

Report of the Workshop on the Protection and Management of Small Water Bodies

Brussels, 14th November 2013



Report of the workshop organised by the **European Environmental Bureau (EEB)**, in co-operation with the **European Commission**, the **Lithuanian Presidency** and the **Freshwater Habitats Trust**

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Glossary of terms

CAP	Common Agricultural Policy
EFA	Ecological Focus Area
GES	Good Ecological Status
BHD	Birds and Habitats Directive
HD	Habitats Directive
IUCN	International Union for the Conservation of Nature
RBMP	River Basin Management Plan
WFD	Water Framework Directive

Disclaimer

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Summary

A workshop on the protection and management of small waters took place in Brussels on 14 November 2013 with the aim of providing a forum to discuss possible ways to better protect and manage small waters in the context of the Water Framework Directive (WFD) and Nature Directives, and to begin the process of preparing an advisory manual for policy makers and practitioners.

The workshop was organised by the European Environmental Bureau (EEB), in co-operation with the European Commission, the Lithuanian Presidency and the Freshwater Habitats Trust. A total of 62 participants from 18 Member States attended the workshop, including water managers and nature conservation practitioners, policy makers, scientists, other stakeholders and NGO representatives. The programme for the day included presentations and question and answer sessions in the morning, followed by three discussion groups in the afternoon.

The workshop programme aimed to introduce and discuss the main issues affecting the protection and management of small waters. Key scientific evidence of the importance of both lentic and lotic small waters for the protection of freshwater biodiversity at the catchment scale has only become available after the introduction of the WFD and is now becoming more widely known. Small waters also play a crucial role for the conservation of species and habitats of European and national importance. Together with the provision of other ecosystem services, such as nutrient retention and nursery areas for fish, these are the main drivers underpinning work to enhance the protection and management of small waters.

There is no accepted pan-European definition of small waters (or small water bodies), but it is generally accepted that they include headwater streams, small lakes, ponds and ditches. Small waters – running or standing – occur in all landscapes and are inherently heterogeneous. Indeed, in contrast to larger water bodies, because of their small size and small catchment areas, the biological characteristics of small waters are considerably affected by local environmental factors. Small waters are also varied across biogeographical regions. Mediterranean small waters are often temporary and support high endemism compared to more temperate regions.

Improved links between the implementation of water management and nature legislation and policies could potentially be one of the mechanisms to improve the protection of small waters, and this was one of the key issues discussed during the workshop. The WFD, Birds and Habitats Directives (BHD) and the EU 2020 Biodiversity Strategy all include provisions or policies which could lead to better integration of small waters within existing legislative mechanisms, potentially leading to better monitoring and management. Resource issues and knowledge gaps have so far been perceived as major barriers to this integration.

Existing initiatives and projects throughout Europe provide examples of the benefits of protecting and managing small waters. Re-wetting agricultural landscapes by creating new habitats or restoring hydrological regimes in modified catchments, either for biodiversity and/or the provision of ecosystem services such as nutrient retention, are some of the examples presented in case studies during the workshop. There are also examples of how small waters monitoring and management programmes have been implemented by the general public, including landowners. This is potentially an important mechanism to raise awareness of water management and biodiversity issues, and to ensure better stakeholder engagement in the WFD process.

A number of key points and recommendations emerged from the information presented and discussed throughout this one-day workshop:

- There is now broad consensus that small waters are a critical but vulnerable part of the freshwater landscape, and that their protection needs to be integrated within the existing legislative framework.
- A catchment approach is needed for the protection of small water bodies to maintain their heterogeneity, which underpins their role as reservoirs of biodiversity and the significant contribution they make to catchment diversity.
- Better synergies between the WFD and BHD would not only benefit the implementation of these directives but also lead to improvement in the protection of small waters, at least within designated areas. Improved implementation of BHD may also lead to better protection of small waters supporting species or habitats of European importance outside designated areas.
- The specific role of small waters in delivering EU 2020 Biodiversity targets, and in particular ecosystem services, and in improving the WFD and BHD delivery overall needs to be evaluated further. For example, are the ecosystem services provided by small waters different from those provided by larger waters? Bearing in mind that 80% of the running water network is small waters, is the integration of small waters in the WFD crucial to reaching good ecological status (GES)?
- Further research is needed to improve our knowledge of small waters in Europe and to develop practical tools to monitor and manage them. In order to minimise cost, risk-based approaches or other methods involving grouping small waters need to be further explored and informed by the knowledge gained during the development of the WFD monitoring and classification methods for larger waters.
- Public and landowner participation may provide a mechanism for monitoring small water bodies but this is not resource-free because of the structures needed to ensure data quality and volunteer training, coordination and support in the long-term. This approach is however likely to provide added benefits in terms of improved stakeholder participation in water issues.

