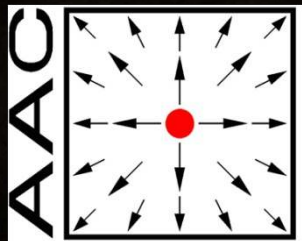


4th International Symposium for Dark-sky Parks

Parc Astronomic Montsec, 27.06.2011

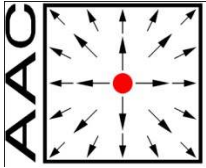
The Starlight Initiative in the Reserve of Biosphere of La Rioja : Scope and Results



AAC Acústica + Lumínica



Consejería de Turismo, Medio Ambiente y Política Territorial



The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results

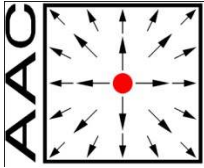


Aim

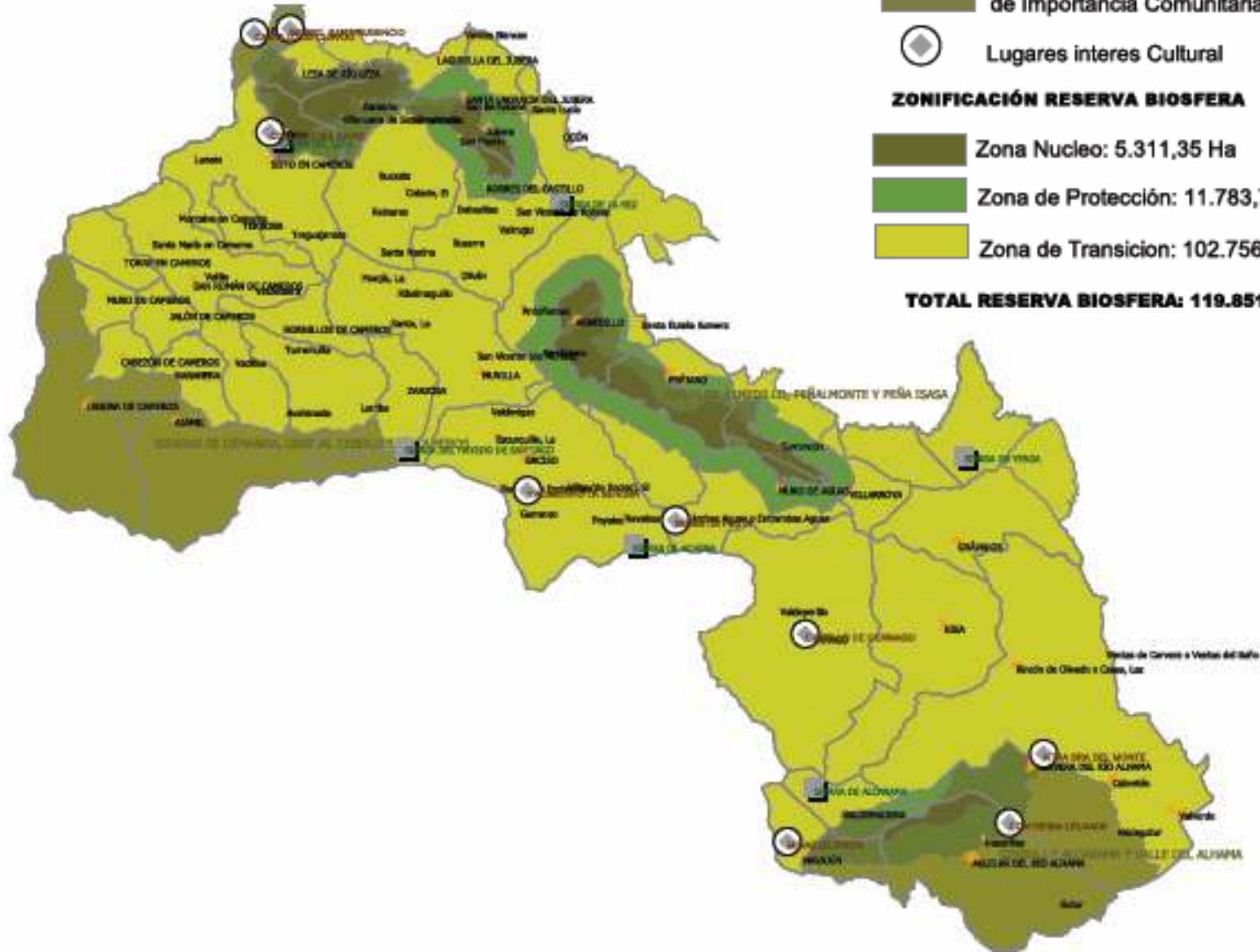
- Assessment of possibilities: light pollution:
 - ✓ StarLight Reserve
 - ✓ StarLight Touristic Destination

- Possibilities as Quiet Area : Natural origin sound Reserve

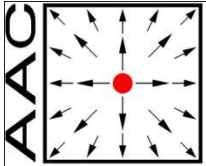
- First Action Plan



The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results

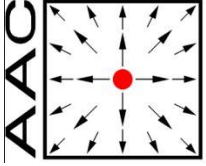


- ZECIC: Zona de Especial Conservación de Importancia Comunitaria
- Lugares interes Cultural
- ZONIFICACIÓN RESERVA BIOSFERA**
- Zona Nucleo: 5.311,35 Ha
- Zona de Protección: 11.783,73 Ha
- Zona de Transición: 102.756 Ha
- TOTAL RESERVA BIOSFERA: 119.851 Ha**



