Pilot experiences / Presentation of scenarios: description and comparison – Criteria for scenario choice

Environment Regional Ministry , Andalucia
Consejería de Medio Ambiente. Junta de Andalucía

Enerscapes Meeting
6th and 7th of March 2012
Lyon, Rhône-Alpes, France

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Scenarios – METHODOLOGY

SUSTAINABLE EXPLOITATIONS OF NATURAL ENERGY RESOURCES

SUSTAINABLE ENVIRONMENTAL DEVELOPMENT

LANDSCAPE IMPACT

IDENTIFY THE BEST PLACE TO RES

Scenarios

EXISTING WIND FARM

IDENTIFY THE LANDSCAPE IMPACT

PARTECIPATORY PROCESS

ACTION PLAN

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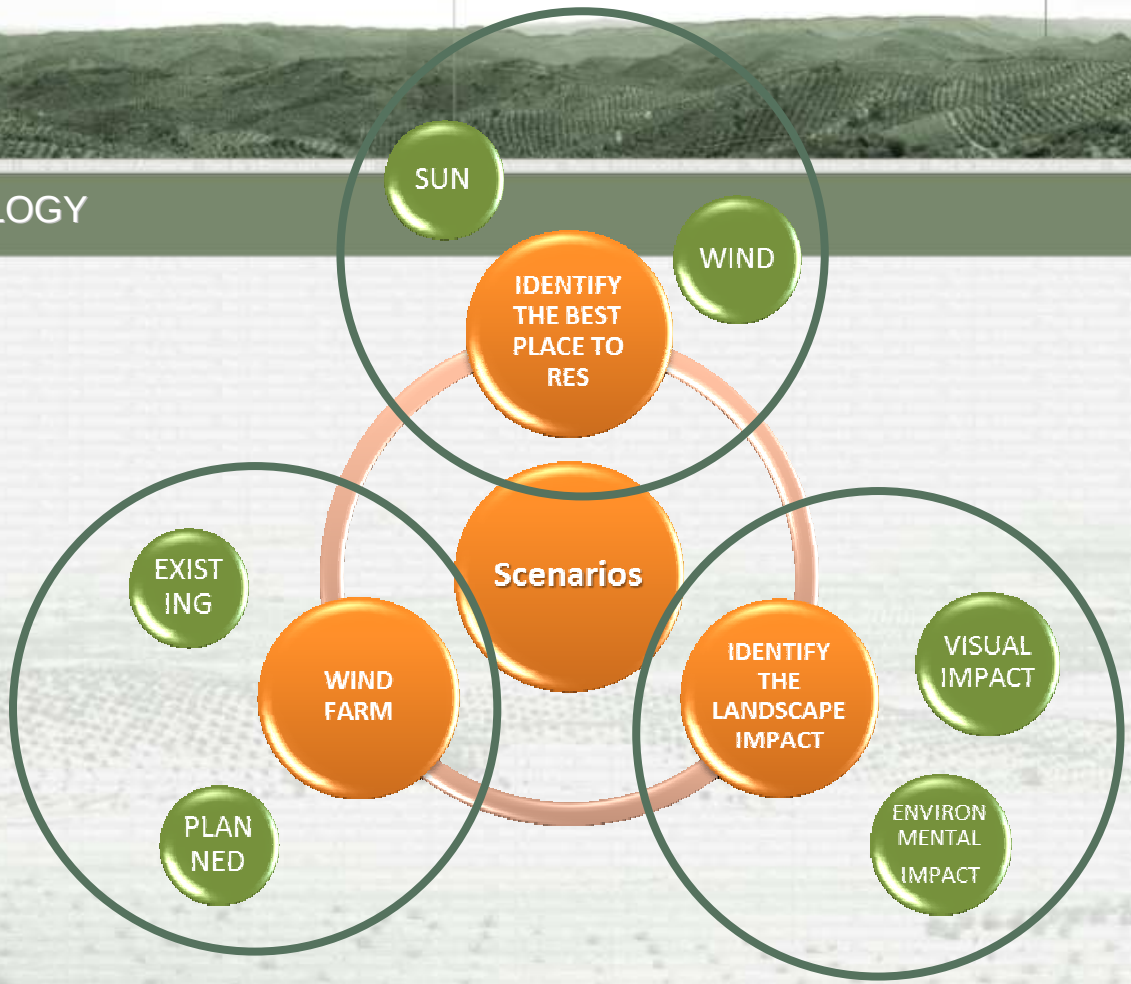
Scenarios – METHODOLOGY



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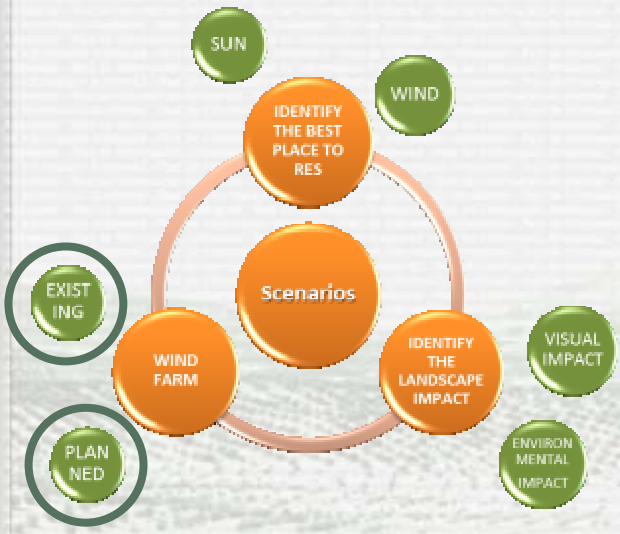
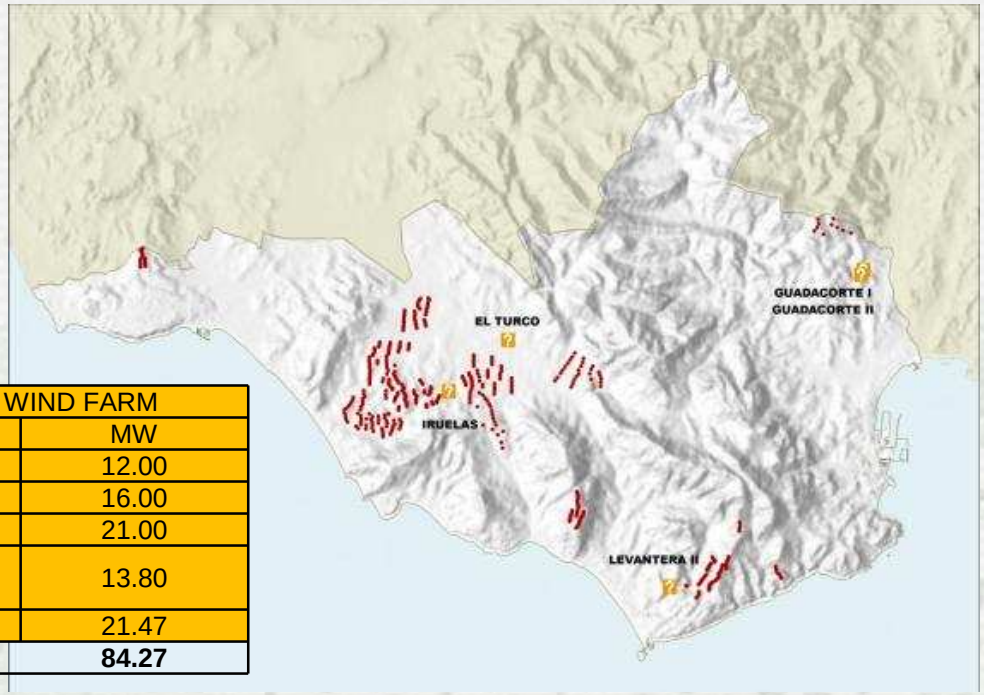
1.1 WIND FARM– Existing and planned wind farm



EXISTING WIND FARM	
36	MW
TOTAL	**583.26**



PLANNED WIND FARM	
NAME	MW
GUADACORTE I	12.00
GUADACORTE II	16.00
IRUELAS	21.00
LEVANTERA (AMPLIACIÓN)	13.80
TURCO (EL)	21.47
TOTAL	**84.27**

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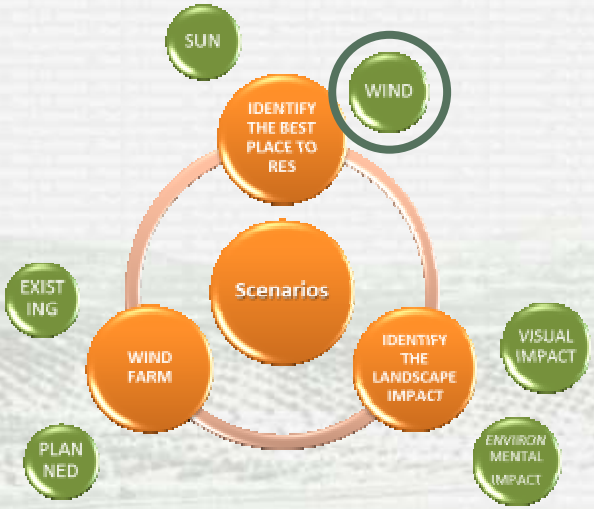
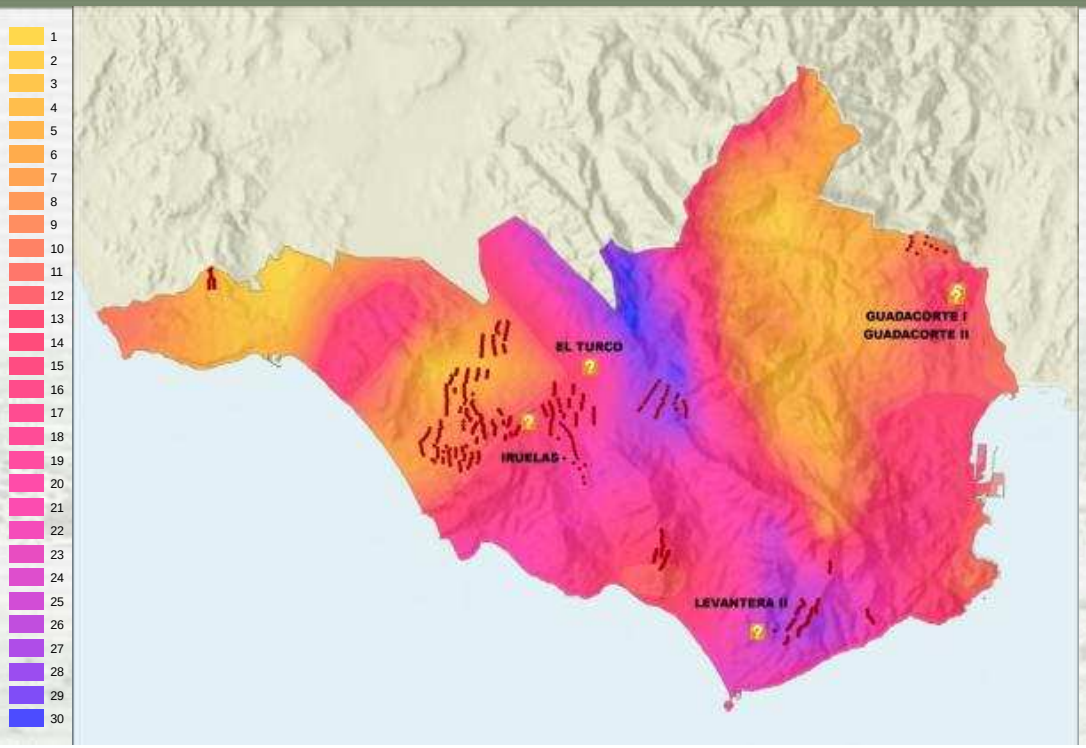
1.2. IDENTIFY THE BEST PLACE – Wind potential map





