

AN ENDEMIC NEWT (*Calotriton arnoldi*) AS A TOOL  
FOR CONSERVATION OF RIVERSIDE HABITAT



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Valencia, September 2019





CATALUNYA  
31.89 km² - 7,5 million inhabitants  
Density: 234 people / Km²



# OBJECTIVES



To conserve the Montseny newt  
*(endemical and critically endangered)*

To improve river habitat  
*(in regression with anthropogenic threats)*



## OPERATIONAL TARGET



Protection



Dissemination  
& Education



Conservation  
(in-situ & ex-situ)



Research  
& Monitoring



Habitat  
management

## METHOD

- > **120** people involved in multidisciplinary teams
- **6** Areas of work, with **49** different actions



2.971.276 € (60 % EU)



Oct. 2016 / Des. 2020



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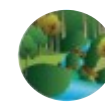
Dissemination  
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Goal 4: To establish proper legal coverage

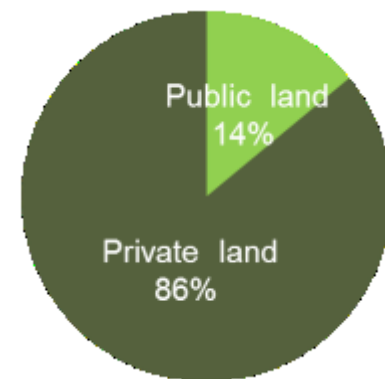
To ensure proper management of Montseny newt's territory

5 Actions: A4, C1, C2, B1, B2



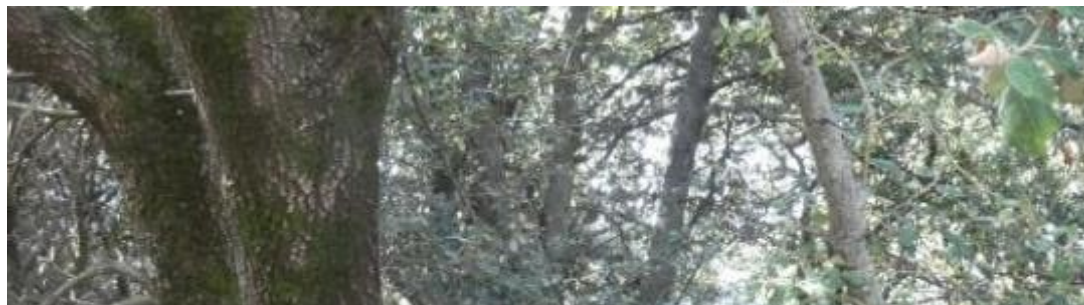
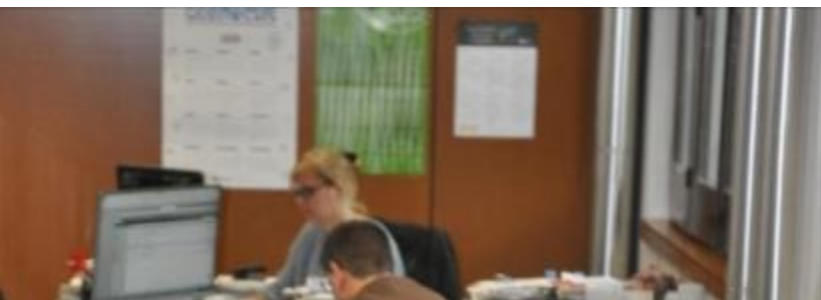


Montseny Natural Park



- Montseny newt is not explicitly within the Habitat Directive
- Montseny newt don't have a Conservation Plan
- ~ 80% of Montseny newt populations are inside private property
- No population is inside Protected Natural Reserve Zone





- ✓ Montseny newt is listed in HD as *Euproctus asper* (Annex IV) BUT it's included in the Art.17 as *Calotriton arnoldi* (id.6920)
- ✓ Administrative procedure have been initiated, to approve the Decree of *C.arnoldi* Recovery Plan.
- ✓ 377 ha have been proposed as a “ Supervised Management Area ” , where river habitat conservation is the aim.
- ✓ The acquisition of private land is in process ( 60ha of purchase and 45ha of swap)
- ✓ First Land Custody Agreement with a private land is ready to be signed, and there are tree more in negotiation.







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Goal 6: To involve general public, stakeholders and land owners  
in habitat conservation

13 Actions: D7, E1, E2, E3, E4, E5, E6, E8, E9, E10, E11, E12, E13





- High visitor frequency (> 1 million visits in N.Park/ year) with impact on riparian habitats
- Ignorance of the function of riverside forest, in the Mediterranean ecosystem
- Negative environmental impacts of traditional forest activity
- Doubtful ecological sustainability of natural resources (water, timber) exploitation
- Montseny newt, is an unknown and undervalued endemism







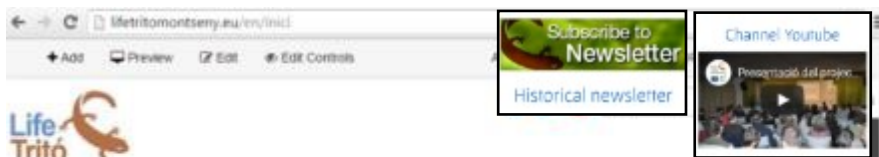
100 media appearances:  
(press, radio, TV & digital news)



Information to landlords  
48 meeting with 9 land owners



Documentary edition &  
Photographic report



**Social networks**

(24,168 website visits, 15,000 Wikipedia, 700 twitter trackers, 2.500 youtube visualizations )



**Promotional material**

(8 big panels, 16,500 brochures, 3,000 children's book, three-monthly bulletin)...







