AMERICAN UNIVERSITY OF BEIRUT

UNDERGRADUATE CAPSTONE PROJECT
IN
LANDSCAPE ARCHITECTURE

SUBMITTAL FORM

PROJECT FULL TITLE

Rethinking the Mseilha Dam

by
STUDENT FULL NAME

Andrea Hadwan

LDEM 242- ADVANCED DESIGN
SPRING 2019-2020
CAPSTONE PROJECT COORDINATOR:

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[Signature]

[Dr. Full Name, rank]
[Department]
(as listed in AUB Catalogue of current year)

Date of project presentation: [**May 08, 2020**]

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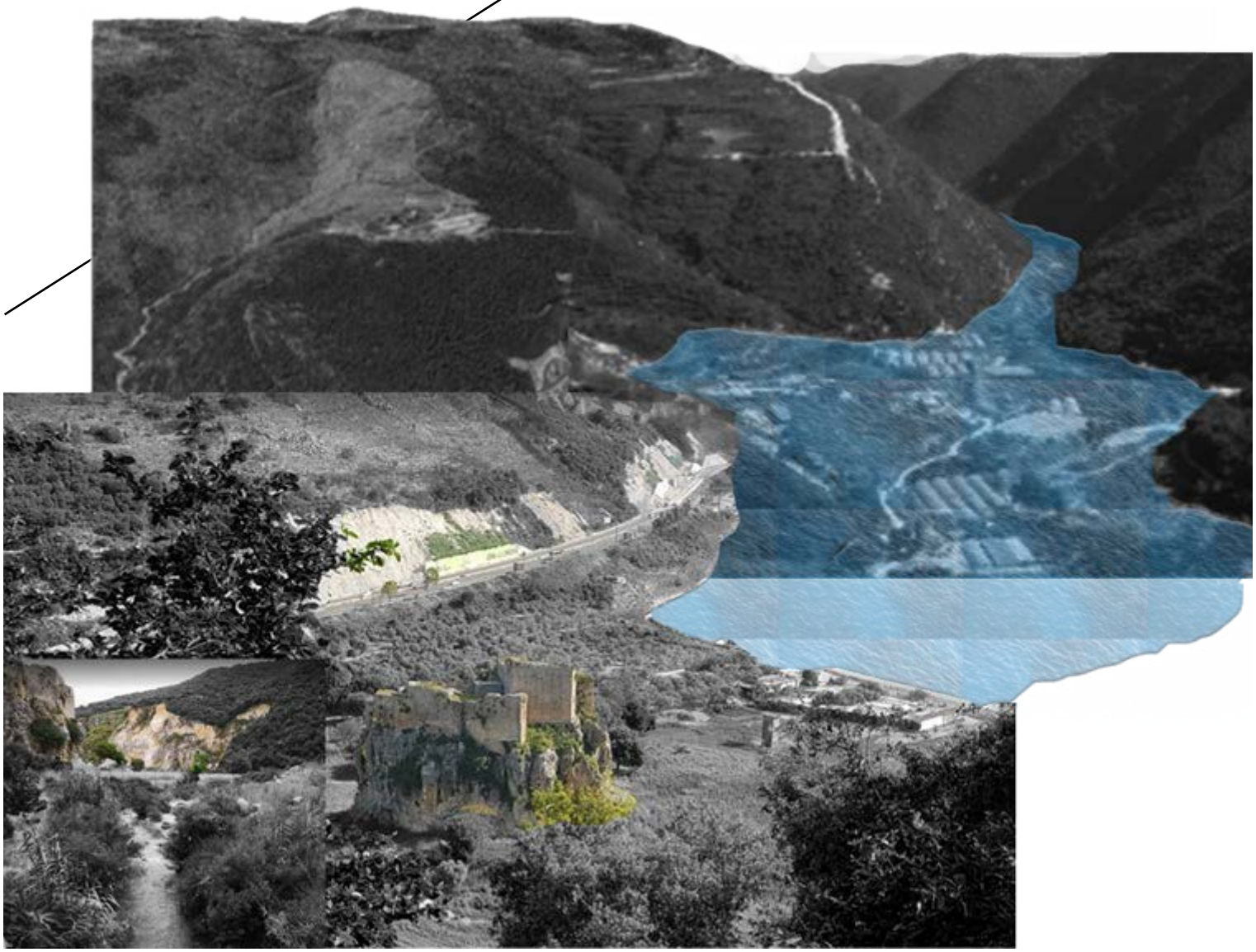
RETHINKING THE MSEILHA DAM

Portfolio by Andrea Hadwan



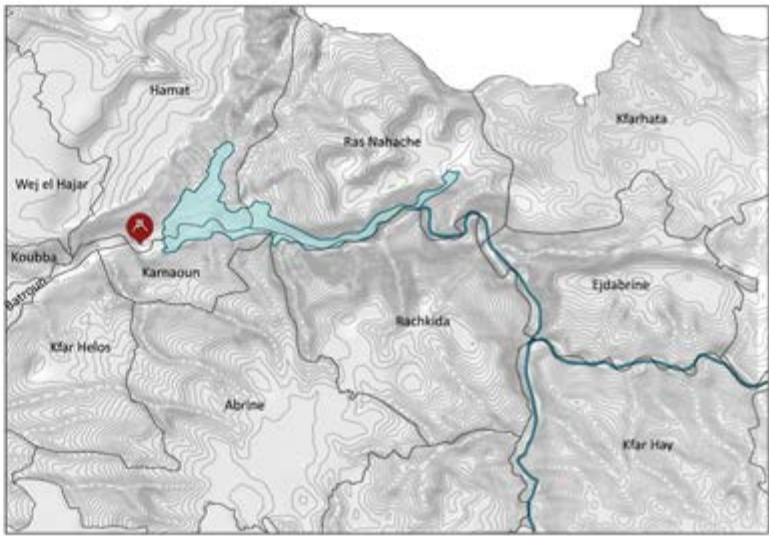
Contents

.01 Statement

Mseilha is a historic fort located in Hamat district, in the northern part of Lebanon. The fort, built on an isolated massive rock, stands in the middle of a river plain surrounded by hilly landscape. The newly constructed Dam on the downstream part of Nahr El-Jawz river has transformed the site impacting its ecological equilibrium, disrupting the landscape character of the area and damaging the cultural integrity of these important features.

The intervention focuses on the ecological regeneration of the area as a means to recreate connections between human and nature, the old and newly inserted components and to emphasize the role that the historical features could play in the reconstruction of a cultural landscape.

