Service-learning, educational innovation and geography: an experience in assessing territorial heritage in the Biosphere Reserve of the area known as the *Ancares Leoneses* (Cantabrian mountain range, Spain)

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Abstract: The article weighs up the didactic proposal carried out by the authors in the Biosphere Reserve of the *Ancares Leoneses* (RBALE) with students enrolled in the *Practical and Applied Geomorphology* class of the fourth year of the *Undergraduate Degree in Geography and Land-use Planning* of the University of Valladolid. Its development has served, firstly, as a basis and a tool for geographical work in a mountain site of heritage value, a key objective of the matter. At the same time, it has allowed students to take part in a real service-learning experience, interacting with local parties and management entities of the RBALE. This experience was awarded the "Prize for Educational Innovation by the Social Council of the University of Valladolid -2013-".

Keywords: Service-learning, Educational Innovation, Geography, Territorial Heritage, Biosphere Reserve of the *Ancares Leoneses* (RBALE).

1. Background and starting points

Throughout the year 2012, the Scientific Committee of the Biosphere Reserve of the *Ancares Leoneses* (RBALE), by mutual agreement with the Consortium, the Participation Committee and the Management, launched an ambitious knowledge exchange programme between the local population and the academic community entitled "Joining experiences: science and popular wisdom in the *Ancares Leoneses*", in order to generate mutual learning dynamics through a series of collaborative activities.

Within this vast programme, the participants considered producing the "Inventory of geomorphological heritage, geodiversity assessment and proposal of tour routes in the municipality of Peranzanes". The aim of all this was to acquire further knowledge about the geomorphology of the municipality and the hypothetical geomorphological heritage that it could enfold. Starting from this knowledge, its geodiversity would be considered, as a tool for land-use planning and management of the environment. Finally the aim was to design the routes for a type of tourist wishing to combine hiking and learning about the landscape, and focusing on -as a driving force- the "glacier landscapes" of the Fornela valley (figure 1).

Commencing from this approach, the Consortium of the RBALE signed an Internship Agreement with the University of Valladolid in 2013, by means of which several of the students of the *Practical and Applied Geomorphology* class of the *Undergraduate Degree in Geography and Land-use Planning* of the University of Valladolid undertook their "External Internship" by carrying out a set of tasks derived from the making of the "Inventory", under the guidance of

the teacher of the subject -at that time a member of the Scientific Committee-, as "Academic Tutor", and by the Manager of the RBALE as "Company tutor". *Practical and Applied Geomorphology* is an elective subject in the final year of career (4th), which usually enroll an average located between five and ten students. In the specific course that relates this experience, five students participated in it.

