was conducted for three years from 2004. Towards the end of the project, the US Forest Service sent a delegation to Israel that spent seven days here in March 2007. The delegation published a summary report, which Bonneh considers a milestone in evaluating KKL-JNF’s achievements in developing Lake Agmon. The Americans viewed this cooperation as a major element in continuing the relations with Israel.

The first International Hula Valley Bird Festival – 2011.
which could produce insights regarding the management of similar ecosystems located along bird migration routes in the United States and in other parts of the world.

The American team was impressed by the successful management of the site by KKL-JNF and the farmers. Maintaining this success, would require, in their opinion, regular coordination between all the stakeholders, research to support decisions and a management strategy. They recommended conducting a study together with colleagues from Russia and Africa, to attach transmitters to individual cranes, in order to develop an energetic model that would explain why the crane population is growing. The team viewed the area as a protected area, because of its impact on the water quality in Lake Kinneret and the tourism development at the site, and recommended implementing principles of sustainable tourism in the future management and development of the site. They believed that the main concern of the site operators should be the possibility that unsustainable tourism development would have an adverse effect on a natural resource, which is the reason visitors come to the site. Consequently, they recommended that KKL-JNF and other stakeholders formulate a joint vision regarding the site's management and optimal maintenance. In their opinion, building cooperation with the Hula Nature Reserve in the management and planning context, would contribute to creating the joint vision and contribute to strengthening sustainable tourism in the valley. They also recommended creating opportunities for the local population to volunteer and become supporters of the site.

KKL-JNF works today with the Upper Galilee Regional Council, the Hebrew University of Jerusalem, Tel-Hai College, MIGAL and other stakeholders to position Lake Agmon as an international center for ecological research. The initiative came from Professor Ran Nathan, from the Hebrew University of Jerusalem, who proposed establishing an International Center for the Study of Movement Ecology. The
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Center would include an area open to the public, classrooms, laboratories and even accommodation for visiting students and researchers and would focus on studying the movement ecology of animals and plants, such as the study of bird migration routes. In addition, it would also support ecological research on diverse plant and animal habitats. According to the objectives of the Hula Project, the site would also be a center for research on the interface between nature conservation and agriculture and aspects of water and soil conservation.

In 2009, Lake Agmon was impressively positioned as a globally unique ecotourism site. The prestigious magazine BBC Wildlife named Lake Agmon “one of the most outstanding sites in the world for nature observation and photography” — ranked ninth out of 20 selected sites. The selection was conducted by 300 experts from all over the world. In that same issue renowned nature photographer, Niall Benvie called it the nature experience of a lifetime and described the feeling of sitting alone in a hide in the middle of a field, surrounded by 15,000 cranes who came daily to eat.

Another project that contributed to the international positioning of Lake Agmon as an ecotourism site was the signing of a twin site agreement with the Oak Hammock Marsh Park in Manitoba, Canada. In 2010, a twin-site treaty was signed between the government of Manitoba and KKL-JNF with the goal of creating a partnership that would advance the management of the sites and the educational and scientific aspects of wetland management. The signing took place at Lake Agmon, in an official ceremony, with the participation of Chris Melnick, Manitoba’s Minister of Water Stewardship, Paul Hunt, Canada’s ambassador to Israel, KKL-JNF World Chairman, Efi Stenzler, KKL-JNF director general Yael Shaltiel, JNF Manitoba president, Mel Lazareck, Prof. Uri Shani, the Israel Water Commissioner and Aharon Valensi, the representative of the Hula Valley regional councils. The content of the memorandum signed at
The cover of the book published after the International Artists Festival at Lake Agmon.
the ceremony is an expression of the environmental transformation KKL-JNF underwent, with the agreement between KKL-JNF and Manitoba as evidence that the two organizations share the same value of conserving natural resources in the world for the benefit of future generations. The memorandum specifies the similarity between the two sites, both of which are located along a major bird migration flyway and are part of larger freshwater drainage basins. Moreover, at both sites human drainage activity destroyed the wetland ecosystem, which subsequently underwent ecological rehabilitation and development of supportive infrastructure for management, research, tourism and education. The signatories of the memorandum committed to promoting the importance of the two sites as unique environmental projects that combine water conservation, ecological restoration, tourism development and agricultural activity.

One of the unique international events held at Lake Agmon was a festival of nature artists from all over the world. The festival was initiated by Zev Labinger, an ornithologist and an artist, together with the SPNI, KKL-JNF and the Artists for Nature Foundation. The festival was also supported by the European Union. In 2008, nine foreign artists from Spain, Britain, Scotland, Holland, the United States and Russia came to Israel and were joined by seven Israeli artists. The public was invited to observe the artists at work, and over 20,000 people visited Lake Agmon during the festival. In 2009, another international art festival was held, which was dedicated to spreading a message of peace. Jewish, Israeli Arab and Jordanian Arab children participated in a joint artists’ workshop that was visited by Israel’s president, Shimon Peres. Mr. Peres freed a bird of prey with the children as a symbol of freedom and cooperation. The goal of the event was to portray Israel as an international cultural center and not just as a focus for conflict, and nature art as a platform for inter-cultural exchange and dialogue, international cooperation and bringing people together. In 2011, a book describing the project with explanations in Hebrew, English and Arabic was published.

The International Artists Festival in the Hula Valley did not become a regular annual tradition. On the other hand, from 2011 onwards, the tradition of an International Hula Valley Bird Festival began, which has been held, relatively regularly, on most years. Birders from twelve different countries, who identified 200 bird species, came to the first festival. The festival was marketed via organizations that specialize in ornithological tourism, such as WildWings, the largest provider of birdwatching holidays in England. Every morning there were excursions to birding sites in the area and field workshops focusing on raptor identification, photography and other topics. One of the highlights of the first festival was the premiere of Flyways, a musical work composed by Paul Winter that integrates birdcalls during migration over the Great Rift Valley. The SPNI promoted the organization of the festival and Paul Winter’s participation, with the support of KKL-JNF, the Ministry of tourism and other bodies.