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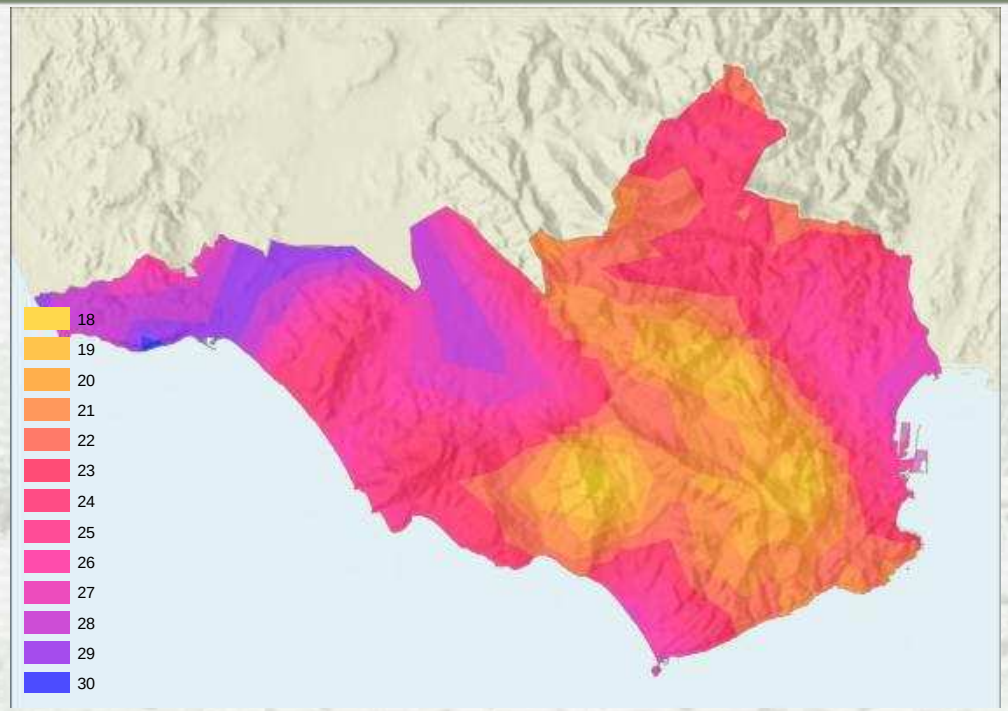
1.2. IDENTIFY THE BEST PLACE – Sun insolation potencial map



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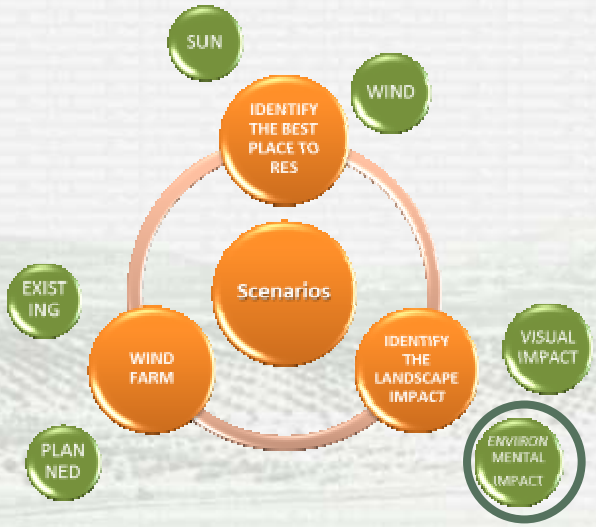
1.3. IDENTIFY THE LANDSCAPE IMPACT- Factors

In order to follow the ENERSCAPES' indicator , we consider these environmental factors:



BIODIVERSITY, FLORA AND FAUNA
- Biodiversity (Andalusian biodiversity map)
- Natural Protected Areas (SCI, SPA, NP, etc.)
- Geomorphological interest areas

POPULATION AND HUMAN HEALT No

SOCIAL AND ECONOMICAL No

SOILS AND GEOLOGY
- Flooding risk area
- Landslide risk area
- Erosion risk area

WATER
- Surface water bodies and hidrographic network

MARINE AND GROUNWATER
- Groundwater sensibility

AIR AND CLIMATIC FACTORS: AIR QUALITY, NOISE, CLIMATE No

MATERIAL ASSETS. ROAD AND TRANSPORT INFRAESTRUCTURES, PIERS AND HARBOURS, ENERGY
- All kind of buildings and cities
- All kind of infrastructure (Road network, energy network, piers and herbours, airport..)

MATERIAL ASSETS: WASTE INFRAESTRUCTURE, WASTEWATER INFRAESTRUCTURE, DRINKING WATER No

FOREST
- Hight natural value

CULTURAL HERITAGE. ARCHAEOLOGICAL HERITAGE, ARCHITECTURAL HERITAGE
- Archaeological, architectural and ethnologic heritage

LANDSCAPE (specifically calculated for the pilot area)
- Natural Index
- Diversity Index
- Wealth ondex

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1. 3. IDENTIFY THE LANDSCAPE IMPACT - Assessment

FACTORS

BIODIVERSITY, FLORA AND FAUNA
Biodiversity (Andalusian biodiversity map)
Natural Protected Areas (SCI, SPA, NP, etc.)
Geomorphological interest areas

SOILS AND GEOLOGY
Flooding risk area
Landslide risk area
Erosion risk area

MARINE AND GROUNWATER
Groundwater sensibility

FOREST
Hight natural value

LANDSCAPE
Natural index
Diversity index
Wealth ondex

WATER
Surface water bodies/hidrographic network

MATERIAL ASSETS
All kind of buildings and cities
All kind of infrastructure

CULTURAL HERITAGE
Archaeological, architectural and ethnologic heritage

LOCAL CHARACTERISTIC ASSESSMENT
(Environmental impact)

REMOTE CHARACTERISTIC ASSESSMENT
(visual impact)

TO QUALIFY THE VALUE

«UNTOUCHABLES» AREAS

VISIBILITY IMPACT

FOR US, THERE IS VISUAL IMPACT

ONLY

IF OBSERVERS EXIST

1.3. IDENTIFY THE LANDSCAPE IMPACT

WE

NEVER

CALCULATE ONLY THE VISUAL IMPACT!!!!!!

1.3. IDENTIFY THE LANDSCAPE IMPACT: Environmental factors and classifications

BIODIVERSITY, FLORA AND FAUNA

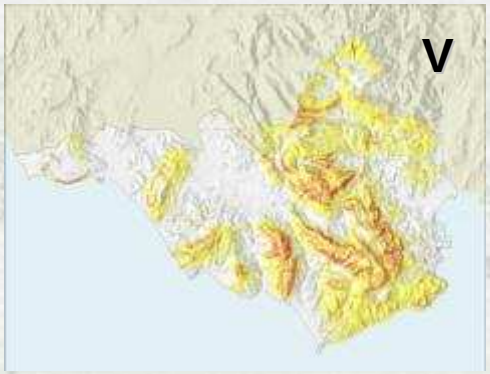
I. Biodiversity
II. Natural Protected Areas
III. Geomorphological interest areas

1.3. IDENTIFY THE LANDSCAPE IMPACT: Environmental factors and classifications

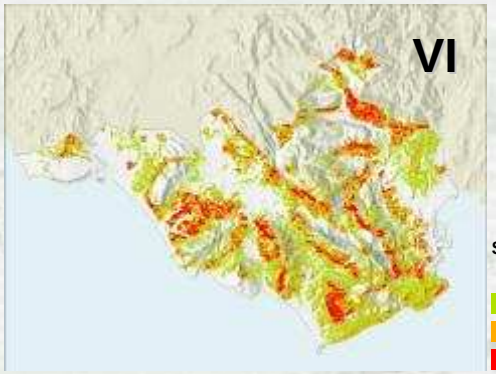
SOILS AND GEOLOGY

IV. Flooding risk area
V. Landslide risk area
VI. Erosion risk area

FLOODING RISK
TOPOGRAFY
meters
- 0 - 5
- 5,1 - 10
- 10,1 - 15
- 15,1 - 20
- 20,1 - 25
- 25,1 - 30
- 30,1 - 35
- 35,1 - 40
- 40,1 - 50
- 50,1 - 900