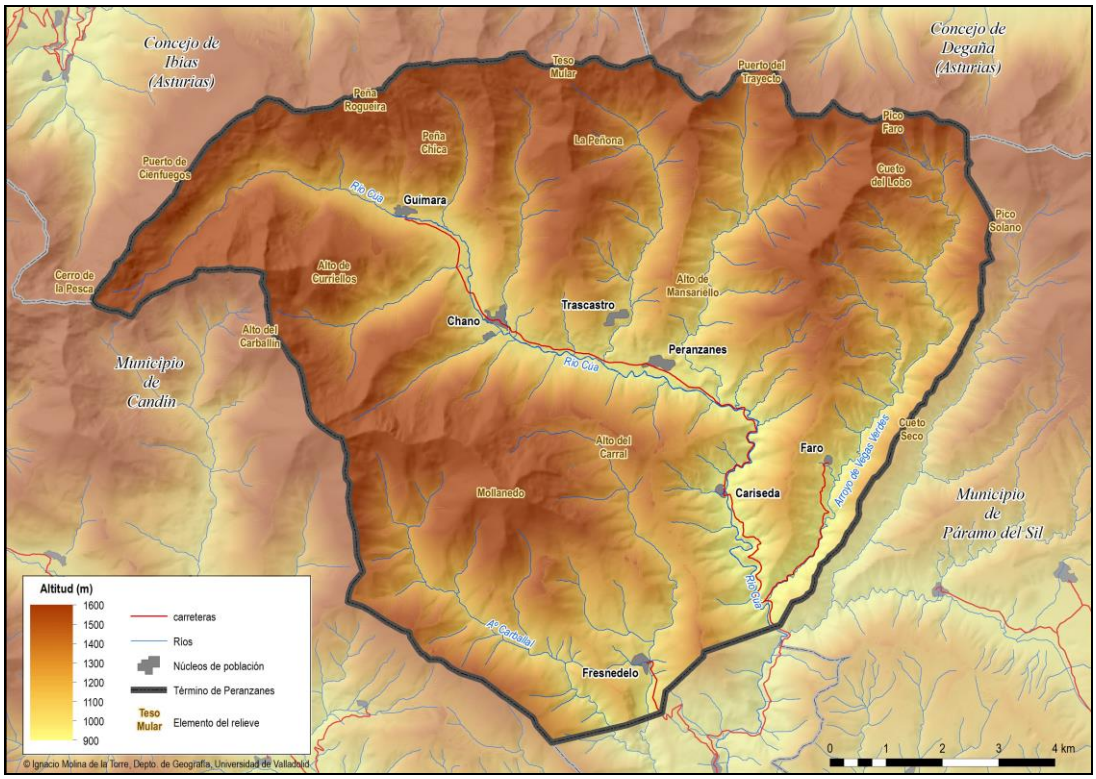

Figure 1. Study area: municipality of Peranzanes (Fornela valley)

The creation of the "Inventory of geomorphological heritage, geodiversity assessment and proposal of tour routes" had a triple function: firstly, the very purpose for which it was designed, secondly to provide a basis and a tool for work in the *Practical and Applied Geomorphology* class, and thirdly for several of the students enrolled in the class to gain an External Internship. And its fourth purpose, no less important, and that serves as a learning aid for all the above: to be a real service-learning experience. In this case the service would refer to the learning internship within an innovative teaching methodology which does indeed entail by means of a single activity, the acquisition of content -as well as abilities- by carrying out community service tasks (Puig and others, 2007; Puig, 2009).

2. Practical and logistical aspects of the didactic experience

Throughout the second semester of the academic year 2012-2013, between the beginning of February and the beginning of June 2013, an intense teaching activity was carried out, consisting of in-class sessions, for the teaching of the theoretical and methodological tools and for the tasks of preparing the fieldwork (these sessions took place in the lecture theatre of the Arts Faculty of the University of Valladolid) and in fieldwork sessions. There were a total of nine field trips that lasted one and a half days.

Each field trip started on Monday at 7 p.m. (when the students finished their other classes), and lasted all Tuesday, returning to Valladolid around 8 p.m. The hours on Monday afternoon were devoted to the journey between Valladolid and Peranzanes (around three hours), to have dinner at the destination. On Tuesdays, the fieldwork would start at 9 or 10 a.m. until 4 or 5 p.m., and at that time the return journey would begin.

Transport costs were financed by the Consortium of the Biosphere Reserve, and the accommodation costs were paid by the Town Council of Peranzanes. The living expenses were paid by the students enrolled in the class themselves, and by the teacher.

3. Educational outcomes and teaching-learning objectives accomplished

From an academic point of view, the students achieved several learning objectives:

- They took part in a real practical and applied geomorphology experience, which was the main aim of the class.

- They understood the difficulties related to preparing and executing a geomorphology fieldwork campaign.

- They learned the techniques for preparing geomorphological fieldwork: selecting cartographic and graphic bases, photo-interpretation, the making of geomorphological drafts and the selection, design and preparation of the weekly field trips.

- They learned to assess geomorphological elements, selecting the most outstanding and the most deserving of being part of the natural heritage of the area.

- They carried out the cataloguing of said elements, using the methods published by the Geological and Mining Institute of Spain (IGME).

- They produced a geomorphological map at 1:20000 scale using photo-interpretation, fieldwork and ICTs applied to geography, that is, Geographical Information Systems (GIS).

- They mapped out the geodiversity of the area using GIS.

- They participated in the drafting of several guided tours designed for the tourist and educational use of the resources of the territorial heritage.

- They lived intense group dynamics with constant joint decision making encompassing all sorts of issues: logistics, coexistence, work, etc.

- They experienced frequent meetings with different kinds of actors: with the population (neighbours, cattle breeders, hotel managers) and with local managers (town council, management of the Reserve, etc).