The Ministry for the Development of the Negev and the Galilee, together with other organizations, published an attractive colorful brochure in English, intended to attract tourists to the Galilee. What made the brochure special was that the attraction intended to convince tourists to visit the Galilee was bird watching and not archaeological or religious sites. Lake Agmon appears as the first recommended option for watching birds, and the Eurasian Crane adorns the cover of the booklet. It is followed by the Hula Nature Reserve, the Gamla Reserve and other options. The brochure is illustrated mainly with close-up pictures of birds. Only at the end of the brochure is there reference to the fact that the Galilee also has cities of historic and religious significance such as Nazareth, Akko, Tsfat and Tiberias.
The cover of the brochure published by the Ministry for the Development of the Negev and the Galilee, inviting tourists to visit the Galilee to see birds.
Israel supposedly has the perfect conditions for developing tourism on an international scale. Five hundred million birds fly over the area, some of which cannot be seen in Europe, and Israel has a diversity of habitats on a relatively small area, is easily accessible and has suitable accommodations. Professional birding tourism can find sites of interest throughout most of the year, because in addition to the migration seasons there are many species overwintering, summering and nesting in Israel. A study found that 35% of British birders (1.1 million) travel outside their country to watch birds. Of the 100 countries in the survey, Israel and Eilat in particular, are in second place as tourism destinations favored by the British after Spain. Every tourist visiting Israel produces an average revenue of 1,200 dollars. Israel has many birding sites, but only Lake Agmon attracts hundreds of thousands of people. Harmelin believes that only the surface of Lake Agmon’s international tourism has been scratched. According to surveys from other parts of the world, ecotourists are better educated, more affluent and older. They will prefer a better guide, meetings with local inhabitants and visits to uncrowded sites. Despite the international positioning of Lake Agmon, it is still not very popular with amateur or professional ornithologists. Thought should be given to the reason for this, whether it is related to Israel’s status in the world or to other factors, which can be changed, such as addition of “environmental” accommodation.

It is difficult to know how many tourists from abroad came to visit Lake Agmon because of the brochure published by the Ministry for the Development of the Negev and the Galilee. The Lake Agmon Tourism Administration, however, succeeded, in a focused marketing effort, to bring many Jewish young adults, from different part of the world, to visit Lake Agmon as part of the Birthright Israel program. From 2009 onwards, Lake Agmon was declared as the environmental “headquarters” of the Birthright Israel program. Birthright Israel is a program that allows Jewish young adults between the ages of 18 and 26 to visit Israel for a 10-day educational excursion to get to know the country. During the trip, which usually takes place in summer, the participants visit major sites related to the history of the Jewish People and the State of Israel. The significance of declaring Lake Agmon as a “headquarters” site for the Birthright Israel project is that each of the 40,000 participants will visit the site and experience ethical activity, such as building nest boxes.

In 2009–2010, additional elements were added to the tourism complex at Lake Agmon, which contributed both to its international and local positioning. At this time the Aquatic Plants Botanical Garden, which extends over an area of 3 hectares, was established, and included a system of water pools around which 50 species of aquatic and riparian plants were planted. A year later the southern lookout, which is situated on a floating raft, was inaugurated, allowing visitors to watch from close up what was going on in the water, on its surface and in the sky. The unique lookout, designed by the architect Gadi Politi, resembles a bird spreading its wings.

Another unique attraction is the bird ringing (banding) station, which was operated by the SPNI in its early years. The station is intended for studying phenomena related to bird migration, habitat quality and monitoring breeding birds, as well as to acquaint the public with the research activity. The large island in Lake Agmon was selected for a ringing station open to the public, because of the diversity of its habitats that include flooded marsh areas, reeds, disturbed grassland, and fruit trees. There is a bridge connecting the station to the main road, and a second bridge that provides convenient access for the bird ringers across the sailing canal to the trapping site. The station was designed to
allow bird ringing throughout the year. According to Labinger, seeing birds from close up has great educational value for children. The bird ringing station is open throughout the year, but visits must be arranged in advance and the station is not open to everyone visiting Lake Agmon. At the ringing station, visitors are guided by a professional ornithologist, and they observe bird ringing from close up and accompany the ringed bird until it is released. In 2015, the operation of the bird ringing station on the large island was transferred to the Lake Agmon Administration and development of a second station near the botanical garden began. This station is intended for families and is a short walk from the entrance to Lake Agmon. The addition of these elements testifies to the fact that the site management is not satisfied with just random public visiting Lake Agmon, but is striving to create an ecotourism experience, which is as diversified as possible. The position of Lake Agmon in internal tourism can be seen by the fact that in 2009 it was ranked 9.7 on the Mapa website. A Mapa Recommendation is given to businesses that received a ranking of 8 or above, from the website experts and Mapa subscribers. The website also lists the reviews of the various subscribers regarding their visit to Lake Agmon, from 2002 onwards. Most of the reviews are excellent and recommend visiting the site. The major complaints are the high price, in the opinion of the reviewers, of renting transport and the time limit for renting golf carts, which affects the visit experience.

The oldest tradition at Lake Agmon is the day in October or November when a welcome ceremony for the cranes is held, and the day in February when send-off ceremony is held. In 2011 another project for the benefit of the cranes was inaugurated, the Crane Race, whose revenues support the Crane Project. The race is held annually and it has a competitive heat of 10 kilometers and two recreational heats of 1 and 5 kilometers. Since 2012, the race has included participants from Jordan and the Palestinian Authority, a contingent of soldiers from the IDF Northern Command and participants from the region and the public at large.
The Crane Project also inspired an illustrated children’s book, The Miracle of the Swamp and the Cranes, by Ran Levy-Yamamori. The book is a simple portrayal of the drainage and restoration of the Hula Valley, and concludes with the arrival of the cranes, the conflicts they created with the farmers and the solution of supplemental feeding that has attracted multitudes of visitors. Another example of how the Crane Project became part of the collective awareness as a cultural activity is evidenced by Efraim Rachman’s poem: “Be nice to the birds / such as pelicans and cranes. / We will host them / Food, drink and a place to stay. / Because this is the migration season / We have to help. / When the time comes they will fly / All the way back.”

One of the earliest and major KKL-JNF programs to position Lake Agmon as an internationally recognized ecotourism site and KKL-JNF as an active environmental organization was to develop a modern visitor center, intended to enrich the visit in nature, as well as to regulate the visitor load in the field. Ilan Ben Yosef was chosen to coordinate the project that included competitive elements. Ben Yosef recommended that the first stage of the project should not be an architectural competition as was customary in similar projects. He suggested that proposals for the project theme be considered first, and that they be the base for the architectural proposal. The concept chosen was presented by CompuGraphic, and its elements included various types of exhibits focusing on the Great Rift Valley, the migratory flyways, the Hula drainage and the Hula Restoration Project. Part of the thematic concept included direct access to the transport rental compound for those interested in proceeding to Lake Agmon upon entering the site.