Landslide risk
%
- 0 -3
- 3 -7
- 7 -15
- 15 -30
- 30 -45
- > 45

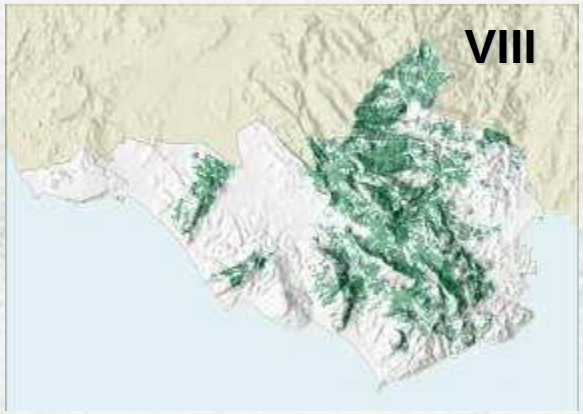


Soil loss
- Low
- Medium
- Hight
- Very hight

1.3. IDENTIFY THE LANDSCAPE IMPACT: Environmental factors and classifications

MARINE AND GROUNWATER
VII. Groundwater sensibility

FOREST
VIII. Hight natural value



Hight
Medium-low

HIGH_NATURAL_VALUE

NATURAL PHISIOGNOMIC UNIT

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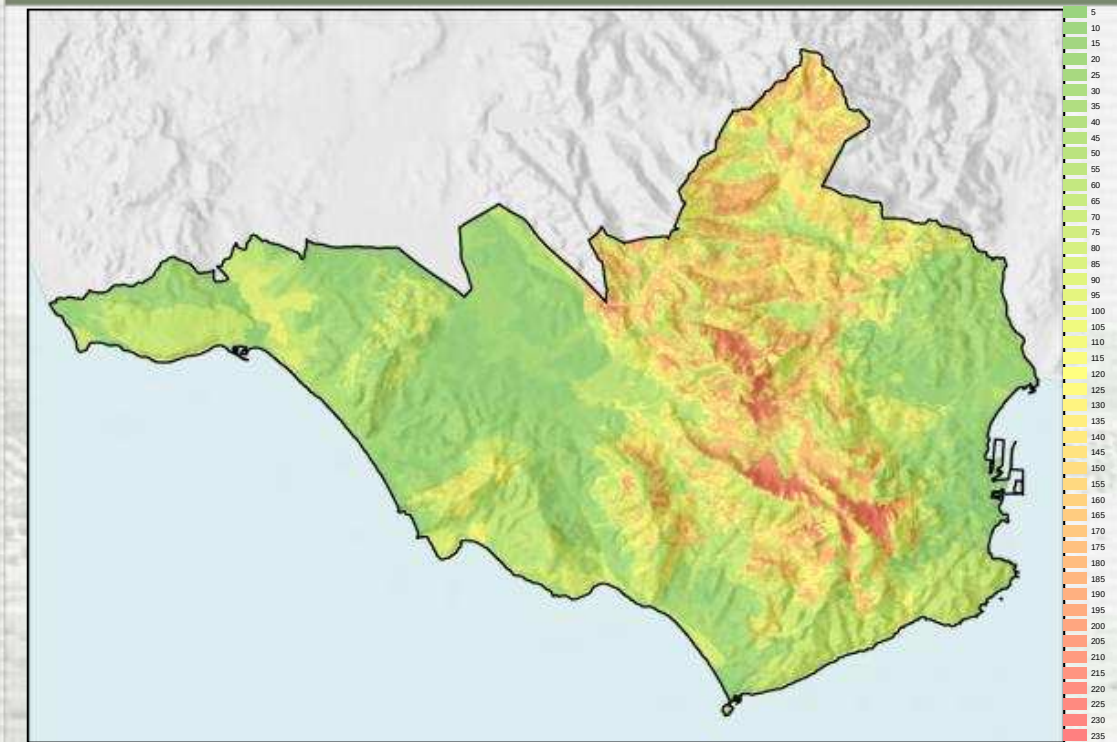
1.3. IDENTIFY THE LANDSCAPE IMPACT: Environmental factors and classifications



Best conservation

ENVIRONMENTAL FACTORS	VALUE					
	Low	Medium-Low	Medium	Medium-Hight	Hight	Yes/no
Biodiversity	5	/	15	/	30	/
Natural Protected Areas	/	/	/	/	/	25
Management plan of natural resources	/	/	5*	15**	30***	/
Geomorphological interest areas	/	/	/	/	/	15
Flooding risk area	/	/	/	/	/	15
Landslide risk area	0	0	5	10	15	/
Erosion risk area	5	/	10	/	15/20	/
Groundwater sensibility	5	10	/	/	15	/
Hight natural value			/	25	30	
Natural phreatophytic unit	/	/	/	/	/	15
PHISICAL CONSTRACTIONS	/	/	/	/	/	60

Low conservation

1.3. IDENTIFY THE LANDSCAPE IMPACT_ Environmental factor and classification: Untochables areas

Identified as «UNTOUCHABLES AREAS» for wind farm or exthensive photovoltaic plants (the most likely RES installation in pilot area)

Not possible to build

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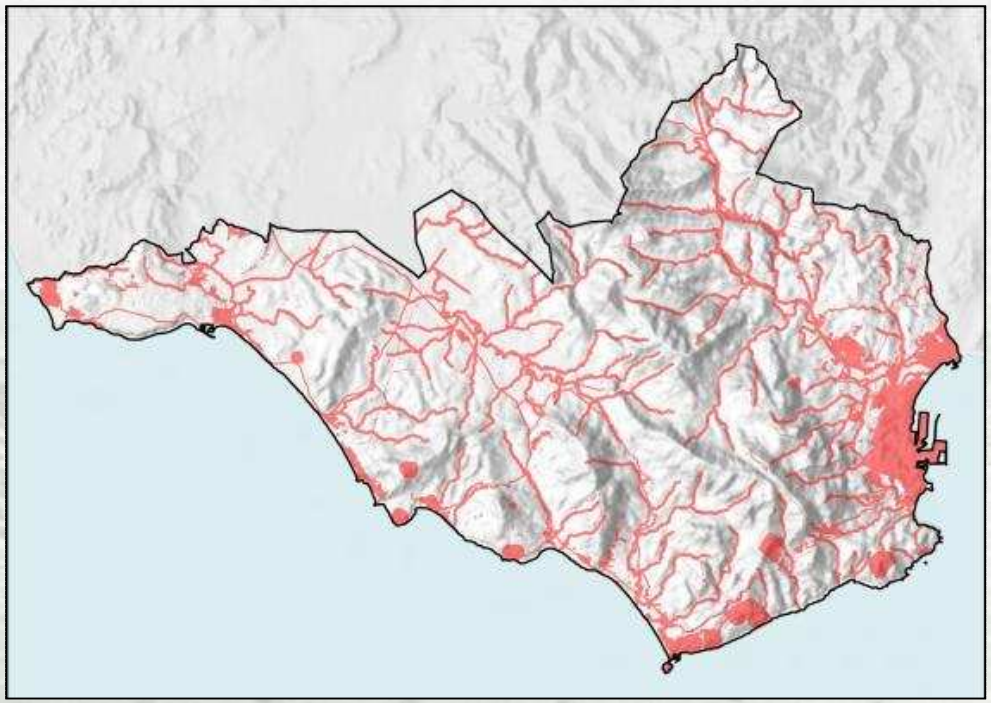
1.3. IDENTIFY THE LANDSCAPE IMPACT_ Environmental factor and classification: Untochables areas

1.3. IDENTIFY THE LANDSCAPE IMPACT_ Environmental factor and classification: Untochables areas

WE CONSIDER THIS POSSIBILITY

1.3. IDENTIFY THE LANDSCAPE IMPACT_ Environmental factor and classification: Untochables areas



Phisical constraction

Buildings areas
Urban soil, industries, rural buildings, facilities (wastewater treatment plants, lighthouses…). Incluing monuments, singular buildings, Archaeological site and militar zone.

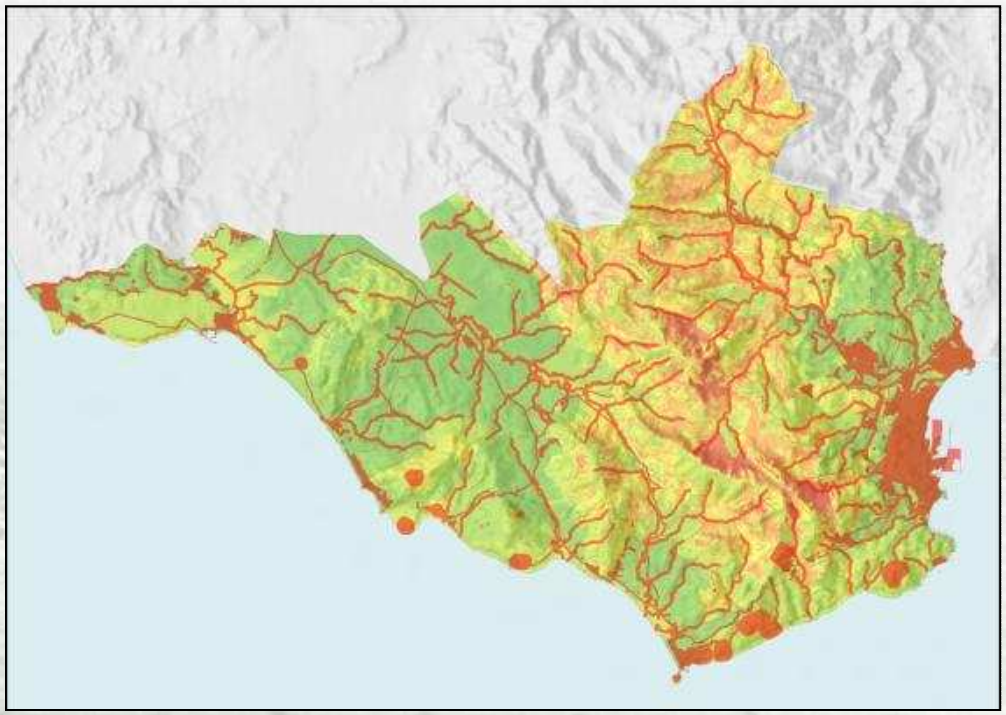
Infraestructures
Road network, railroad
Energy network. Including electrical station and substation..