The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results



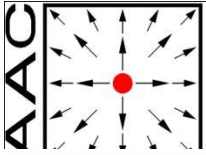


The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results



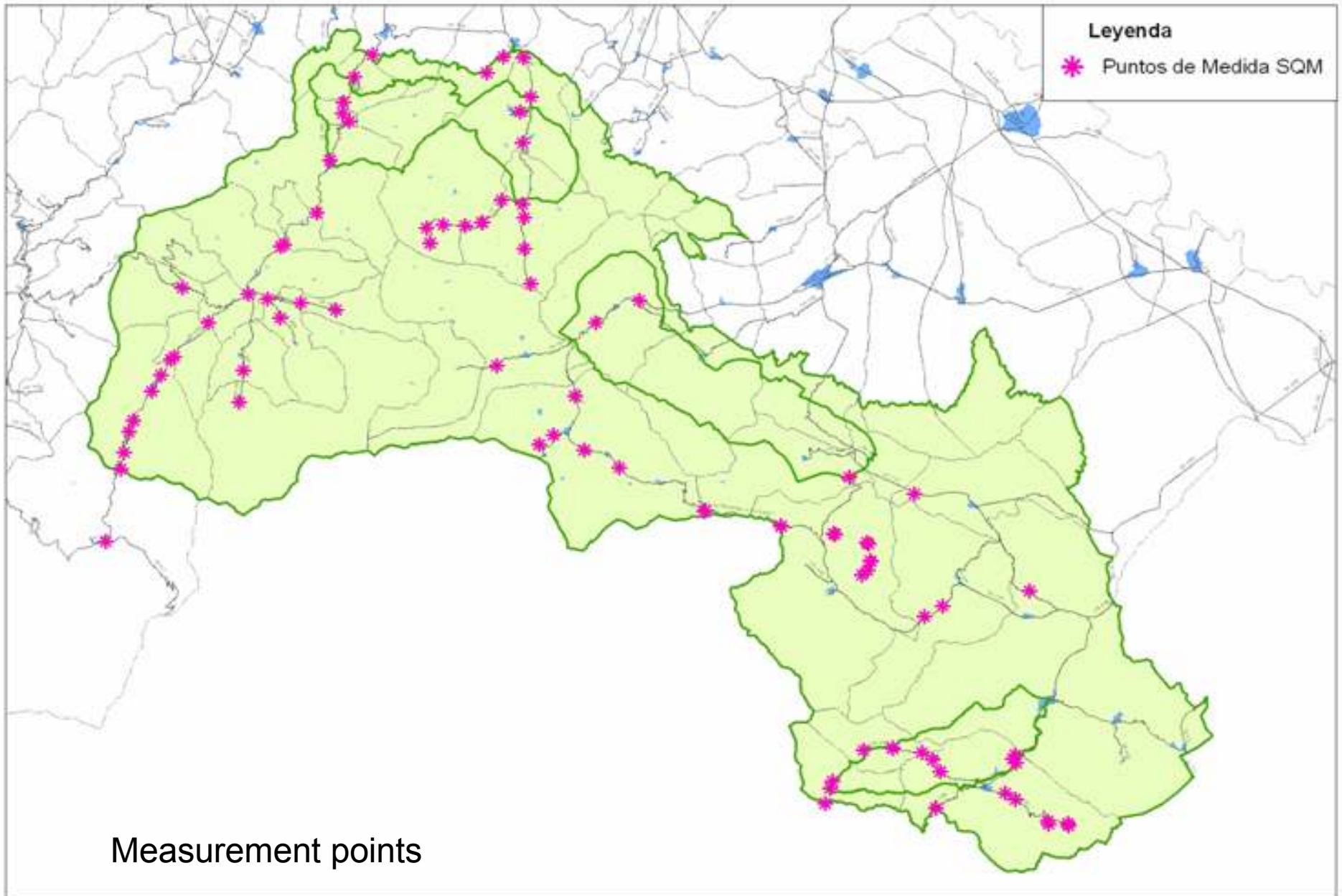
Measurements and information to assess the territory of BR

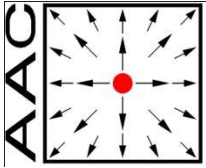
- SQM: Point Measurements
- Lighmeter : Routes measurements
- SQM: monitoring
- Pictures
- Starlight zones
- Sound: Quiet areas: low noise level and natural sound reserve
- Lighting in the municipalities



