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Deliverable 12: Report on the second seminar on Trivers

February 2016

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LIFE13 ENV/ES/000341

With support from the LIFE+ programme of the European Union

Project partners:

Duration: 06/2014 – 06/2018

Implementing the Water Framework Directive to temporary rivers: tools for the assessment of their ecological status
LIFE13 ENV/ES/000341

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Responsible beneficiary: Universitat de Barcelona (UB)

Design by: © GLOBAL DESIGN DEVELOPMENT, S.L.

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CONTENT

Deliverable 12: Report on the second seminar on Trivers

1.- Organization 5

2.- Summary of the meeting 9
2.1.- Field trip with stakeholders at the Chícamo stream 9
2.2.- Usage of TREHS: playing with data 12

3.- After the meeting 17

4.- References 18

Abstract

This deliverable reflects the organization of the second stakeholders Meeting of Trivers on 27 and 28 January 2016 at the Central office of the Segura River Basin District, located in in Murcia (Spain). The meeting aimed at presenting the latest version of the software TREHS (Temporary Rivers' Ecological and Hydrological Status) developed by TRivers and the most recent results on hydrological status and ecological status of the selected study sites. It was planned in such a way that the participants the possibility to practice with the software, using their own data and the TREHS installed in their computers. A field trip to a temporary river in the Murcia Region (Chícamo stream) was also organized.

Participants' opinions about the use of TREHS and about the meeting were very positive. The debate on TREHS functions, data input and output, was very active and increased the understanding of the tool for its application in management. Some of the stakeholders stated that such a tool was really needed since long time ago. This allowed enlarging once again the TREHS community and creating synergies with other ongoing projects.

1. Organization

The LIFE+ project TRivers organised the second stakeholders meeting on 27 and 28 January 2016 at the Central office of the Segura River Basin District, located in in Murcia (Spain). This meeting aimed at showing the use and applicability of the recently developed software TREHS to the stakeholders and experts involved in the management of temporary rivers and streams. The main objectives were:

- To present the latest version of the software TREHS (Temporary Rivers' Ecological and Hydrological Status) developed by TRivers.
- To present the most recent results on hydrological status and ecological status of the selected study sites.
- To offer to the participants the possibility to practice with the software in situ, using their own data and the TREHS installed in their computers.
- To visit a temporary river in one of the most arid areas of southern Spain (the Murcia Region).
- Enlarge the TREHS community and create synergies with other ongoing projects.

The meeting preparation consisted of:

- First announcement of the meeting. A save the date email was sent to stakeholders by the project coordinator.
- Creation of an online application for registration.
- Preparation of the programme (Figure 1).
- Announcement at the website and twitter. The announcement contained information about the nature of the event, the programme, link to the online registration form, address of the place, and contact details (Figure 2 and 3).
- Last announcement. A final reminder was sent to all invited stakeholders.
- Room booking at the Central office of the Segura River Basin District.
- Preparation of material to be distributed to participants. This pack consisted of: TRivers leaflet and postcard, meeting programme, list of participants with contacts, questionnaire for stakeholders (figure 4), authorization for data usage, TREHS manual. All materials were environmental friendly and with low ecological footprint.
- Preparation of presentations. PowerPoint presentations were prepared by TRivers partners.

Uso y manejo del software TREHS: aplicación en la gestión de ríos temporales

Segunda reunión de *stakeholders* del proyecto TRivers

28 de enero de 2016

Sede Central de la Confederación Hidrográfica del Segura (CHS)- Plaza de Fontes, 1 - Murcia, España

Programa	
10:00	Registro de participantes
10:20-10:30	Presentación de la Jornada. (*CHS*)
10:30- 11:30	Estado de los trabajos del proyecto TRIVERS. *Narcís Prat, Núria Cid (Departament d'Ecologia- UB)* La herramienta TREHS, utilidades actuales, problemas encontrados, posibilidades futuras. *Francesc Gallart (IDAEA-CSIC)* Con un comentario sobre los resultados obtenidos en el campo el día anterior. Evaluación del Estado de los ríos temporales en el Plan de Cuenca de la demarcación del Júcar. *Teodoro Estrela (CHJ).*
11:30-12:00	Pausa-café
12:00-13:30	Taller sobre el uso de la herramienta TREHS. Uso de la herramienta TREHS por parte de los participantes. Animamos a todos los participantes a aportar su base de datos en el formato requerido por el programa*
13:30- 14:30	Trabajos que se van a realizar durante 2016 en el proyecto TRIVERS. Discusión y preguntas.
14:30	Fin de la sesión