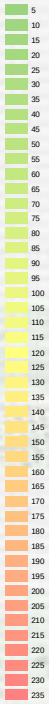
Water network
Hydrographic network and water surface body, springs

Other
Caves, shelters and only natural monuments (prohibited any action)

INCLUDING MAIN LEGAL CONDITION
In Spain is prohibited building within:
-20/10 m from road
-8 m from rail
-100 m from river
-various from electrical line
-300 meters of a military zone
-100 m from coastal line (not included)

2. SCENARIOS 1. Environmental factosr and classification: total map.





Best conservation

Low conservation

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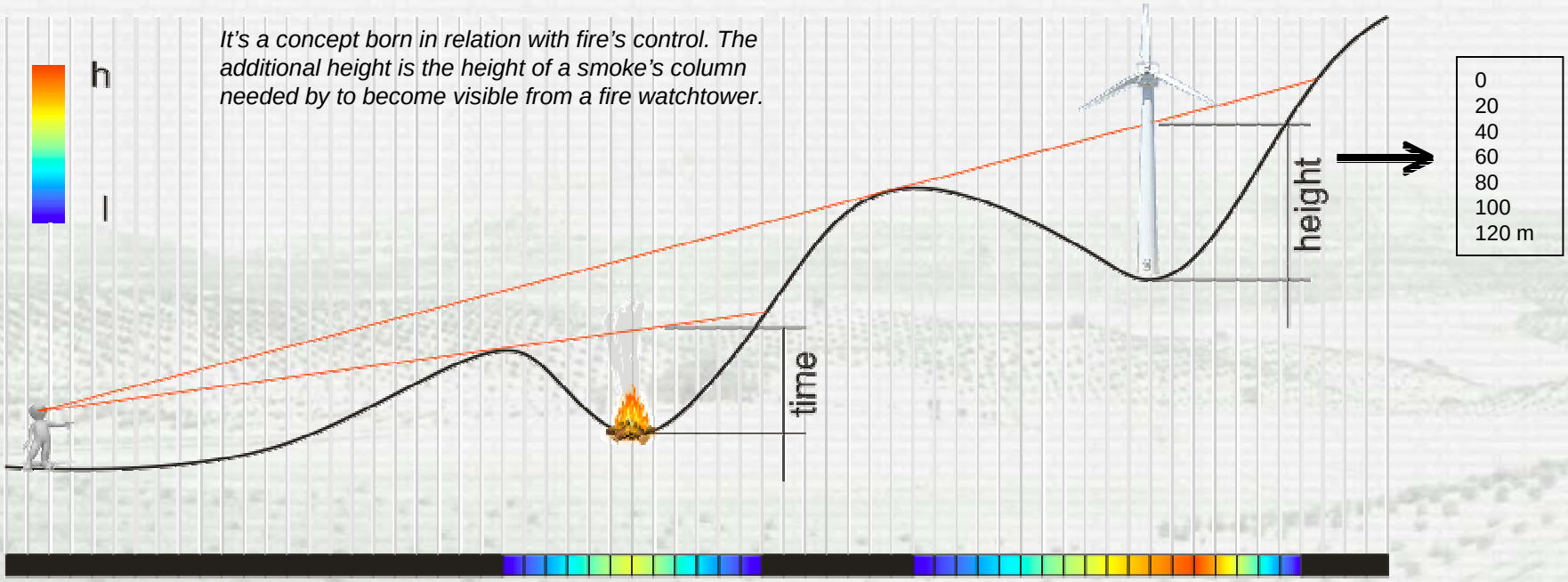
1.4. IDENTIFY THE LANDSCAPE IMPACT_ Visual impact

Additional height needed (to become visible)

It's a concept born in relation with fire's control. The additional height is the height of a smoke's column needed by to become visible from a fire watchtower.



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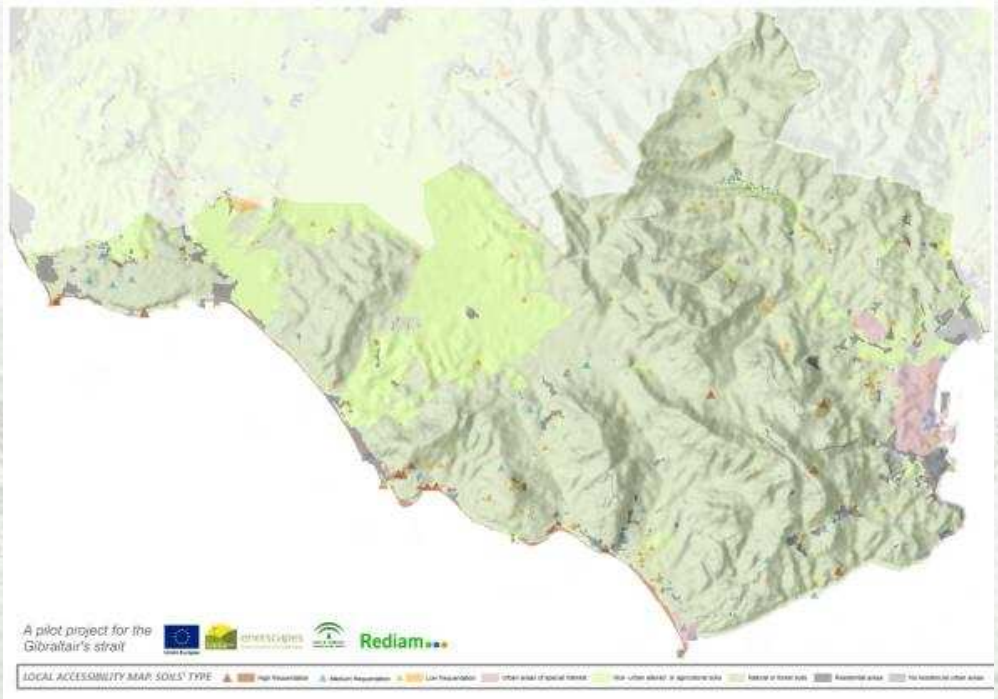
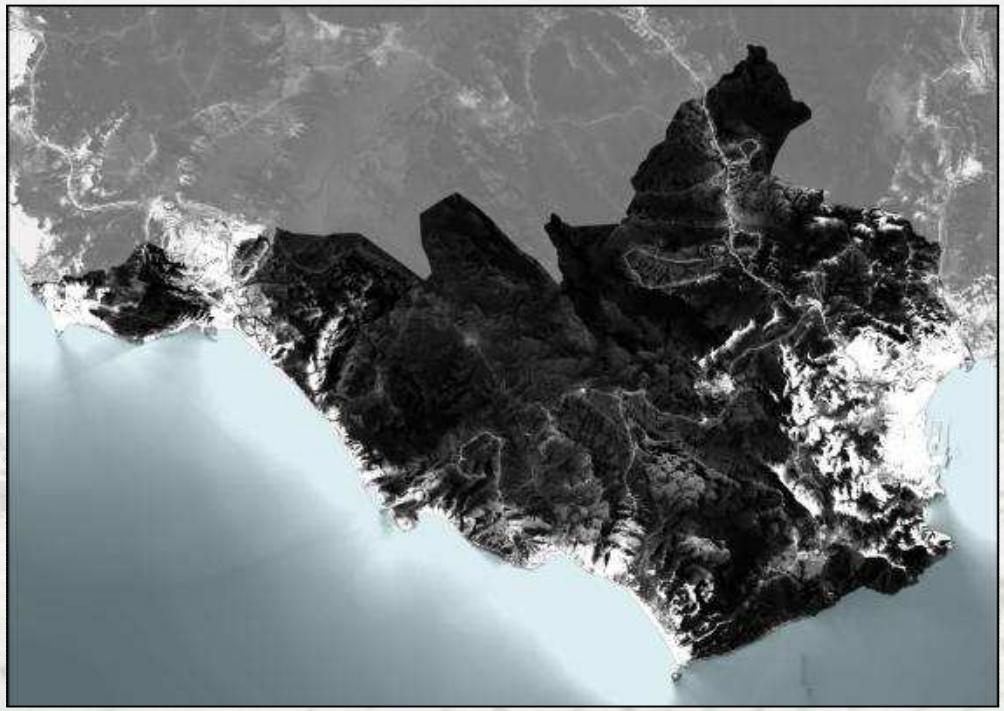
1.4. IDENTIFY THE LANDSCAPE IMPACT_ Visual impact



Human settlements	Urban areas of special interes Residential areas No residencial urban areas
Rustic soils	Natural or forest soils Non- urban altered or agricultural soli
Tourism resorces ***Recursos turísticos***	# High frequentation # Medium frequentatio # Low frequentatior

1.4. IDENTIFY THE LANDSCAPE IMPACT_ Visual impact 0 m, weighted by distance

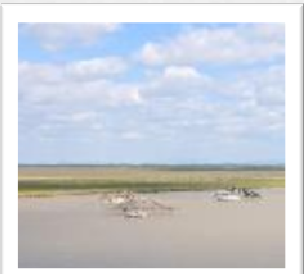
Special interest city	=500
Residential áreas	=200
No-residential urban soils	=50
Agricoltural soils	=2
Natural soils	=1
Railroad	=500
CH	=5000
Common road network	=2000
Rural roads	=100
CT	=10000
Hight puntual frecuency	=5000
Medium frecuency	=2000
Low frecuency	=500
Hight frecuency	=1000