The participation at this workshop of a wide range of stakeholders from across Europe showed that there is increased awareness and interest in the issues surrounding small waters protection and management. The general consensus that small water bodies are important for biodiversity and other ecosystem services, highlighted in the current workshop, is a major step towards their protection. An advisory manual on the protection and management of small waters, primarily for policy makers and practitioners, is being prepared as a result of this workshop and will be published in 2014. There are still major challenges that need to be addressed before small waters are fully integrated into the existing legislative framework.

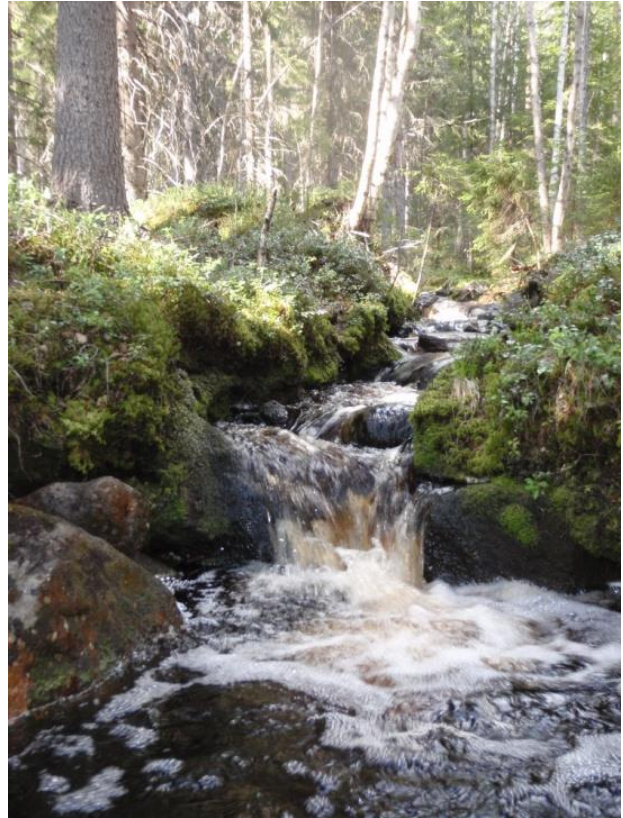
1. Background and aims of the workshop

Small water bodies are abundant in Europe but it is only comparatively recently that research has shown how important they are for freshwater biodiversity and ecosystem services (see Box 1 for definitions of small waters). There is now growing awareness of their significance, as shown by the EEA's *European waters – assessment of status and pressures*¹ and the European Commission's *Blueprint to Safeguard Europe's Water Resources*², both published in 2012. However, they remain largely neglected in water management policy and practice, despite the opportunities presented by small waters management and protection for the conservation of freshwater biodiversity (see Box 2).

On 14 November 2013 the European Environmental Bureau (EEB), in co-operation with the European Commission, the Lithuanian Presidency and the Freshwater Habitats Trust, organised a workshop on the protection and management of small waters (see Box 1 for definitions) with the aim of exploring how to prevent further degradation of small waters and begin the process of developing a small water bodies advisory manual for policy makers and practitioners.

The workshop took place in Brussels and aimed to bring together policy makers, technical specialists and other stakeholders to consider how to better manage small waters without excessive cost. Specifically, the workshop objectives were to:

- provide a forum to discuss possible ways to better protect and manage small water bodies; and
- begin the process of developing a manual of best practice advice for the protection and management of small water bodies in EU Member States.



Forest stream in Denmark (Emma Göthe)

The workshop on the protection and management of small waters was attended by 65 participants from 18 Member States including water managers and nature conservation practitioners, policy makers, scientists and NGO representatives (see Annex 1 for a list of participants). The workshop programme included presentations and plenary sessions followed by breakout groups to discuss key aspects of the protection and management of small waters (see Annex 2 for a full workshop programme). The present document summarises the presentations and discussions that took place during the day. The speakers' presentation slides can be accessed through the EEB website: <http://www.eeb.org/index.cfm/news-events/news/how-protecting-small-things-matters-a-lot/>.

¹ EEA (2012) European waters – assessment of status and pressures, EEA Report No 8/2012.