*El análisis hidrológico en TREHS requiere información sobre el régimen de caudales o aportes del río. Los caudales pueden ser procedentes de una estación de aforos y/o de simulaciones mediante un modelo precipitación-escorrentía (PATRICAL, SIMPA, SACRAMENTO...) ya sea en régimen natural o alterado. Para introducir datos de caudales, el formato idóneo es el de valores de aportes (hm^3) o caudales ($m^3\ s^{-1}$) medios mensuales, ordenados en forma de tabla: las columnas representando los meses (de octubre a septiembre) y las filas los años hidrológicos. Los meses sin datos deben estar en blanco.

Figure 1. Programme of the meeting (in Spanish).

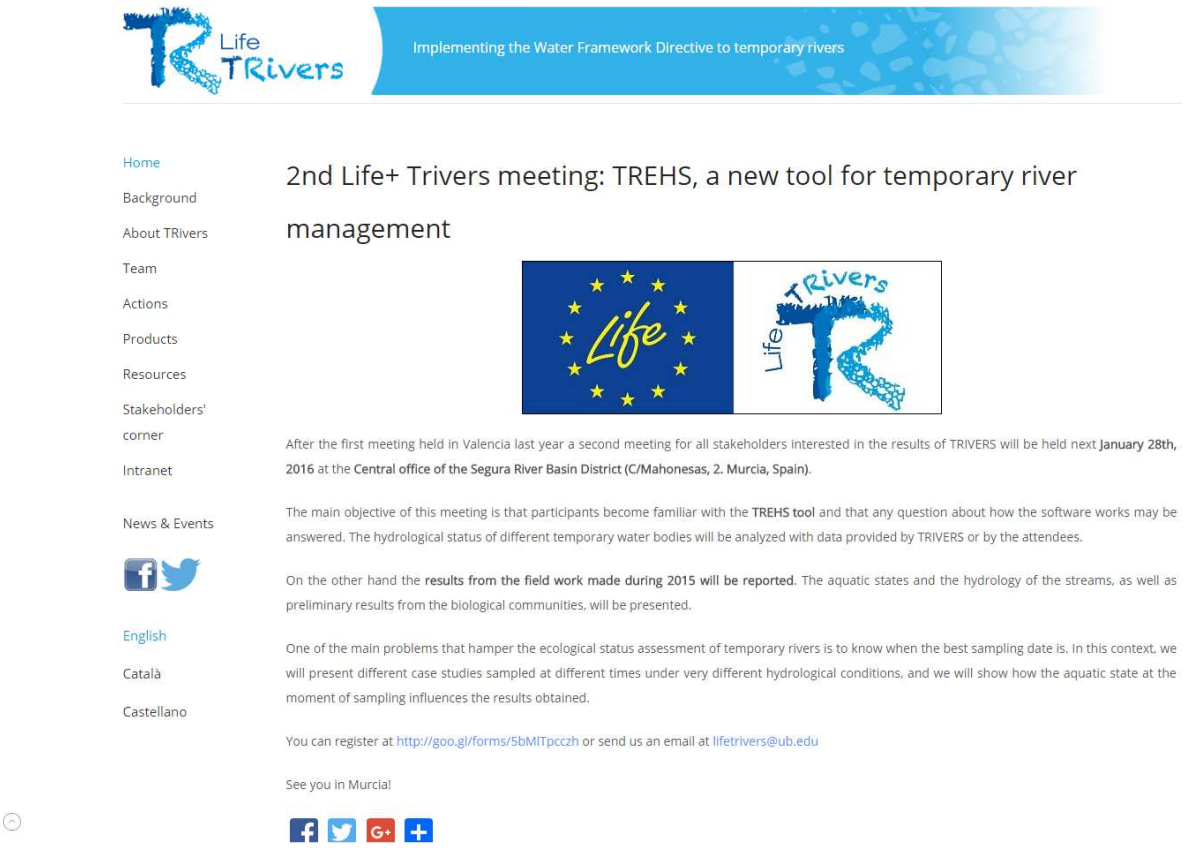


Figure 2. Announcement of the meeting at the TRivers website.