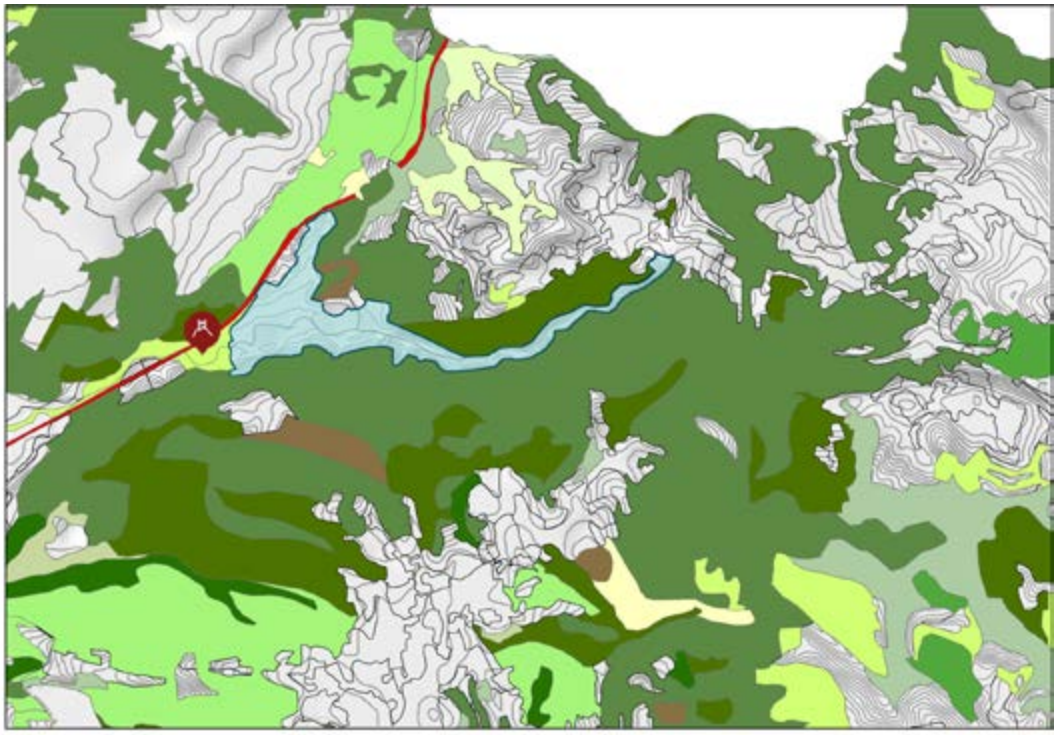
.02 Context

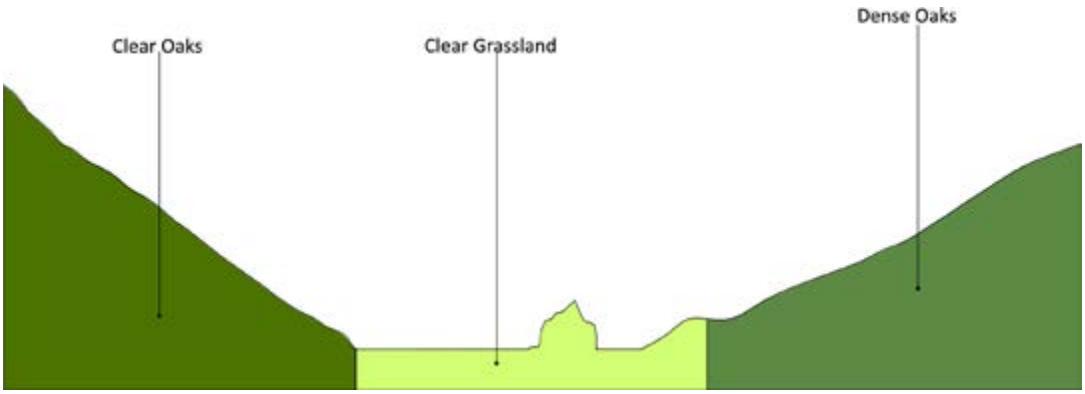


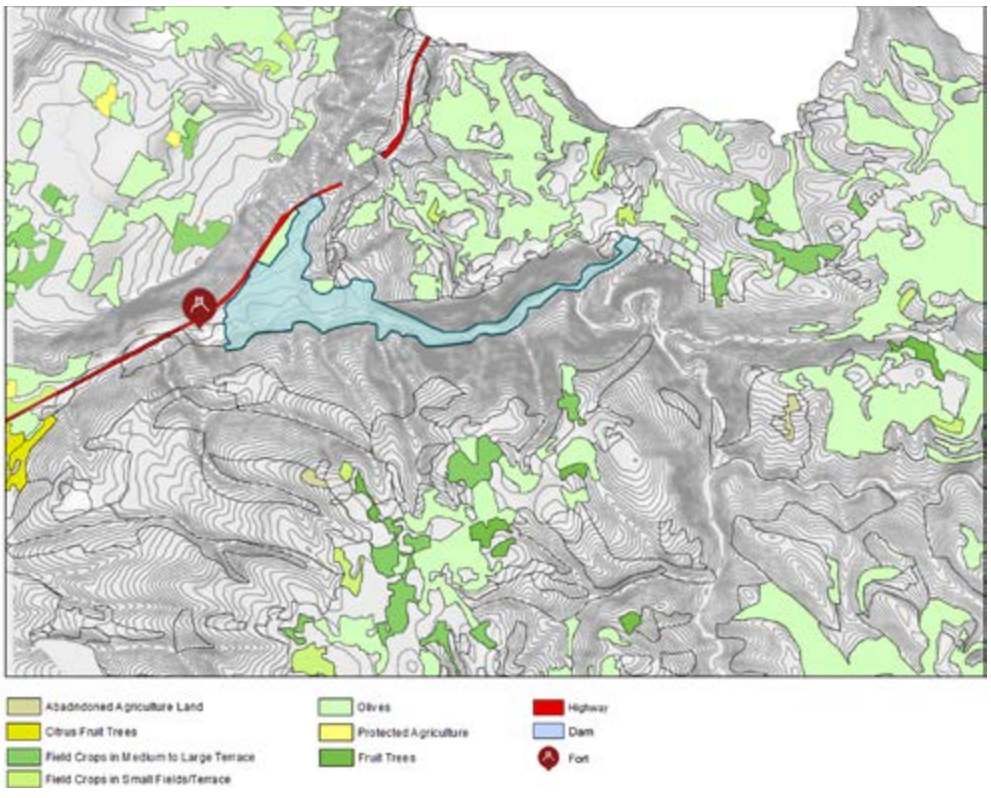
HISTORY

.03 Inventory

Land cover:
Untouched Forest



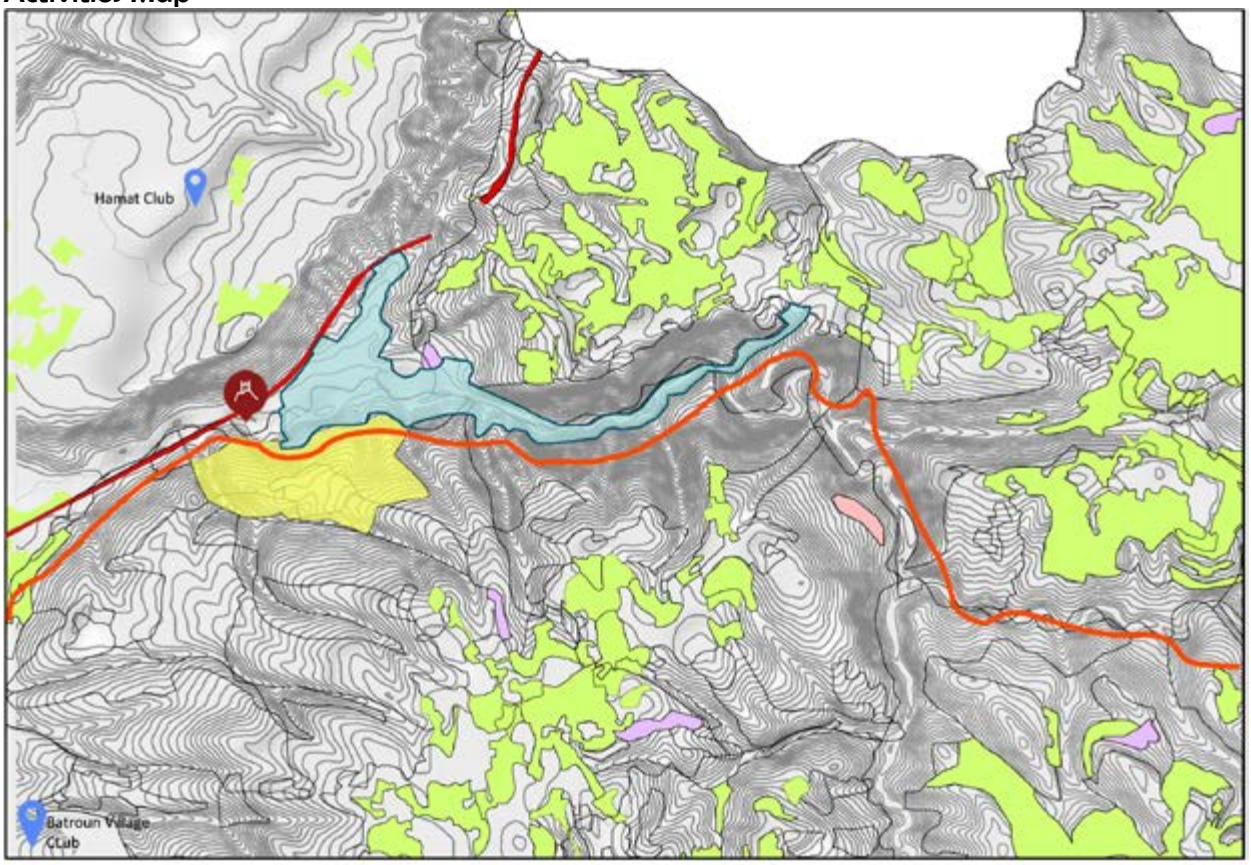




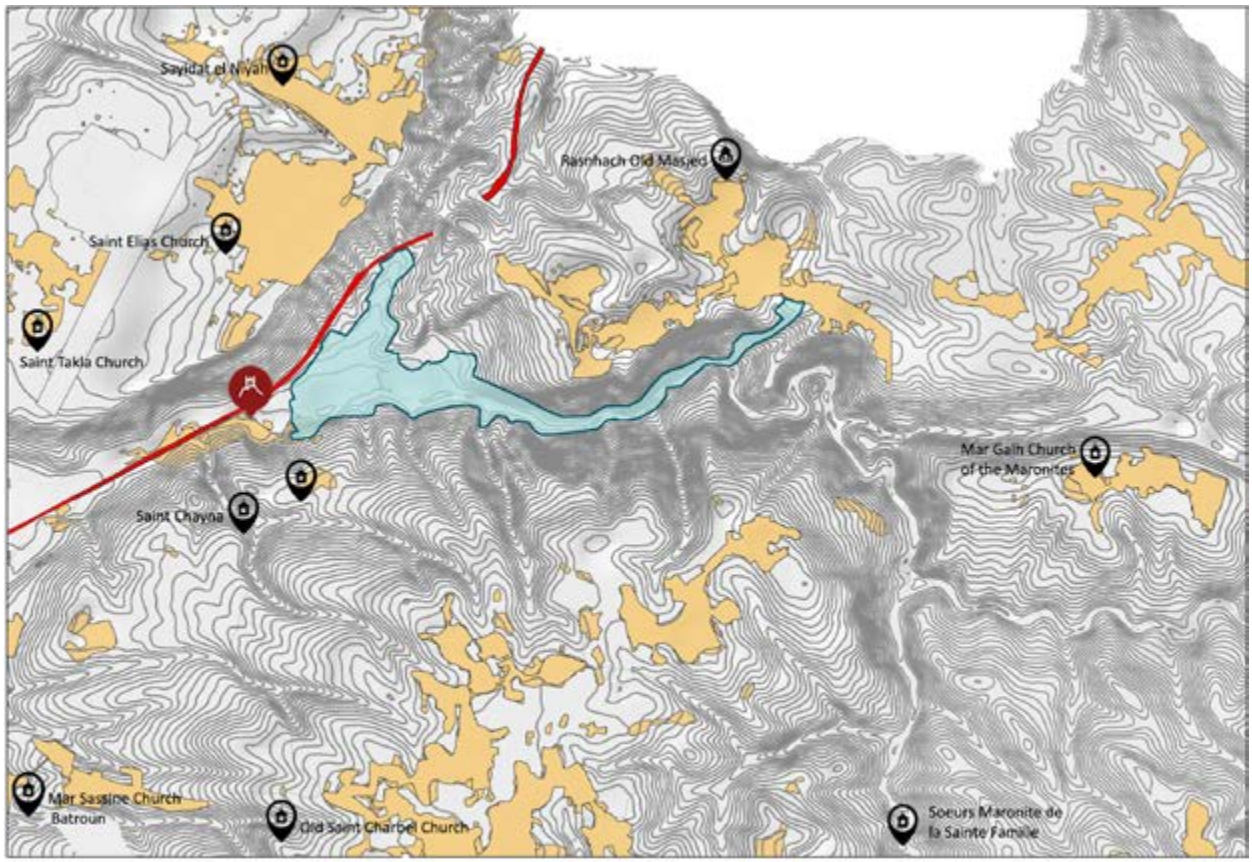
Land cover:
Touched Agriculture

.03 Inventory

Activities Map



Cultural landmarks Map



.04 Analysis

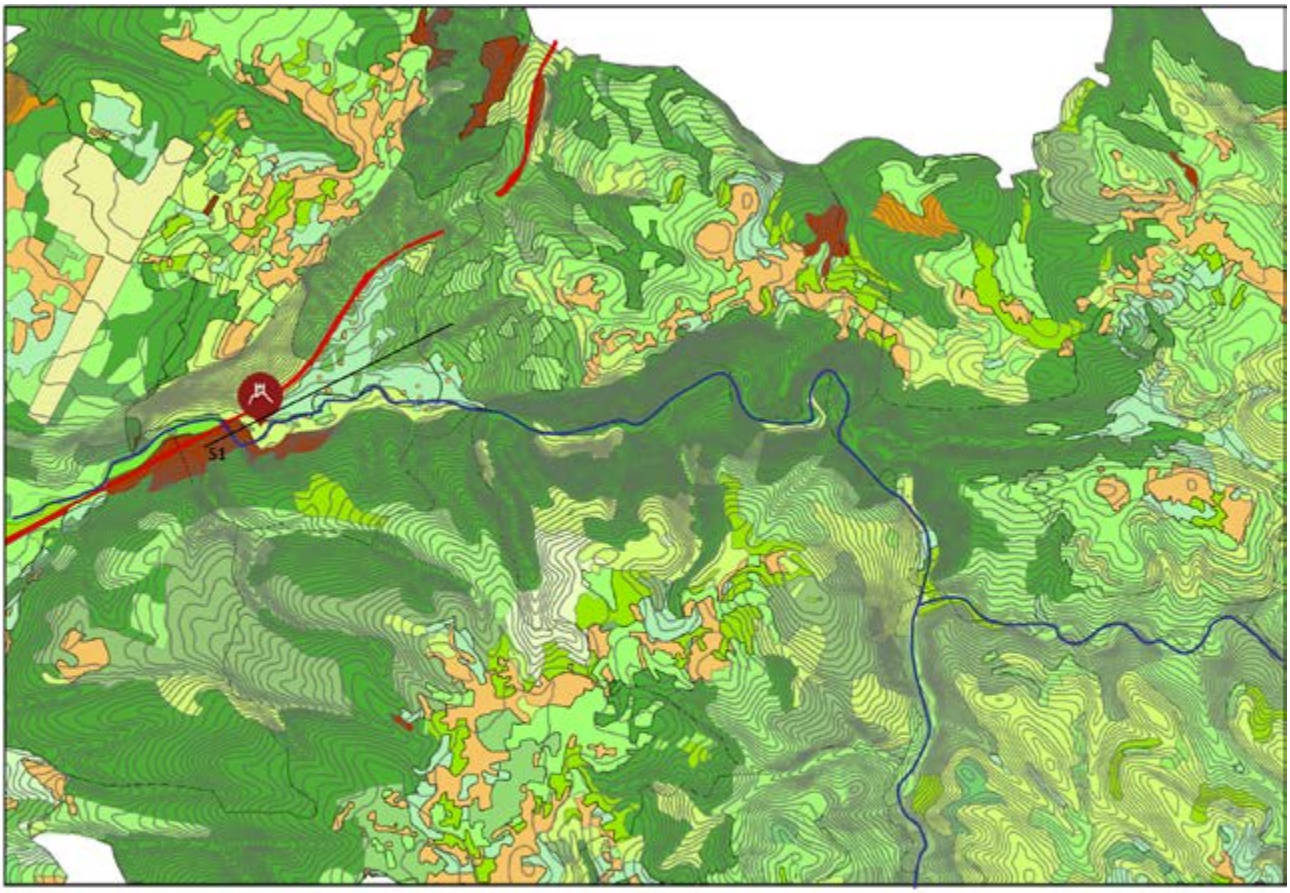
Landcover transformation through time

2010

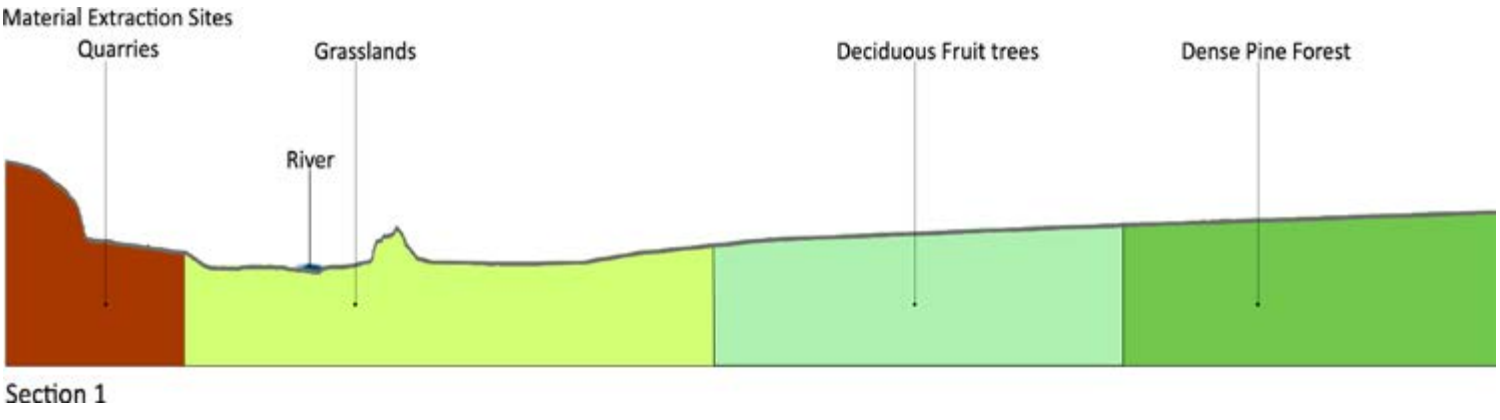
2017

2019