Furthermore, and bearing in mind that the European convergence of university studies has lead, amongst other things, to changes in the organisation of teaching, adjusting the teaching-learning methods to the objective of the acquisition of abilities by the students (Universidad de Valladolid, 2008), the experience of service-learning has become an effective resource for the development of basic skills: particularly social and citizenship skills and personal autonomy (Ferrán & Guinot, 2012).

4. Contributions; scientific-technical and applied outcomes: transfer of knowledge

As a result of all the activities carried out during the second semester of the academic year 2013 in Peranzanes, a basic geomorphological map was obtained (figure 2). This map, made at 1:20000 scale, represents an original scientific document and an unprecedented contribution to the study of territorial heritage in that area of the Reserve (Garcia and others, 2013).

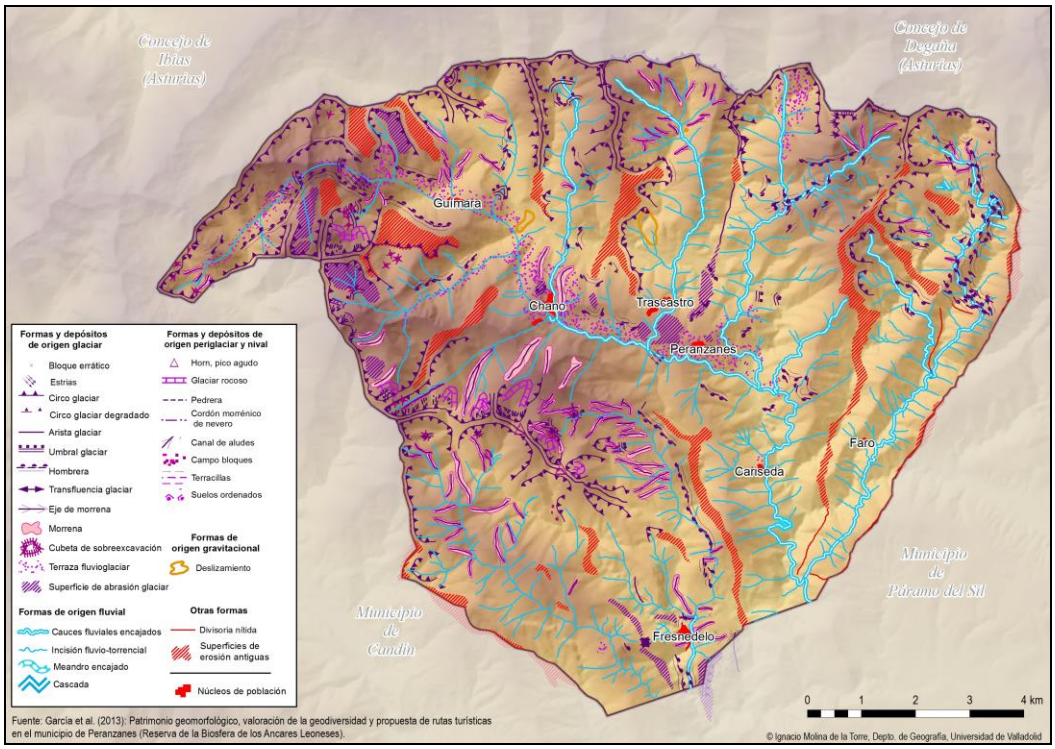

Figure 2. Peranzanes basic geomorphological map

Places of geomorphological interest were inventoried and catalogued (García & Carcavilla, 2009). A set of detailed, descriptive cards was created, each card corresponding to a single geomorphological heritage element, so as to create a registry of elements that were found interesting from a scientific, educational, tourist, landscape or natural point of view (figure 3).

Geodiversity in the area was mapped by applying a randomised grid to the geomorphological map, adding information related to soil, geology, water and active processes and finally counting the number of elements that appeared in each grid. The outcome was a tool oriented toward land-use and management: a geodiversity map that highlights the areas that are most relevant from a geological-geomorphological point of view.

