

Minutes – Barrier Assessment Workshop (BAW)

Dates: 02 Nov 16 to 03 Nov 16
Location: Southampton University,
Southampton, UK
Minutes by: Dr. Ian Dodkins
i.r.dodkins@swansea.ac.uk



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Additional files:

1. BAW meeting schedule - final.pdf
2. Simone DRAFT D1.1.1_PartB_v1.0.pdf
3. Joost - AMBER app tender.pdf
4. Pao-Wouter Data collection responsibilities.xlsx
5. Jim Kerr - Barrier survey methods.pptx
6. Tim Feierfeil IBK passability metric.pdf
7. Southampton_workshop_beavers_culverts.pptx

Attendees:

SU Ian Dodkins, Carlos Garcia de Leaniz
DU Jeroen Tummers
SOTON Jim Kerr and Andrew Vowles
UHI -
DTU Kim Aarestrup and Niels Jepsen (attended via skype)
UCC -
IFI Jimmy King and James Barry
WFMF Joost van Deelen
WFMF Pao Fernandez
UNIOVI Elena Arboleya and Sara Fernandez
AEMS César Rodríguez and Gloria Lázaro
ERCE Zbigniew Kaczkowski
SSIFI Piotr Parasiewicz
POLIMI Barbara Belletti
POLIMI Simone Bizzi
CNSS Gilles Segura and Patrick Martin
WWF Chris Hossli (attending via skype) *experienced technical difficulties*
IBK Tim Feierfeil
SYD Johan Tielman
RWE Devid Krull
JRC Wouter Van der Bund
EDF Stéphane Tetard

Chris Griziok (Environment Agency - England)

Key

Grey boxes = quoted from grant agreement
Blue boxes = major decisions made (D1, D2...)
CS = Citizen Science

1. Previous Actions

First meeting of the Barrier Assessment Workgroup (BAW)

This section is relevant from Grant Agreement:

T1.1. Development of common standards for stream barrier surveying and inventorying

Participants: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19*, 20 (*) = task leader

Common standards are needed for the characterization and reporting of stream barriers. A Barrier Assessment Workgroup (BAW) will be formed and a Barrier Expert Assessment Workshop will be organized to develop a classification of stream barriers (typology) and the barrier qualitative/quantitative attributes (function, structure and context) that need to be reported. This will then be trialed by all partners before the national surveys are conducted.

T1.1.1. Constitute a Barrier Assessment Workgroup (BAW) among participants, with help from external experts.

T1.1.2. Organize a Barrier Expert Assessment Workshop (BEAW).

T1.1.2. Develop a barrier data management strategy.

This is needed to limit the survey to a representative, yet manageable subset of all European stream barriers (e.g. a threshold on barrier height, and/or a threshold on the hydrographic level of streams to be considered). For any European country, it is expected to collect at least data on the rivers reported under the WFD and for barriers of height 1.5 m or more (to be agreed at the BEAW)

- a. Define standards and spatial coverage for data collection
- b. Define thresholds/filters for barrier reporting
- c. Define structure of reporting tables to be used in the country-specific stream barrier surveys
- d. Develop criteria for data verification, dealing with duplication, and reusing
- e. Define standards for data curation, updating and long-term preservation
- f. Define standards for data accessibility

T1.2. Stream barrier inventories in individual European countries

Participants: 2, 5, 6, 7, 8*, 10, 11, 12, 13, 14, 15, 19

All 33 EEA countries will be covered by the atlas; with data collated by experts from the 11 participant AMBER countries, and national experts contracted by JRC in the other 22 countries (this task will be subcontracted). They will compile the available information on stream barriers from existing national and regional databases and enter it on the AMBER database. Additional data will be fed in from the European wide 'citizen science' volunteers network in WP5 and from additional available sources such as Google Earth. The result will be a GIS spatial database with the location of barriers, their type and their attributes as identified under T1.1. We will agree on a realistic and cost effective target completeness rate (e.g. 70%).

T1.2.2 In situ field validation of barrier data in selected, representative watersheds (detailed in WP2 and WP5).

T1.2.3. Estimate reliability and spatial coverage of barrier data for different countries, regions, and types of watershed.

Coverage of existing databases is likely to differ widely among countries and regions. We will estimate true positive rate (sensitivity) and false positive rate (100-specificity) to derive ROC curves for different barrier heights, types and watersheds.

T1.2.4. Apply correction factors (derived from ROC curves and machine learning) to reduce bias in the estimation of barrier density, and derive more accurate assessments of the extent of stream fragmentation in transnational comparisons.