Mseilha and its surrounding before the construction of the dam (2010)



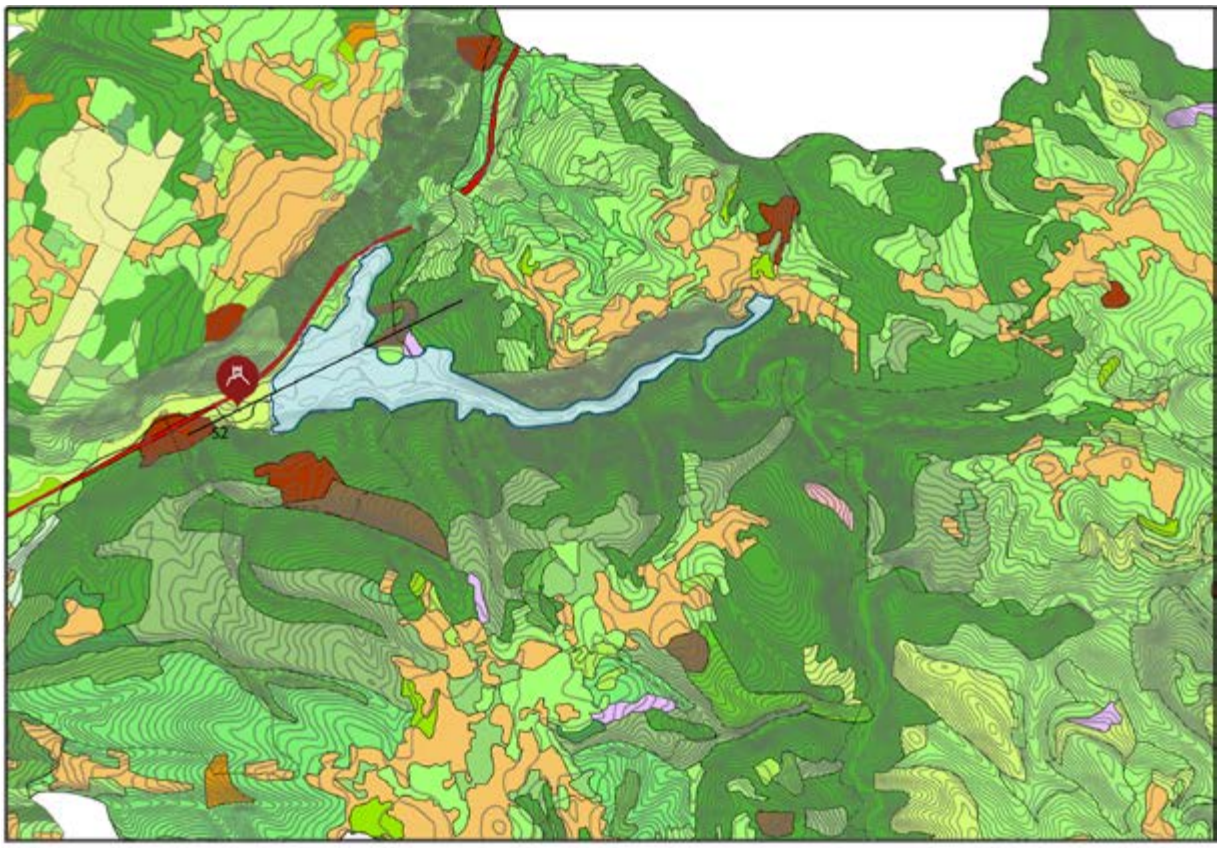
- Dense forest of Oaks
- Dense pine forest
- Field crops in large areas
- Field crops in small fields/terraces
- Burnt Wooded Lands
- Abundant farmland
- Agricultural Units
- Low density oak forest
- Low density pine forest
- Deciduous fruit trees
- Highway
- Airport
- Urban Fabric
- Material Extraction Sites
- Mixed low density forests
- Olives
- Grasslands
- Protected agriculture
- Shrublands
- Fort