**School programme**  
(ZOO BCN & "Montseny a l'Escola")



**Conferences & Articles**  
(62 scientific, technical & informative)



**LIFE Networking**

(TRivers, LimnoPirineus, PirOs, Hydrology, Freshabit, Wet FlyAmphibia)



**Itinerant exhibition**  
(6.700 visits in 13 villages)



**Educational classroom & breeding centre**  
(> 95.000 visitors in ZOO BCN)







Conservation  
(in-situ & ex-situ)



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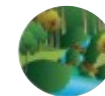
Dissemination  
& Education



Conservation  
(in-situ & ex-situ)



Research  
& Monitoring



Habitat  
management

Goal 1: To ensure conservation of Montseny newt populations

11 Actions: A1, A2, A3, C9, C10, C11, C12, C13, C14, C15, F2



Conservation  
(in-situ & ex-situ)

## START SITUATION



Infectious  
diseases

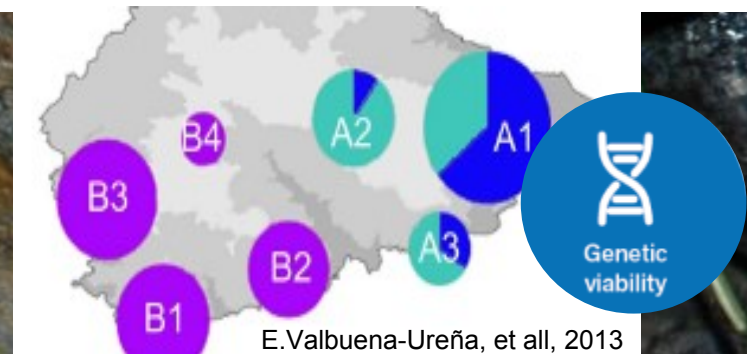
<1,500  
adults

in a 5 km  
stretch of stream

total area  
8 km<sup>2</sup>

7  
different  
populations

4 W  
3 E



E.Valbuena-Ureña, et al, 2013

The IUCN Red List of Threatened Species™ 2017-3 [Learn | FAQ | Contact](#)

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Enter Red List search term(s) [GO](#) [OTHER SEARCH OPTIONS](#) [Discover more](#)

ANIMALIA - AMPHIBIA GLOBAL, EUROPE

***Calotriton arnoldi***

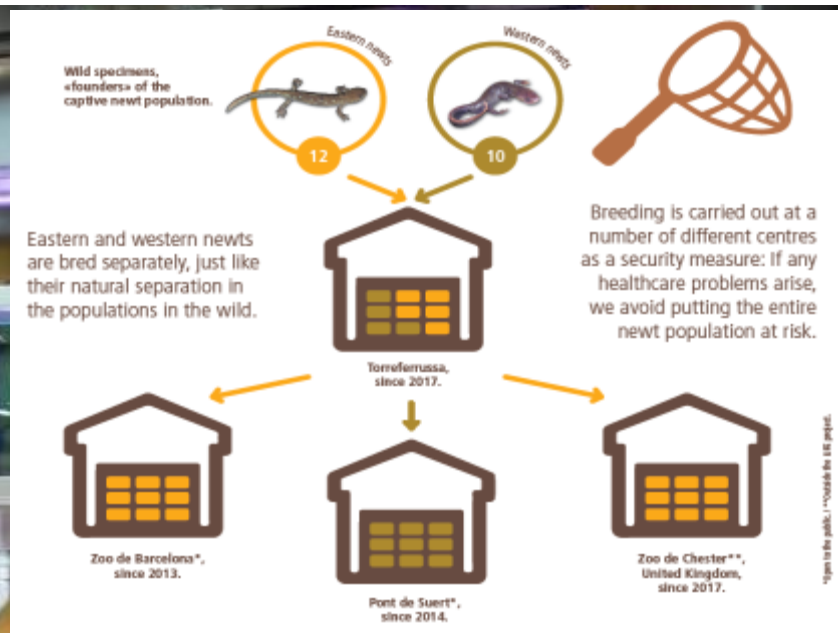
↓ Decreasing [<CR>](#)