The Starlight Initiative in the Reserve of Biosphere of La Rioja

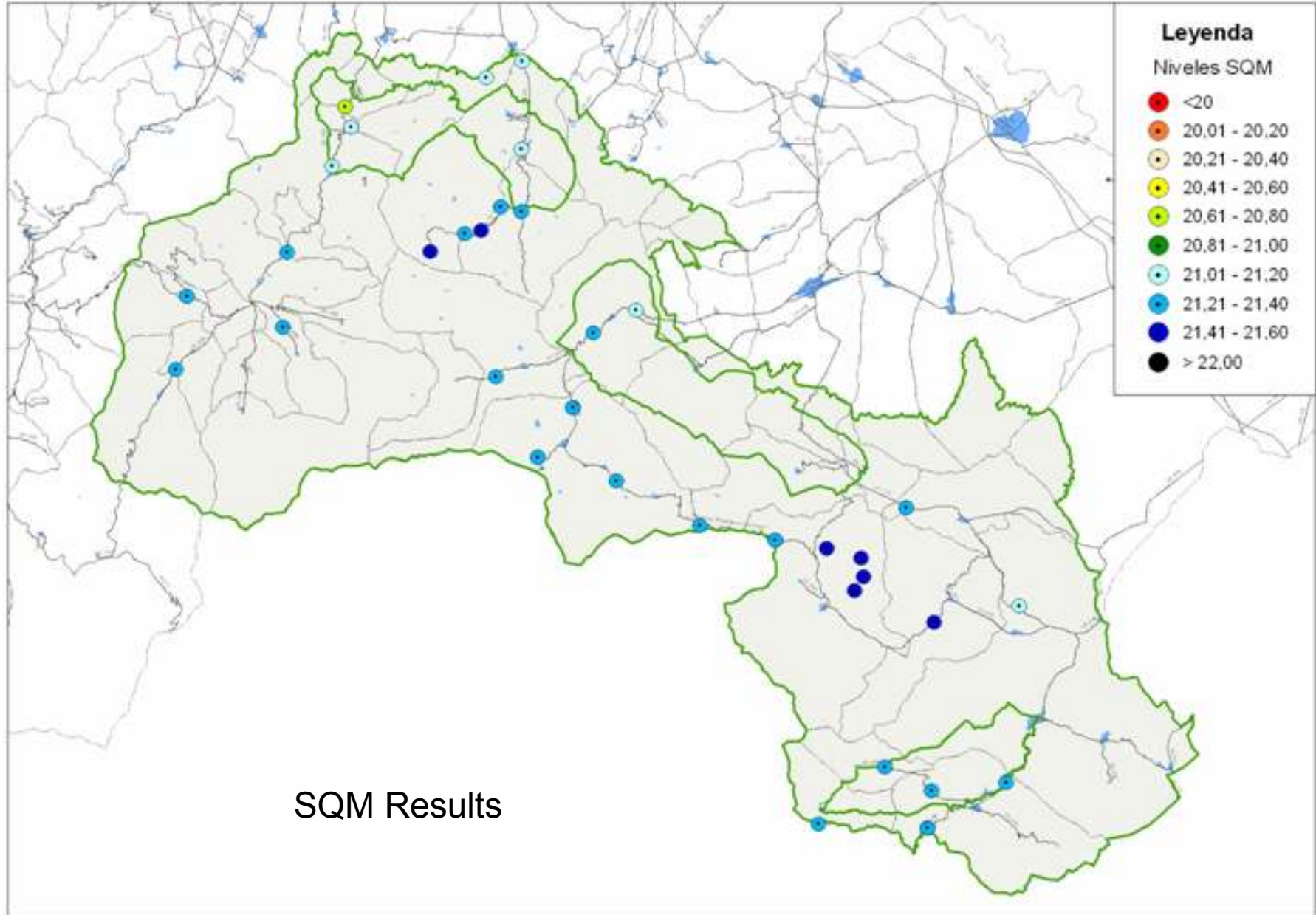
Scope and Results

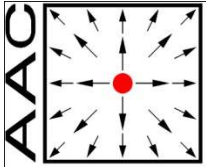




The Starlight Initiative in the Reserve of Biosphere of La Rioja