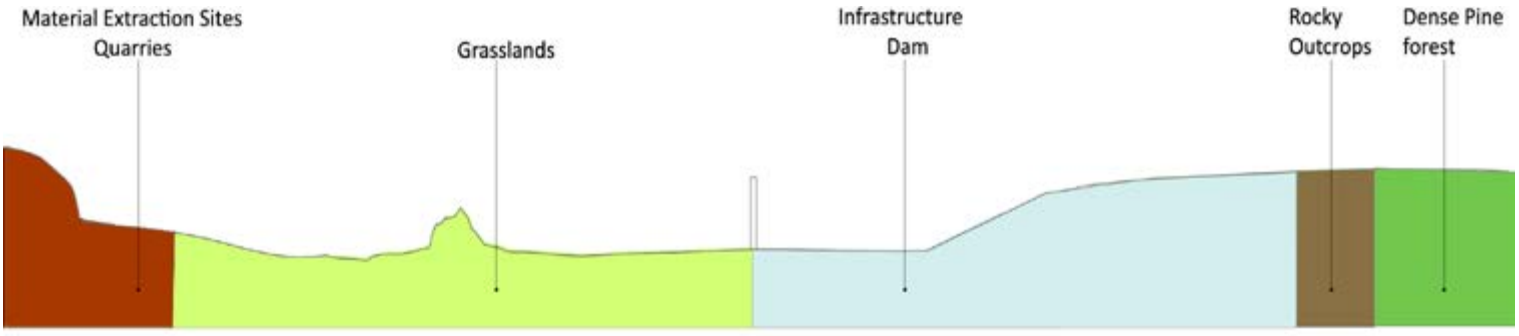


Section 1

.04 Analysis

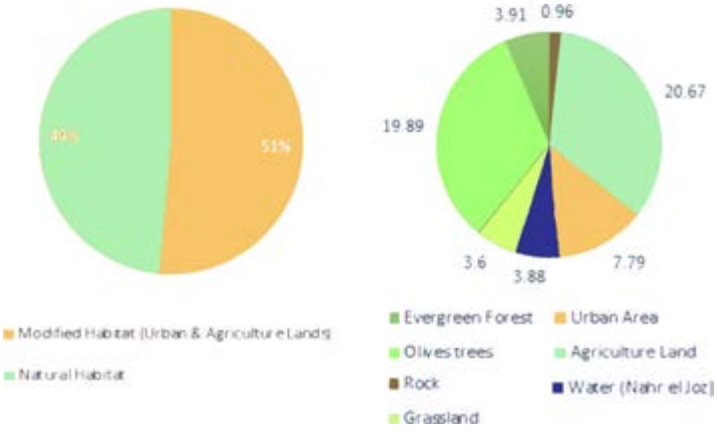
Mseilha and its surrounding after the construction of the dam (2017)



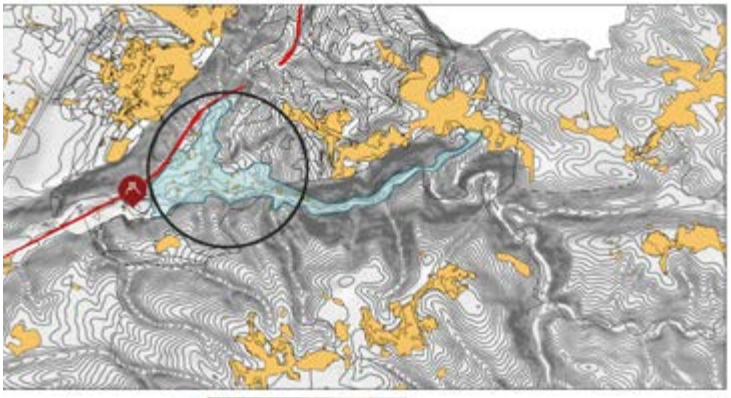


Section 2

Impact of dam: Landcover eliminated

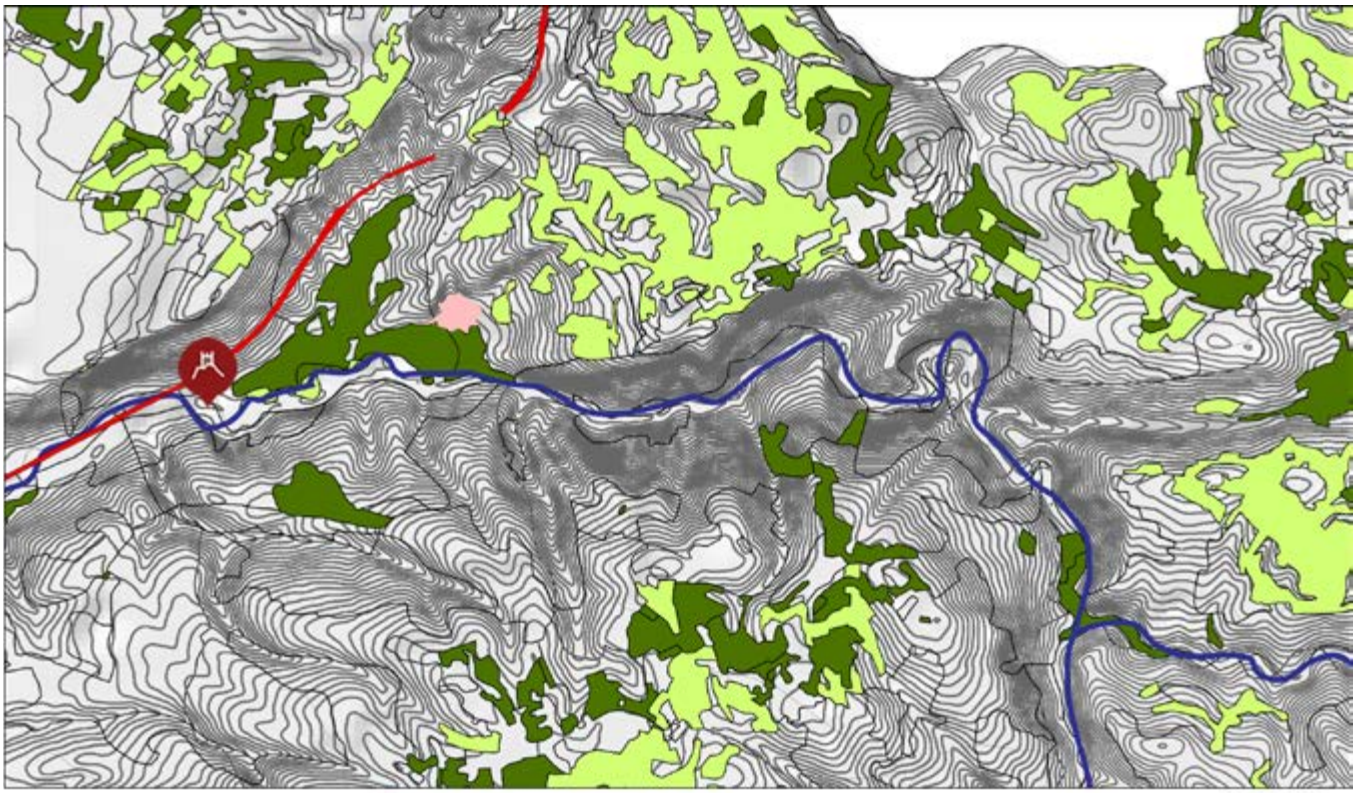


Relocation of inhabitants

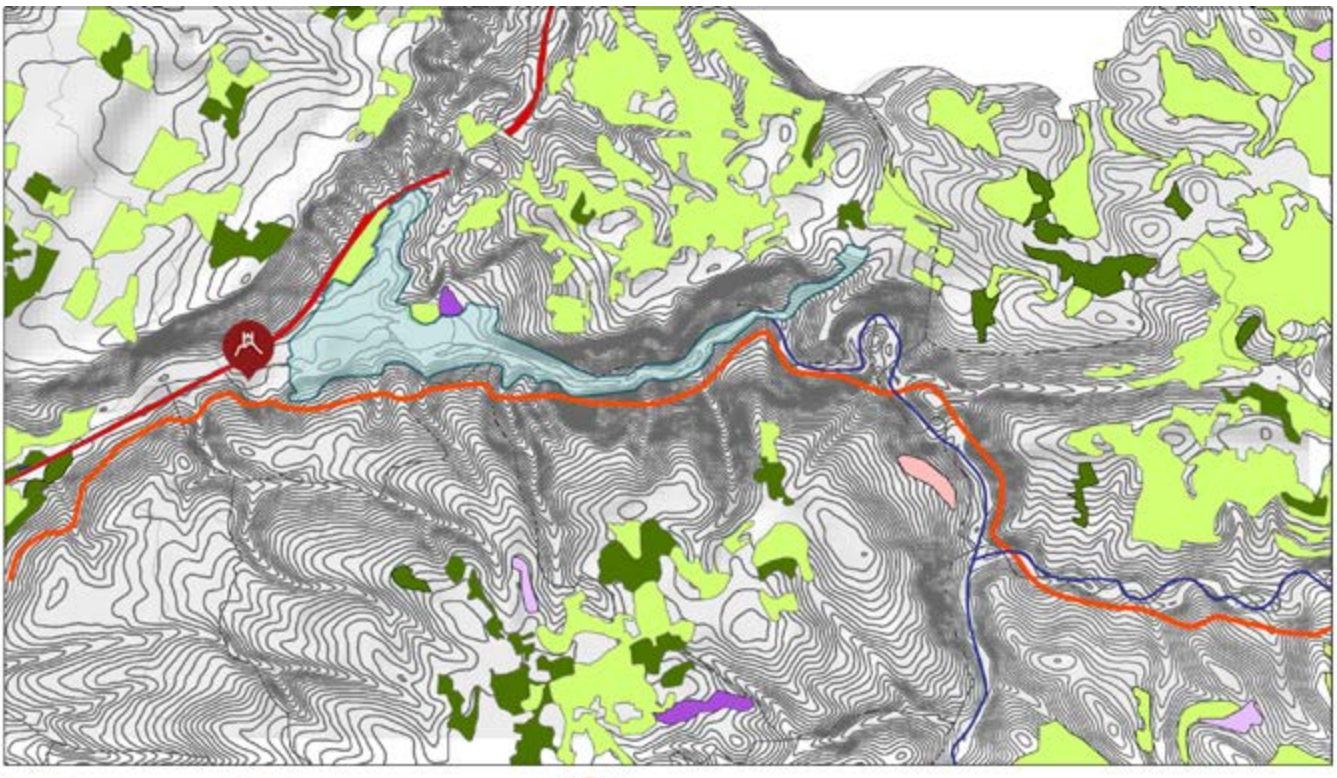


.04 Analysis

Activities before the construction of the dam (2010)