After the thematic concept was selected, an architectural competition was held between a number of firms and the architect Hanoch Roginski won. He termed his proposal “Soil Fold” — a structure that blends from the outside and inside with the landscape, with the roof serving as an observation lookout for birds. The goal of the plan was that the structure would be a living symbol of sustainability, which would fulfill two main functions. Firstly a center for content, culture and education, employing advanced experiential tools and the secondly, a bottleneck-free, delay-free entrance to Lake Agmon. The program included building a model, the “Mini Hula”, a bird wall and a sophisticated auditorium. The Mini Hula was to provide a sensation of floating above Lake Agmon, and would include interactive stations, at which visitors could choose the information they were interested in. The Bird Wall will be a broad wall on which a unique hands-on presentation will be screened to provide experiential information about the tens of bird species visiting Lake Agmon. The Auditorium can seat up to 210 people; two breathtaking 15-minute presentations will be screened alternatingly. The first one “Four Seasons in the Hula Valley” was filmed during an entire year at Lake Agmon and emphasizes the harmony and interactions between humans and animals. The second “in constant motion” describes the Great Rift Valley from prehistoric times to the present. The roof of the structure will be a living garden accessible from the park level that becomes a scenic lookout overlooking Lake Agmon at its highest point. The walls will be transparent, especially designed in a combination of steel columns and glass that will provide views of the scenery outside and into the building. Together with the roof, they will form an impressive, high central enclosure.

The cornerstone for the Lake Agmon Visitor Center was laid on January 22, 2014, in the presence of Canadian Prime Minister Stephen Harper. In his greetings, he mentioned the fact that the prestigious BBC magazine ranked Lake Agmon as one of the ten best birding sites in the world. Harper’s agreement

Author: Ran Levy-Yamamori; Illustrations: Josiane Habib-Mor, Har-Yaar Books.

We are all Protecting Nature – a children’s poem.

Author: Efraim Rachman, in “We are all protecting nature”, Tsiv’Onim Publishing House.
to be the guest of honor at the fundraising event organized by JNF Canada in Toronto, for the benefit of the Stephen J. Harper Hula Valley Bird Sanctuary Visitor and Education Center, was undoubtedly a great success and reinforced the international positioning of the site. KKL-JNF World Chairman, Efi Stenzler, said that the visiting Canadian Prime Minister was one of Israel’s greatest friends and noted the reciprocal commitment to values of education, science and natural resource conservation for the benefit of future generations. Josh Cooper, CEO of JNF Canada, expressed the hope that the visitor center would double the number of visitors to the site and they would reach one million visitors a year. When the new visitor center will open, it will be the final stage of the development of Lake Agmon as an internationally significant ornithological ecotourism site and of positioning KKL-JNF as an environmental organization committed to the sustainable restoration of the Hula Valley ecosystem.

The development of the Lake Agmon site by KKL-JNF created great enthusiasm both among the supporters of JNF Canada and among KKL-JNF supporters and donors in Israel and worldwide. At the time this book is being published, more than twenty of the project’s components have been donated. This is another example of KKL-JNF’s unique capability as an international organization to partner with its supporters around the world, for fundraising, branding, developing knowledge, contributing to international recognition, and developing global professional connections. This has been expressed fully in the Lake Agmon project up to now, and we have only started out.
F. The Elements of Success of Lake Agmon

Every ecotourism site is based on natural elements around which an architectural and operational envelope is developed, which along with other factors determine its character. The ecotouristic success of Lake Agmon comes, foremostly, from the arrival of the Eurasian Cranes in the fall, and the fact that tens of thousands of them remain to overwinter in the Hula Valley. This is a sight unequalled at any other birding site in Israel, as can be seen from the fact that transport methods on their own could not provide the experience sought by the visitors to Lake Agmon. Therefore, in the summer, when the cranes leave, the number of visitors and tourists coming to Lake Agmon decreases. If the cranes once again decide to change their migration route, because of reduced food supply, lack of protected roosting site, fear of visitors or any other reason and will not come to Lake Agmon, the major attraction of the site will disappear with them. The arrival of the cranes to the Hula Valley was the big surprise of the peatland rehabilitation in the Hula Valley and the development of Lake Agmon as a birding site sought to provide visitors with the ecotourism experience of watching the cranes and other birds.

Lake Agmon is an ecotourism site, but it is not a nature reserve. As the Hula Reserve is located near Lake Agmon, one of the challenges facing the planners of Lake Agmon was to create a different nature experience, which would attract many visitors and provide a source of income for the farmers and the entire region. Renting recreational means of transport, which include golf carts, bicycles and the safari wagon, are the main element that make the experience more attractive for people (adults and children) for whom the birds are not a sufficiently exciting experience. Nevertheless, visitors for whom nature is the main goal of their visit can walk around the site free of charge. From this perspective Lake Agmon is a “soft ecotourism site”, which is it is not intended just for environmentally aware visitors, but for larger segments of the population, for whom it can intensify their awareness of nature conservation, even if this was not the original reason for their visit to the lake.

Lake Agmon became Israel’s most popular birding site almost overnight, and the number of visitors has reached 420,000 a year. The site’s tourism administration is constantly working to market and position the site as an attractive ecotourism birding site, both in Israel and globally. The various marketing methods used include developing a tradition of seasonal festivals and ceremonies, creating global partnerships and the like. The most significant success of the site was not deliberately initiated; it was the piece published in the BBC Wildlife Magazine ranking Lake Agmon as the ninth best birding site in the world. In addition, the site management is constantly increasing the number and quality of the attractions included in the visit to Lake Agmon, with crowning project being the establishment of the new state-of-the-art visitor center.

One of the goals of ecotourism is that the local population will benefit from the operation of the site, and will be involved in its management. At Lake Agmon, the management includes KKL-JNF, a public non-profit organization that invested extensively in developing the site’s tourism potential, and representatives of the farmers who are interested in increasing revenues from the site as much as possible. Lake Agmon has undoubtedly become a regional economic anchor, particularly in autumn
and winter. According to a study conducted by researchers from the Tel Hai College and the Technion, 60 million NIS have been added, directly and indirectly, to the regional tourism economy. Most of the moshavim that agreed to contribute their land to the project are located far from Lake Agmon and therefore do not profit directly from its contribution to the economy of the communities in the Hula Valley and its immediate vicinity. Now, however, when the new visitor center will open, more people will come and their revenues are expected to grow.