² EC (2012) A Blueprint to Safeguard Europe's Water Resources, COM(2012) 673 Final.

Box 1. Small waters, what are they?

There are no universal or legislative definitions of small waters or small water bodies (these terms are interchangeable), but it is generally accepted that small waters include headwater streams, ditches, small lakes and ponds.

Headwater streams are normally defined as zero, first or second order watercourses, although some European headwater studies have extended the definition to third order streams. In the WFD terms, small linear headwaters are those with catchments less than 10 km².

Springs and flushes occur on gently sloping ground, are often linear or triangular and may include small watercourses. Flushes are defined as an area of wet ground over which water flows without being confined to a definite channel.

Ditches are man-made water bodies created primarily for land drainage that do not follow pre-existing valley landscape contours.

In the WFD terms, **small standing waters (lakes and ponds)** are water bodies with a surface area of less than 50 hectares (ha). Ponds, specifically, are small standing waters from 1 m² to 2-5 ha in area, the maximum surface area depending on the definition used. Small lakes can therefore be defined as standing waters between 1-5 ha and the WFD limit of 50 ha. Both small lakes and ponds include brackish waters. Ponds also include a wide variety of temporary water bodies (e.g. Mediterranean temporary ponds).

Box 2. Small water bodies protection and management: recognising barriers and opportunities

Barriers

- Small water bodies are abundant throughout Europe and this may represent a significant financial and administrative burden for Member States if they were included in the WFD process more extensively.
- Compared to larger water bodies, small water bodies have historically been largely ignored by water and nature conservation managers and researchers. As a result there are (i) many gaps in our knowledge of small water bodies and (ii) relatively few available tools to classify and monitor them.
- Small water bodies, because of their small size, are perceived to be less important than larger waters despite the fact that, collectively, they represent a large proportion of the surface water resource and are a critical habitat for threatened freshwater biodiversity.

Opportunities

- Because of their relatively small size and surface area of their catchments, small water bodies are far easier and cheaper to protect and restore than larger waters.
- Identifying and protecting high quality headwater streams and other small water bodies in catchments helps protect the regional species pool, potentially improving the success of larger water restoration schemes.
- Small water bodies provide a wide range of ecosystem services, including nursery habitats for economically important fisheries, and are integral to the development of green infrastructure.
- For some, like ponds, creation mimics natural processes and can be used to help restore landscapes, increasing connectivity, resilience and biodiversity at relatively low cost.
- Because of their sizes and abundance, small water bodies are of considerable interest to citizens, and so they are ideal habitats with which to engage individuals in EU water policy decision-making and practical action.

2. Setting the scene and plenary sessions

2.1 Welcome and opening speeches

The workshop was hosted by **Ms Martina Mlinaric, of the EEB**, who welcomed participants and presented an overview of the programme and the aims for the day. The opening speeches were given by **Mr Dalius Krinickas, Water Director for Lithuania**, and **Mr Peter Gammeltoft, Head of the Water Unit DG ENV C1**. **Dr Jeremy Biggs, Director of the Freshwater Habitats Trust**, followed with an introduction to small water bodies and the Water Framework Directive (WFD).

In his **welcome** speech, Mr Dalius Krinickas, Water Director for Lithuania, noted the wide concern about small waters - headwaters, small streams, ponds and small lakes - and their importance in Europe. For example, 80% of Europe's river network consists of small rivers, commonly known as headwaters, creeks, streams or brooks. He also noted the common understanding of their exceptional value from an ecological and economic viewpoint, and their greater vulnerability to human activities compared to larger waters. He concluded that the goal of good ecological status should be applied to small waters, and that the workshop would contribute towards this ambitious goal.



Small waters support Annex II species, for example Eel (*Anguilla anguilla*) and the Southern Damselfly (*Coenagrion mercuriale*) (left: Neil Phillips, right: Philip Boissel)

Mr Peter Gammeltoft, Head of the Water Unit DG ENV C1, addressed in his presentation the **Common Implementation strategy (CIS) Work Programme 2013-2015 and the WFD implementation**. He summarised the substantial progress that had been made in the implementation of the WFD, particularly the impressive improvement in the knowledge of water status, increased transparency in setting objectives and managing water, and the firm integration of the ecological perspective into water management. He noted that there are still areas where additional guidance may be needed (monitoring, chemical status, costs and benefits analysis, hydromorphology etc.) and that there is still a need for a determined effort to ensure achievement of the WFD objectives in the 2015 and 2021 cycles. Finally, he commented on the areas where small waters have been identified in the Blueprint³ and noted that although the Blueprint does not contain specific measures for small waters, the output from the workshop should usefully contribute, for example, to the work on Natural Water Retention Measures (NWRM), hydromorphological pressures and e-flows. He noted that headwater streams are critical in catchments because they are akin to the capillaries of our blood circulation system.