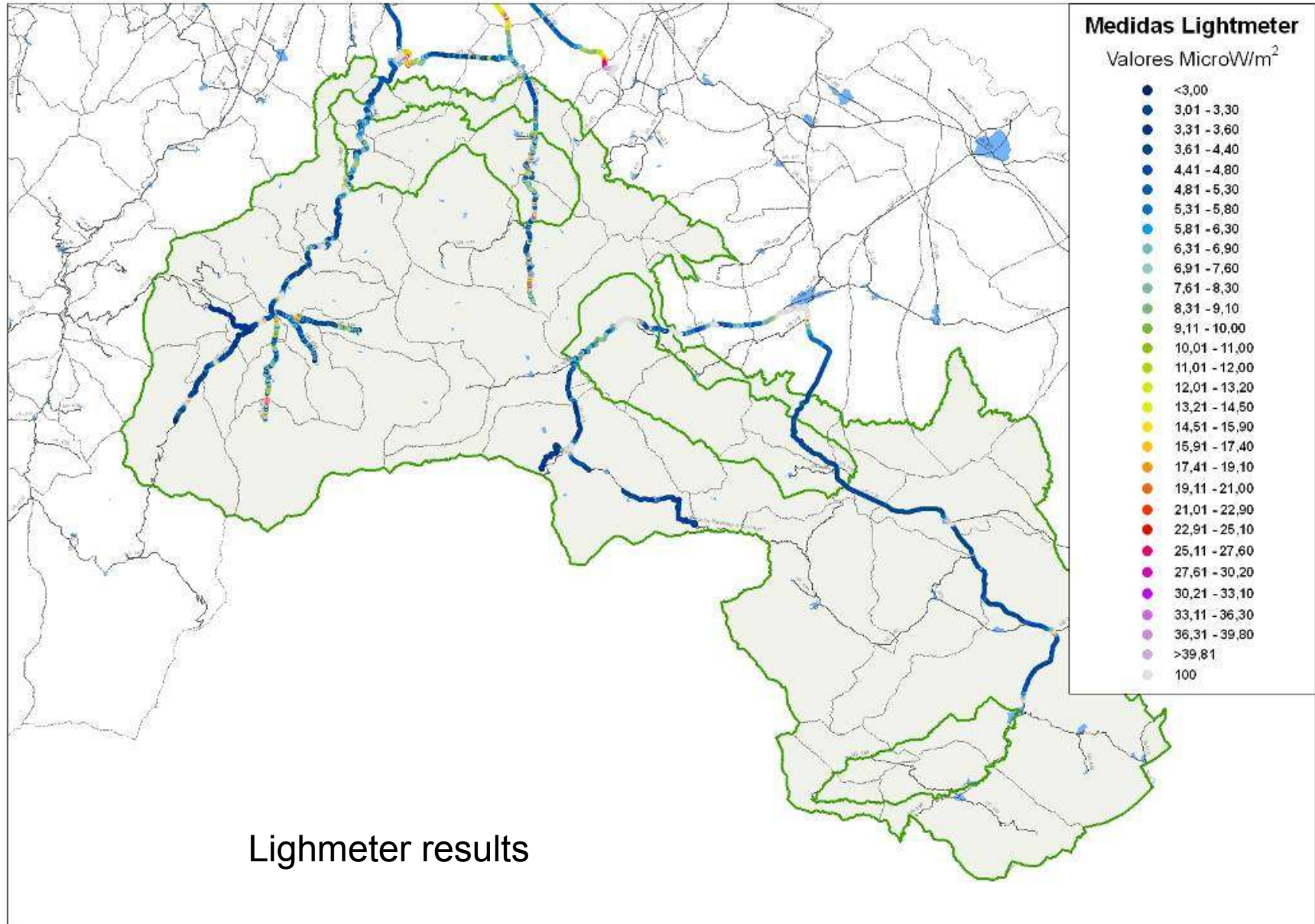
Scope and Results

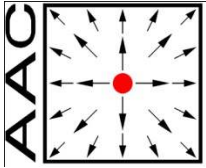




The Starlight Initiative in the Reserve of Biosphere of La Rioja

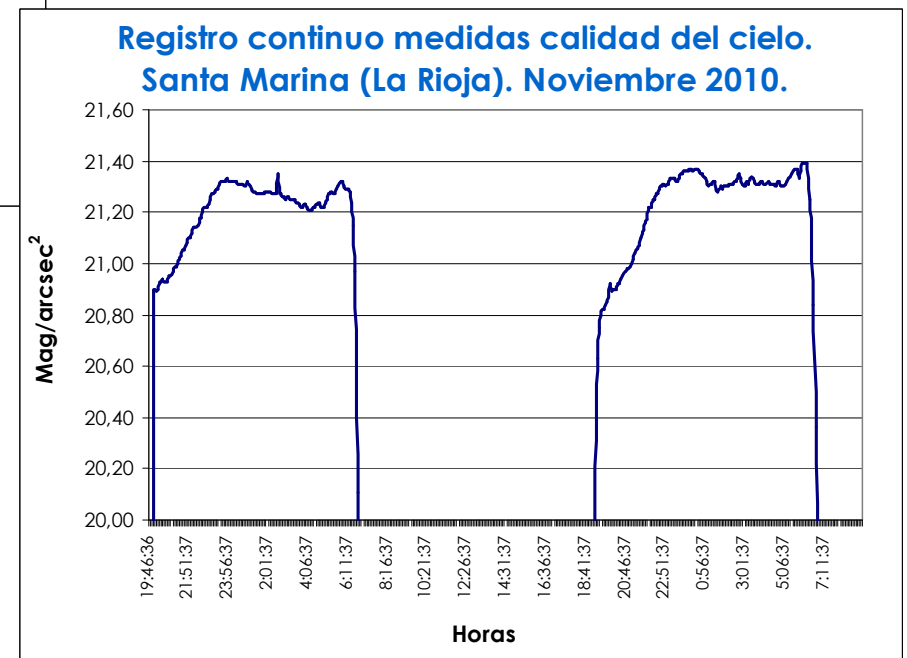
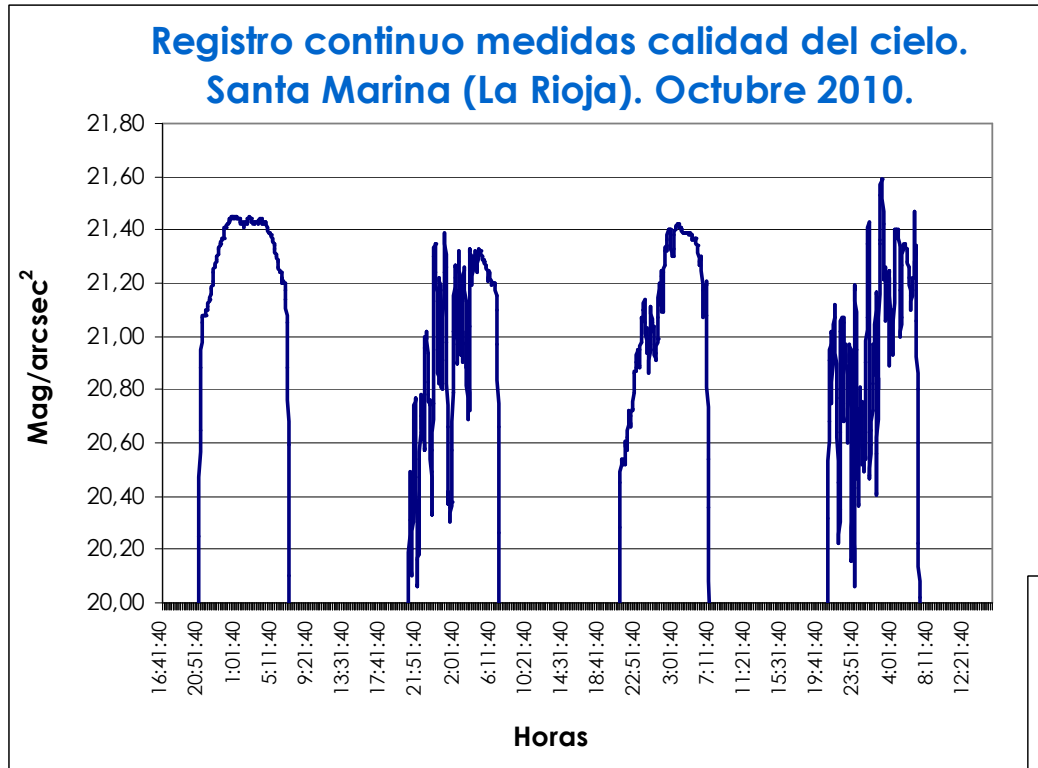
Scope and Results