T1.3. Harmonisation of country-specific surveys and quality control

Participants: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19*

Survey results will be collected and harmonised in order to ensure consistency. Contributors will be asked to crossvalidate data subsamples to achieve standardisation and quality control, as much as possible. The harmonised database will use agreed standards (such as PostgreSQL), appropriately organized, and will be made available through the project web site, JRC data portals, as well as a one-off product.

T1.4. Launch of Europe's Stream Barrier Atlas (ESBA)

Participants: 1,8,19*

Based on the outcomes of WP5, the database will be ported to an interactive web site that will allow users to submit additional information on existing barriers, as well as to introduce information on new barriers. "Unchecked" data will be made provisionally available, while data submitted by the public will be incorporated in the database after appropriate quality control checks. This will take the form of an interactive online Atlas. This capacity for on-going data collection and database management beyond the end of the AMBER project is an integral aspect of the Adaptive Management philosophy within this proposal.

Publications: 2 peer review (Reconnecting EU rivers, Extent of River fragmentation), 1 policy briefing (JRC Science for Policy Report on barrier metadata)

2. Noted and discussed:

2.1 Outline of the Atlas and definitions

refer to document: 2. Simone DRAFT D1.1_PartB_v1.0.pdf

Simone's talk

1. Atlas has to (i) be a pan-european data base (ii) be feasible (iii) cover all the data collected (ie. inc. Balkans)
2. The GranD database is the only global dam database (it also covers Europe) but only includes large dams. There are also high quality national databases (e.g. France, Sweden) and regional databases available.
3. Most databases miss small barriers, which are the majority of barriers. Thus barrier numbers are highly underestimated.
4. Two levels of data in databases:
 - barriers across Europe (general & common variables.. as listed in attachment)
 - more detailed information e.g. specific catchment studies on Danube

D1. A simple unified database needs to be created. Thus Level 1 variables are 20 defined variables (supplied in document no.2) based on a compromise of what is both commonly available and useful. Level 2 is additional data which is also useful but is not available for many barriers. ALL the data for a barrier will be kept in the database. Thus Level 3 data (all additional data) will be in subsequent columns.

5. European standards will be used in constructing the database.
6. All available barrier data will go into the Atlas data-base, including national data, district or local data, citizen science data (once validated), previous case studies, AMBER case studies and new data from Balkans. From experience, an authority just provides ALL the barrier data so no problem asking for it all. Case studies, CS and validation will provide new data collected by AMBER, but there will be no other AMBER data generated by surveying (other than for field validation)
7. **Carlos - Prime aim is:** to produce one map with common standards to be able to influence policy makers. It must be uniform in content and of similar spatial density (i.e. representative) across Europe. Small barriers are collected in different ways in different countries, so needs to be unified way of examining this. Some form of field validation needs to be carried out to estimate the incidence of missed barriers and derive correction factors across countries

D2. It was decided that the parameters to create a single map to influence policy makers (e.g. just barriers over 0.5m) will be deferred until after the data has been collected or until just before this map has to be produced. The Atlas will not exclude any barrier data collected, and the Atlas data will apply filters to be able to create the map to influence policy makers.

8. Piotr: Ideally the atlas should show the range of types of real barriers (including those below 1.5m) and should show impact, not just number.
9. Joost's app presentation: Friday (4nov16) is tender submission deadline. Obligatory for app is photo, location (gps) and date. Optional is height; use; partial/complete barrier. By mid-November 16 candidate will be selected. App ready for field use by June 2017 (details of tender in file 3). Tier 2 is still tentative.
10. Within app it was suggested that it could be used to attract public attention to a dam which has issues (e.g. clicking to say they are concerned about the dam), but there were worries that this may be subjective and become political.
11. There is some data from authorities or hydropower that is not for the public. We should take this data, and we can use it for our scientific analyses (and for barrier number estimations) but we cannot use that within the Atlas to be presented as a publicly available map nor downloadable to the public.

12. Culverts should be part of barrier assessment, even if not within the available data. There is the potential to use method of intersecting streams and roads (from GIS) to estimate culverts and also the validation exercise will examine culverts.

2.2 Validation Process

The methodology to validate the data will aim to determine anything which is a barrier to the biota. We need to be able to compare connectivity between countries across Europe; to get a realistic idea of the extent of river fragmentation in Europe and ensure that the density of obstacles is comparable across Europe (i.e. doesn't appear to be more obstacles just because it is an area with high survey intensity). The purpose is to enable the upscaling of the barriers counted in national surveys. Thus validation is likely to choose catchments or sub-catchments that are representative of a certain survey method. It has to be relatively quick due to the resources available for validation.