³ EC (2012) A Blueprint to Safeguard Europe's Water Resources. COM(2012) 673 Final.

Dr Jeremy Biggs, of the Freshwater Habitats Trust (United Kingdom), made a presentation on **small waters and the WFD**. He illustrated the wide variety and widespread nature of small water bodies, covering different parts of the globe. The misconception that large things are more important than small things is a saliency error and he noted that small waters are increasingly recognised as important in a global context, both for freshwater biodiversity and ecosystem services. Much of the information describing their importance, however, has only become available in the last 10-15 years, after the introduction of the WFD. He commented that in the context of the Blueprint, the EU 2020 Biodiversity Strategy, and the 2nd round of RBMPs, it is now a good time to review how we protect and manage small water bodies, and review the options for including small waters in the WFD implementation, in keeping with the stated intent of the directive to protect all of the freshwater environment. Given the large number of small water bodies, he stressed that the integration of small waters within the WFD needs to be proportionate.



Small waters support Annex I habitats including Mediterranean temporary ponds (Office de l'Environnement de la Corse)

2.2 Why are small water bodies so important?

This session aimed to set the scene and present an overview of current research on small running and standing waters, and their particular importance for catchment biodiversity.

Dr Nikolai Friberg, of Aarhus University (Denmark) spoke on **small running waters: their value and function for freshwater biodiversity** and their special features compared to larger running waters, particularly their contribution to catchment aquatic biodiversity, which has only recently been recognised and is greater than would be expected from their size. He noted that many headwater streams, although apparently connected to the rest of the network, are in practice quite isolated – rather like small standing waters – and largely influenced by local factors that tend to vary considerably between headwater catchments. He concluded that to protect small running waters, rather than simply protecting individual water bodies, management of landscapes is required to maintain networks of distinctive small headwater catchments.

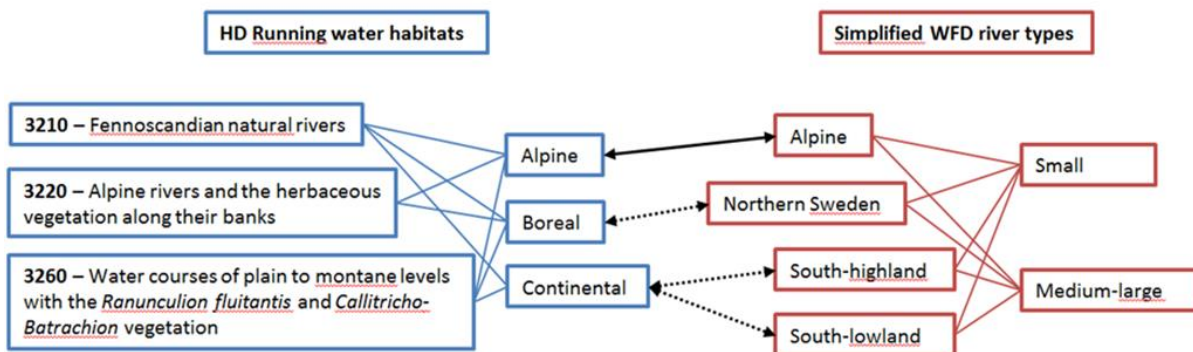
Dr Pascale Nicolet, of the Freshwater Habitats Trust, reviewed **the role of small standing waters in maintaining diversity in the freshwater landscape**. She described the particular importance of small standing waters (ponds and small lakes) compared to other freshwaters. In all landscapes so far investigated – including different parts of Europe and multiple UK landscapes – ponds surprisingly support a larger proportion of freshwater biodiversity than lakes or rivers, and are especially important for uncommon freshwater species. Thus collectively, at the landscape scale, small standing waters are critical to maintaining freshwater biodiversity. The targeted protection, management and creation of small standing waters to restore freshwater landscapes is particularly important for populations of threatened species, including some specialist habitats and species listed in Annex I and Annex II of the Habitats Directive, which depend on networks of high quality small water bodies for their survival. We need to recognise the value of small standing waters, and that protecting them is relatively cheap and easy because of their small catchments.