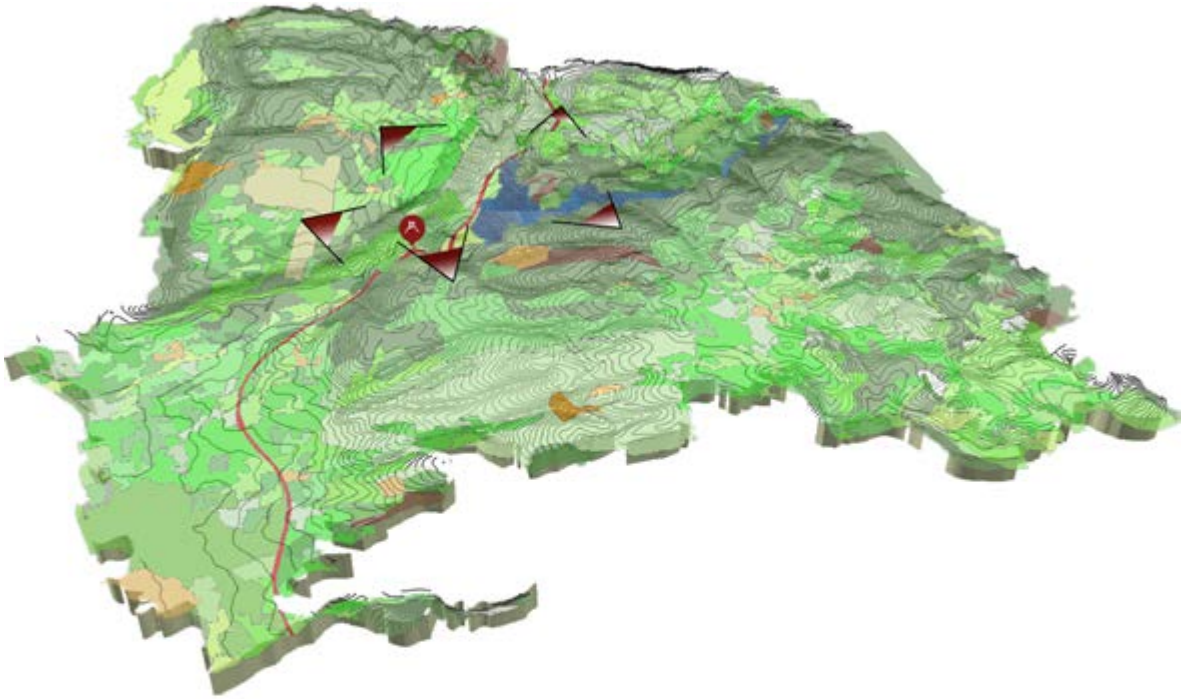


Activities after the construction of the dam (2017)



.04 Analysis

Visibility of dam



Insurable drinkable water tilll 2030

Locality	Average Altitude (m)	Population		Need for water (l/day)		Need for water (m3/day)	
		2006	2030	2006	2030	2006	2030
Batroun	10	18,170	34,013	3,031,050	6,870,626	3,031	6,871
Chekka	20	13,335	24,691	2,200,275	4,987,582	2,200	4,988
Daoura	580	1,225	2,268	202,125	458,136	202	458
El- Heri	10	2,449	4,533	404,085	916,070	404	916
Enfeh	10	8,845	16,376	1,459,425	3,307,952	1,459	3,308
Hamat	260	1,905	3,527	314,325	712,454	314	712
Koubba	50	1,769	3,275	291,885	661,550	292	662
Ouajh el Hajar	180	953	1,764	157,245	356,328	157	356
Selaata	150	816	1,511	134,640	305,424	135	305
Total		49667	91961	8195055	18576122	8194	18576

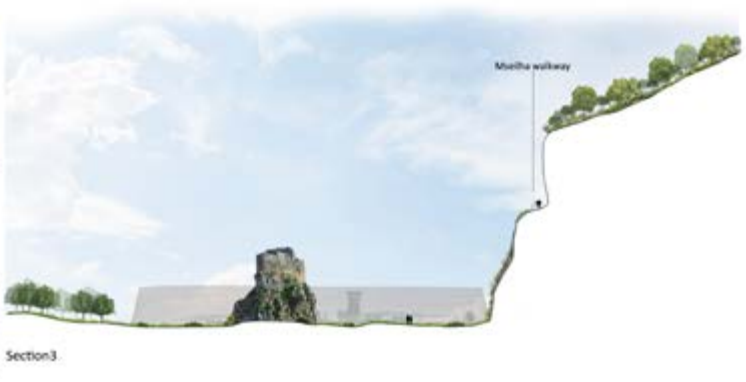
.04 Analysis

Mseilha Walkway

The trail was established in 2018

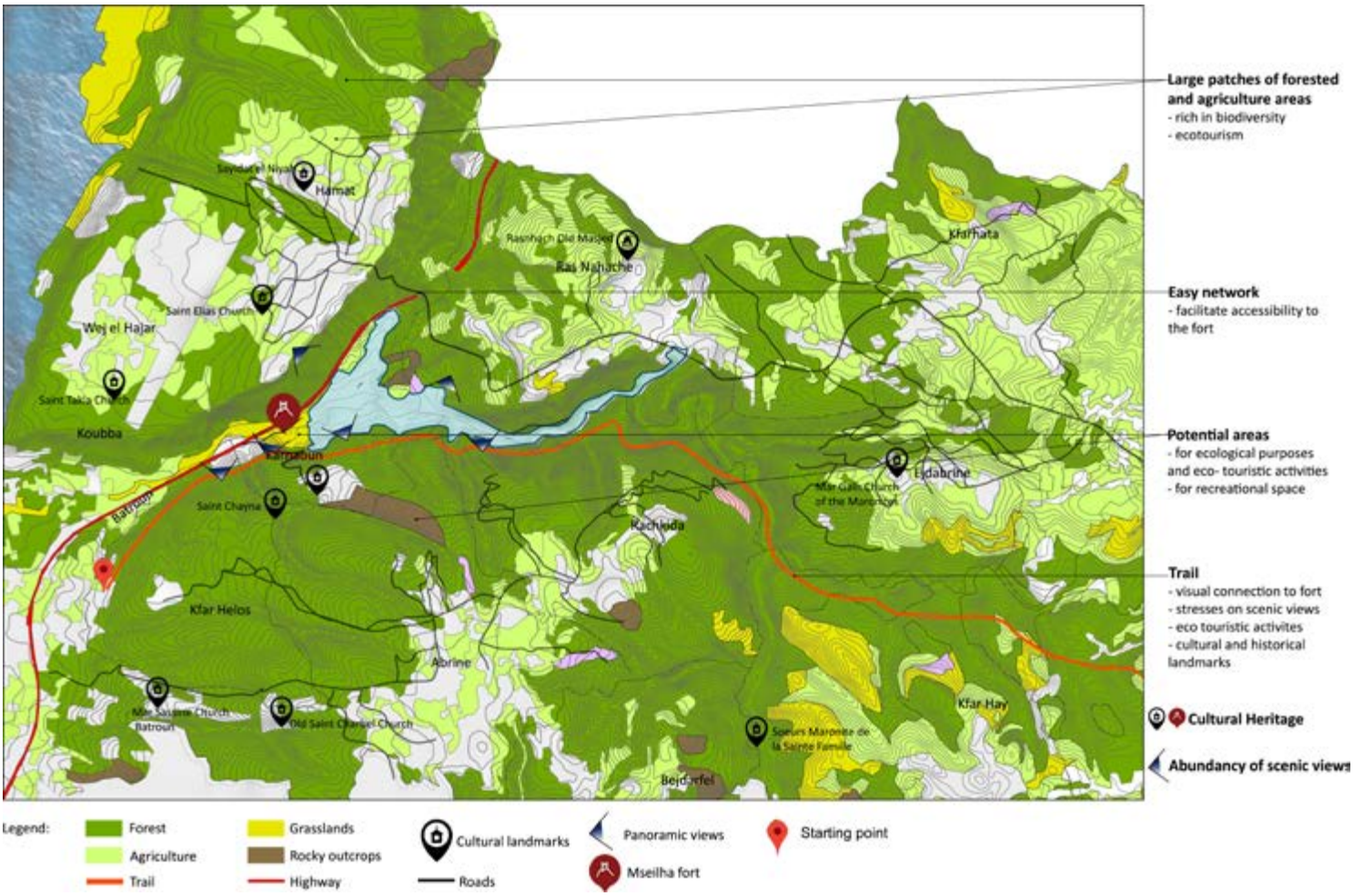
Starting point: Batroun Village Club
Ending point: Der Kaftoun