## Breeding program : genetic reserve & production to release

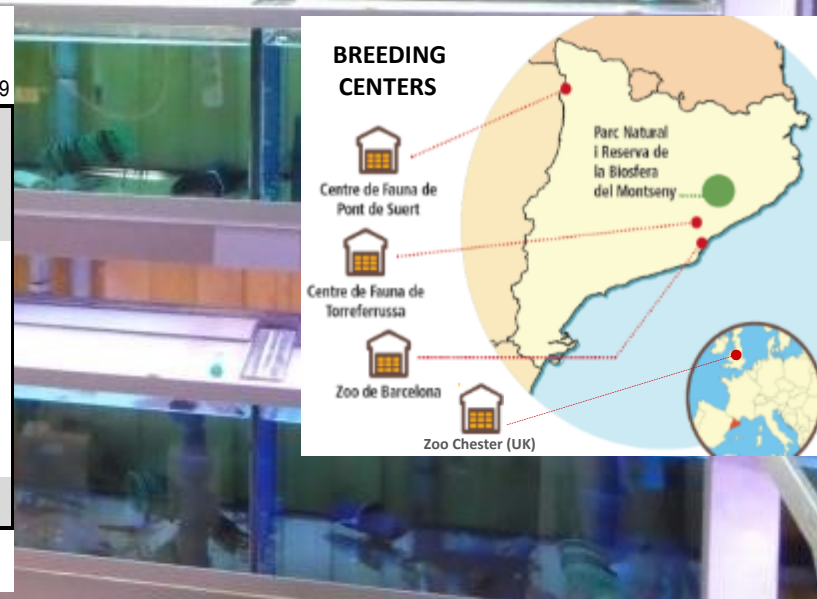



## Number of Montseny brook newt kept in reproduction program.

May 2019

Breeding Centers	Breeding pairs	Newts of western population	Newts of eastern population	TOTAL newts in captivity
Torreferrussa	90	578	401	979
Pont de Suert	19	222	0	222
Zoo Barcelona	24	26	105	131
Chester Zoo	12	0	32	32
<b>TOTAL</b>	<b>143</b>	<b>826</b>	<b>538</b>	<b>1364</b>

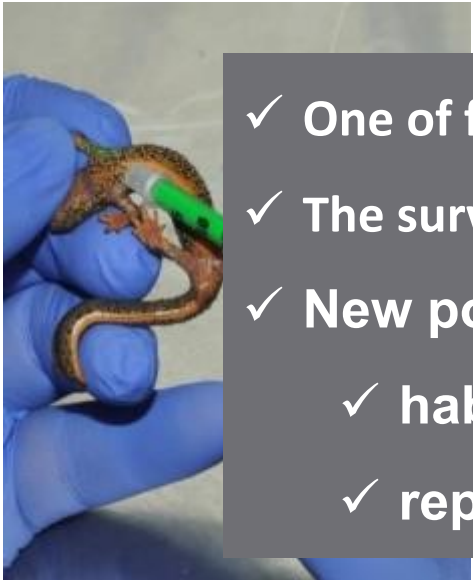
Nº Founding parents : W: 8 newts (2007) + 2 newts (2010) & E: 10 newts (2007) + 2 newts (2010)





New Population	Years of release	Total Núm. delivered animals	Age of animals
* West 1	2010,11,12,14	390	2-3 anys
West 2	2014, 15	106	0-1 anys
West 3	2019	136	2-3 anys
Est 1	2011, 14	166	2-4 anys
Est 2	2014, 15	62	0-1 anys

\* confirmed wild births

- 
- ✓ One of four reintroduced populations is working.
  - ✓ The survivorship of this population is 19.2% of the released individuals
  - ✓ New populations can be created IF :
    - ✓ habitat conditions are optimal
    - ✓ repeated releases of newts were done





## Infectious disease

Analitic Result	<i>B.dendrobatidis</i>		<i>B.salamandrivorans</i>		Ranavirus	
	-	+	-	+	-	+
<i>Calotriton arnoldi</i>	200	0	200	0	169	0
<i>Salamandra salamandra</i>	1	0	1	0		0
<i>Bufo spinosus</i>	7	0	7	0	3	0
<i>Rana temporaria</i>	2	0	2	0		0
<i>Hyla meridionalis</i>	0	1	1	0	1	0
* <i>Lissotriton boscai</i>	24	2	26	0	26	0
Total	234	3	237	0	199	0



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**Habitat  
management**

Goal 5: To monitor newts populations and its habitat  
To increase scientific and technical knowledge

7 Actions: C3, D2, D3, D4, D5, D6, F3





Where do newts live?  
What do newts eat?  
Which are habitat threats?  
Where could newts reproduce?  
What's the ecological flow ?  
... ?