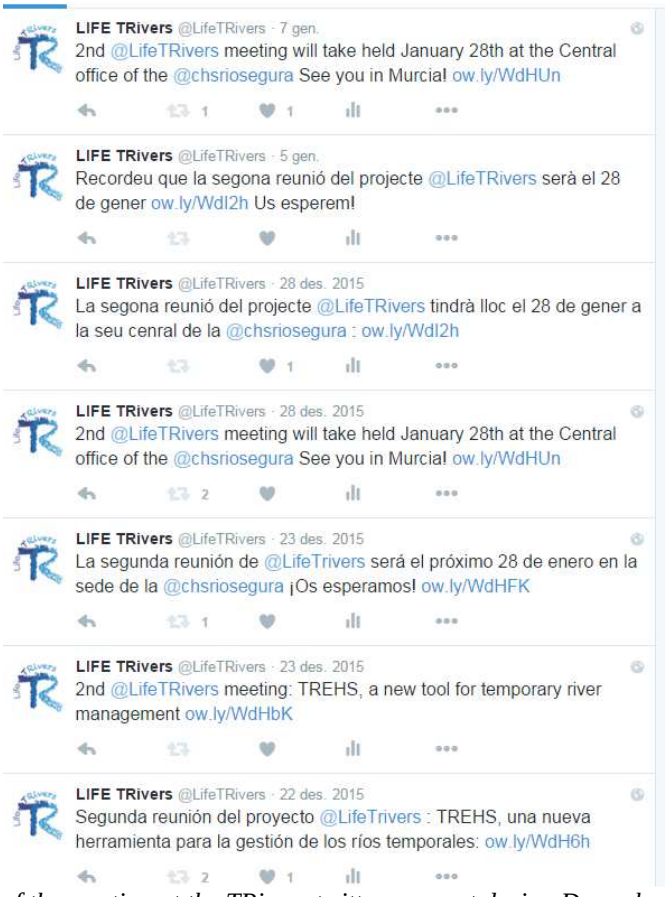


Figure 3. Announcement of the meeting at the TRivers twitter account during December 2015 and January 2016.

Segunda reunión stakeholders del proyecto Trivers- Murcia, Sede Central de la Confederación Hidrográfica del Segura, 28 de enero de 2016

Cuestionario stakeholders

Durante la parte final de la reunión se discutirá sobre el uso en la gestión de la herramienta TREHS. Para facilitar el diálogo y entender mejor cuales son los temas que os interesan, nos gustaría saber un poco más sobre vuestra experiencia en la gestión de ríos temporales, vuestras impresiones e ideas. A continuación os planteamos una serie de preguntas, las cuáles podéis responder durante el curso de la reunión. El objetivo final es tener una herramienta que responda a las necesidades de los propios usuarios.

Nombre y organización: ……

1. **¿Qué herramientas ha utilizado hasta ahora para diagnosticar si un río es temporal? ¿Cuáles son los principales problemas/limitaciones que ha encontrado en estas herramientas?**
   Comentarios……
   ……
   ……
   ……
   ……

2. **¿Cree que dispone de la información suficiente para poder determinar si un río es temporal de manera natural o debido a las pressiones e impactos que recibe?**
   □ Sí □ No
   Comentarios……
   ……
   ……
   ……
   ……

3. **¿Cuál es su impresión/ experiencia sobre la evaluación del estado ecológico en los ríos temporales? ¿Qué aspectos cree imprescindibles para mejorar su integración en los planes de cuenca?**
   Comentarios……
   ……
   ……
   ……
   ……

4. **¿Dispone de datos de ríos temporales que quiera utilizar para el ensayo y aplicación del TREHS?**
   □ Sí **¿Qué cuenca?** ……
   □ No, pero voy a disponer en un futuro.
   □ No
   Comentarios……
   ……

5. **¿ Le gustaría formar parte de la comunidad de usuarios del TREHS y recibir información al respecto?**
   □ Sí Contacto/s ……
   □ No

¡Gracias por colaborar!

Figure 4. Questionnaire given to stakeholders (in Spanish).

2. Summary of the meeting

On 27 and 28 January, the second stakeholder meeting of the LIFE+ TRivers project took place at the headquarters of the Segura Water Agency, in Murcia. During the first day, a field trip to the Chícamo temporary river was organized. During the second day, the latest TRivers results, both hydrological using the TREHS software and ecological, were presented and stakeholders and experts involved in temporary river management had the opportunity to use with their own data and see the functionalities of the TREHS software.