The opening of the 'Galilion' tourist and commercial center, located near route 90 and the Lake Agmon access road, and which brands and positions itself on its proximity to the lake, is evidence of the contribution of Lake Agmon to the economic development of the region. The Galilion is a joint venture of the entrepreneur Haim Ohayon and Kibbutz Kfar Giladi, on whose land it was built, and cost 120 million NIS. It opened in April 2016 and has 120 rooms built on only two floors, with a pool at its center and an adjacent conference center. The walls of the hotel are decorated with mosaics of birds and in each room is a color photo of one of the birds that can be seen at Lake Agmon. At the center of the hotel, near the pool, is a large screen showing the birds that are at the site at that time. At the entrance to the compound is a hot air balloon, 150 meters up in the air, tied to the ground that provides a view of the entire Hula Valley. Haim Ohayon said that a half a billion birds and a half a million people cannot be mistaken, and if they decide to visit Lake Agmon, apparently it has an attraction that justifies the investment. Ohayon intends to encourage people to stay in the area by subsidizing entrance to the various tourist attractions in the valley, according to the number of nights they spend at the hotel (Gpass).

One of the goals of ecotourism sites is sustainable management, so its resources remain for future generations as well. With this in mind, KKL-JNF led by Bonneh, director of KKL-JNF’s northern region, is working to modify the plans for the Hula lands and to move the site of the proposed recreational villages outside of the core area, efforts which have not yet succeeded. One of the major issues related to the operation of the site, is the ecological and social carrying capacity of the site. The opening of the new visitor center is intended to regulate the visitor pressure at the site so that the wait at the entrance with its varied means of transport, on peak days, will become an experience of its own at the new attractive visitor center. However, if the number of visitors to the site will grow significantly, it is important to see how this affects the behavior of the birds and the welfare of visitors, who come to see a unique natural phenomenon and not a multitude of people seeking exactly the same thing. One of the pioneering environmental historians, Roderick Nash, termed this danger the “irony of victory”. The victory is the success of nature reserves and natural parks in creating a positive attitude to nature conservation in humans. The irony is that we have been so successful that the danger to ecotourism sites today is not development pressure and urbanization, but the visitors themselves, who are "loving nature to death". KKL-JNF deals with this risk by establishing and funding a research and monitoring system that allows it to make educated decisions and modify policy in real time. The maintenance of this research and monitoring system as a support for decision-making is an essential element in the success of the site in maintaining its ecological and touristic resource sustainably.

We can also learn about the success of Lake Agmon as an ecotourism venture that conserves its natural resource sustainably from the people entrusted with nature conservation in Israel, who do not
belong to KKL-JNF. Dr. Uzi Paz, who was the chief scientist of the INPA, originally opposed the concept of developing an ecotourism site that would offer the same product as the Hula Nature Reserve. In retrospect, he changed his mind, and admitted that Lake Agmon is one of the most amazing sites to visit today and praised it. In his words: "One of the greatest ornithologists in the world, Roger Peterson, described the Lake Nakuru in Kenya as the most amazing bird spectacle in the world. He was never at Lake Agmon. Had he been, I imagine that he would debate the validity of his statement... In any case, as a veteran birdwatcher, who is acquainted with quite a few birding sites the world over; I cannot describe in words the experience from my double visit to the site...Well done!!". Yohanan Darom led the battle on behalf of the SPNI against the plan to integrate accommodation in the project core. KKL-JNF's decision to adopt the lake and develop it as an ecotourism site, with no added accommodation, made KKL-JNF in his eyes the “hero of the story of the Hula lands”.

Lake Agmon is an ecotourism site in the heart of an agricultural area. The original purpose of re-flooding the area was not wetland restoration; it was to improve the Lake Kinneret water quality, to improve the farming of the peat soil and to provide farmers with an alternative source of income. The management of Lake Agmon affects both farming and the Lake Kinneret water quality for whom the Kinneret Drainage Authority and the Water Commission are responsible. One of the essential elements in the success of Lake Agmon is the ability to consider different interests of the various entities affected by its operation. KKL-JNF is an inclusive organization that developed a mechanism of cooperation by establishing a broad public administration, in which 24 different organizations participate. The crane project that was developed with the farmers and the Upper Galilee Regional Council, and the peat soil maintenance and monitoring project that are implemented together with the Water Commission and the farmers are examples of projects fulfilling the goals set by the various stakeholders.
Over the years, since Lake Agmon has become operational, it has lost more than 60% of its impoundment capacity due to deposition of plant material and accumulation of soil sediment, which raise the bottom level. The decrease in the volume of Lake Agmon and the constant increase in the number of visitors, which will grow after the opening of the new visitor center raise the issue of whether the time has not come to create additional flooded areas in the Hula Valley as proposed by the master plan.

The experience accumulated in the project to rehabilitate and operate the Hula peatlands as a multi-objective project, followed by the creation of Lake Agmon as an ecotourism site by KKL-JNF, can serve as a model for future projects.
CONCLUSION:
LAKE AGMON –
A MODEL FOR FUTURE ENVIRONMENTAL INITIATIVES
The creation of Lake Agmon is part of a broader initiative to rehabilitate the peatlands in the Hula Valley, which was intended to solve the issues that developed during the years following the drainage of Lake Hula and its surrounding marshes. This initiative can serve as a model, both because of its originality, and mainly because of its success. In this chapter, we will summarize the series of events that led to the creation of Lake Agmon, from the perspective of identifying the potential of the project and the manner in which it was implemented, as a model for future environmental initiatives.

One of the factors underlying the success of the Hula peatlands rehabilitation project was the fact that it was based on comprehensive study of the environmental and hydrological changes created by the Hula drainage project. The drainage produced agricultural, economic and environmental benefits, at the expense of a unique ecosystem. Serious agro-technical and environmental problems developed only on 500 hectares of peatland out of the 6000 hectares covered by the drained lake and marshland. Nevertheless, studies on the Lake Kinneret water quality, raised concerns that nitrogen compounds originating in the peat soil could lead to increased growth of Peridinium algae in northern Lake Kinneret and seriously impact the water quality. Furthermore, the farmers who cultivated the peatland had to cope with subterranean fires, accelerated soil subsidence, dust storms, spread of noxious weeds and increase of voles, all of which together restricted agricultural cultivation and harmed crops. Some of the farmers, whose plots were in the heart of the peatlands, abandoned their fields, which accelerated the deterioration of these lands. While issues related to peat soil cultivation were only local, the decline in the water quality of Lake Kinneret, Israel’s major source of drinking water was a national problem, and consequently far more serious. The Hula peatlands rehabilitation project can serve as a model for a resolute approach that admits to the damage caused by previous actions and suggests remedying them based on results of objective research. Yossi Beilin viewed the rehabilitation of the peat soil in the Hula Valley as a successful adjustment that should be imitated in the political world.