## Workshop & Discussion sessions

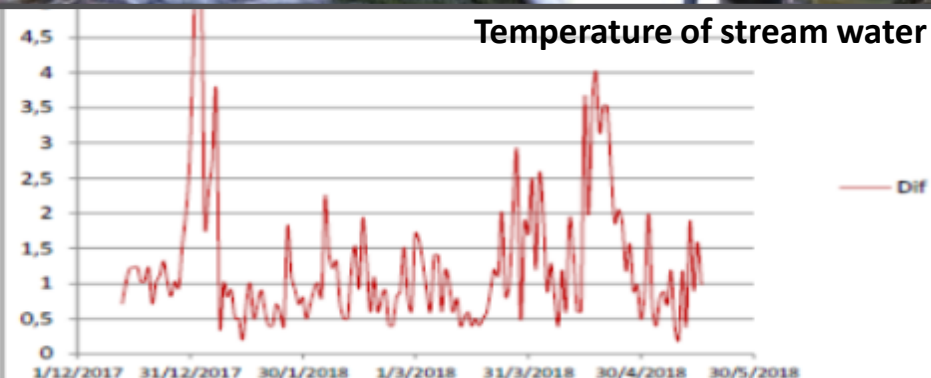
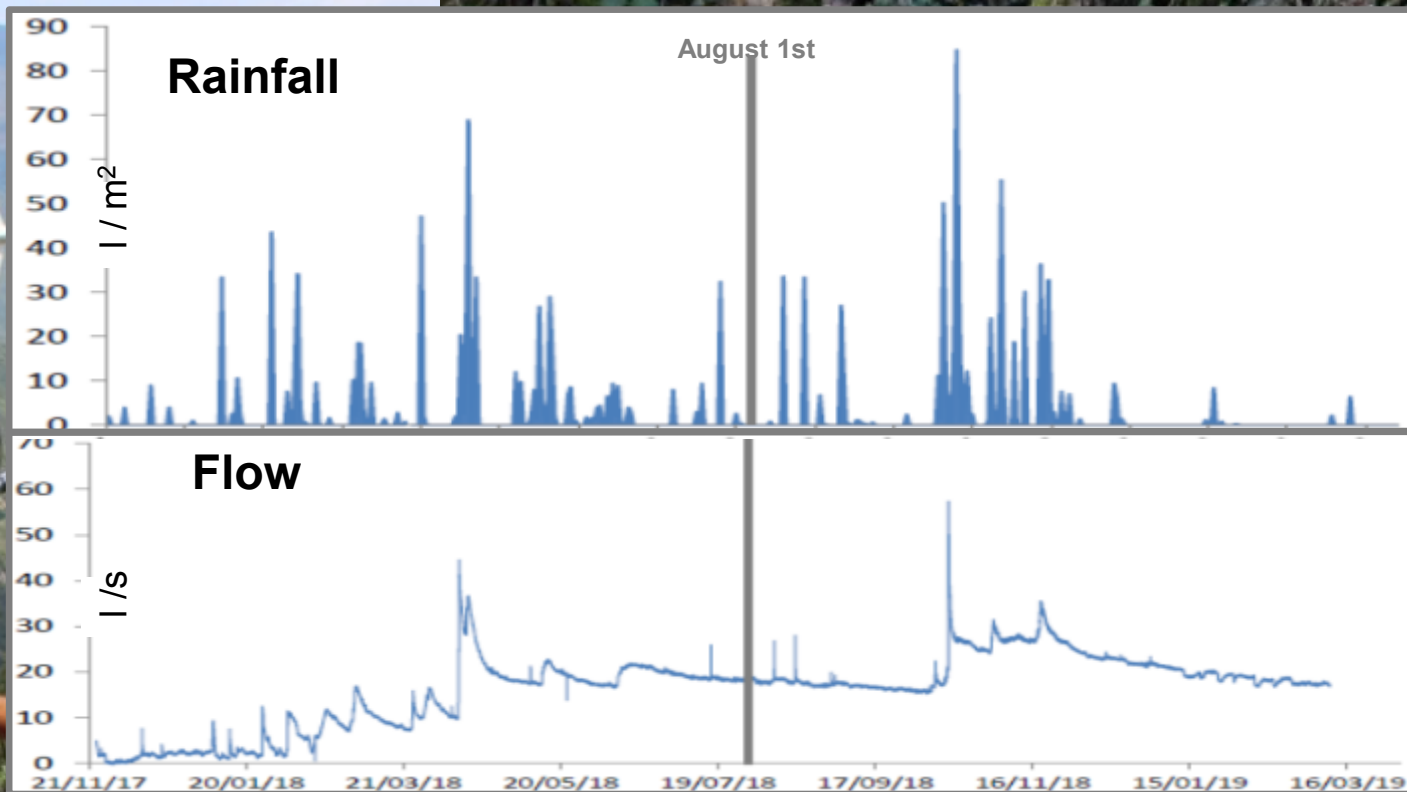
> 100 technician and scientific, from several fields, are implicated in the project