Nine different tours were drafted (figure 4 and table 1), as a result of the knowledge that had previously been acquired, regarding the elements and areas that were of a greatest interest, from a natural heritage point of view. Also, it was suggested that each population center left a different route, so that the results would feel involved and concerned everyone in the town. These tours will allow for visitors to enjoy and have a direct contact with the natural heritage. They are self-guided tours. The whole itinerary is explained, and given greater value by means of simple explanations and tips that allow visitors to achieve a better understanding of the origins of the landscape. The aim would be for local

authorities, hotel and restaurant managers etc. to provide visitors with the guides, as a means to complement and promote tourist activities.

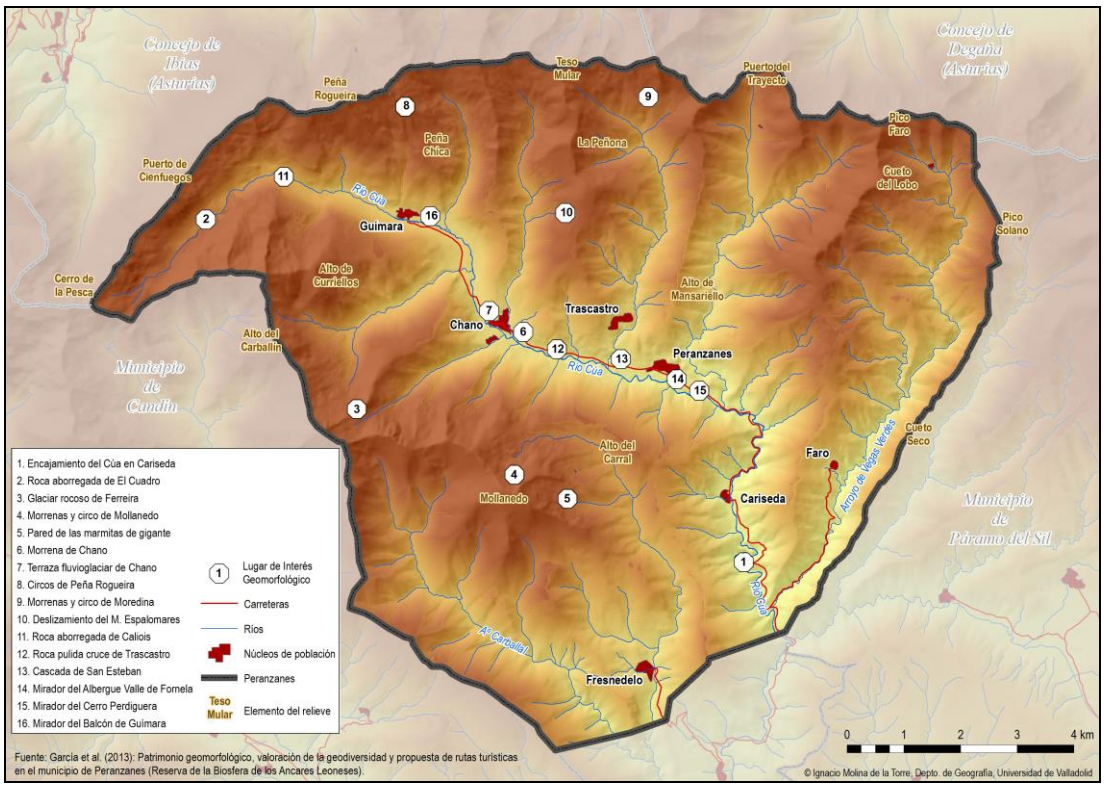

Figure 3. Peranzanes places of geomorphological interest

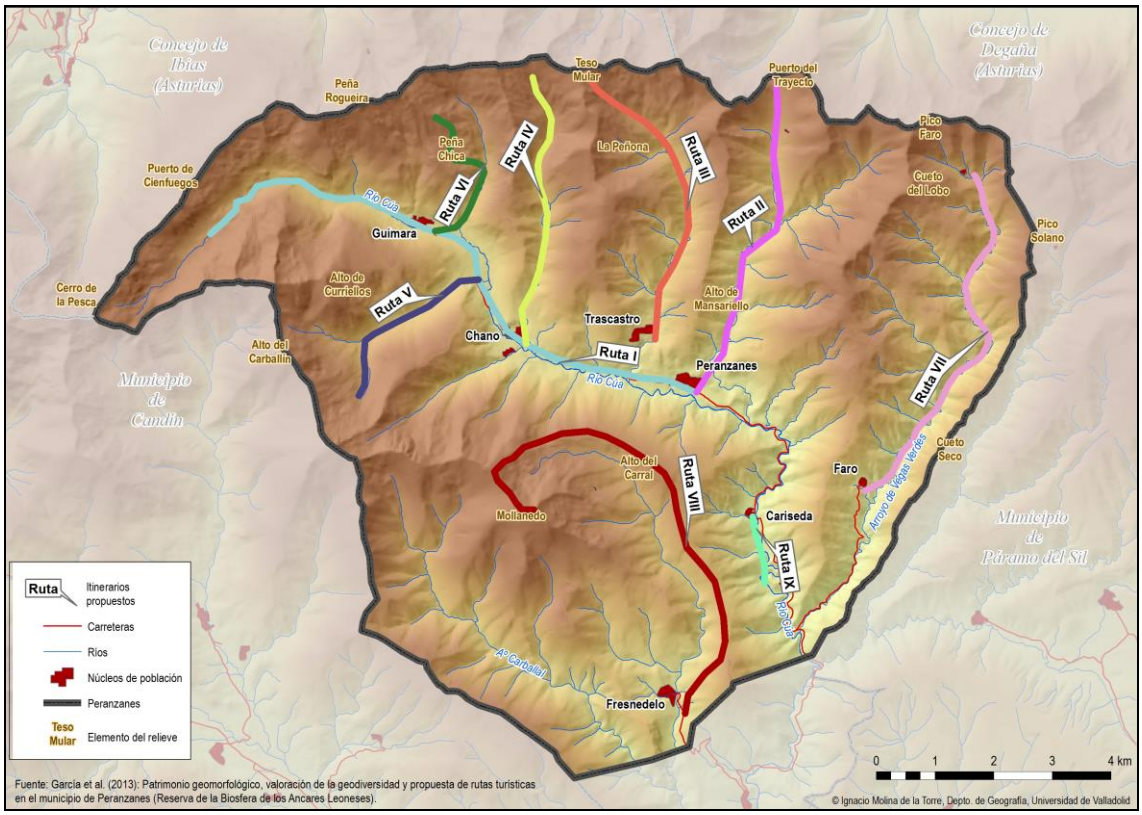

Figure 4. Peranzanes: proposed routes

A report that included improvement recommendations was drafted and addressed to the Local Authorities. This report was drafted as a result of the accessibility issues that were encountered and it included suggestions related to the improvement and clearing of pathways as well as other issues aiming at optimising the use of the tourism related resources that were identified.