The Hula peatlands rehabilitation project was financed by three agents: the Ministry of Agriculture, the ILA and KKL-JNF. The latter's decision to take on the rehabilitation project was not self-evident, as it was the organization that led the Hula drainage project in the 1950s. General (res.) Ori Orr, however, who was then KKL-JNF director general, believed it to be fitting that KKL-JNF in particular should display public responsibility and see to the resolution of the issues that developed in the peat soil consequent to the drainage of the marshes. The Hula Administration, headed by KKL-JNF, joined by representative of the Ministry of Agriculture, the ILA, the Ministry of Environmental Protection, the INPA, the local farmers, the Water Commission and the regional councils, was established to determine the best alternative for rehabilitating the Hula peatlands. In modern times, there are usually numerous stakeholders participating in environmental projects, because the land involved usually serves many purposes, such as farming, settlement, tourism, conservation, water supply and other goals. The environment is often perceived differently by different stakeholders: thus, water authorities are responsible for providing quality water for drinking and irrigation, while environmental organizations view water as a habitat to preserve biodiversity, as a recreational venue, and the like. The rehabilitation of the Hula peatlands can serve as a model for the management of an environmental initiative that is based on cooperation and dialogue between diverse stakeholders.

The planners of the project were faced with two possibilities for restoring the area. The first was to prepare a purely agricultural rehabilitation program for the entire area, and the second was to prepare an agricultural rehabilitation for part of the area, and include a tourism element in the area.
at the heart of the peatlands, by flooding some 110 hectares and restoring the area around it as a wetland. The alternative that integrated agriculture and tourism was selected because of the belief that a combined alternative would create a vested interested in maintaining the land in a manner that would prevent the flow of peat water into Lake Kinneret. Moreover, at the time, there was a drastic reduction in water allocation due to continuous droughts and it seemed sensible to diversify employment opportunities, particularly in view of the assessment that tourism would grow stronger. Although this was the only alternative that included ecosystem restoration, in the eyes of the planners, the rehabilitation was not an end in itself, but a means of establishing an alternative source of revenue from tourism for the farmers. Nevertheless, in principle, the choice of the combination of tourism and agriculture, which was more complex to establish and maintain, was a refreshing change from the unidimensional concept focusing only on agriculture associated with the management of the Hula Valley since the drainage.

The peatland restoration project in the Hula Valley was a complex engineering challenge, whose purpose was to improve the Lake Kinneret water quality, to improve agricultural cultivation and to create a wetland on part of the land, similar to the one that existed previously, which would provide the farmers with an alternative source of income from ecotourism. The engineering program to rehabilitate agriculture on an area extending over 2,800 hectares was based on raising the groundwater level to reduce the drying out of the peat soil and its subsidence. For this purpose, 90 kilometers of drainage canals were excavated and hydraulic installations were built intended to preserve a high groundwater level. The second major element was implementing surface irrigation with moving sprinkler systems, to ensure a crop cover for most of the year. These two actions together were intended to significantly retard peat soil subsidence, which occurred at an average rate of seven to ten centimeters annually, and to substantially reduce peat soil erosion by wind and prevent soil salinization. In order to prevent the flow of peat water into Lake Kinneret a plastic separator was placed at a depth of 4.5 meters along 2.8 kilometers south of Lake Agmon. The lake was excavated on an area of 110 hectares, to serve as a drainage base for the peat water, and 500 hectares surrounding it were allotted for nature and tourism development. The ecological restoration was based on diverting clean water from the Jordan River at Kfar Blum, where a sophisticated dam and diversion installation was built, from where the historic flow route of water was restored from the Jordan River to Lake Agmon.

One of the lessons learnt from the damage caused by the drainage project, was that even the most successful engineering project could not fulfill its long-term goals without proper maintenance of the engineering installation, and the drainage canals in particular. The main maintenance action required in this sort of project is mechanical mowing of vegetation in the canals and on their banks about five times a year. One of the project mottos became “the final outcome begins with maintenance”\(^6\). The current maintenance budget is 2,120,000 NIS, which is divided between the Water Commission, KKL-JNF and the farmers. The issue of long-term project sustainability should be part of every environmental project from the start. The Hula Administration created a maintenance system backed by a permanent budget that allows optimal operation of the new engineering infrastructure to be maintained.

\(^6\) This was a play on words of a Jewish prayer in which one verse is “the final deed begins with thought”, or in other words, plan before you execute.
A multi-goal initiative requires management to coordinate or mediate between the implementation of the various goals. Giora Shaham who managed the peat land rehabilitation project on behalf of KKL-JNF, believed in the method he termed the “compromise curve” — every side cedes a bit, but gains many other things. Thus, the representatives of the water economy would admit to the fact that the Hula had been over-drained and it was necessary to allot some of the water taken at the time of the drainage for the restoration project, and in exchange, the water quality in Lake Kinneret would be improved. The representatives of the farmers in the area agreed to cede some of their land for the benefit of tourism development and habitat restoration in exchange for water allotment and agricultural machinery. The representatives of the INPA realized that the site could not be converted into a typical nature reserve, but that there was need of a program that would combine commercial elements in the new landscape that would be created at the site. As stated before, the restoration of natural values was not a goal in itself, but a catalyst to create an alternative source of income for the farmers. Therefore, one of the commercial elements included in the project was the recreational villages on the water, near Lake Agmon. The SPNI, which unlike the INPA had not been included in the project steering committee in the early 1990s, opposed the establishment of recreational villages on the Lake Agmon shores, believing that the proximity to the new water body would prevent ecosystem restoration.

The tourism development program at Lake Agmon included construction on agricultural land, and therefore required the approval of the Committee for Preservation of Agricultural Land and Open Spaces (CPALOS). The deliberations in the committee allowed the SPNI representatives to voice their objections to the plan for building in the heart of the project. The CPALOS did not rule out the establishment of recreational villages but determined environmental restrictions that included gradual building and subsequent environmental impact statements that would examine how the tourism accommodation affected the ecosystem. Both the project management and the SPNI were not happy with the planning compromise and continued to battle in the High Court of Justice and in the various planning committees for five years. In 1999, the Hula Lands Outline Plan (Gimel/8923) was approved according to the recommendations of the CPALOS. It is possible that if the SPNI would have been represented in the project steering committee, this prolonged statutory conflict could have been avoided.