Different typologies found throughout the beginning of the trail

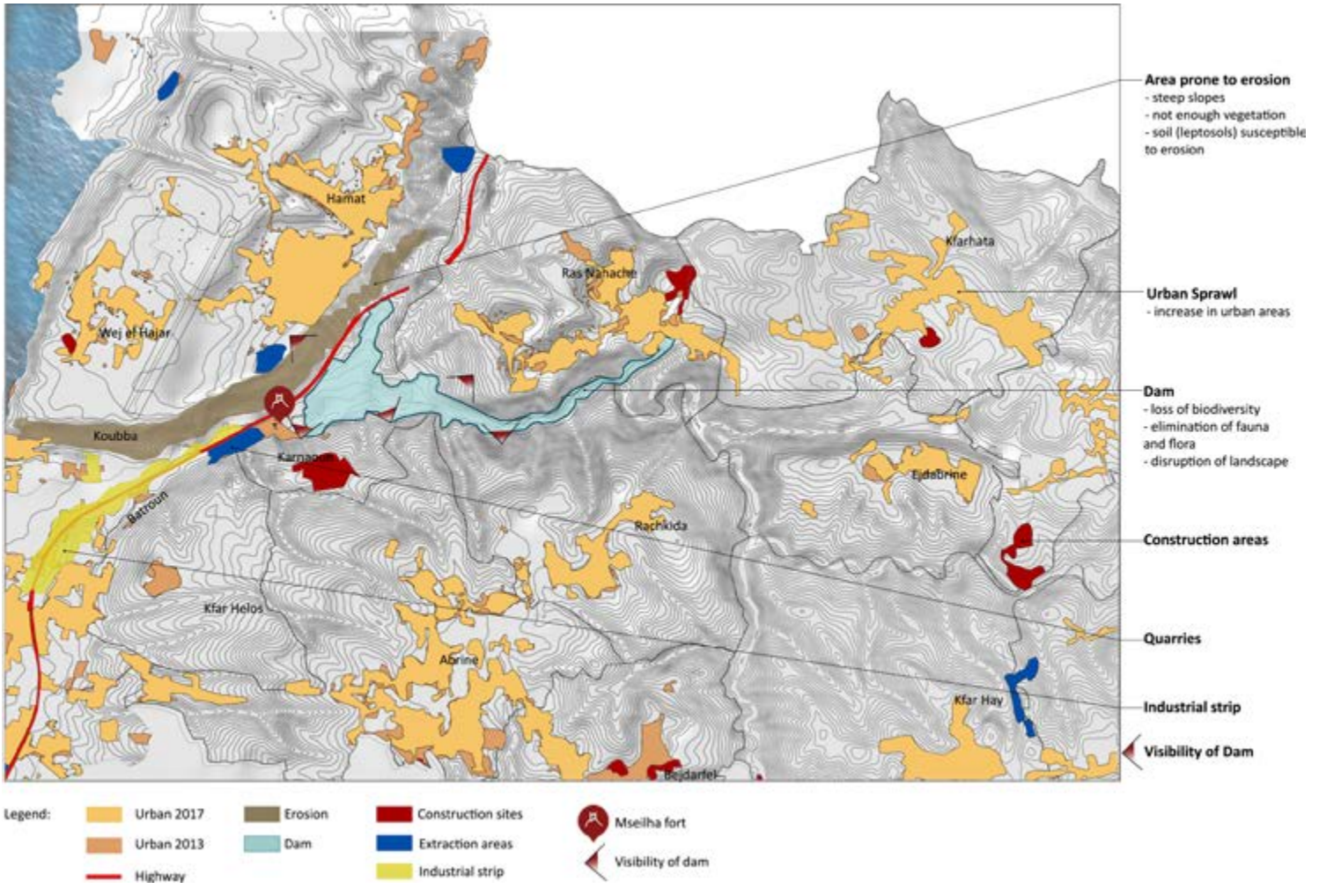


.05 Opportunities & Constraints Maps

Opportunities



Constraints



Explanation

My project challenges the existing dam, that was recently built, it responses to the ecological as well as the cultural needs of the area. Revitalizing the river, integrating the fort, reintroducing elements and introducing new ones. Mseilha, before the construction of the dam, was an area rich in deciduous trees that were mainly agriculture surrounded by pine and oak forests.
Unfortunately, the construction of the dam interrupted and created a clear and harsh cut in the area, disconnecting it. Not only did it modified the natural habitat of the area, damaging the integrity of the area, it also relocated inhabitants that used to live out of these agricultural lands.

Even though it was believed that the dam would ensure drinkable water till 2030 for more than 10 villages along the coast, apparently, it is not as efficient and has leaking problems.
In addition, I once read that rivers are the veins of our planets and by definition a river flows. It is supposed to flow freely without any disturbance and disruption. Today, in the 21st century, many dams around the world are being demolished and destroyed, rivers are being valued and people are aware of their importance. Sadly, in the middle east, while the world is evolving, the middle east is going backwards by constructing, implementing, and destroying the whole ecosystem that a river holds with its surrounding environment. Even though, water is vital for our survival there are many ways of collecting water without heavily impacting and harming the river. Therefore, I decided to remove the dam and challenge its existence.

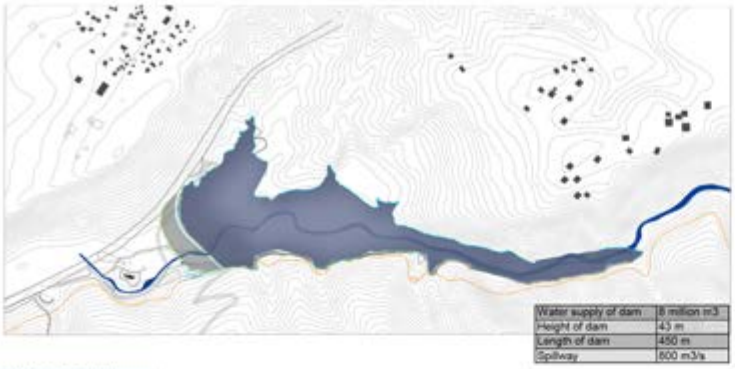
By removing the dam, I established a large-scale strategy that would supply the same mount of water. However, the collection of water can only be achieved when applied along the whole nahr el joz river. The source of the river is in Tannourine region.

In order to achieve the aim of my project, a reforestation process will occur around the whole area, an extension of the existing forest will occur around the borders of the Mseilha dam. In addition, a revitalization and restoration of the river will also occur, emphasizing it with a riparian green corridor along the river. Agriculture patches will be reintroduced in the area for production and eco-touristic purposes. The fort itself will be the main attraction for tourists and will be part of the recreational area that starts from the Mseilha fort itself.Furthermore, a new landscape will be introduced to the area which is based on wetlands. Wetlands will be introduced along the river, to improve the quality of the water and introduce a new type of ecosystem to the area. Seasonality is also taken into consideration since the plants chosen are deciduous and evergreen. In fall, a clear contrast between these trees is shown as well as the color variety and the experience.

An ecological phasing is established for the area and by 2035, “Rethinking the Mseilha Dam” could be open for public.

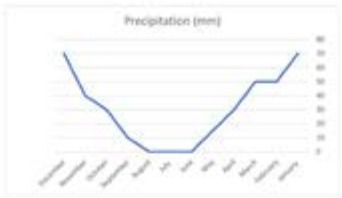
.06 Large Scale Strategy

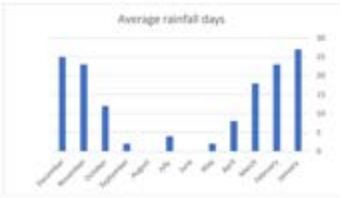
DAM INFORMATION



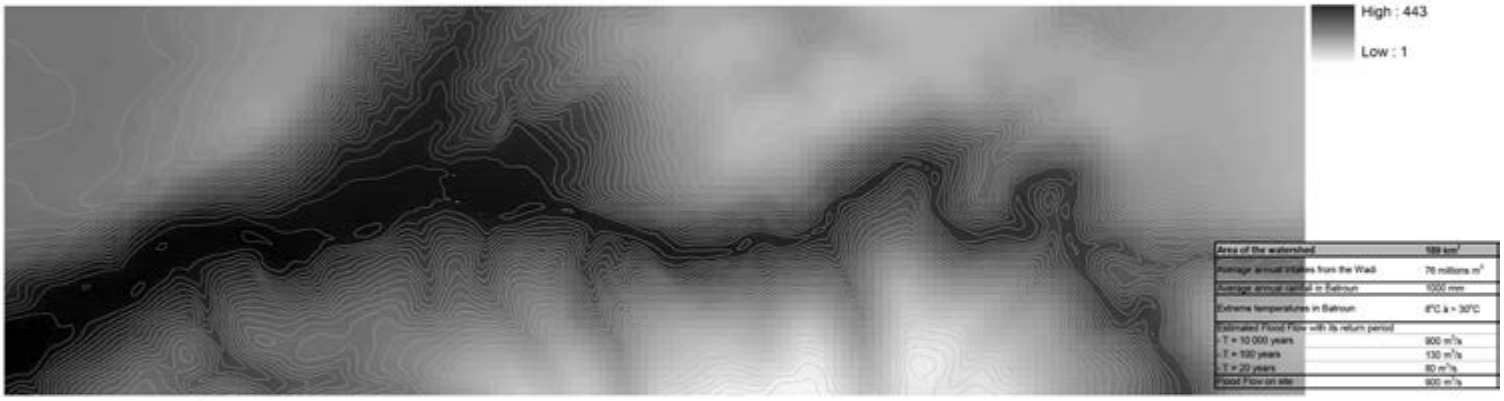
Water supply of dam	8 million m3
Height of dam	43 m
Length of dam	450 m
Spillway	800 m3/s

RAINFALL



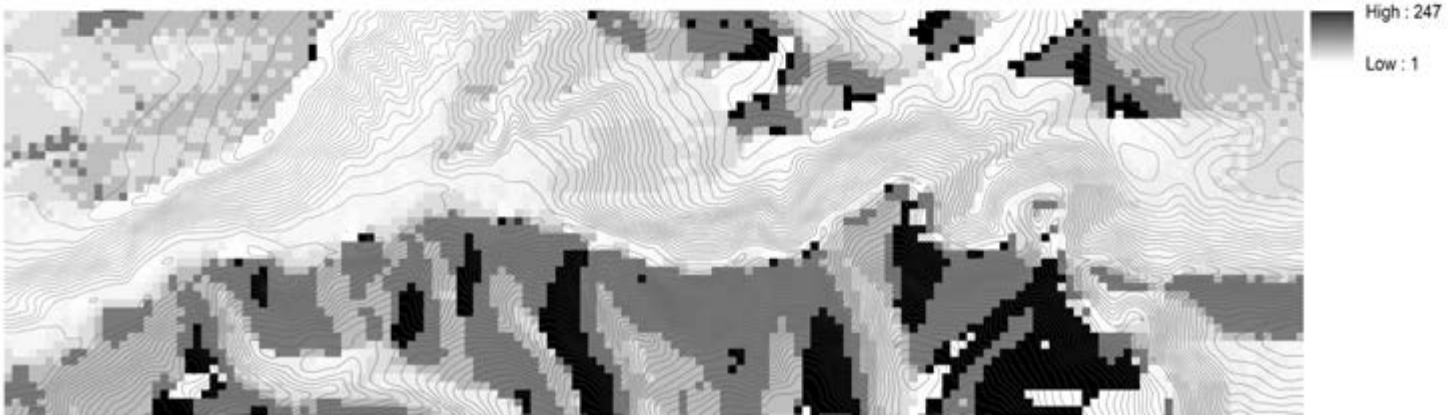


WATERSHED



Area of the watershed	189 km²
Average annual intakes from the Wadi	76 millions m³
Average annual rainfall in Batroun	1000 mm
Extreme temperatures in Batroun	8°C à + 30°C
Estimated Flood Flow with its return period	
- T = 10 000 years	900 m³/s
- T = 100 years	130 m³/s
- T = 20 years	80 m³/s
Flood Flow on site	900 m³/s