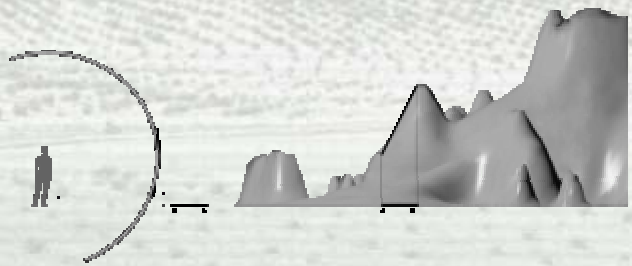


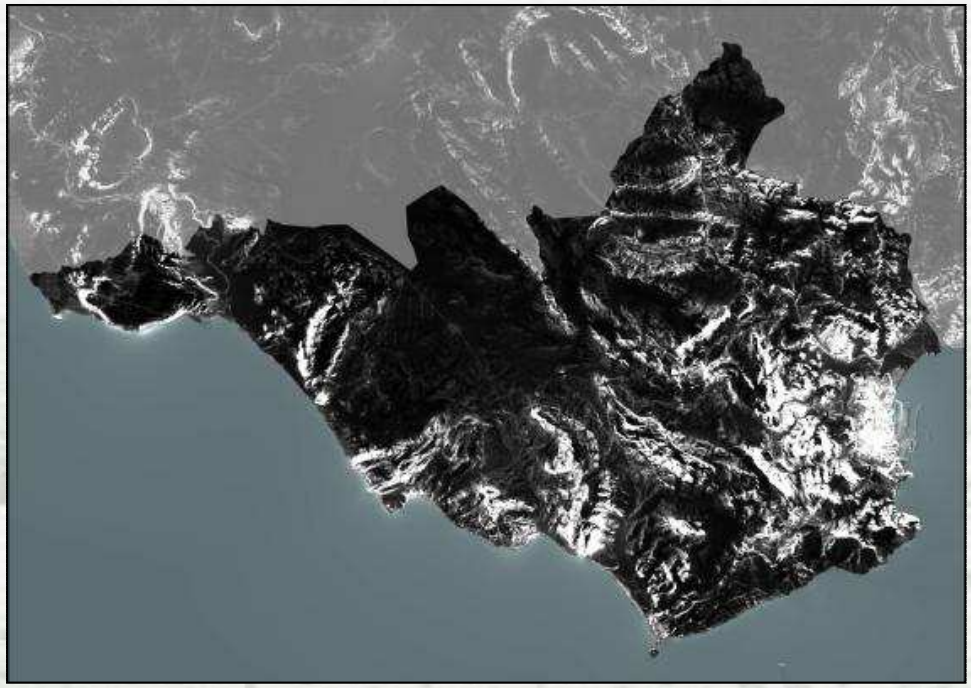
Visual impact 0 m, weighted by distance and visual proyection

Hight visual proyection

Low visual proyection







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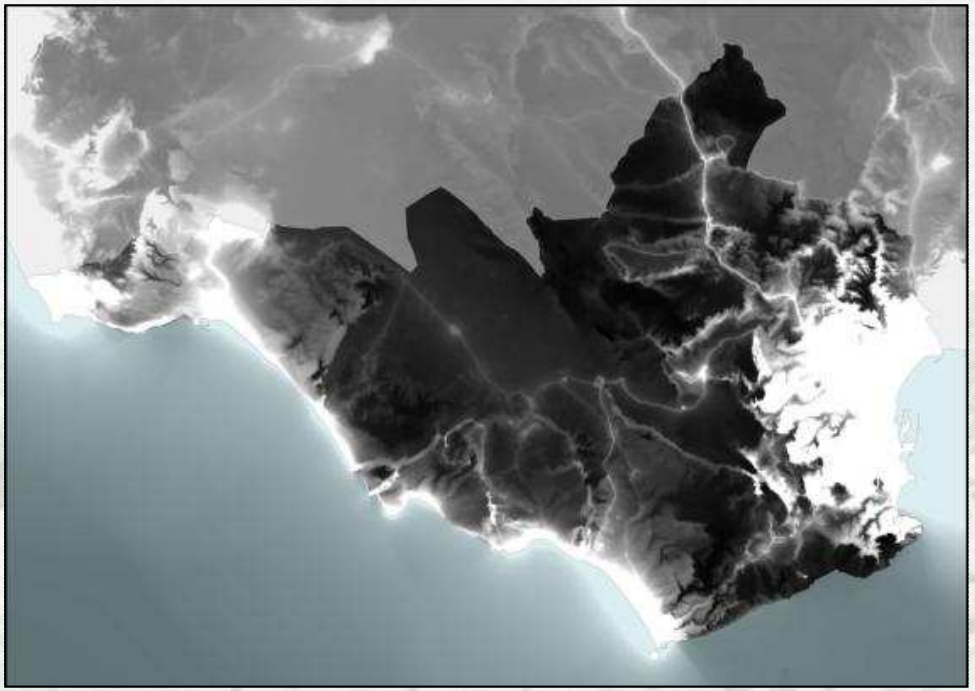
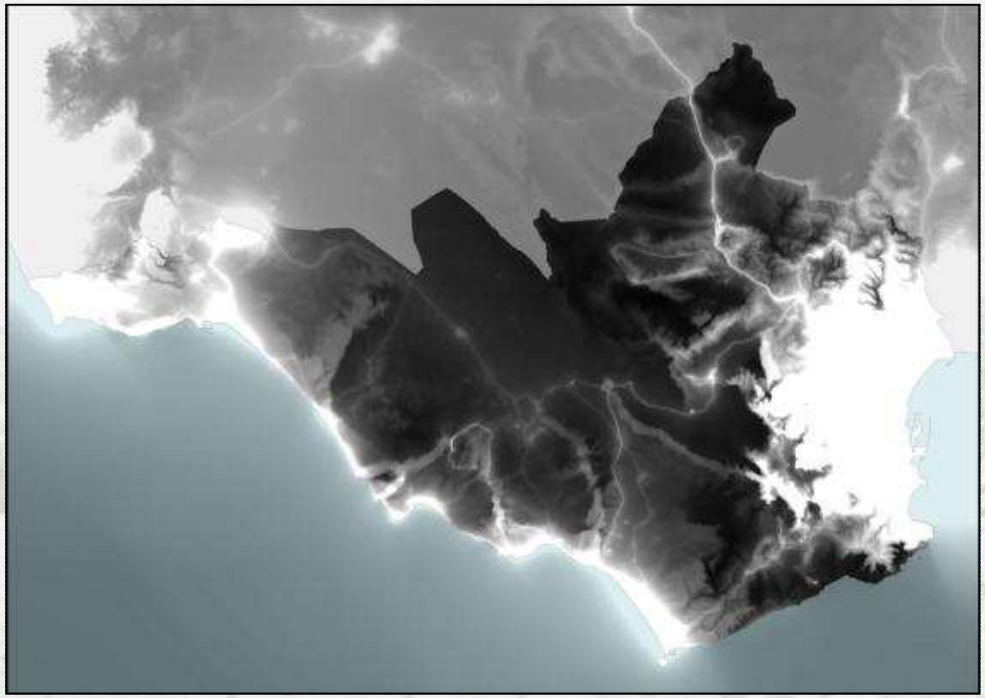
1.4. IDENTIFY THE LANDSCAPE IMPACT_ Visual impact. 60 m, weighted by distance



1.4. IDENTIFY THE LANDSCAPE IMPACT_ Visual impact. 120 m, weighted by distance



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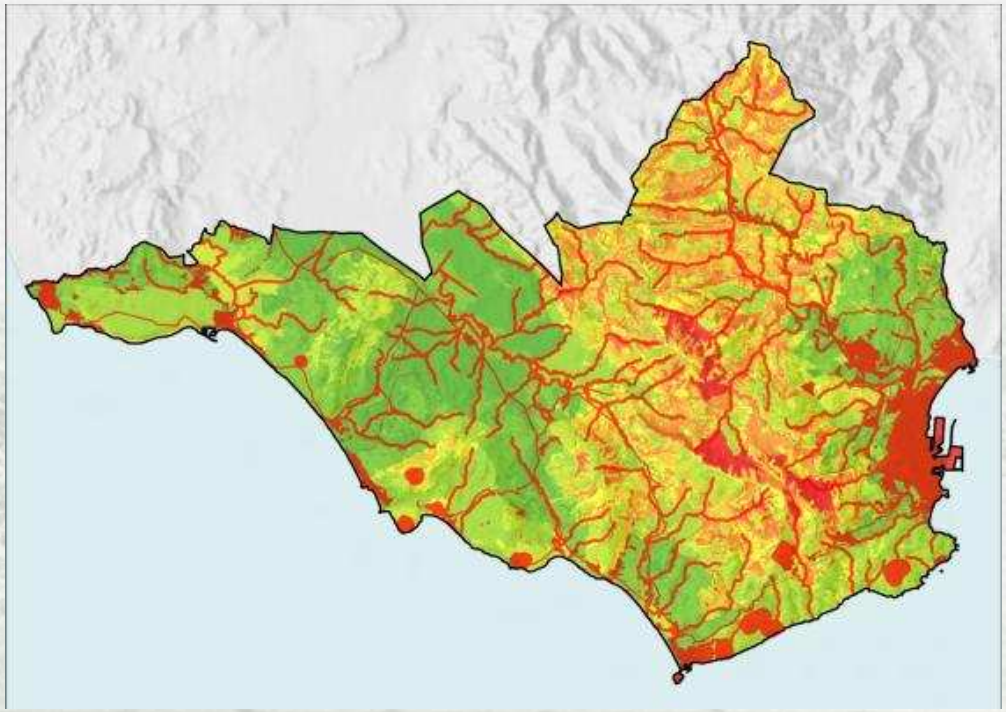
1.5. IDENTIFY THE LANDSCAPE IMPACT - Environmental qualification