(I). RUTA BÁSICA POR LOS PAISAJES GLACIARES DEL VALLE DE FORNELA	**Distance:** about 10 km. **Difficulty:** low (tour of asphalt or track in good condition). **Possibilities:** by car, bicycle or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(II). RUTA DEL VALLE DEL TRAYECTO	**Distance:** about 12 km. **Difficulty:** medium (tour of path, incline 450 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(III). RUTA DEL VALLE DE LA BRAÑA	**Distance:** about 10 km. **Difficulty:** medium-high (tour of path, incline 650 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(IV). RUTA DEL VALLE DE RÍO	**Distance:** about 10 km. **Difficulty:** medium-high (tour of path, incline 750 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(V). RUTA DEL VALLE DE MONDIEGO	**Distance:** about 6 km. **Difficulty:** low (tour of track, incline 350 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(VI). RUTA DEL VALLE DE ZAVUELVE Y LAGUNA DE GUÍMARA	**Distance:** about 10 km. **Difficulty:** medium-high (tour of path, incline 800 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(VII). RUTA DE LAS BRAÑAS DE FARO	**Distance:** about 15 km. **Difficulty:** medium-high (tour of path, incline 450 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(VIII). RUTA DE FRESNEDELO AL PICO MOLLANEDO, POR CARRAL	**Distance:** about 20 km. **Difficulty:** medium-high (tour of path, incline 1,000 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.
(IX). RUTA DEL ENCAJAMIENTO DEL CÚA Y LOS BOSQUES DE CARISEDA.	**Distance:** about 6 km. **Difficulty:** low (tour of track, incline 200 m). **Possibilities:** mountain bike or on foot. **Recommendations:** can be made at any time of year. From November to April will be cold and easily will find snow and ice.