FLOW DIRECTION



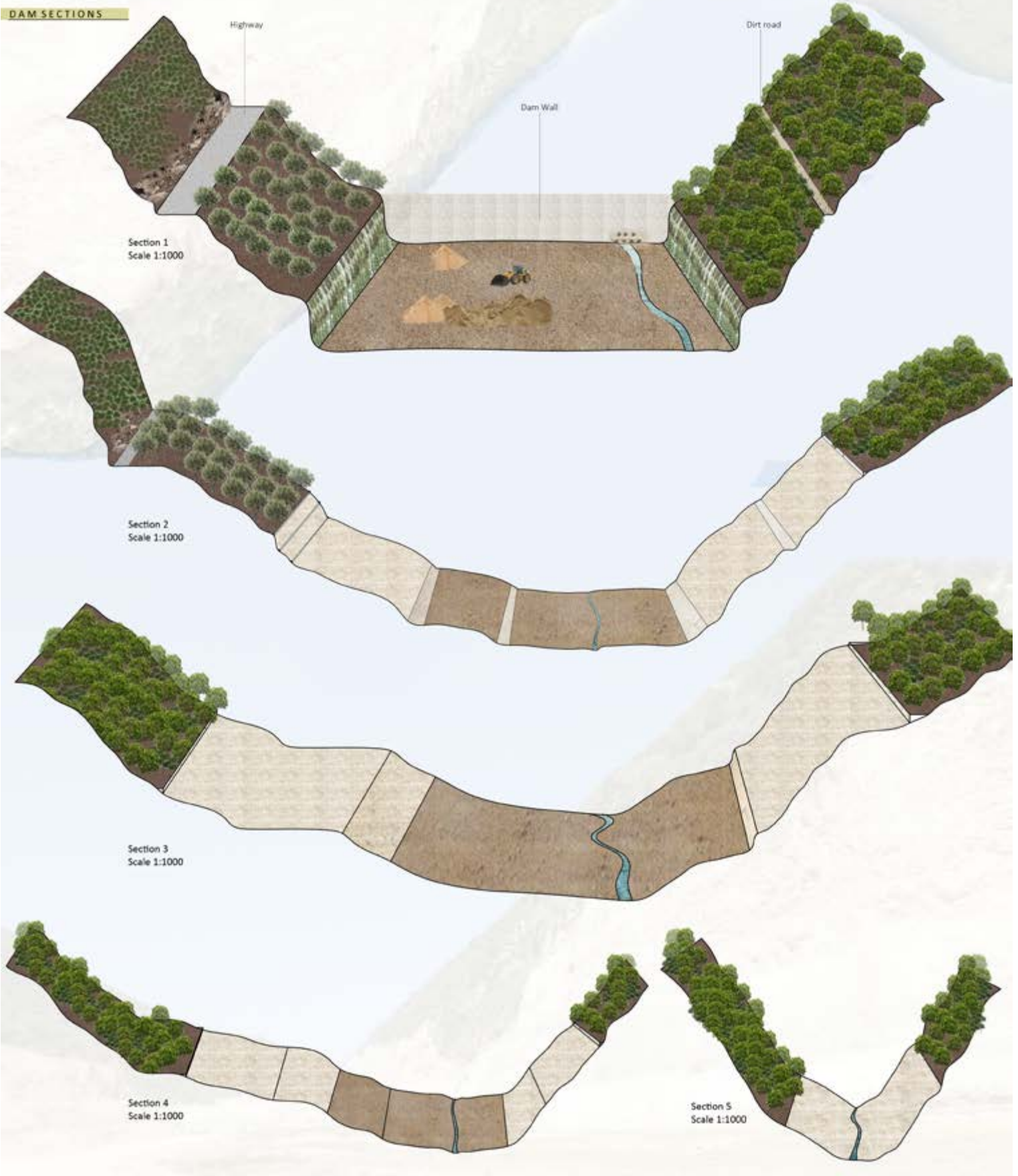
STRATEGY

Collection of water through differents types of ponds across all the river

.07 Existing Conditions

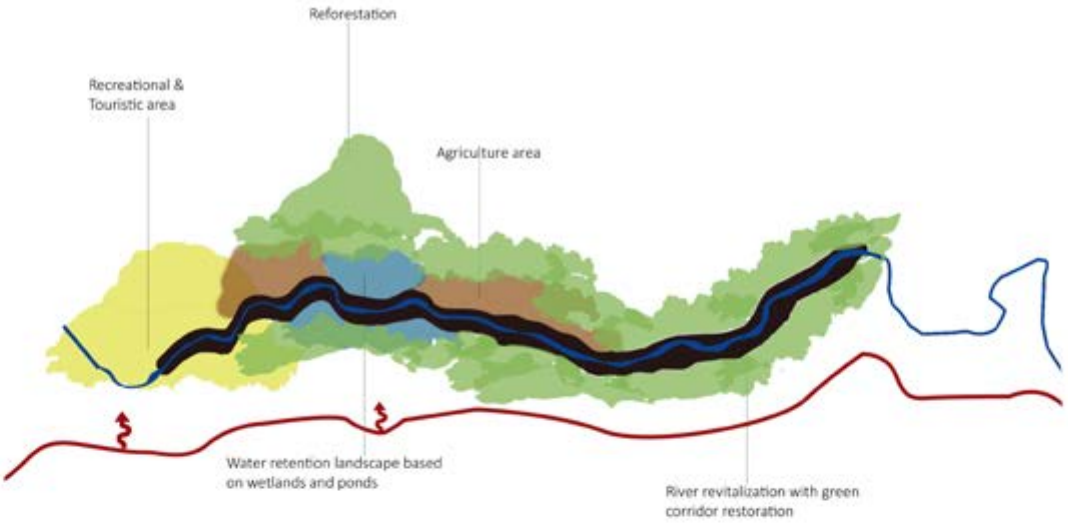
SECTION CUTS PLAN

DAM SECTIONS

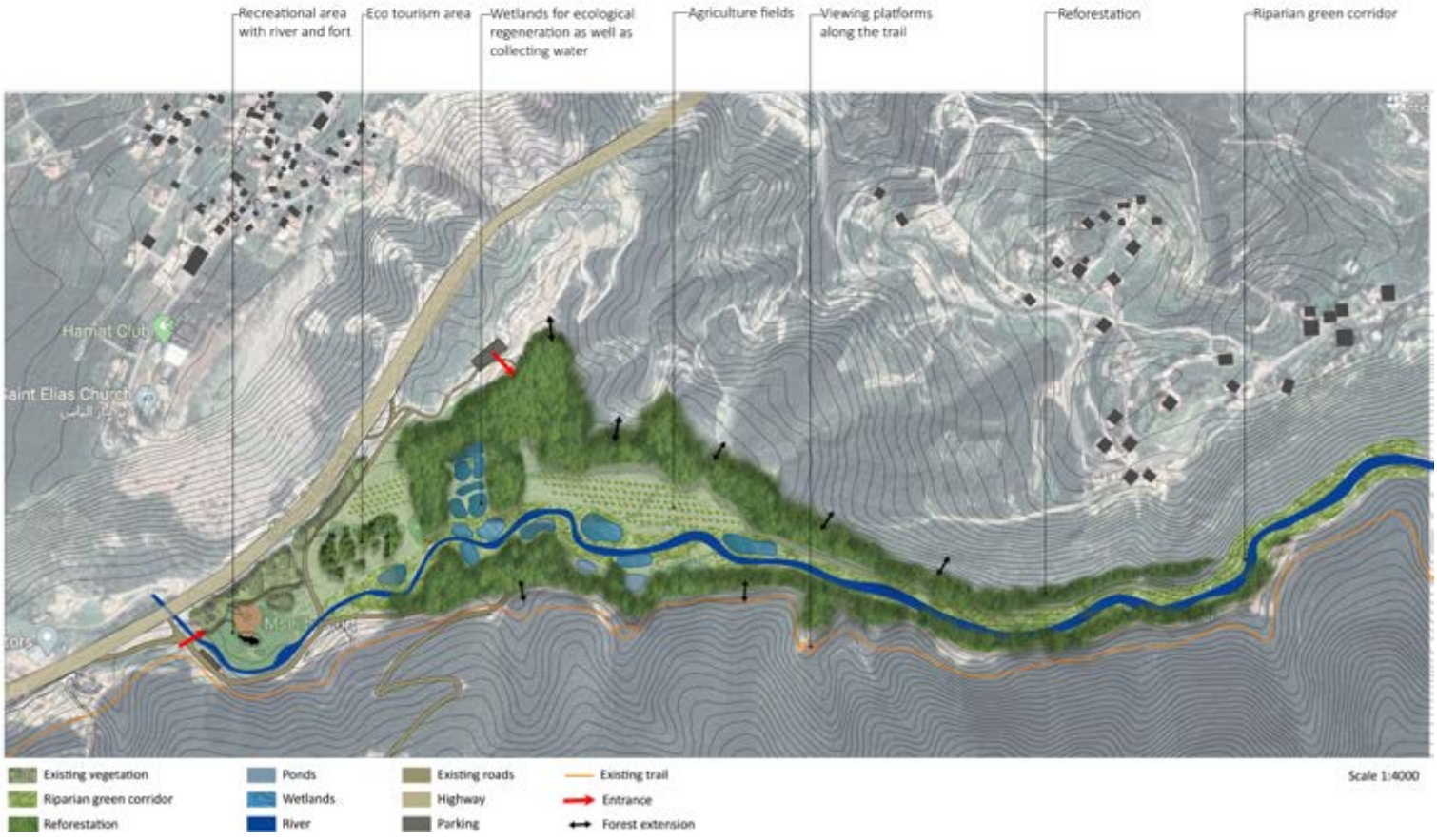


.08 Concept & Strategy

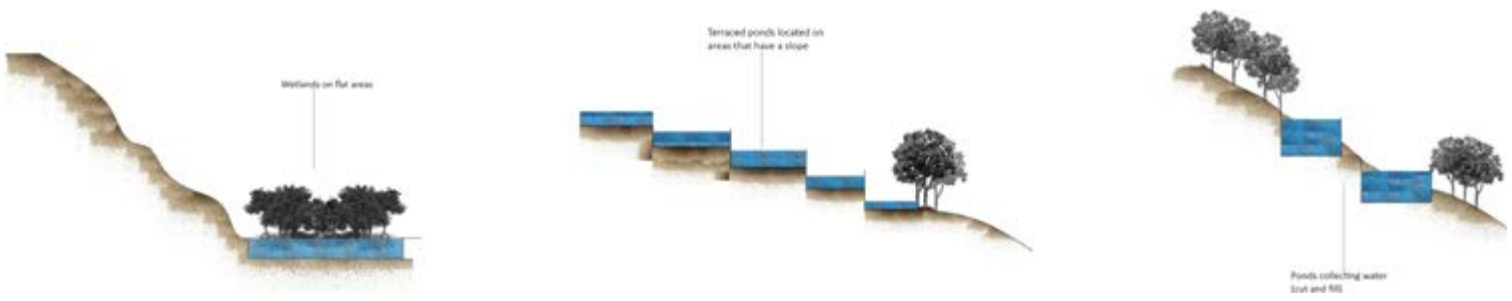
CONCEPT



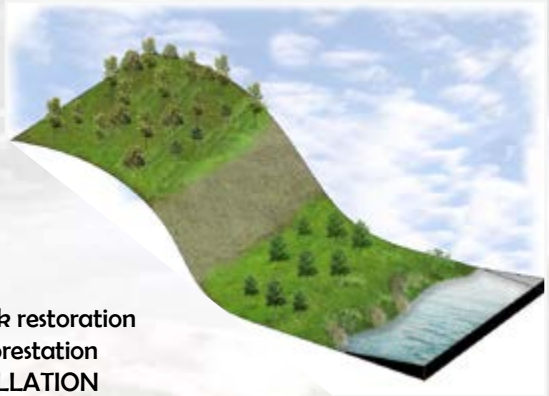
STRATEGY



WATER COLLECTION STRATEGY

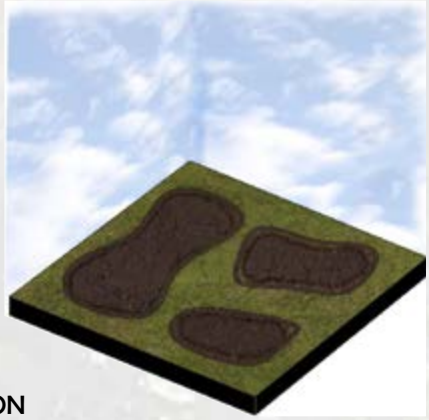


.09 Plan

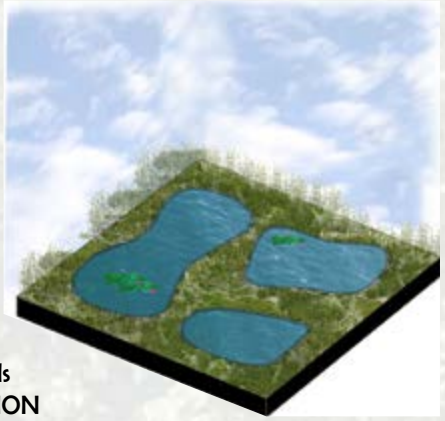