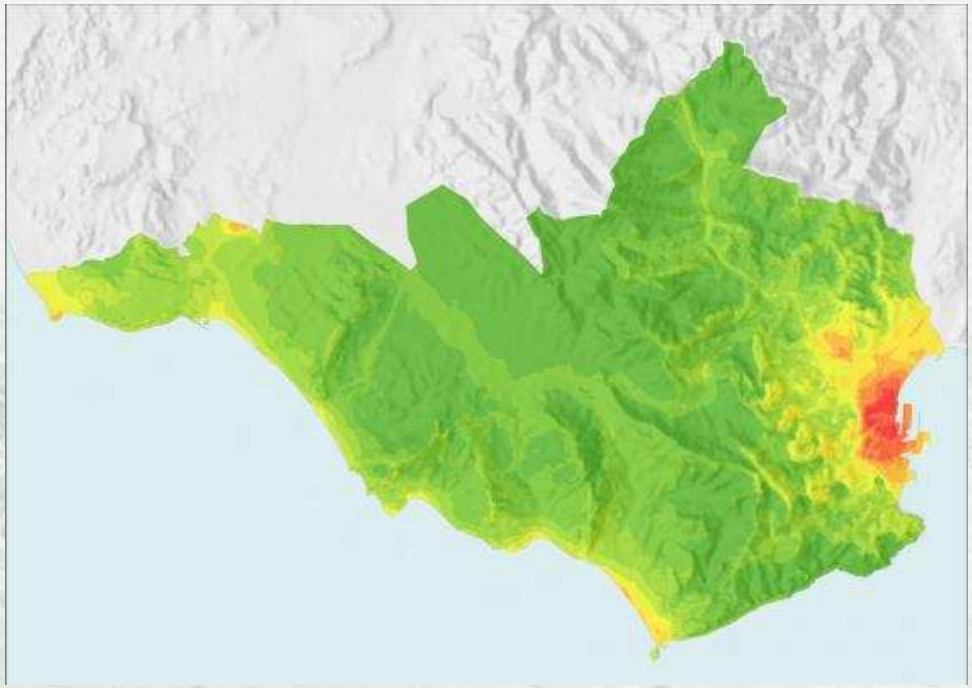


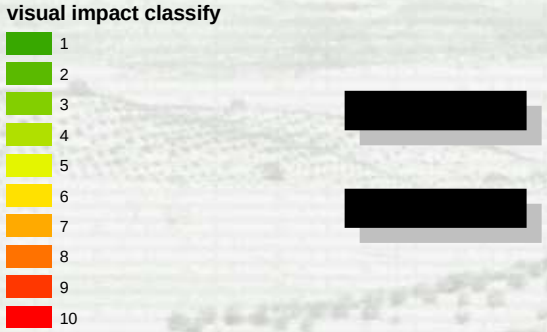
enviromnetal impact qualify

CLASS_2

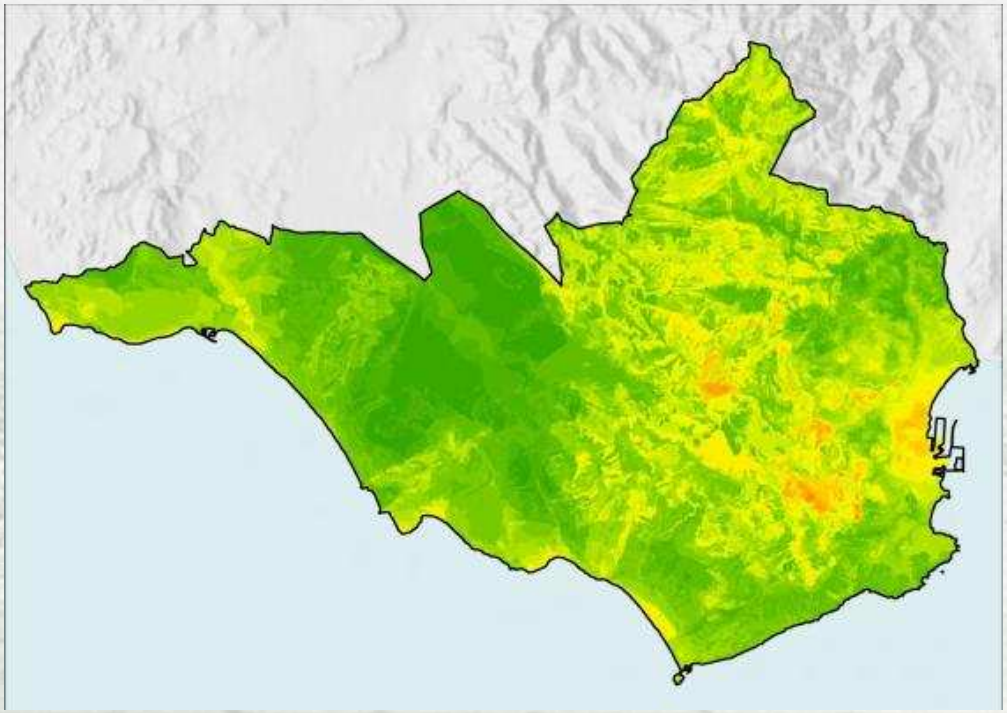
1
2
3
4
5
6
7
8
9

1.5. IDENTIFY THE LANDSCAPE IMPACT - Visual impact classification (60m)





1.5. IDENTIFY THE LANDSCAPE IMPACT: landscape impact



2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
19

Low landscape impact

Hight landscape impact

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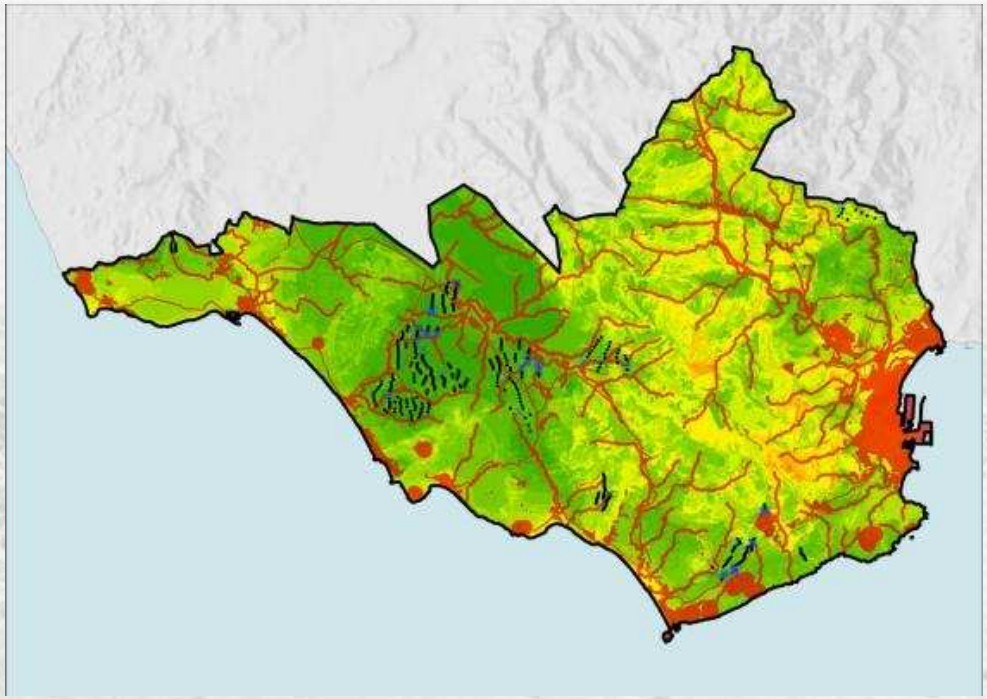
2.1 STATE OF THE ART. THE CURRENTLY LANDSCAPE IMPACT (60m)



Impact		Aerogenerators
2	LOW	!
3		
4		
5	MEDIUM-LOW	!
6		
7		
8	MEDIUM	D
9		
10		
11	[illegible]	no
12		
13		
14	HIGHT	no
15		
16		
19		

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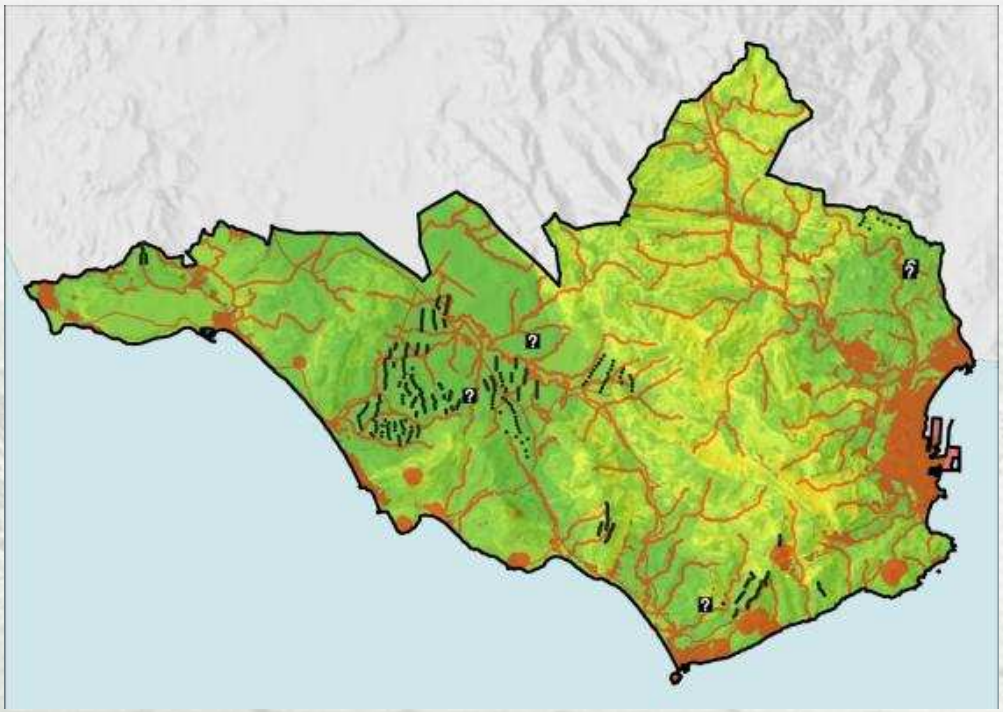
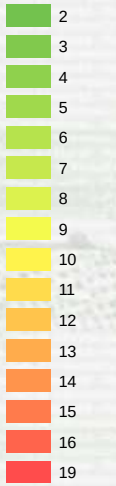
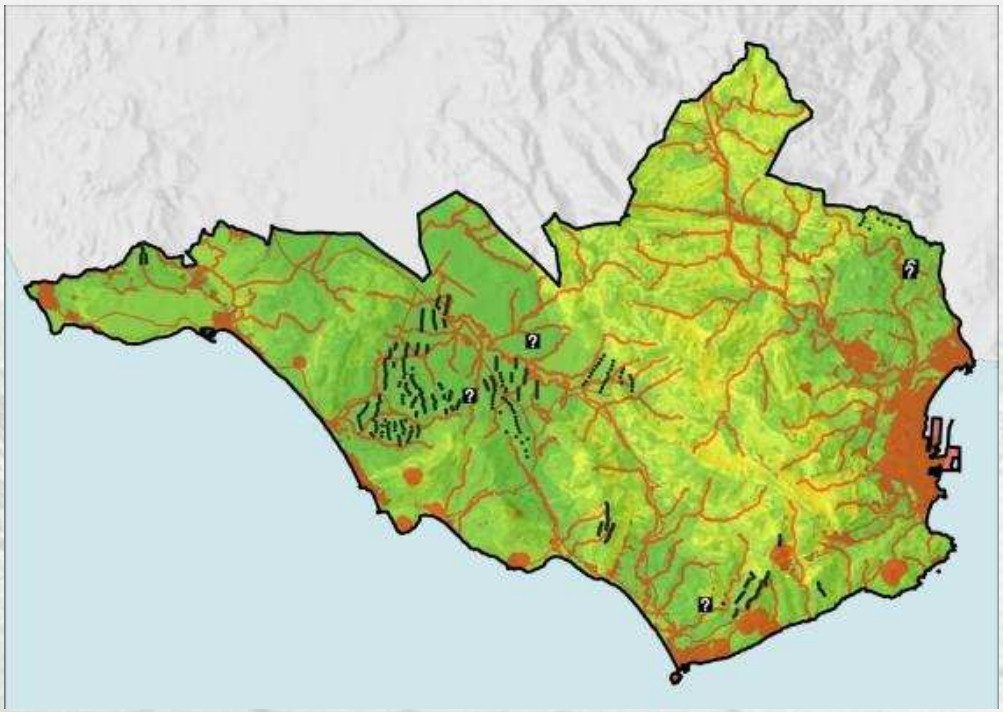
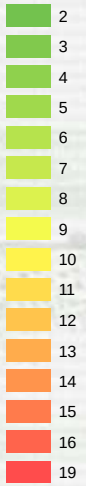
2.2 SCENARIOS O «as usual»., for 0m height installation. Weighted by distance + visual proyection