While the sides were arguing how tourism at Lake Agmon would be developed, the ecosystem began recuperating, in a manner that surprised all the parties involved. The ecosystem was rehabilitated by excavating a topographical depression in which there was permanent standing water to which clean water from the Jordan River was added. The creation of this habitat did not restore the situation to its original state. Thus, former water sources were more diverse and included floodwater, spring water from the Enan Spring and the valley rim springs and other sources. Moreover, the water chemistry of Lake Agmon was different because it was affected by the peat oxidation process that occurred only after the drainage. Therefore, it was necessary to recreate precisely the ecosystem that once existed in the Hula Lake and marshes, before the drainage. In fact, however, the mere creation of Lake Agmon and the diversion of water from the Jordan River into it rehabilitated the ecosystem and all its components. In 1994, 160 different species of birds were recorded and there are now records of 300 different species. Many plant species that previously grew in the valley, e.g. Yellow Iris, White Water-Lily, Yellow Water-Lily, various Pondweed species and other plant species were reintroduced. The successful wetland rehabilitation of Lake Agmon, is evidence that other
wetlands in the Hula in particular, and in Israel in general, can be rehabilitated, even if there have been significant environmental modifications. This insight is true for Israel's streams as well, many of which have dried up because of over-pumping and anthropogenic over-use. During all these years in which KKL-JNF worked to restore the peatlands and develop Lake Agmon, it was also actively involved in caring for the environment and rehabilitating Israel's streams.

The most impressive success of Lake Agmon is its transformation into a paradise for birds. A few species breed in the lake, such as ducks (including the Marbled Duck, an endangered species), grebes, herons, ibises and waders. Most of the birds stop to rest and feed during their migration journey, and some overwinter in the area and continue on their journey in spring. The highlight is the arrival of the cranes that have become the major tourist attraction at the site and the symbol of Lake Agmon. The fact that the cranes began overwintering in the Hula Valley in constantly growing numbers and gather to root in Lake Agmon is the greatest surprise of the rehabilitation of nature in the valley. Cranes were seen in the Hula Valley both before the drainage of the Hula marshes and before the re-flooding of Lake Agmon, but only in small numbers. Consequently, the people who thought of and planned the Hula Restoration Project looked for other attractions, such as creating a wildlife safari, because they did not believe in the potential of nature on its own to attract visitors.

The Crane is a bird that arouses interest in birders, nature lovers and the public in general because of its size, its large flocks, its flight and other reasons. During the first years of massive crane arrival in the Hula Valley, they gathered to roost in the Hula Reserve. From the winter of 1997, due to hydrological and agricultural reasons, Lake Agmon began being operated at low summer-autumn water levels. This change allowed the cranes to spend the night in Lake Agmon instead of at the reserve, something no one had considered. After the feeding station was opened near Lake Agmon in 1999, the cranes gathered there and flew together to roost in Lake Agmon. The sight of tens of thousands of cranes gathering and flying together in the evening, from the feeding site to the roosting site is a magnificent sight. The rumors regarding the cranes in the Hula Valley spread and people began arriving to Lake Agmon from all over the country to see the sight, even though there was no infrastructure for tourism at the site. Omri Bonneh, who was appointed head of KKL-JNF's northern region in 1999, said that the first time he visited the site and saw the crane roost, he immediately understood that this was a unique natural phenomenon which could transform Lake Agmon into a significant ecotourism site.

By 1997, 15,000 cranes were overwintering in the project area, and 8,000 cormorants and 10,000 pelicans were passing through. At present, more than 40,000 cranes overwinter at Lake Agmon. The Eurasian Crane feeds on plants and small animals, but in Israel prefers mainly peanuts, corn and wheat. This fact has created a conflict between farmers, who are concerned for their crops, and environmental organizations that are concerned for the cranes. The solution, initiated by Dan Alon, head of the SPNI's Israel Ornithological Center was the establishment of an artificial feeding station for the cranes within the tourism area around Lake Agmon at which the cranes are fed with corn. At the same time, other fields are guarded and the cranes chased away from them, and alternative fields are allotted for feeding the cranes. This management method achieved both goals — preventing damage to crops and harm to the cranes. The conflict was solved by dialogue and establishing a “crane team” comprised of representatives of farmers, KKL-JNF, the SPNI, the INPA and the Upper Galilee Regional Council. The cost of the project is three million NIS annually, which is not budgeted and supported mostly by government agencies on a regular basis, as it should be. Nevertheless,
the approach that conflicts between farmer interests and nature conservation and environmental interests can be solved by dialogue and management that bridges between the different interests, can serve as a model for other initiatives as well.

The farmers, who had given the agricultural land for the benefit of creating Lake Agmon, awaited the day that an entrepreneur would come to invest and establish the recreational village that had been approved in the plan. However, no one wanted to risk their money in the venture, and the farmers did not have the required capital. Therefore, they requested that KKL-JNF take on the extensive tourism development in the Lake Agmon compound, in hopes that it would create the change that would attract investments by entrepreneurs to develop the recreational village and the commercial tourist areas associated with it according to the development plan.

KKL-JNF decided to accept the challenge, after it understood that this was a transformative project, which would reinforce its position as an organization that worked both for the environment and for the benefit of the local inhabitants, who would enjoy the revenues from tourism. The format for tourism development was implemented by means of a unique plan for Lake Agmon, as well as including a master plan for landscape and recreation in the entire Hula Valley. In order to formulate the plan KKL-JNF established a broad public management board, in which representatives of 24 different bodies participated, this time including representatives of the SPNI, together with representatives of the regional councils, the farmers, the Ministry of Agriculture, the Kinneret Drainage Authority, the Government Tourism Corporation, the INPA, the Ministry of Environmental Protection and others. The master plan transformed KKL-JNF into an inclusive body that succeeded, for the first time, in obtaining the agreement of all the stakeholders that the “Hula Lands” plan should be modified so that the recreational village and commercial tourism areas that had originally been placed near the lake, would be moved away from it. Thus, even the farmers, who strove to maximize their revenues from tourism, now agreed that implementing the original plan would be self-defeating for tourism, which could only develop based on ecological assets, particularly birds, if the core area remains intact.