# ACTIONS PERFORMED

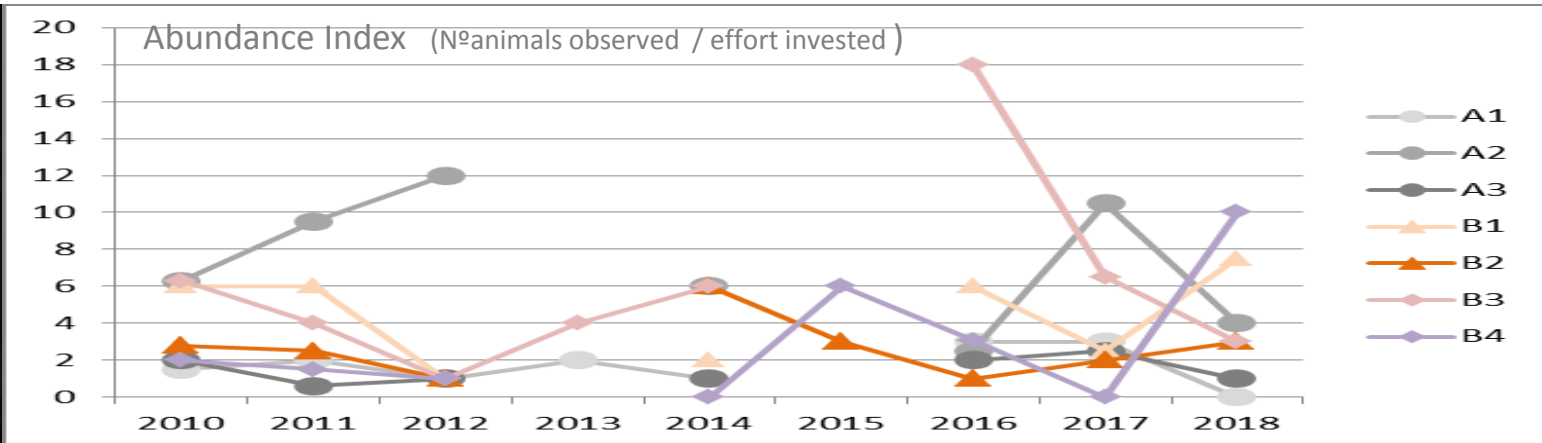
Abiotic Monitoring



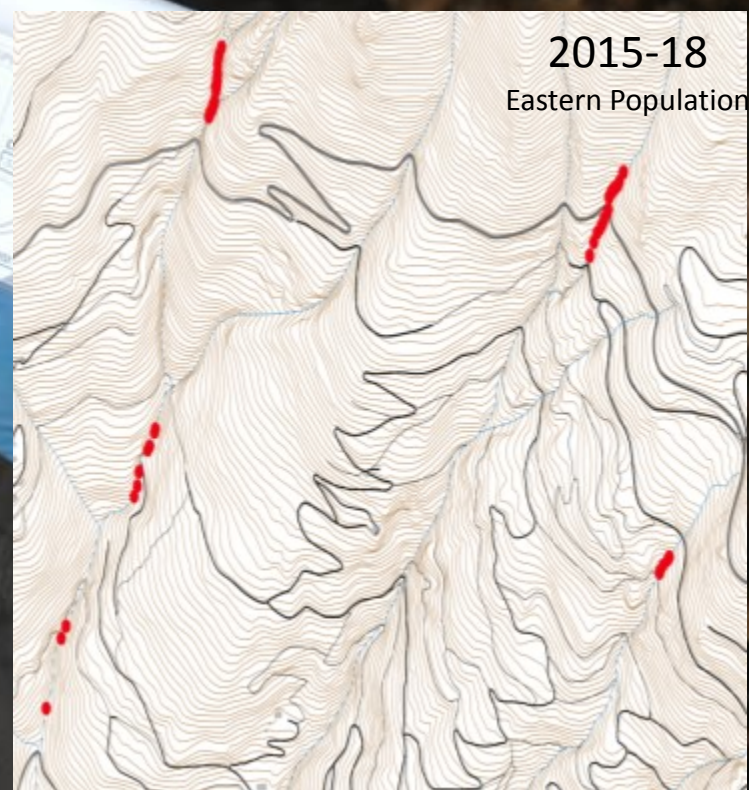
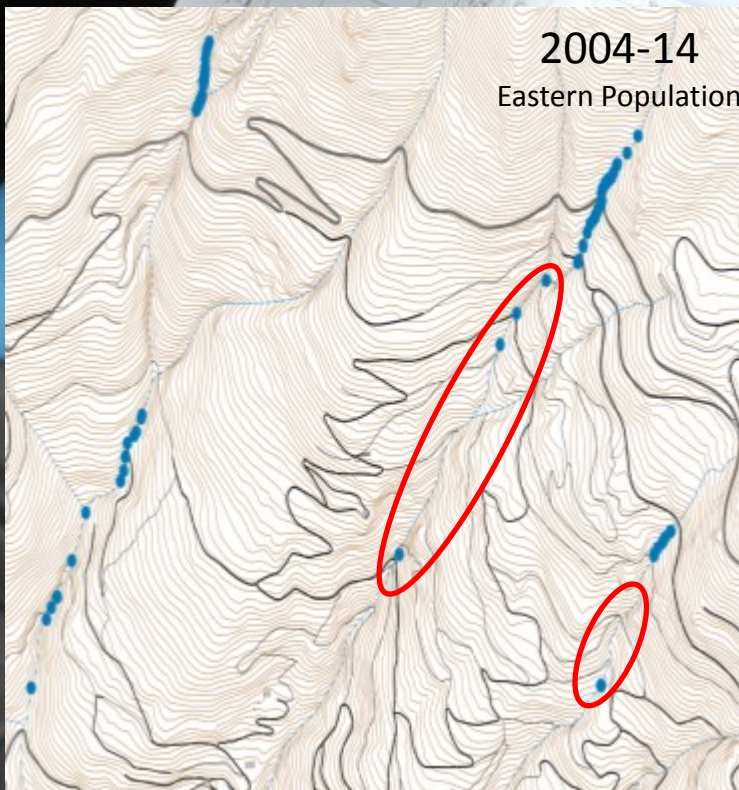