2.2 SCENARIOS 0: «as usual», for 0m height installation. Weighted by distance





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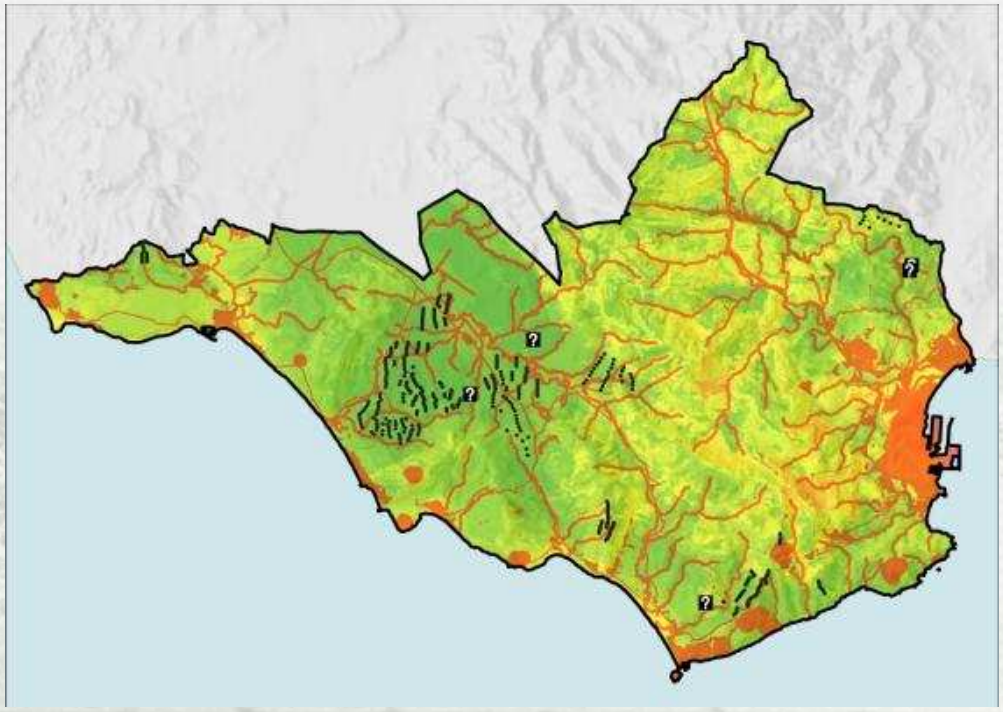
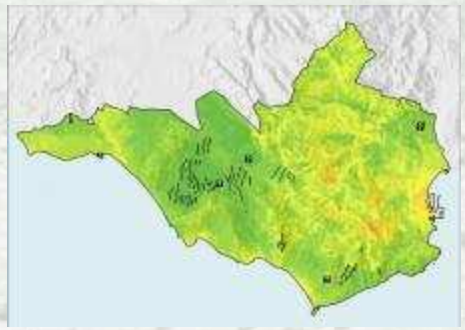
2.2 SCENARIOS O «as usual», for 60m height installation. Weighted by distance





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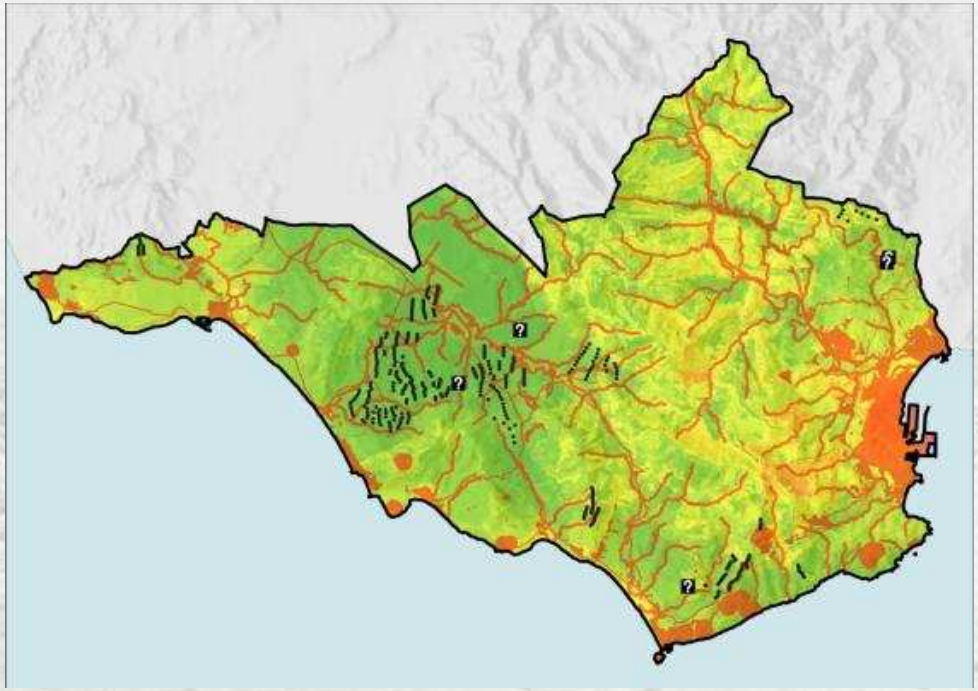
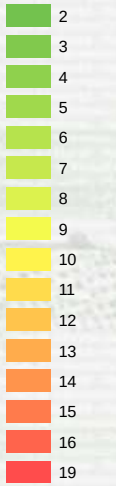
2.2 SCENARIOS O «as usual». For 120m height installation Weighted by distance





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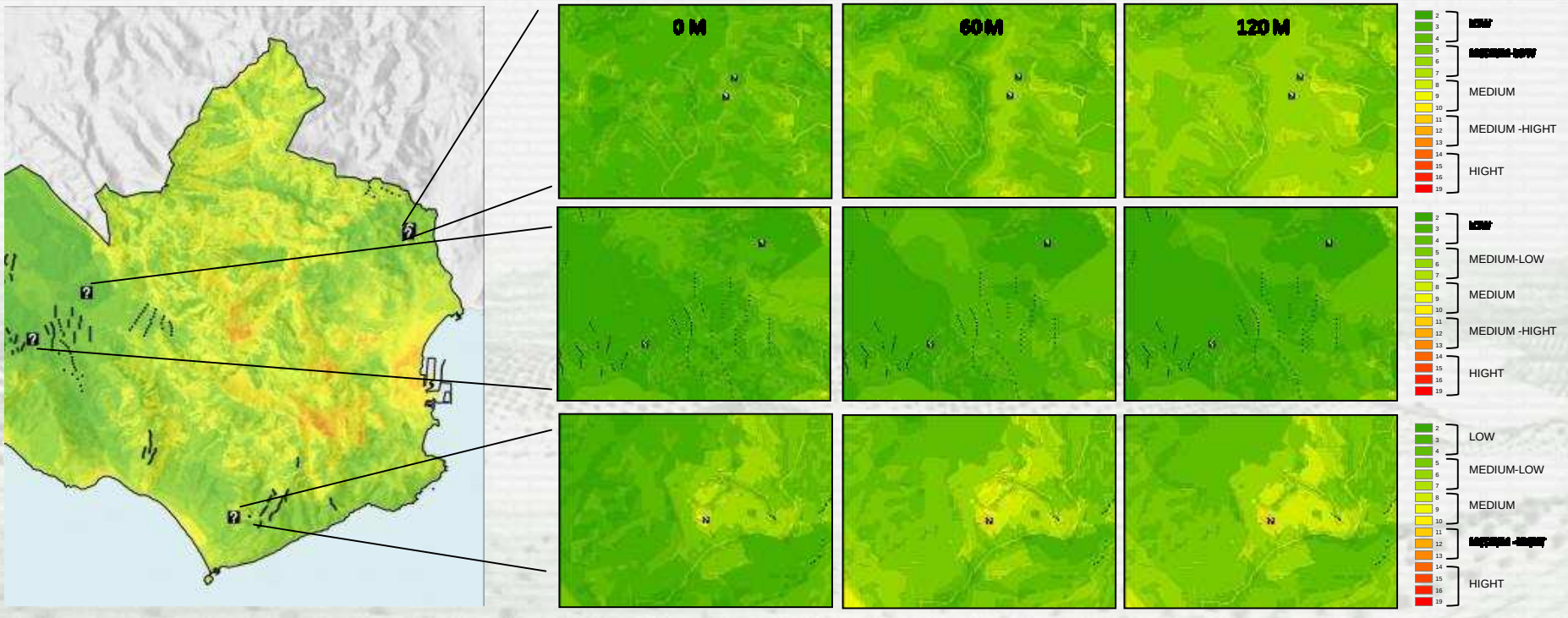
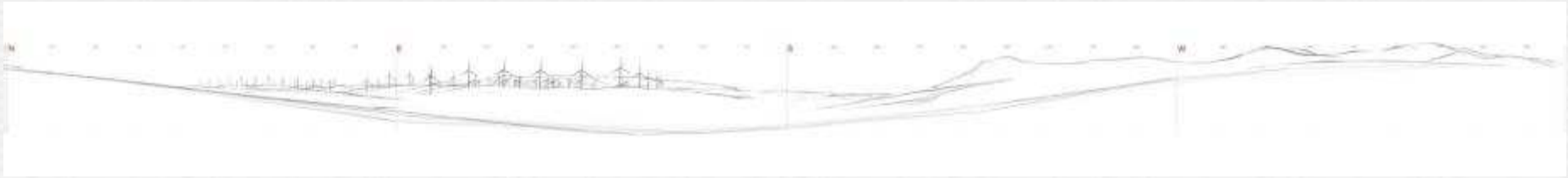
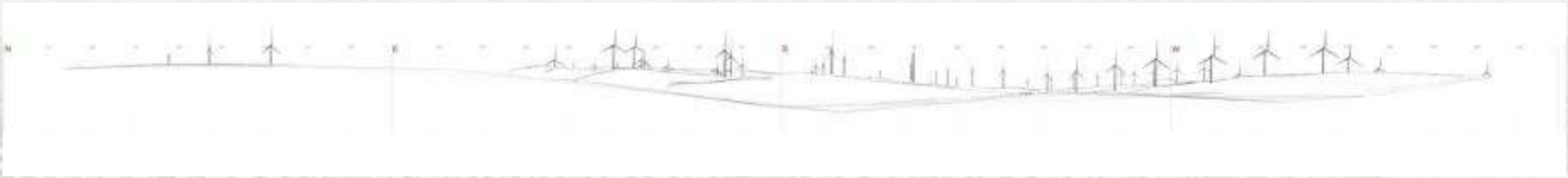
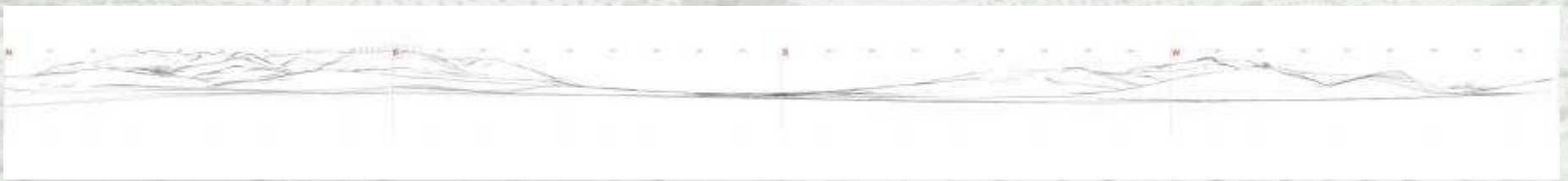
2.2 SCENARIOS O «as usual». Landscape impact of planned wind farm. Detail.