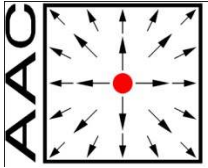


The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results



SQM Monitoring in Santa Marina



The Starlight Initiative in the Reserve of Biosphere of La Rioja
Scope and Results

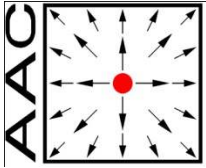


W

E

S

Laguna en Cameros



The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results

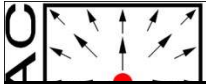


North

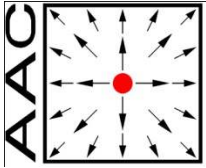


South

Laguna en Cameros



Santa Marina: South – External light pollution



The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results



Gobierno
de La Rioja

N

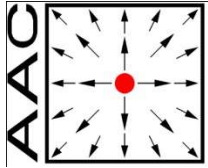
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Los Cayos

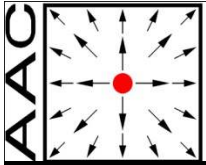


The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results



Los Cayos

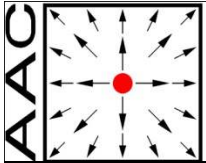


The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results



Navajun

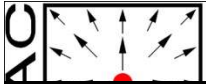


The Starlight Initiative in the Reserve of Biosphere of La Rioja

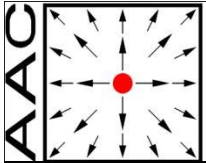
Scope and Results



Navajun



From Valdemadera to Cervera and Aguilar: local sources of light pollution

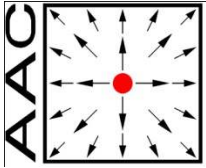


The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results

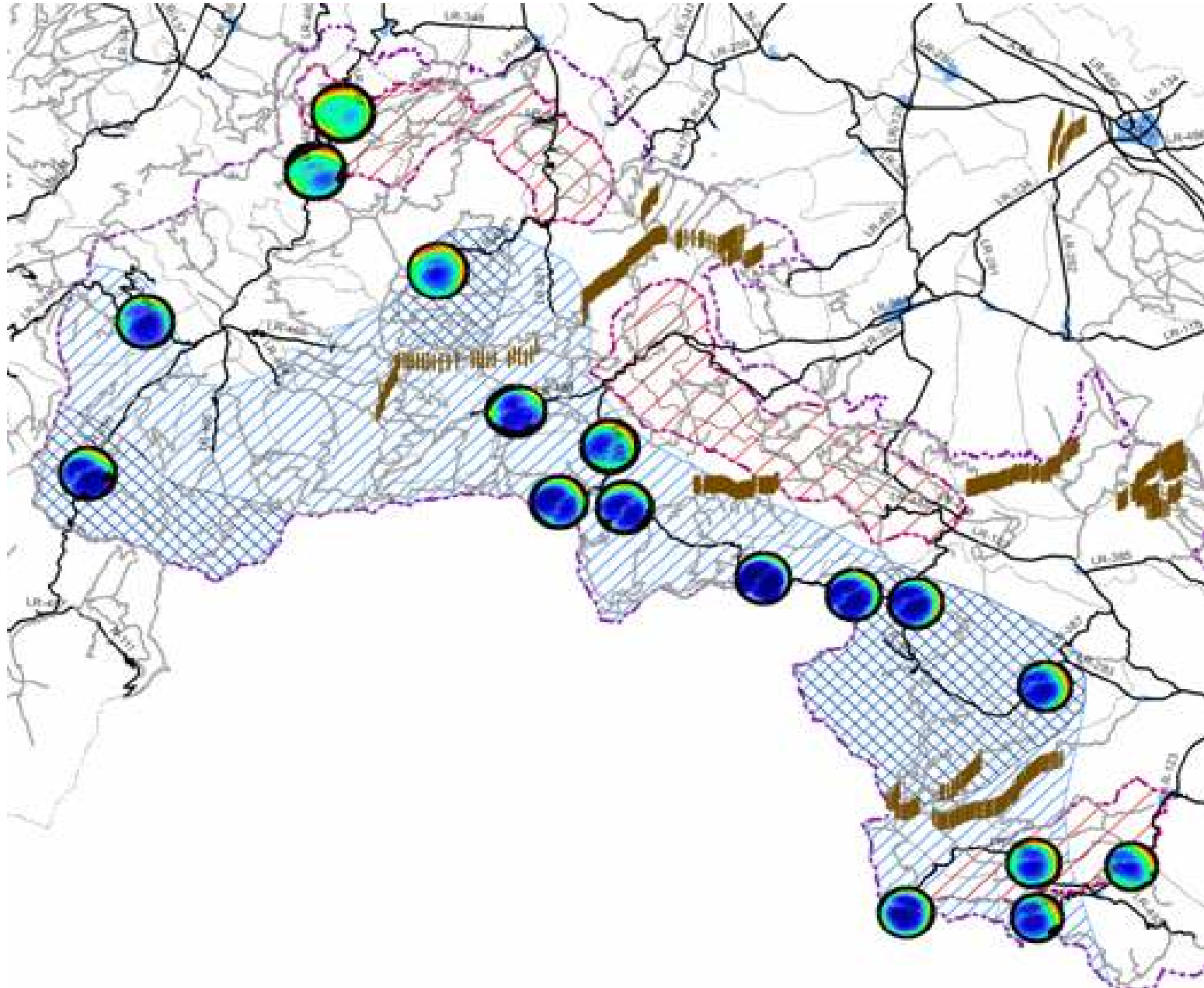


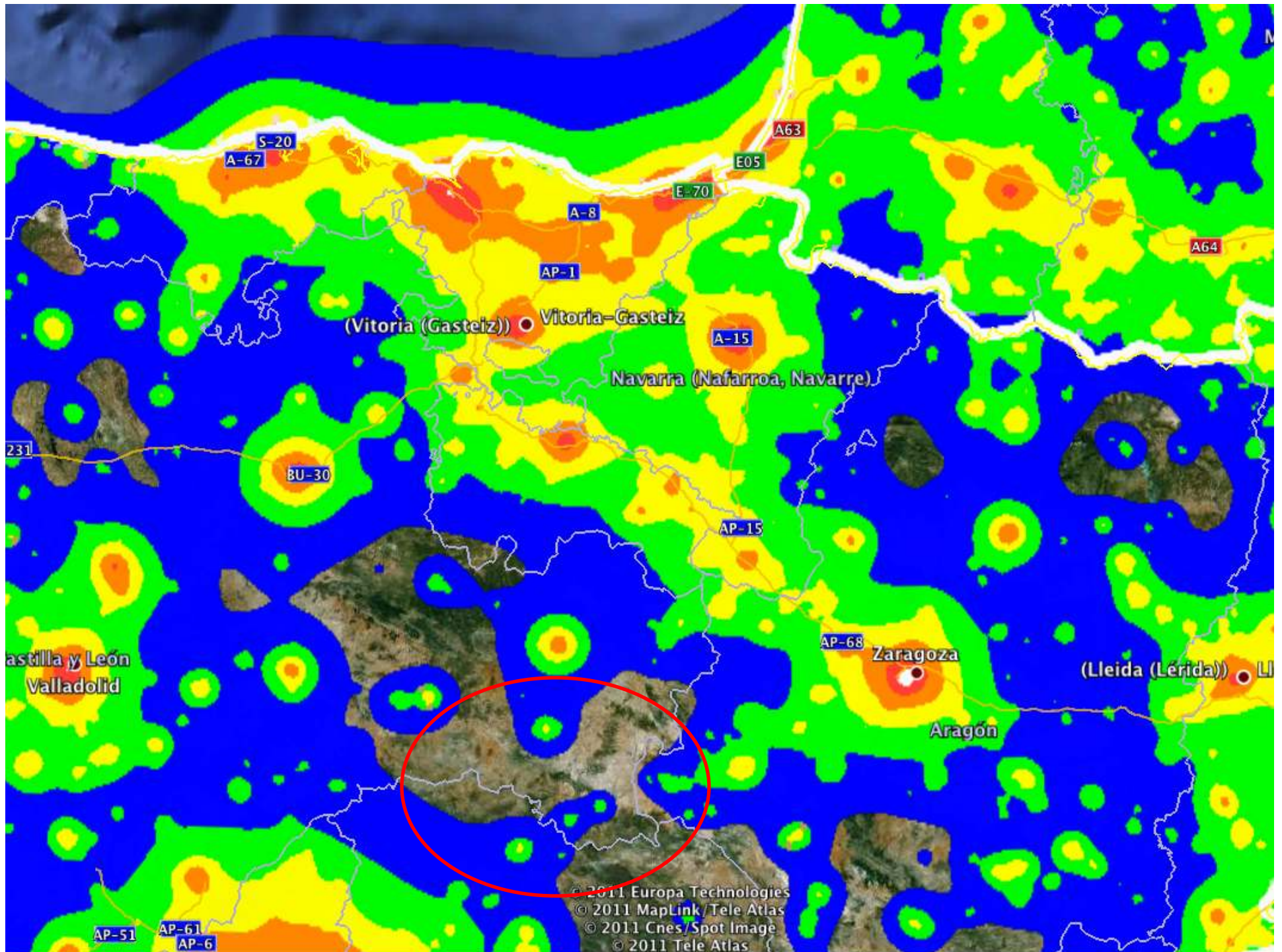