2.1 Field trip with stakeholders at the Chícamo stream

The fieldtrip to the Chícamo stream, a tributary of the Segura River and one of the water bodies where the WFD need to be implemented by the Segura Water Agency, had the objective to show the ecosystem in question, and to find some of the methodological difficulties in assessing the ecological status of temporary rivers and the needs for their adequate management.

The Chícamo stream drains a watershed of 501.8 km^2, having surface water flow for 13.5 km from the source, where 2 reaches with differing hydrology can be distinguished: a perennial upstream reach, and a temporary reach caused by diversion of surface water for irrigation (Gómez et al., 2012; Vidal-Abarca et al., 2004) (Figures 5, 6 , 7). Riparian vegetation is very scarce along the river and dominated by sporadic halophytic plants (Gómez et al., 2012). Recently, the Chícamo perennial stream reach has been declared as a fluvial reserve in the Segura Basin (Urquiaga et al., 2015)

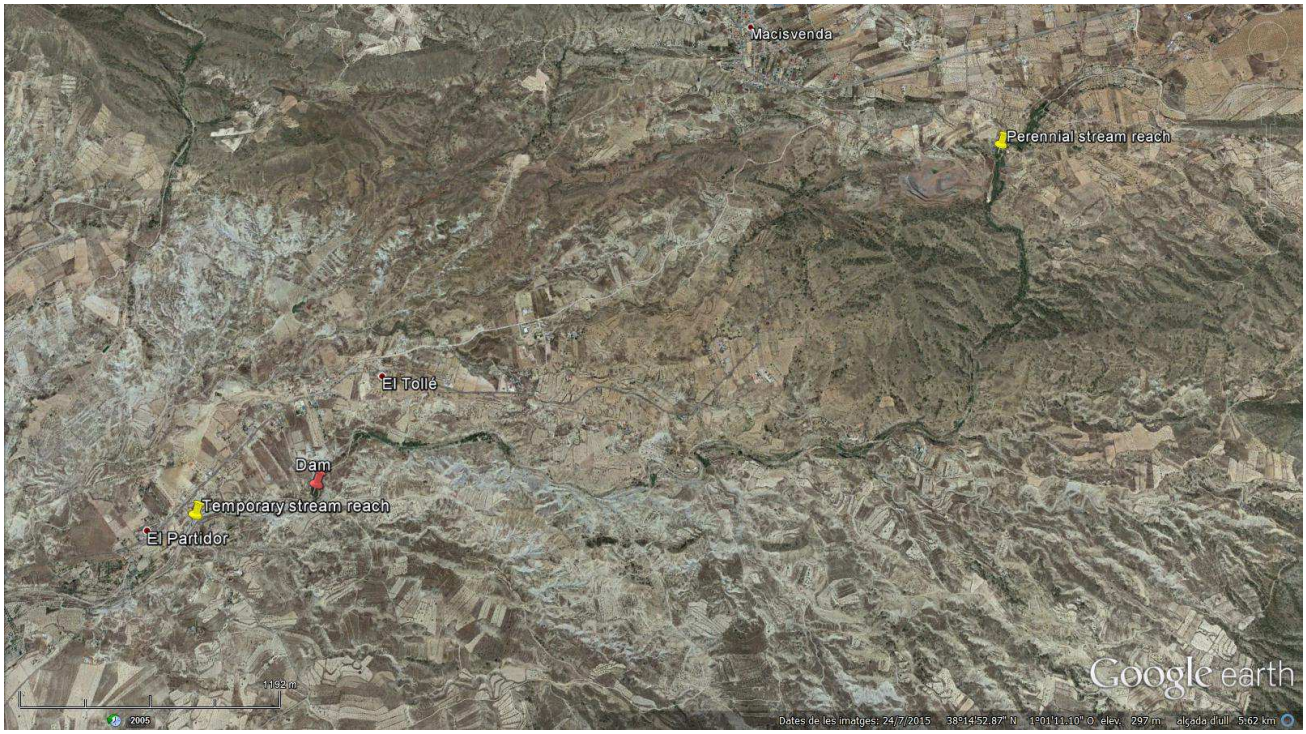


Figure 5. Map of the Chícamo River with the visited sites in yellow. In red, the location of the dam for water diversion.