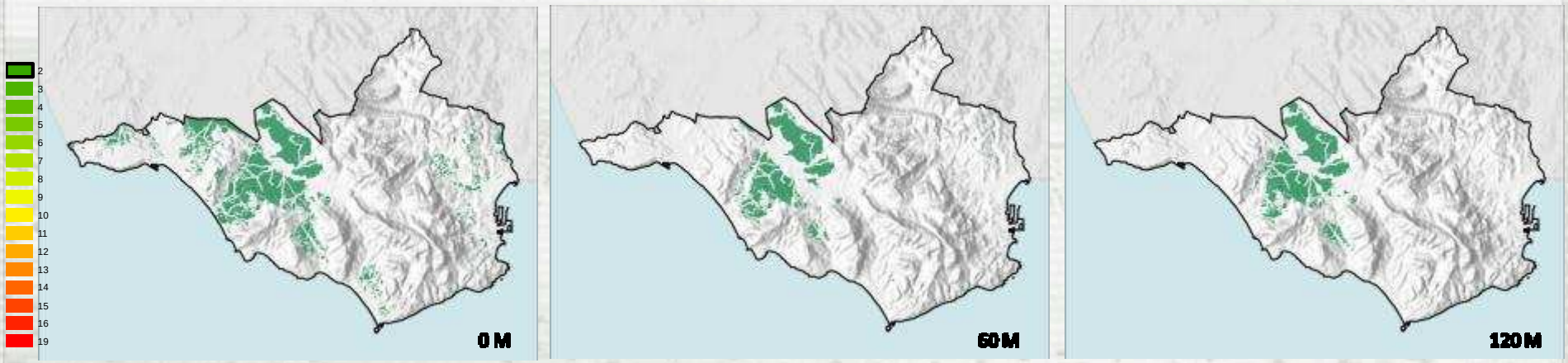
2.2 SCENARIOS O «as usual»., for 0m height installation. Weighted by distance + visual proyection







2.3 SCENARIOS. Priority to landscape



2.4 SCENARIOS. Attention to landscape

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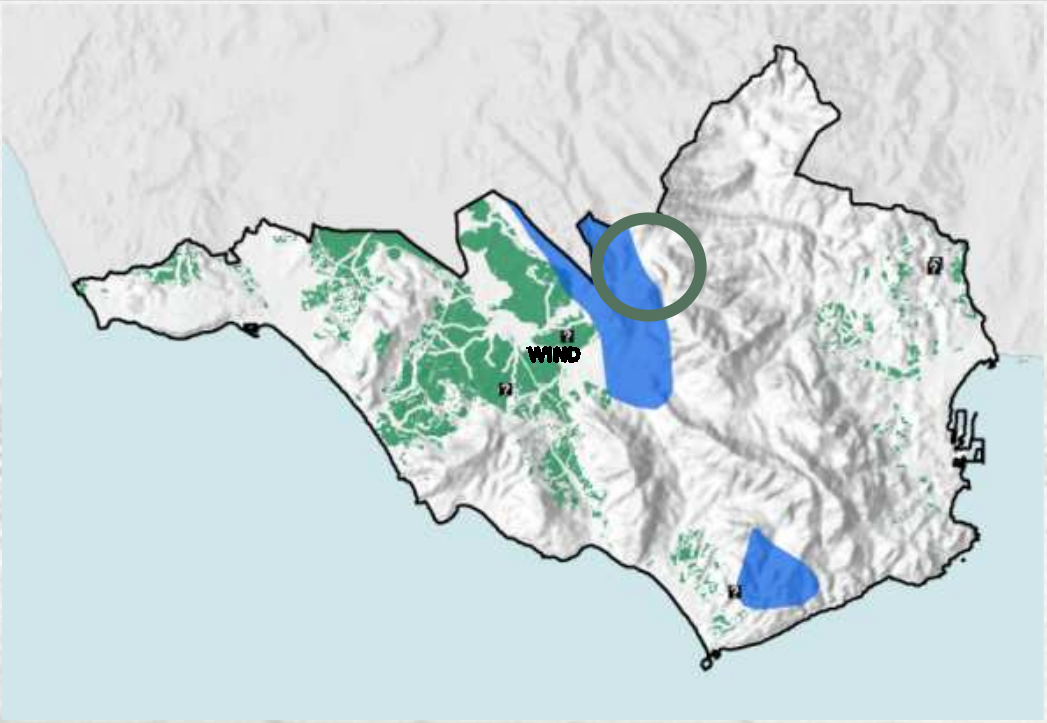
2.5 SCENARIOS. Attention to RES

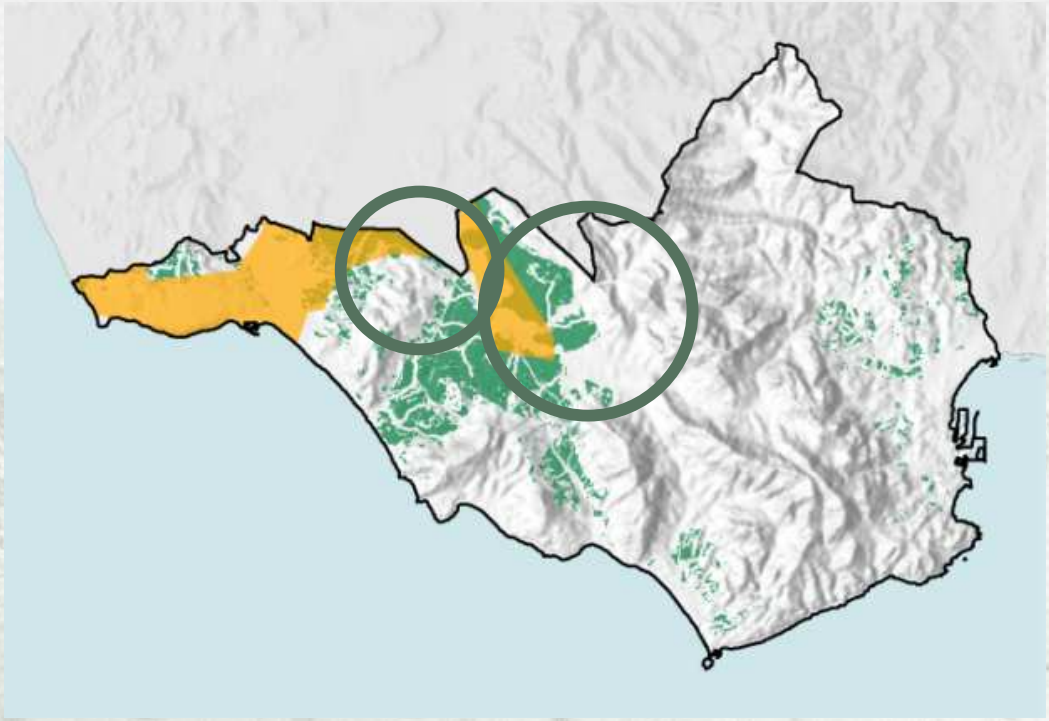
2.6 SCENARIOS. Priority to RES

3. CONCLUSIONS



There is a very small zone with best wind potential and very low landscape impact

3. CONCLUSIONS



SUN

There are someone smalls zones with best sun potential and very low landscape impact

Scenarios' steps

STATE OF THE ART

1.- To identify the **scenarios' goals**……

2.- To georeference wind turbines ……

3.- To generate a **accessibility model**……

4.- To generate a **territorial resources' map**……

5.- To make the necessary calculations, as seen above: **visibility model** results……

6.- Generate **scenarios**……

7.- Compare the results with the **experts' approach**……

8.- ..and take them to public trial – broadcasting……