Table 1. Peranzanes: proposed routes

5. Social and participative outcomes of service-learning: local agent involvement

Although there was no official evaluation on this matter, it would be interesting to highlight the high degree of involvement shown by the local agents, which left a very positive impression on the participants.

They cooperated, whenever it was required, in a selfless manner, at different levels: they helped with the preparation and choosing of the tours during fieldwork, as well as providing information related to the state and accessibility of the pathways. They were always thankful and congratulated the participants on their initiative and on their work.

They would also become involved in the enhancement of natural and landscape resources. They had always found these resources interesting and valuable -it is their homeland- but they lacked an access to a sound knowledge of their characteristics, origin and objective value. The combination of local knowledge and scientific work appeared at different levels: information about places of interest (because of their intriguing nature or their unknown origin), suggestions as to what places to visit (waterfalls, lakes, etc.) as well as active participation in fieldwork.

6. Problems and final assessment

Among the different issues that were encountered, the weather stands out. All the fieldwork took place during a period when the weather in the area is winter-like and highly unstable most of the time, rendering all work highly difficult. Weather conditions were adverse and uncomfortable, even dangerous at times, thus greatly hindering the work. Because of these conditions, the photographic material that was gathered was of a poor quality in general. Cataloguing the entire geomorphological heritage was also difficult, as well as drafting the tours. This problem would be difficult to solve, since the fieldwork needs to correspond with the academic year, making it impossible for the field trips to take place during the summer, which would be ideal from a logistical point of view.

Funding should not be a problem as long as it is not a problem for the sponsors of the service-learning experience: the Consortium and the Local Authorities of the area. On the other hand, another problem that was encountered was the exhaustion generated by the excessive length of all the trips involved in the fieldwork. The trips were organised in two-week periods, with a one-week break in between. However, Valladolid is about 250 km away from Peranzanes, making it necessary for a 3-hour trip to take place on Mondays and a 3-hour trip back the following day, with a single working day of intense physical and mental effort in between trips. A possible solution would be to concentrate all the fieldwork in several working days that would take place in a period of one to one and a half weeks. However, this is not an easy solution: Due to logistical, organization and permission matters, the working period would need to be programmed one to two months in advance, at the beginning of the semester. If the weather were unstable during the chosen period, all the effort would be wasted. In addition to this, class attendance would be completely altered for one to one and a half weeks, both for the students and the teachers. It would therefore be necessary for all the different possibilities to be tried out in order to establish which one is the most suitable.

In spite of all the issues that were encountered, the experience was clearly positive. From an educational point of view, the subject, which had a practical approach and content, was taught in a truly practical and applied manner, carrying out real and practical work. Students received comprehensive training that included a personal and intense service-learning experience that served as an educational innovation method. They worked outside the classroom, in direct contact with everyday issues and conditioning factors and working for the community -the local population and the managers of the RBALE-. In addition to this, several students obtained compulsory credits that corresponded to the "External Internship" required by the Undergraduate programme.

From the perspective of the application and transfer of results, the experience was also positive, with real scientific and technical results. The results can be used for land management purposes (both by the Local Authorities and the Reserve). The material that resulted from this experience can also be used by local actors: mainly rural tourism-oriented businesses.

In this way, the work developed was presented to local authorities in a meeting hosted by the Reserve which was held at City Hall of Vega de Espinareda on Thursday, September 26, 2013. This presentation was welcomed with signs of approval and in fact, decided at the same meeting that the project had continuity with its repetition, for the following year, in the town of Villafranca del Bierzo.

Also, results from studies are being broadcast in two main ways: by publishing routes on the website of the Biosphere Reserve of the *Ancares Leoneses* (http://www.ancaresleoneses.es/?p= 1031), and by publishing a book result of a cooperation agreement between the Publications Service of the University of Valladolid, the town council of Peranzanes and the Biosphere Reserve of the *Ancares Leoneses*. The book is expected to see the light at the end of 2014 or early 2015.

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