Environmental initiatives, involve many stakeholders. Creating a dialogue between them is a crucial factor in advancing these types of projects. KKL-JNF, a non-governmental organization, proved its ability to be an inclusive organization for all its partners, which also ensured that resources would be pooled to allow for its implementation.

KKL-JNF’s decision to develop tourism in Lake Agmon and to try to modify the Hula Lands plan, to remove the recreational villages and commercial tourist areas from the heart of the valley, is evidence of the environmental transformation it underwent while managing the project. At first, the flooding and ecological rehabilitation were means of providing tourism as an alternative source of revenue for the farmers. Now the ecological rehabilitation has become a goal on its own that does not invalidate the previous objective of developing tourism as an alternative source of revenue. One of the dangers to natural sites in modern times, in addition to urban or agricultural development, is how tourism at the site is managed. Tourism is the largest industry in the world and the number of visitors and how they spend time in nature can destroy, albeit unintentionally, the nature they have come to enjoy. Every tourist nature site has to make use of natural scientists that can provide guidance on how to manage visitors in a manner that its natural assets will be preserved for future generations.

The Hula peatlands rehabilitation project was accompanied, from the start, by research and monitoring of various factors, e.g. flora and fauna, chemical composition of the water, soil status, meteorological
and hydrological conditions, and more. For this purpose, a research center was established at the entrance to Lake Agmon. Coordinating and conducting research activity is done by MIGAL, the Galilee Research Institute. Presently monitoring is financed by KKL-JNF, the Water Authority and the farmers. The multidisciplinary monitoring system strives to document changes in the new habitats created and to study the intensively dynamic interactions between all the biotic and abiotic factors. The purpose of monitoring is also to guide the dynamic management of the site operation, and its adaptation to changing conditions and according to the different objectives of the project. The monitoring covers the entire area of the Hula project, which includes areas dedicated to farming and tourism, the water body and the canals. After 20 years of monitoring large amounts of information have accumulated, which are the basis for research projects conducted in the area. Every environmental project that intervenes in nature has multiple objectives, which can lead to unpredictable changes in ecosystems, and should be accompanied by a monitoring team. The people who planned the Hula drainage project did not expect that it would lead to the washing of nitrogen compounds into Lake Kinneret. Nor did the people that planned the peatland rehabilitation project expect that the reduced nitrogen and increased phosphorus in the Lake Kinneret water would cause other algae to bloom — the cyanobacteria. However, unlike the drainage project, the rehabilitation project is combined with regularly budgeted monitoring, that can warn of problems in real time and suggest solutions rapidly.

In early 2003, Lake Agmon was officially opened to visitors. The site was reached through an entranceway, which could be entered on foot or with private bicycles, without charge. Another option was to rent different types of bicycles, or golf carts, or to purchase tickets for the safari truck, which was the only means of accessing the crane feeding grounds and watch them from up close. There are paths in the site from which the diverse water birds and thousands of cranes can be seen in the meadows and in the water. Nutrias can be seen on the canal banks or swimming in the water, and the occasional Wild Boar, Golden Jackal and Jungle Cat, surrounded by the idyllic scenery of cultivated fields. There are a number of lookouts with optical equipment and guides interpreting the sights. All these create an unusually powerful experience that attracts many visitors, and is different from any other nature reserve or birding site in Israel. The site is not intended only for professional birders or environmentally aware visitors, but for the public at large, and therefore it has top quality services and installations. Every year more than 420,000 people visit the site. The new modern visitor center both enriches the visitor experience at the site, and reduces and distributes the visitor load in the field. As a result of the success of tourism at Lake Agmon, KKL-JNF decided to make birding one of the symbols of its action, by means of an initiative called “KKL-JNF Wings”. This project includes establishing a network of birding sites focusing on ornithological interpretation and education, and advancing bird monitoring and studies.

KKL-JNF transformed Lake Agmon into an ecological tourism site that considers the existing environment and minimizes negative visitor impact. This, thanks to the fact that it refrained from adding built components for accommodation in the heart of the project and based itself solely on rehabilitated natural assets. Another KKL-JNF objective, which is characteristic of ecotourism, is involving the local communities in managing the site and in the generated revenue. When Lake Agmon was opened to visitors in 2003, a joint “tourism administration” was formed that included KKL-JNF, and the Kibbutzim Tourism Consortium and Nahalat HaMoshavim that represented the farmers. Today, half of the profits are transferred to the farmers, and half to KKL-JNF, which is obligated to invest all the
CONCLUSION: LAKE AGMON — A MODEL FOR FUTURE ENVIRONMENTAL INITIATIVES

profits in developing Lake Agmon. Eventually, it became clear that developing recreational villages and commercial tourism near Lake Agmon, according to the Hula Lands Outline Plan, would harm the environment on which the tourism was based. In order to help its partners realize the plan to build a recreational village, KKL-JNF suggested moving the building rights, allotted in the outline plan, from the core of Lake Agmon to another site outside the valley core. A proposal was submitted to the ILA, to move the recreational village to an area west of the western canal, but the ILA did not do not promote the implementation of the proposal. When and if the proposal will be realized, it will contribute to the economic welfare of the farmers and prevent establishment of a recreational village in the heart of the project.

Haim Ohayon, a private entrepreneur, understood the economic potential of Lake Agmon and together with Kibbutz Kfar Giladi established a hotel compound, the ‘Galilion’, near the entrance to Lake Agmon from route 90. The hotel brands itself on its proximity to the lake, via a giant screen near the swimming pool that screens sights from the lake, and a fixed hot-air balloon for observation. A sum of 120 million NIS was invested in the project, evidence that Lake Agmon is a transformative project that significantly contributes to the economy of the region’s inhabitants. Lake Agmon thus became a catalyst for developing the Galilee panhandle region and this is only the beginning. An outline plan to develop research and public institutes and additional commercial tourist enterprises near the new visitor center is now being promoted.