# RESULTS

## *C.arnoldi* Wild Population Monitoring



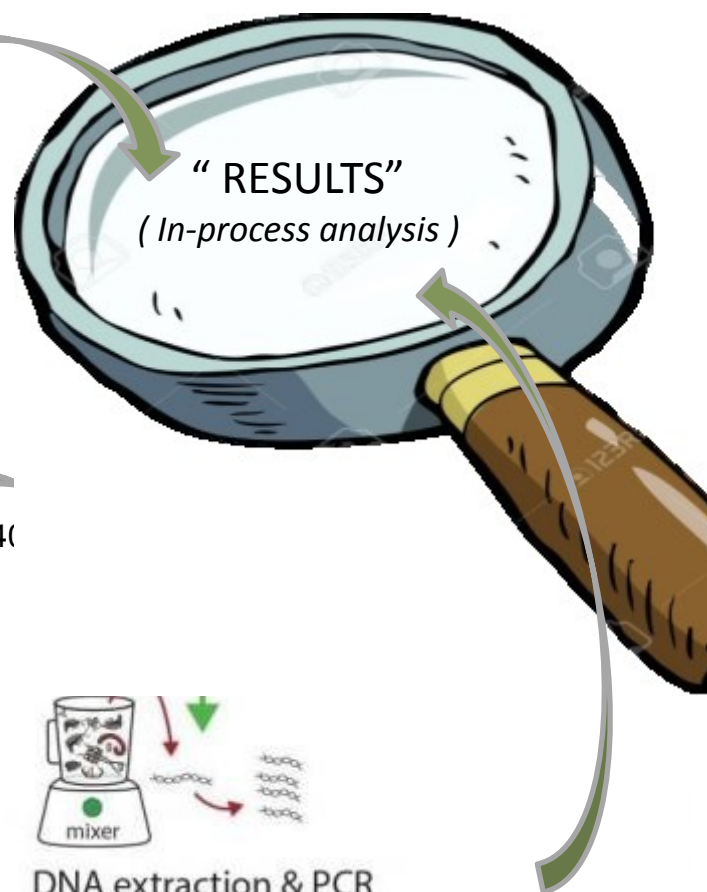
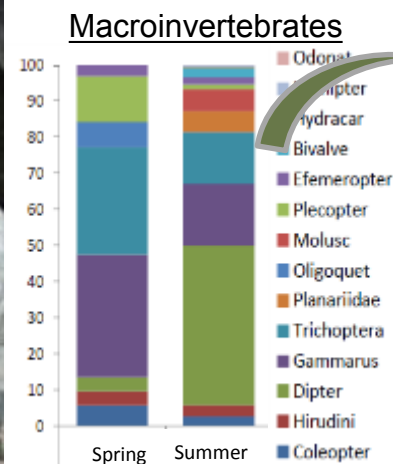
Distribution Area







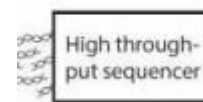
J. Gomà, C. Múrria, F. Sabater (UB), 2019



(4)



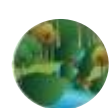
DNA extraction & PCR



Metabarcoding



Barcode database



Habitat  
management



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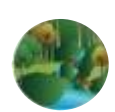
Goal 2: To increase the hydrological quality and ecological flow