River bank restoration
& Reforestation
INSTALLATION

River bank restoration
& Reforestation
MATURATION

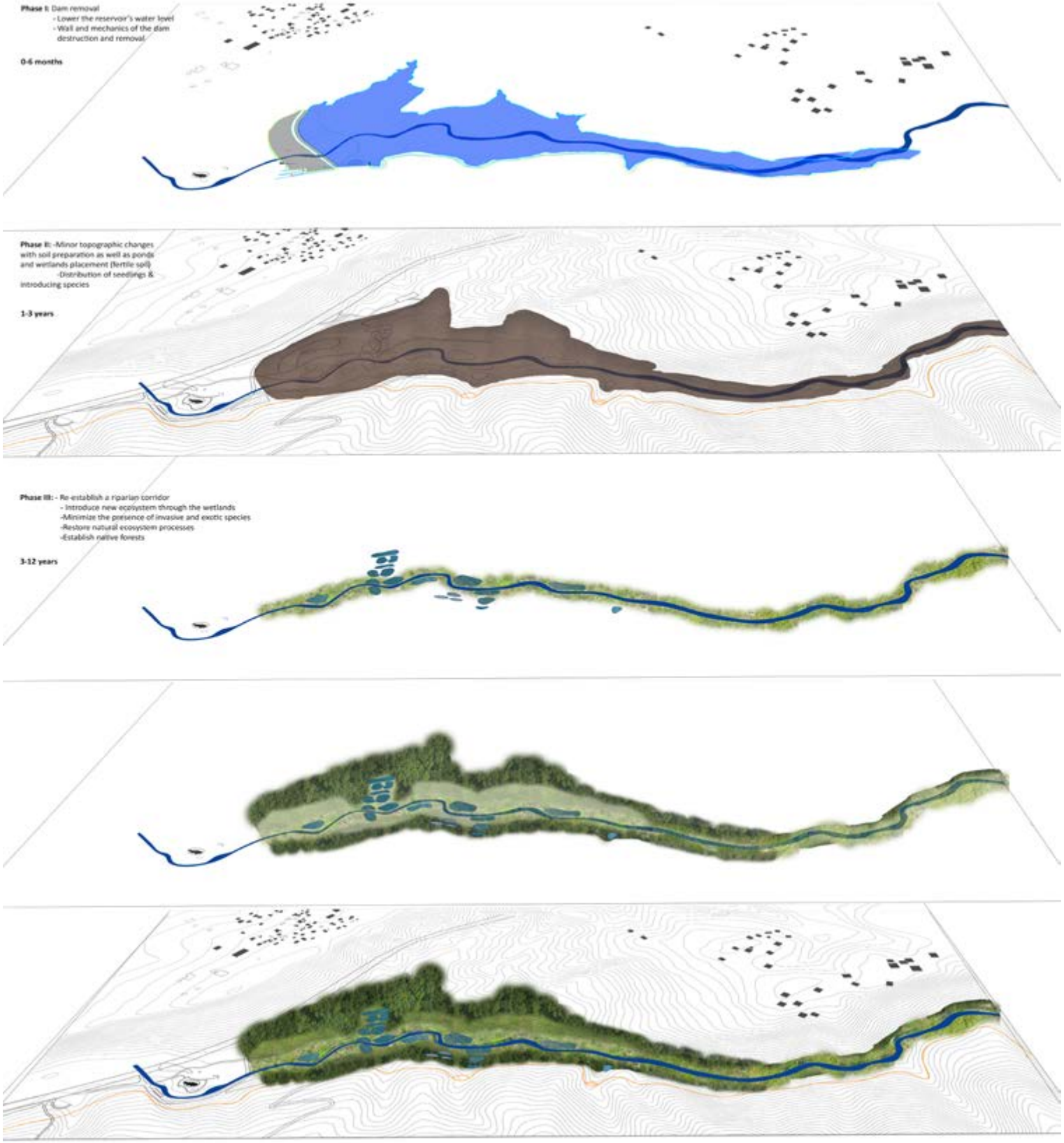


Wetlands
INSTALLATION



Wetlands
MATURATION

.10 Ecological Phasing



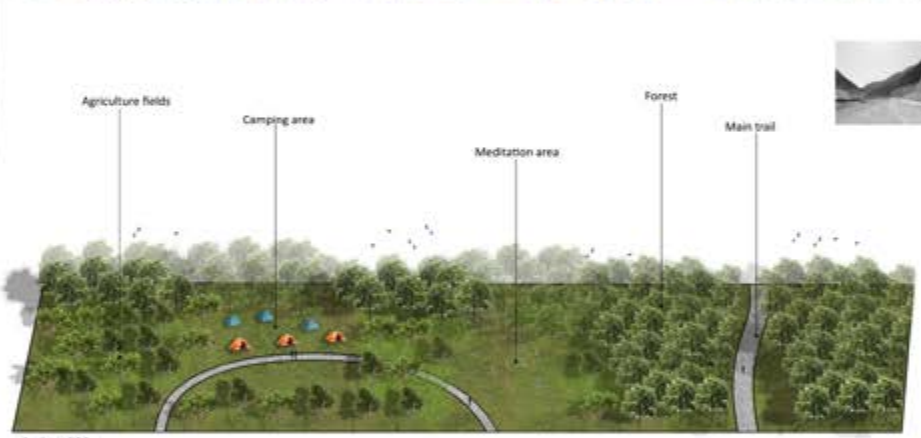
.11 Seasonality

.12 Spaces

PICNIC AREA

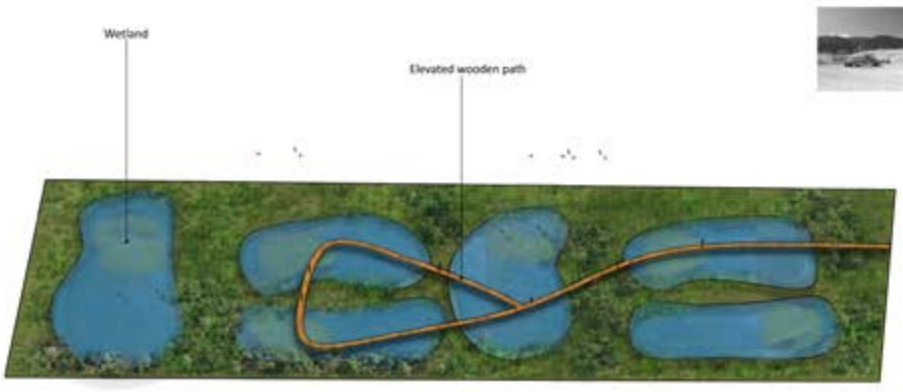
Scale 1:500

CAMPING & MEDITATION SPACES



Scale 1:500

WETLAND PARK



Scale 1:500

Andrea Hadwan
2019-2020

A Special thanks to Liban Consult
Batco Company
Architect Mark Abi Karam