Contrebia Leukade

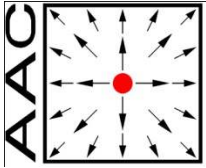


The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results

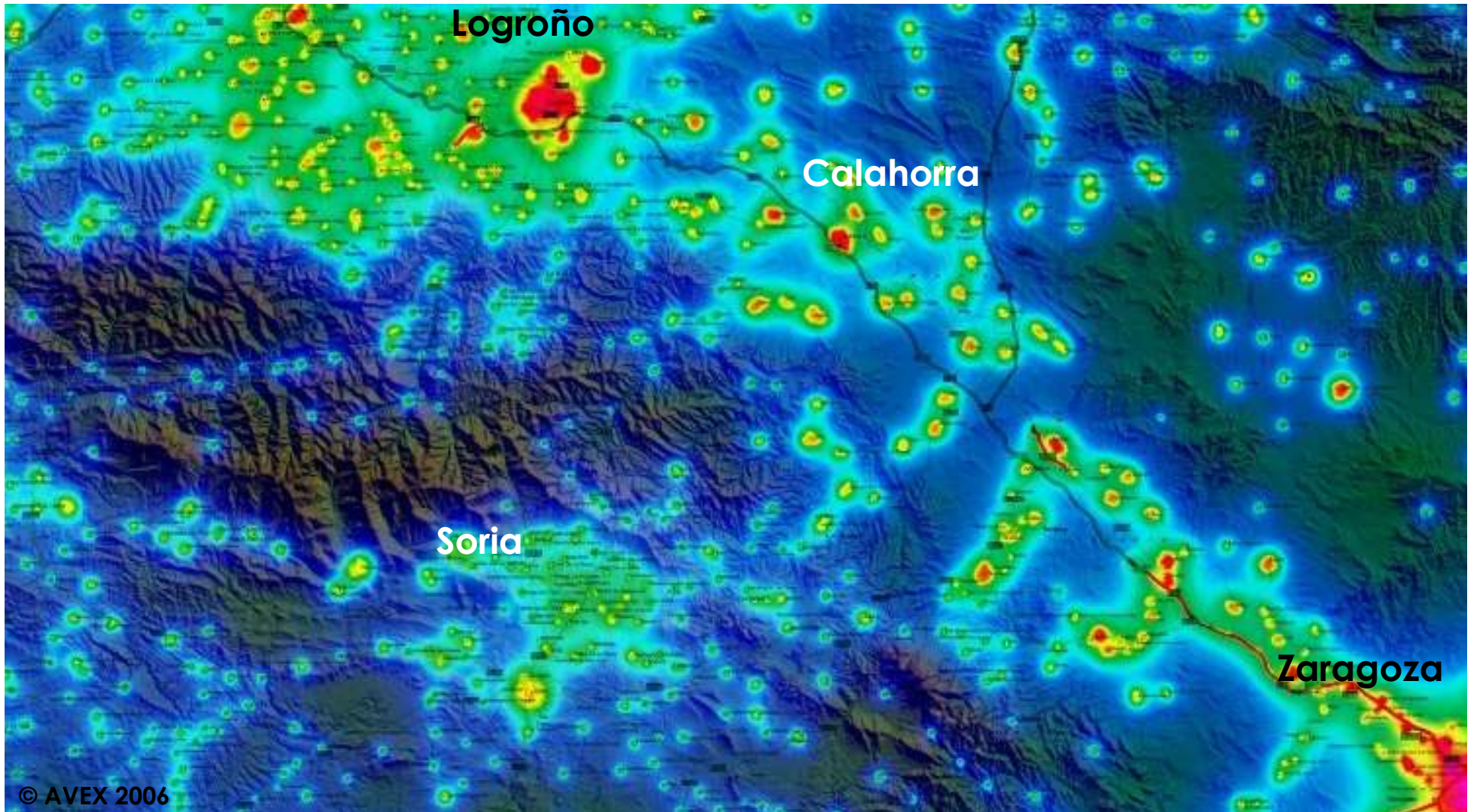


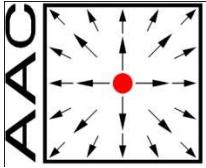




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Scope and Results

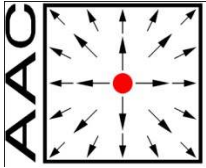




The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results



Modelo luminaria	Imagen	Características	% en la Reserva
		FHSinst %	
Vial sin carcasa Vial curvo		<p>≈ 5 Depende inclinación</p>	42,8
Globo		≈ 50	3,4
Globo carcasa		≈ 5	2,5
Farol		≈ 39	43,7
Farol adaptado		≈ 0	1,8
Otras sin protección		> 30%	2,0
Proyectores		Depende inclinación	3,7



Energy consumption: town and villages in the Biosphere Reserve

Public Lighting Energy / year:

1.947.895 kWh, 245.754 €/year.

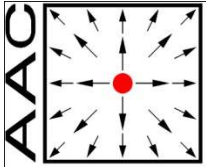
Population: 7.412 inhabitants

Energy rate: **263 kWh/inhab/year**

Spain:

Average: **116 kWh/hab/año**

Goal to 2.012: **75 kWh/hab/año.**



The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results



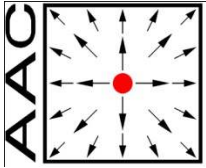
Quiet area: potential to Natural Sound Reserve

Measurements and soundscape

Most of the territory with natural sound; specially at night (no traffic).

Main noise sources:

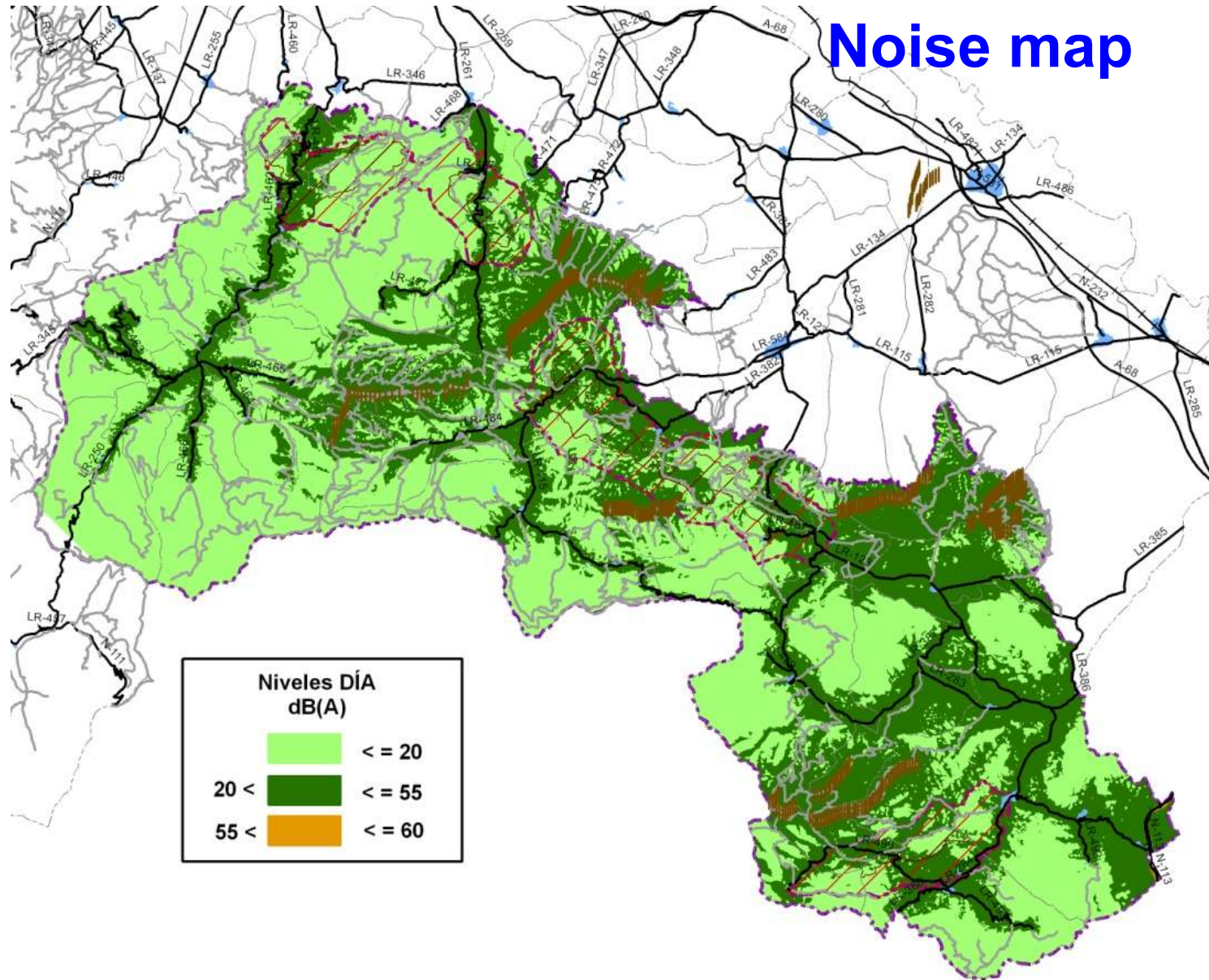
- Road traffic noise: just main roads
- Single vehicles
- Wind turbines
- Agricultural machinery