During the field trip, samples of macroinvertebrates were taken and observed in trays directly in the field in order to determine the ecological status of each stream (Figure 6 and 7). The hydromorphological quality was also assessed with the help of participants. The smartphone app RiuNet, developed by the University of Barcelona, was used in order to make stakeholders familiar with similar products that will be developed in TRivers in the following years (i.e. TREHS app) and to make the activity more interesting.



Figure 6.The Chícamo temporary stream reach, Murcia. Picture: N.Cid.



Figure 7.The Chícamo perennial stream reach, Murcia. Picture: M.R. Vidal-Abarca.



Figure 8 .View of the semi-arid landscape visited in Murcia, with the Chícamo temporary stream reach on the right. Picture: N.Cid.



Figure 9 .Identification of macroinvertebrates for the ecological quality of the Chícamo permanent stream reach. Picture: N.Cid.



Figure 10. Sampling of macroinvertebrates at the Chícamo temporary stream reach. Picture: N.Cid.

2.2 Usage of TREHS: playing with data

The meeting was opened by representatives of the Segura Water Agency, and continued with an introduction of the participants describing their background. In total, 25 participants involved in water management attended the meeting and different profiles were present, including:

- Water managers from the Segura River Basin, the Júcar, the Tajo (from Portugal), and the Catalan Water Agency.

- NGO's such as Fundación Nueva Cultura del Agua.

- Representatives of other LIFE projects implemented in Murcia such as Segura Riverlink and Ripisilva.

- Enterprises related with water resource management working with the Segura River Basin.

- Representatives of the Council of water, agriculture and environment of the Murcia Region.

- Researchers from the University of Murcia who have devoted their work to study the streams and rivers of the region for many years.

The session started with a presentation by the project coordinator, Professor Narcís Prat, who explained the TRivers principles, in which the software **TREHS** (Temporary Rivers Ecological and Hydrological Status) is based on. These are Aquatic States, metrics and graphs, and rely on two main ideas: 1) the macroinvertebrate aquatic life in a temporary stream is controlled by the temporal succession of Aquatic States (AS) or transient sets of mesohabitats occurring in a stream reach at a given moment, depending on the hydrological conditions. 2) using the statistics of the periods with/without flow, two metrics may be defined that allow the characterisation of the regime: the flow permanence (Mf) and the seasonal 6-months predictability of the period without flow (Sd6). For more details, see Deliverable 9: the TREHS Manual.

Aferwards, the researcher Francesc Gallart continued with a presentation on the application of TREHS in the TRIVERS pilot basins. Using observed data, predictive models and, as an alternative, surveys conducted among locals, the participants could see the evolution of a river's aquatic states over time, the probability of zero flow periods throughout

the year and determine if the river regime is due to natural changes or human intervention. The facility works as a data base, a tool for obtaining graphs and metrics for characterizing, comparing and grouping water bodies, as well as a decision-support system for assisting the choice of adequate references as well as to assess the degree of alteration of the regime (hydrological status).

Núria Cid, freshwater ecologist and project manager of the TRivers, presented the recent results from the sampling campaign in 2015 on the ecological status in the TRivers study sites, which showed a clear change in biological quality in relation to the aquatic states. For more details on recent TRivers results, both hydrological and ecological, please see deliverable 11: report of the results for the first year.

Besides, Teodoro Estrela, head of the Hydrological Planning Office at the Júcar Water Agency and also associated beneficiary in TRivers, presented their recently developed approach for assessing the status of ephemerals streams using stressors as a proxy for determining the status of these type of water bodies (Figure 12).



Figure 11. Professor Narcís Prat, with an explanation of the main concepts of TRivers. Picture: CHS.