D3. It will be done by a team within the country but there will be a meeting to ensure that every validation group is surveying in exactly the same way. Only a few selected sub-catchments throughout Europe will be validated due to resources. Thus, culverts, small barriers and indeed anything that a specialist considers a barrier, will be measured. ALSO, there is required to be some classification to ensure that we can have some flexibility in upscaling. i.e. if maps produced from the Atlas can allow filters for barriers >1.5m, then the validation must specify these barrier heights as this will affect the upscaling. Type of barrier will also have to be recorded. JRC will develop a complete and detailed methodology of the validation procedure to ensure that the same procedure is used throughout all validation locations (to make upscaling comparable across Europe). Variables should be kept to a minimum but likely to be exactly the same as those that will be used as filters in the Atlas.

Tier 2 specifications within the app may be coordinated with the requirements for the validation surveys. Algorithm will be used to see if similar sites (recorded with CS) are actually the same site – but we have to remember that each citizen will still want to know that they collected data for that site.

NB: many authorities don't even record criteria they use (e.g. they implicitly assume they are just looking at larger barriers and not e.g. 0.5 m high) thus JRC will look at the data (including distribution histograms) and see if there is data missing (eg culverts, or below a certain height). Clarification on why the data is not as expected will be sought in order to check if there are criteria that were implicit.

2.3 Addressing Grant requirements (T1.1.2)

T1.1.1 Barrier Assessment Workgroup (BAW) was constituted (those listed as attending meeting)

T1.1.2 This meeting is the Barrier Expert Assessment Workshop (BAEW)

T1.1.2

- a. Spatial Coverage: All available existing data for the 33 EEA Members and also countries in the Balkans, where there are plans for extensive dam construction .
- b. Thresholds/Filters: These will be defined at a later date based on all the data collected, to best systematically represent the impact of barriers in Europe.
- c. Reporting tables are based on the 20 level 1 variables (see 2. Simone DRAFT D1.1_PartB_v1.0.pdf), followed by columns for the level 2 variables, as well as any additional data (same order, units as defined in the file or otherwise SI units).
- d. Duplication will be dealt with by an algorithm which will flag if two sites have a similar location. Data will be publicly available through the Atlas website. Data collected by authorities (national and local) will be assumed to be accurate and correct but JRC will ensure there are no overlaps/errors through examination of the database.
- e. Spreadsheet '4. Pao-Wouter Data collection responsibilities.xlsx' lists the responsibility of AMBER members for contacting authorities and obtaining data. The contact list will be maintained to enable future data to be curated and it is hoped that (maybe through the WFD River Basin Management Plans) a more permanent link (real time update) between national barrier records and the JRC database could be established. JRC will

store the data in ISPRA and funding will be applied for towards the end of the project to assist with long term preservation of the data.

f. Data accessibility: There will be two websites: (i) public 'app' website which has a pretty front end and gaming aspect to encourage CS data collection. This will include (and distinguish) validated and non-validated data (ii) an atlas website, which is also open to the public, but orientated towards research. Downloadable Excel files of the data (by country) will be available on the site.

T1.2.1 The Balkans will be covered by staff subcontracted by JRC. Responsibilities for data collection were specified in file 4.

T1.2.2 Representative watersheds for validation will be selected during the ongoing data collection when there is a clearer idea of data extent as detailed in 'Validation Process' above.

T1.2.3

D4. Estimate reliability and spatial coverage of barrier data for different countries, regions, and types of watershed: this will be done by the data analysis team (coordinated by JRC): JRC, POLIMI, SWANSEA, DURHAM, CNSS France and WFMF. Luca Borger (SU) may assist. This will include looking at histograms of data distribution to examine if e.g. smaller barriers and all barrier types are represented.

2.4 Data procurement

File: "4. Pao-Wouter Data collection responsibilities.xlsx" details the agreed responsibilities on who is contacting and collecting the data (taking over from Pao who did preliminary contact in most cases).

D5. Procedure for those collecting data:

1. Use **contact** for the national data base (contact provided by Pao in file (4))
2. Also see if **regional data bases** or previous case studies exist, especially if no national data is available
3. Ask data providers for the **criteria** they used for monitoring barriers (the procedure, which barriers they ignored, limitations etc)
4. Organise this data with the **20 columns** (including same units) for level 1. Categorical data should not be converted to continuous data at this stage. Level 2 data should also have the same columns as listed in file (2) and then all additional data follows in subsequent columns.
5. The contacts from which all the data was/can be provided must be retained and submitted to JRC (i.e. the official contact so that more data can be procured in the future)
6. Ask and keep a record (email, declaration etc) that data can be made available for public use. We could use a variable e.g. public data? with a (1/0) to flag that can't be used (1 = yes, 0 = no).