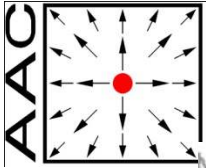
The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results



Noise map



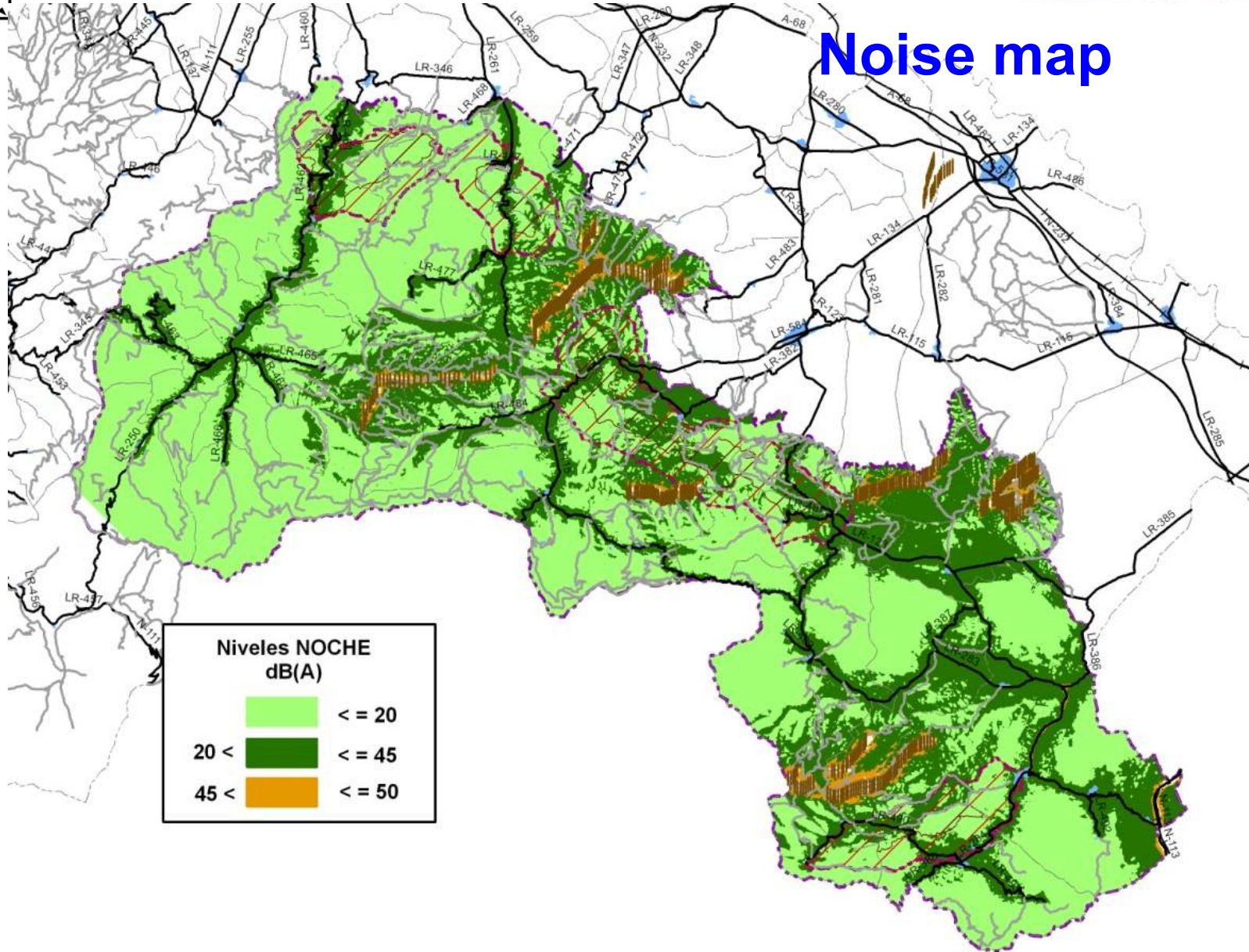
Day: Low noise in open field and possible Natural Sound Reserves



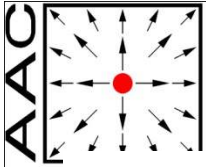
The Starlight Initiative in the Reserve of Biosphere of La Rioja Scope and Results