Lake Agmon is located in the northern section of the Great Rift Valley and is one of the major bird migration routes in the world. The Rift Valley is one of the largest geological rifts in the world, extending along 7,100 kilometers, from the Taurus Mountains in Turkey, south to Mozambique in southern Africa, crossing 22 countries in the Middle East and Africa. Every year more than a billion birds pass over the Hula Valley, 500 million in autumn and 500 million in spring. Thousands of them remain to overwinter in Lake Agmon, while others choose to breed there in spring and summer. The shortage of wetland habitats in the Middle East because of drainage makes Lake Agmon globally significant because of its contribution to the preservation of water birds, in particular those requiring shallow water and peatland as a habitat. KKL-JNF, together with the environmental organizations and the Israel National Commission for UNESCO, worked to have Lake Agmon and the Hula Reserve recognized by UNESCO as a World Natural Heritage Site. The possibility of realizing the initiative requires cooperation with additional African countries. The activity for declaring the entire Rift Valley a transboundary World Nature Heritage Site, which crosses political borders, can serve as a model for the need and the ability to create cooperation between countries for sustainable natural resource management.

Although Lake Agmon has still not been recognized by UNESCO as a globally important site, birdwatchers the world over have already done so. In 2009, the magazine, BBC Wildlife named Lake Agmon “one of the most outstanding sites in the world for nature observation and photography” — ranked ninth out of 20 selected sites. The selection was conducted by 300 experts from all over the world. In that same issue renowned nature photographer, Niall Benvie called it the nature experience of a lifetime. A number of international festivals are held at Lake Agmon, which attract birders from around the world. Lake Agmon also has a twin site agreement with the Oak Hammock Marsh Park in Manitoba, Canada and the new visitor center is named for Stephen J. Harper, former Canadian Prime Minister.
Challenges for the Future

Lake Agmon can serve as Israel’s showcase for the peace-seeking and nature-loving perspective of a country under constant threat. What makes the site unique on a global scale are the cranes and its strategic location on a bird migration route along the Great Rift Valley. Therefore, the most important recommendation is that the Israeli government recognize the global importance of the site and support its future development and management including the crane project and marketing as an ornithological tourism site for birders the world over.

Danny Atar, KKL-JNF World Chairman, believes that Lake Agmon is KKL-JNF’s most important site, and that following the inauguration of the new visitor center it will become globally known, and will advance the tourism economy of the entire Galilee. KKL-JNF will continue to work to promote Lake Agmon as leverage for the development of the entire region.

There are plans for establishing an international center to study the unique ecology of the Hula Valley and bird migration with the support of KKL-JNF. There could be no better site for this initiative than the Hula Valley, along which so many different birds migrate. There are more and more people in Europe and the United States that are becoming involved with ornithology as a research field or a significant hobby, which leads them to leave their countries and follow the birds to different parts of the world.

The plant and animal diversity that developed after the creation of Lake Agmon and its surroundings should be protected. Aquatic biodiversity, for example, could decrease because of domination by predatory fishes, such as Catfish, and it is important to create thermal traps adjacent to springs whose water temperature is higher than that of Lake Agmon to attract Catfish in wintertime and reduce their populations. It is also necessary to continue and seek the proper balance between visitor pressure and the maintenance and growth of natural systems and to reduce farmer-conservation conflicts.

Over the years, since Lake Agmon was developed, it has lost more than 60% of its impoundment capacity because of the deposition of submersed plant material and accumulation of sediments that raise the level of the lake bottom. Sustainable management of Lake Agmon to provide solutions for this issue and other potential management dilemmas that will undoubtedly arise is one of the major challenges site managers will face in the future.

From a broader ecological perspective, an additional future challenge is to increase the flooded area in the Hula Valley. There are a number of plans, such as the “Master Plan for Leisure and Recreation in the Hula Valley” and the “Hula Valley — stage 2” plan that recommend rehabilitating wetlands in other sites in the Hula Valley. One of the sites is the meeting point between the western and eastern canals, which is on the site of the former Hula Lake. If this site would be excavated and filled, the resulting water body would have different characteristics than those of Lake Agmon, which was established on peat soil, where the marsh once existed. A reservoir at the canal junction would restore the features of the Hula Lake, thus increasing habitat diversity in the valley. Moreover, this water body would impound the water flowing in the eastern canal during floods, thus preventing damage to agriculture. Another suggestion to improve the Lake Agmon ecosystem is to expand the restored area in the direction of the valley rim springs. In the past these springs, both those on
the western slopes of the Naftali Mountains and those on the eastern slopes of the Golan Heights contributed to enriching the biodiversity of the lake and the marshes. Supplying water from these springs to Lake Agmon at a constant temperature, would allow a thermal refuge for animals to be created at Lake Agmon in the winter. Restoring the valley rim springs and creating a new water body at the canal junction would reduce visitor pressure at Lake Agmon, thus contributing to the sustainable maintenance of Lake Agmon for future generations. Pressure by local residents, nature lovers, environmental organizations and the like for restoring additional wetland habitats in the Hula Valley could contribute to the realization of these plans.

In conclusion, the Hula Peatland Restoration Project can serve as a model and inspiration for future environmental projects from many aspects. It is a source of pride and an economic mainstay for inhabitants of the entire area. The globally unique ecosystem created at Lake Agmon because of the project should be promoted by the Israeli government. The main challenges for the future are conserving nature in Lake Agmon, its global branding, expanding wetland rehabilitation in the Hula Valley and transforming birding into a feature to attract foreign tourists and researchers.
Fifty years passed between the completion of the drainage of the Hula marshes and the establishment of Lake Agmon in the heart of the area where the marshes once thrived. The rapid ecological rehabilitation of the lake and its environs, along with the unexpected arrival of multitudes of cranes to winter in the valley, transformed Lake Agmon into a major birding site that attracts some half-million visitors yearly, from Israel and abroad. In the short time since it was established, Lake Agmon has become recognized as a major global birding and nature site, ranked ninth in the world by the prestigious BBC Wildlife Magazine, thanks to the abundant birdwatching opportunities it provides.

How, and thanks to whom was Lake Agmon developed, and what were the challenges faced by the leaders of the project and its implementers? What led KKL-JNF, which originally drained the Hula marshes in the early days of the State of Israel, to return to the valley and take on the task of rehabilitating the peat soils and establishing Lake Agmon as its flagship project? How did the project positively affect the ecosystem, agriculture and tourism in the area? The book discusses these and many other issues; it is intended to broaden the outlook of visitors to Lake Agmon, who enjoy this amazing work of nature, allowing them to understand the conditions that enabled the creation of this bird paradise.

The book is evidence of KKL-JNF’s varied activity and of its vision of Lake Agmon as a trigger for accelerating the development of the Upper Galilee. We are already aware of additional investments in tourism development generated by the project, such as the ‘Galilion’ tourist and commercial center and other plans to develop another compound near the new Lake Agmon visitor center, which will include an international center for the study of bird migration and the unique ecosystem in the area.