2.5 App

1. Need to have a separate meeting with relevant people that really focuses on making it into a popular gaming app, and also about marketing it effectively. Marketing and gaming of app a fundamental aspect that needs lots of input, ideas and work.
2. Devid noted important difficulty of app: Health and Safety. Needs a disclaimer and needs to be investigated in ethics WP since people could be risking their lives to take photos of barriers. (I recommend caution and also not to enter private land). Many larger obstacles are blocked to the public (though many of these will be recorded by authorities anyway).
3. Priority is to get app widely used and out quickly, then we can improve its use.
4. Carlos: there is a call to get money for continuing maintenance of science databases – can apply for this nearer the end of AMBER to continue data collection and maintenance.
5. GPS location with a photo is where the phone is located, not where the obstacle is located, so accuracy may not be good. However, at this scale, does it matter? If it is <0.5km from site still gives a good European map.

6. Larger obstructions may not be photographed close up due to lack of access, thus GPS location will be inaccurate. However, this is not a problem because larger dams mostly intensively studied so less important and also the spatial resolution of the Atlas doesn't have to be high (if an important barrier, an expert would still have to go out based on location from CS and survey site).
7. Piotr: is there educational potential in Tier 2 of app where they eg can find or identify different fish ladders at barriers? Much of this can be assisted by the app website.
8. River names in app to identify location would be useful, but problem is that then a keyboard interaction would be needed and app is very simple (categorical, pressing buttons). We could include this in Tier 2 if we want it.
9. T3.1 German case study will utilise app

D6. Two websites will be created: one for the Atlas and one for presenting the Citizen Science data. CS data will be of low quality and may be too large to validate quickly. Thus, in first instance, is just represented in app, then there will be a simple 'game' website for CS interaction. The Atlas will be a separate data base with a map front end (probably based on a few filters of data), allowing data to be simply downloaded and for scientific use and visualisation for policy makers. This will include the CS data that has been validated and case study data and authority data but it is not really targeted towards the general public (even though publicly available).

2.6 Passability method and review

1. Decision tree can save survey costs (Ian asked for evaluation of methods to increase speed/efficiency and cost of survey) e.g. 15 velocity measurements can be very time consuming especially if done for even tiny barriers.
2. Also – we need to be careful about interpreting passability scores (a single score on its own doesn't guide precise management decisions; it is only useful at a wider strategic level)
3. Problem of time consuming monitoring (data -> information -> management)
4. Comparison of methods (by Jim) ICF has binary 1/0 can pass or not and the score is made by combining these.
5. Tim's presentation: The swimming ability assigned to species varies between protocols (see File 6)
6. Hydropower parameters are useful to monitor for hydropower potential (part of decision system)
7. Assessed to look at 300 days of passability but questioned in that, depending on species, some days are very important for migration and others not, so may not represent passability well.
8. Critique of using ratios (1 spp not passing out of 2 is different scale of problem to 30 species not passing out of 60 but a ratio doesn't reflect this. Also ratios are non-linear and lose information)
9. Based on number of naturally occurring species restricted in migration (but is this fish that already exist in the river, or which should exist in the river?)
10. Felt that current methods have already had a lot of work invested so fear about investing time in something that may not be as good as current methods.
11. Piotr: measurements of barrier dimensions (height, width etc) can be done simply using stereo-photography. Quick and easy techniques for this have already been developed.

2.7 Meetings & Admin

1. AMBER members were finding it difficult attending the large numbers of conferences and meetings. Some meetings should be combined.

D7. The General Assembly meeting with Steering Group (EAB) will be around June/July each year (programme in development).

1. Questioned whether Swansea Server was in use. It is being used and will be continued to be used for transferring data.

Actions

1. From each data provider, by 30 November 16 sends to Simone:
 - What they can do in terms of providing data
 - info on the availability and quality of that data
 - When the data will be available (ASAP!)
2. Simone to check Tier 1 & 2 of app to see that he is happy with it.
3. Deliverable D1.2 (metadata) by March 2017. Expectation that the major databases are already collated. Although collection is ongoing (2 years) all available data will be detailed in the March 2017 D1.2 deliverable (i.e. the metadata describing it, not necessarily having all the data). Also will have a complete data base of contacts at the same time. NB. The Atlas data will not be 'complete' until month 36.
4. Data validation meeting in future for all those who will do it (too costly to use the same team to validate everywhere).