Noise map

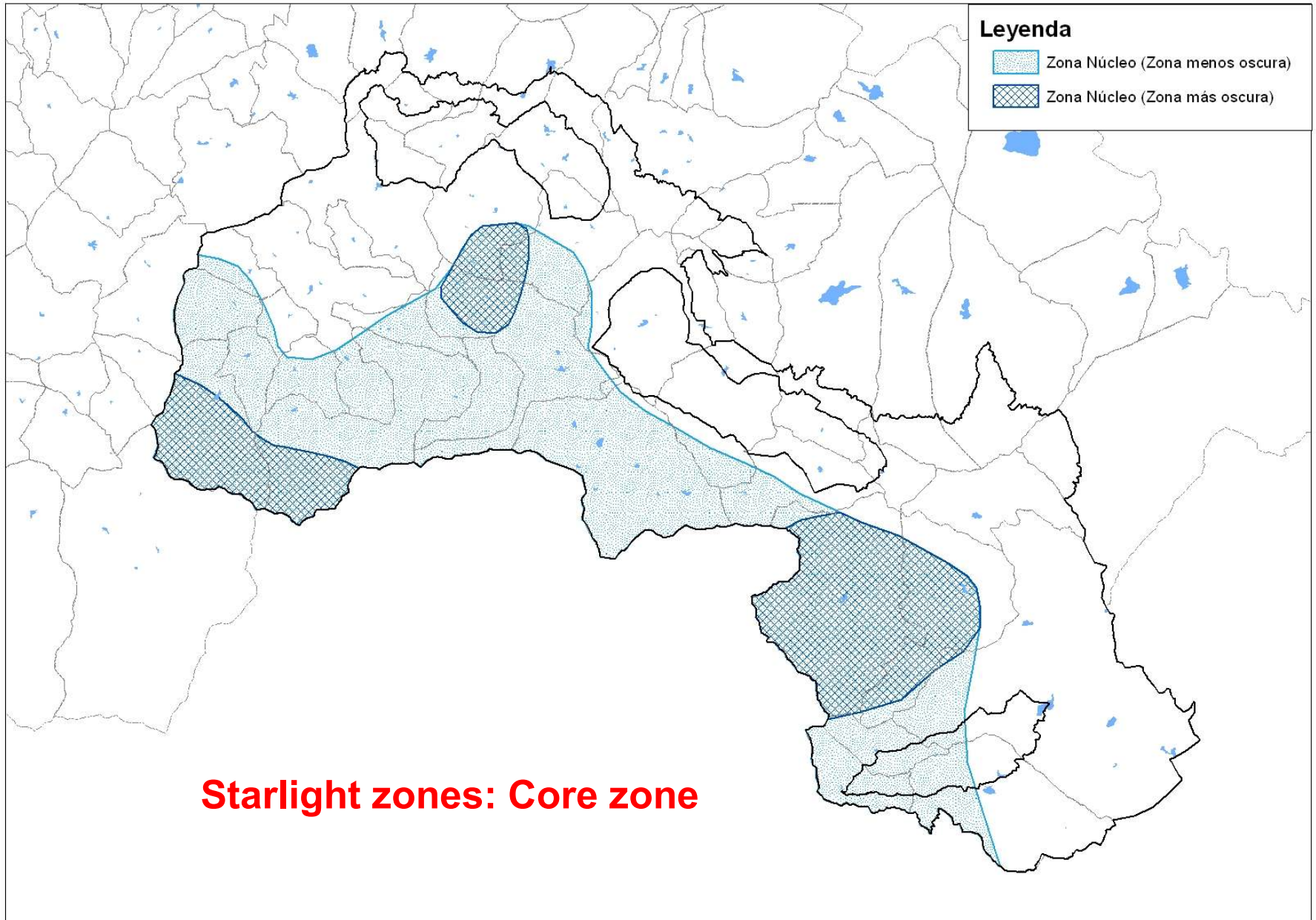


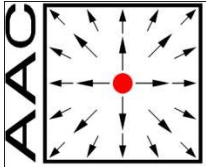
Night: Low noise in open field and possible Natural Sound Reserves



The Starlight Initiative in the Reserve of Biosphere of La Rioja

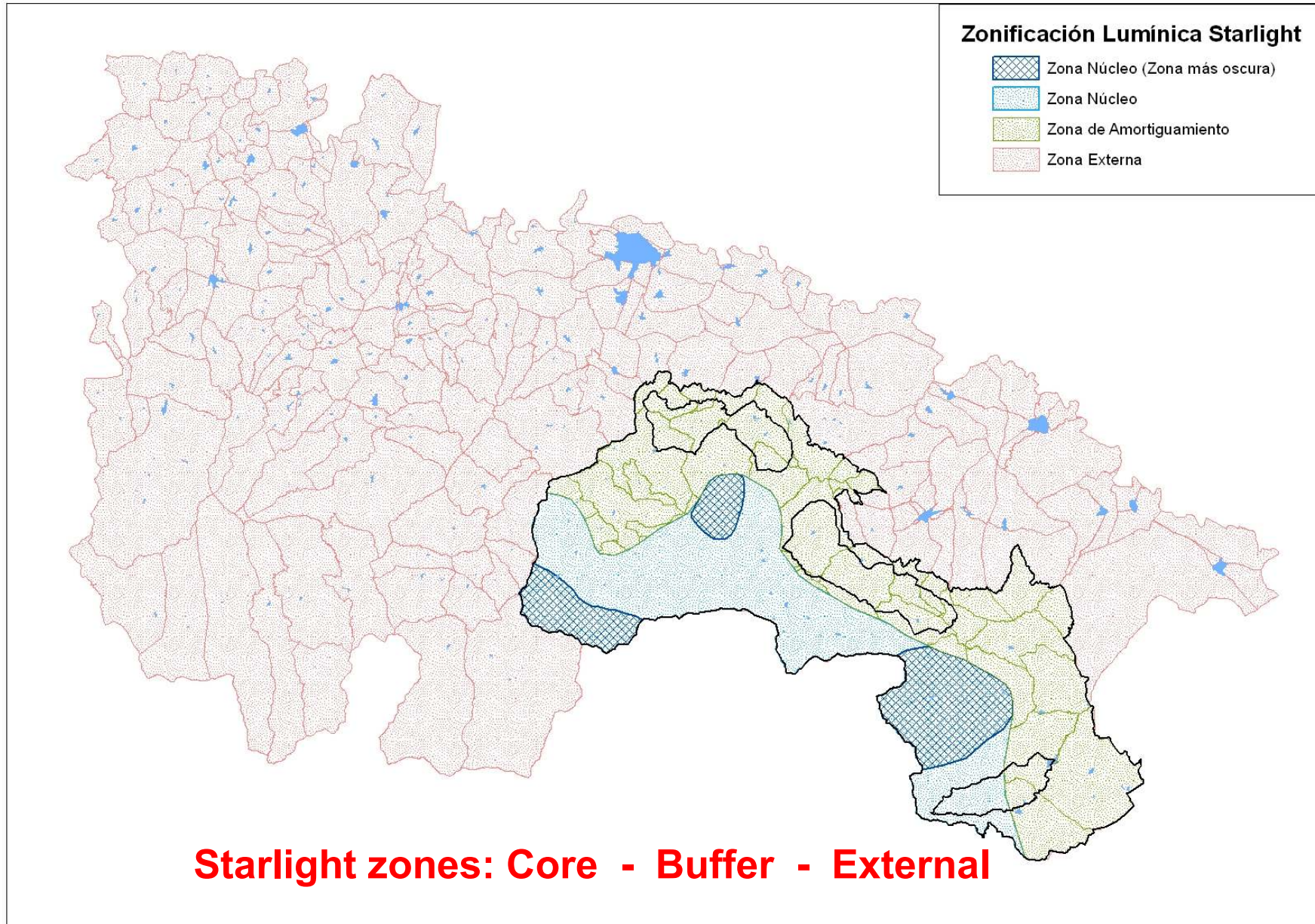
Scope and Results

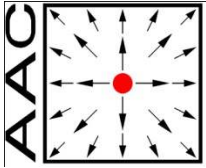




The Starlight Initiative in the Reserve of Biosphere of La Rioja

Scope and Results





Conclusions

Good quality night sky to get:

Starlight Reserve

Starlight Touristic destinations

Good soundscape to quiet area and natural sound reserve

Starlight Action Plan

- Starparks: 2 at present: Laguna and Cervera
- Strategic plan for sustainable lighting
- Quiet areas: low noise zone and Natural Sound Reserves
- Dissemination and Education
- Night sky protection
- Starry sky in the touristic offer
- Promote actions to reduce the external light pollution
- To follow the evolution of light pollution



Thank you for your attention