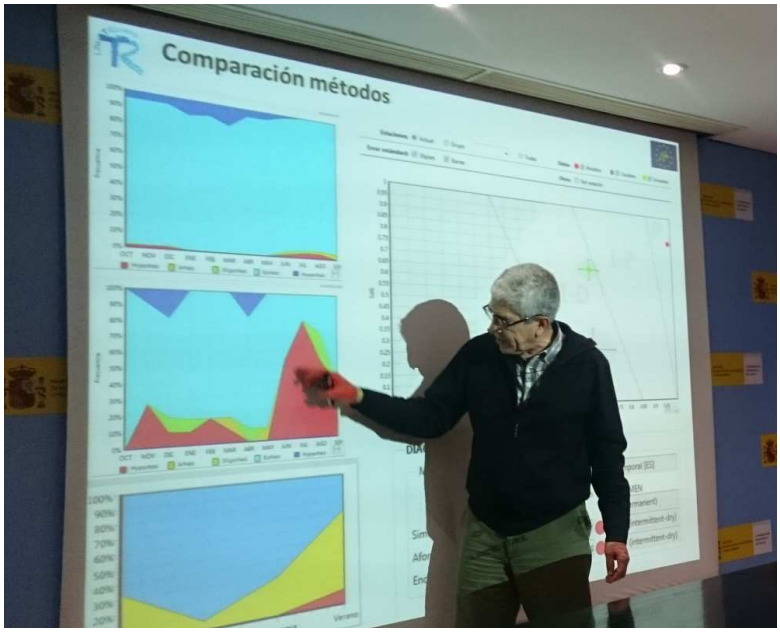


Figure 12. The researcher from IDAEA-CSIC, Francesc Gallart, explaining the different methods to obtain the aquatic regime statistics with TREHS tool using models, hydrological data and interviews. Picture: N. Cid.



Figure 13 .The freshwater ecologist Núria Cid, from the department of Ecology of the University of Barcelona, showing the first results of the ecological status.



Figure 14. Teodoro Estrela, from the Júcar Water Agency, showing an approach developed for ephemeral streams. Picture: N. Cid.

The second part of the meeting was more practical and attendees could install the TREHS software in their computers, enter their own data, and learn how to obtain and interpret the main hydrological statistics (Figure 15 and 16). During the use of TREHS, the following questions arose:

Q- Is it possible to use TREHS with diverse data sets of flows, for instance of diverse periods or diverse simulations for natural, impacted or climate change scenario regimes?

A-Yes, there are two possibilities. The easier one is to upload these diverse data sets for the same sampling reach and afterwards switch among them; the results for everyone will be obtained but can only be compared by pairs. The second option is to input the data as corresponding to diverse observations for the same water body, and then the results can be easily compared among them.

Q- Is it possible to use sparse (discontinuous) flow data?

A- Yes, the flow data can be uploaded as spare mean monthly flows in the year-month matrix. The system recognises blank cells as lacking data, not as zero values.

Q- Is it possible to visualize the historical sequence of aquatic states or flows, such as in a hydrograph?

A- Yes, it is possible to visualize the sequence of aquatic states for a given year if there are flow records for it. Other kind of temporal sequences are not supported by TREHS.

Q- Is it possible to upload another kind of information on the aquatic states?

A- In the present version it only accepts observed and simulated flows, as well as results from interviews. It is foreseen to develop a new version allowing the system to upload instantaneous scattered observations of aquatic states, such as those made by an occasional observer, an operator when taking water or a biological sample, or as interpreted in an aerial photograph or satellite image. In the future, this is expected to be the regular way of obtaining systematic observations of aquatic states, because gauging stations cannot be placed everywhere and do not provide information on all the aquatic states.

Q- Is it possible to work with biological data?

A- Not yet. This is the next step of TREHS development, that will be made by merging TREHS with another facility already developed for analysing the biological information and making the evaluation of the ecological status.



Figure 15. Attendees using the TREHS software. Picture: N.Cid.



Figure 16. Attendees using the TREHS software. Picture: N.Cid.

In conclusion, participants' opinions about the use of TREHS were very positive. Some of them stated that such a tool was really needed since long time ago. In addition, the meeting engaged stakeholders and scientists interested in ephemeral streams to organize a workshop lead by the Júcar Water Agency to be held in Valencia during this year. The meeting will be focused on the potential approaches to be used for determining hydromorphological conditions. At the end of the meeting, a picture of the group was taken at the Segura Water Agency (Figure 17).



Figure 17.Stakeholders and scientists attending the meeting in Murcia. Picture: N.Cid.

3. After the meeting

After the meeting, a *thank you* email was sent to the participating stakeholders and the links to media where the event appeared. The dissemination material of TRivers was given to the Segura Water Agency, to help us in raising the awareness for the recognition, conservation and restoration of these ecosystems in Murcia (Figure 18). For more information on media related with the event see 'Deliverable 10: Press release report'.



Figure 18 .TRivers dissemination leaflets and postcard at the CHS Picture: N.Cid.

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