4 Actions: C4, C5, C6, D1

Goal 3: To minimize threats in the riparian habitat

3 Actions: C7, C8, D1

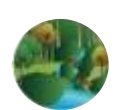




## START SITUATION







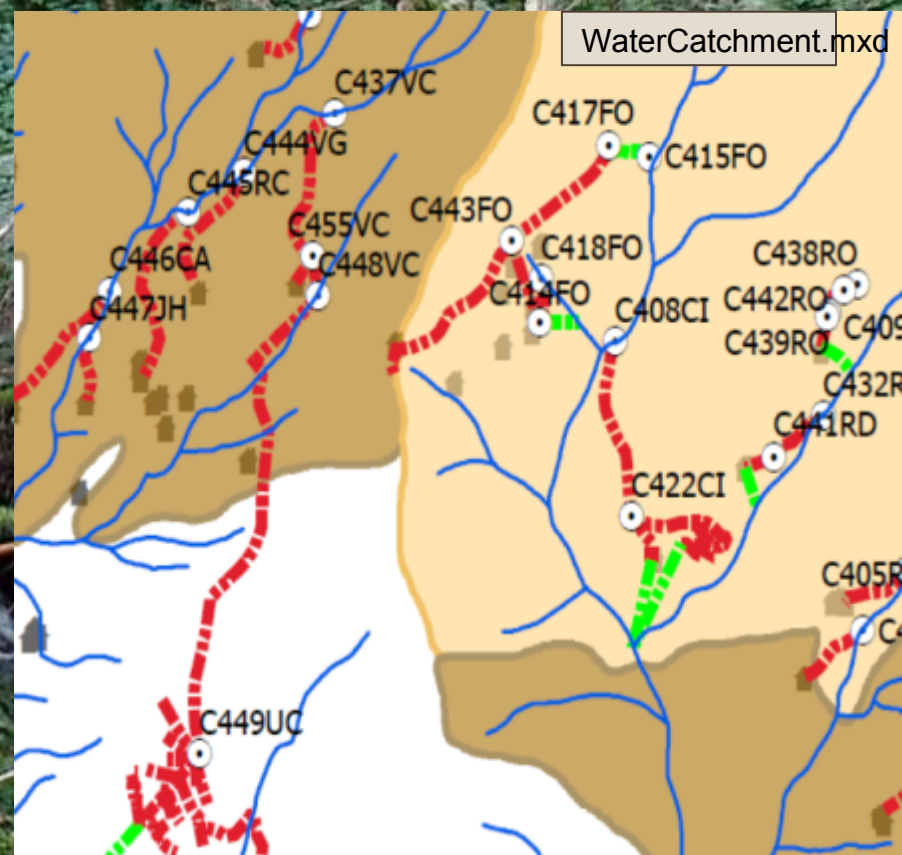
## ISSUES

### Reduced water flow in streams

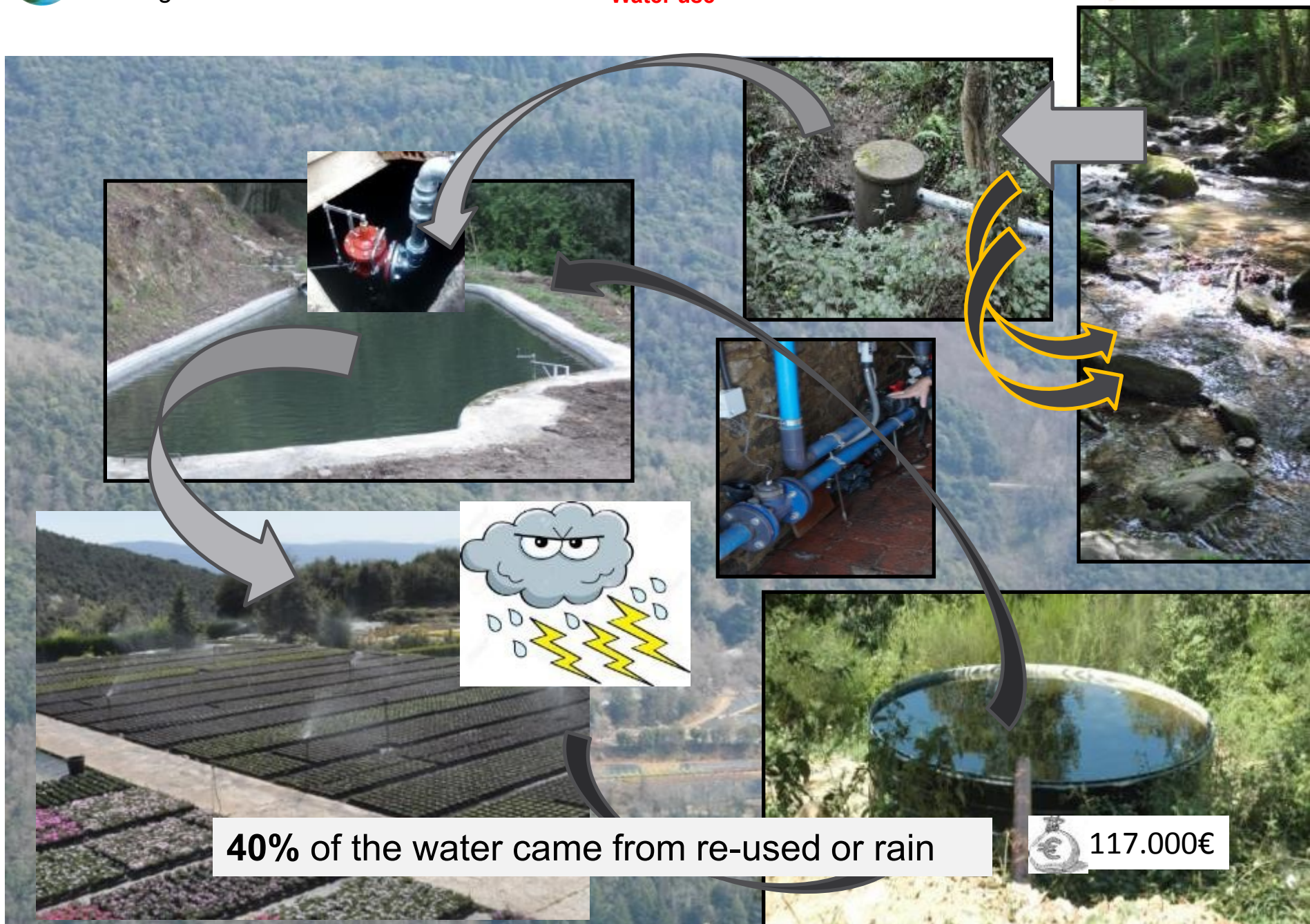
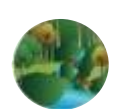
Water harvesting can cause some stretches of stream to dry up, particularly when there has been a drought.

### Discharging of polluted waters

This causes availability of nutrients to increase, affecting water physical and chemical conditions. Modifies communities of organisms.





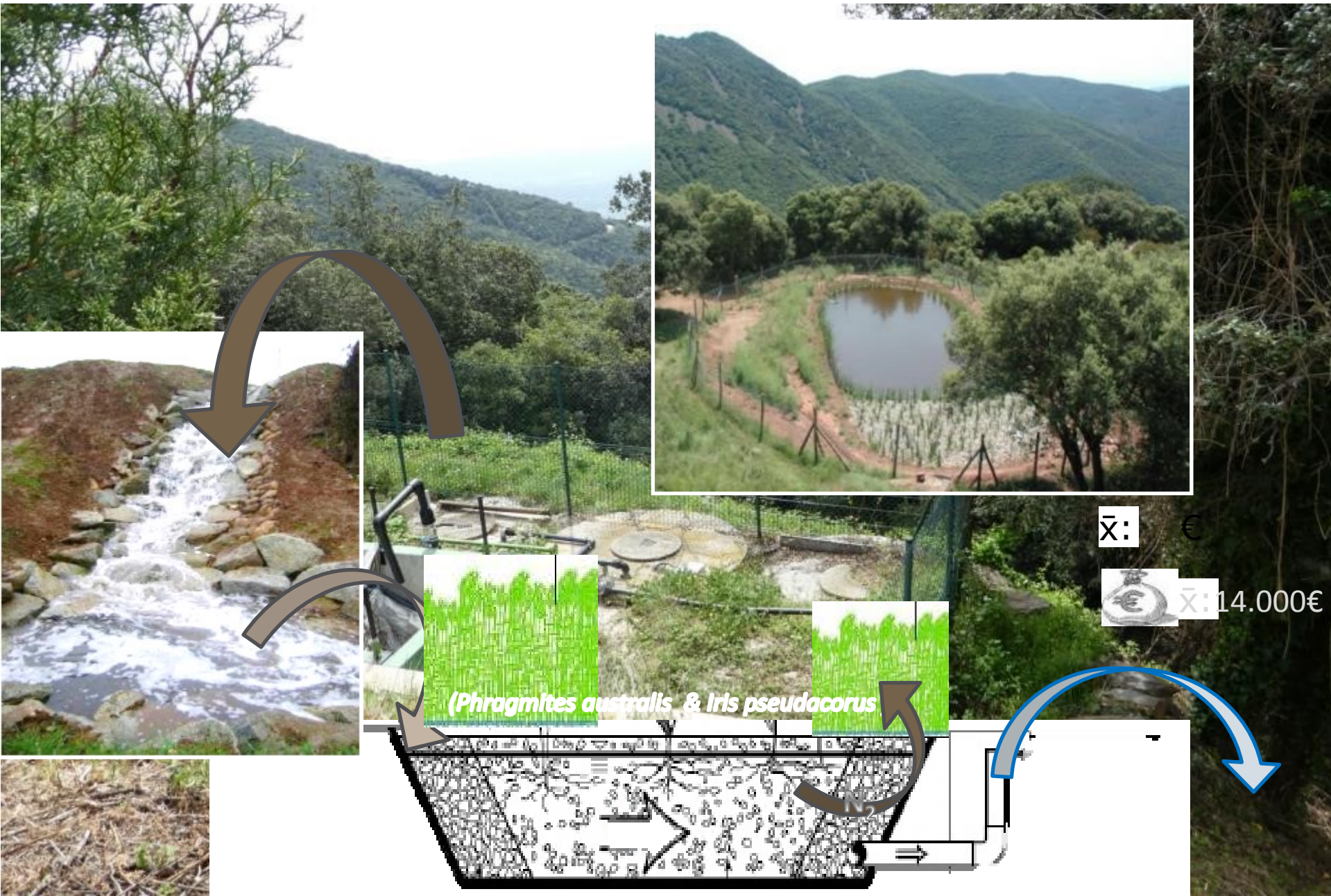
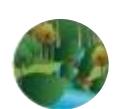


**40% of the water came from re-used or rain**

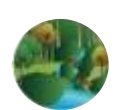


**117.000€**









## ISSUES

### Fragmentation of the habitat

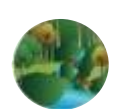
By roads, forest tracks and paths that cross the waterways. They create barriers that the brook newt cannot cross.

### Disappearance of riverside forests and replacement of indigenous forest with commercial plantations

The forest's regulatory function is halted: raising temperatures (reducing shade), increased erosion and dragging of sediment into streams.



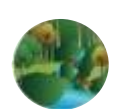




**ACTIONS PERFORMED**







$\bar{x}$ : 1.700€ - Restauration



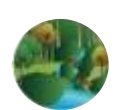
$\bar{x}$ : ~ 15.000€ - "Roman" bridge



$\bar{x}$ : 3.000€ - Stone bridge







*two-way road*

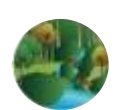


*storage place*



*discharge site*







̄: ~ 3.000€ - River Habitat restoration







*Many thanks*

*Moltes gràcies!*