2.3 The policy framework

The aim of this session was to introduce and discuss some of the challenges the current water management and nature conservation policy frameworks present for the better integration of small waters in the implementation of the WFD and BHD.

Mr Peter Kristensen, of the European Environment Agency, described how we might better link **Habitat Directive freshwater habitats with WFD water types**. He noted that EU policies on water, nature and biodiversity are closely linked and that both the Nature Directives and the WFD aim at ensuring healthy aquatic ecosystems. However, at the moment, assessing status and pressures of both Habitats Directive freshwater habitat types and the WFD water bodies are run in parallel, and there are not enough synergies between the two processes. He concluded that a more coordinated assessment of status, pressures and impacts would result in co-benefits for both processes. He noted that the inclusion of small water bodies in the 2014 assessment of the state of European ecosystems would be valuable for raising awareness of their importance (many are still amongst the highest quality freshwater ecosystems) and, conversely, that the poor state of many small water bodies would require targeted improvement.

Sweden river habitats and WFD types



An example from Sweden of the difficulties with linking Habitats Directive Annex I habitat types (left) with WFD water body types (right) (extract from Mr Peter Kristensen's presentation)

Mr Martin McGarrigle of the Environmental Protection Agency of Ireland considered the question of **how can you protect small waters without excessive cost?** Specifically he described the Small Streams Risk Score (SSRS), an invertebrate-based rapid assessment monitoring method to deal with the large numbers of small headwater streams in many Irish catchments. Using simplified taxonomy the SSRS system assesses risk on first and second order streams, which make up 70-80% of stream length in many catchments. SSRS allows surveyors to concentrate on small streams that are potentially subject to the biggest diffuse pollution risk and is a rapid technique to pinpoint where Programmes of Measures are needed within catchments. Although quicker than standard WFD methods it is still quality assured. He clearly showed that this approach would effectively allow small streams to be included in the WFD implementation process, at a relatively low cost.

2.4 Application of policy in practice

In this session, case studies from different parts of Europe provided the workshop with an introduction to issues associated with broader ecosystem services delivery, the special problems and opportunities connected with small waters in the Mediterranean, and approaches to small water body management in a less intensive landscape in Lithuania.

Prof. Chris Stoate of the Allerton Project, Game and Wildlife Conservation Trust (United Kingdom) presented information on **using small water bodies for ecosystem services in agricultural landscapes** describing the range of services provided by small waters (e.g. clean water, retention of water within catchments, treating pollutants) with examples from trial projects in the UK. He described the examples of field experiments using small water bodies and wetlands showing the level of water quality improvements possible in real-world farming scenarios, which are often more variable than is widely understood due to the characteristics of catchments (topography, soil type, rainfall, water source). He also reported that these wetland features provided a habitat for aquatic invertebrates, despite eutrophic conditions, and small but cumulative landscape scale benefits for farmland birds. He also noted that these constructed wetlands had cultural value as they provided added interest for farmers. The role these small wetlands may play in flood attenuation at the landscape scale is currently unknown. He concluded by asking the audience if small streams should be used to reduce pollution discharge into larger water bodies, or if they should be protected in their own right for their ecological value.



Field drain ponds are created to hold sediment and nutrients from intensive agriculture before they reach streams and rivers (Prof. Chris Stoate)

Dr Jose Prenda, from Huelva University (Spain) presented **small water bodies and the WFD in the Mediterranean region: case study from Spain**, emphasising the special problems of Mediterranean small waters particularly susceptible to human impacts. Chronic water scarcity in Mediterranean regions results in an intensification of water use, and as a consequence, water abstraction, flow regulation, increased salinity and other pollution pressures have severe impacts on streams. On one hand the diversion of water from streams may transform perennial streams into intermittent streams. On the other, discharges from, for example, irrigation and sewage effluents can transform intermittent low order streams into perennial water bodies. The Mediterranean basin is an IUCN biodiversity hotspot⁴ and although species diversity per water body is generally low, the rate of endemism is high. Many species occur in just one catchment and about 60% of all freshwater fish species assessed as Critically Endangered in Europe occur in this area, highlighting the importance of small water bodies. Dr Prenda presented specific information about lower order streams and the WFD in the Guadalquivir basin. He reported that only 52% of lower order streams in the basin were protected under the WFD, with monitoring focusing on larger water bodies, which tend to be in poorer condition. Streams at lower altitude were more likely to be degraded and to support non-native species (e.g. exotic fish). Although pressures are very severe in the Mediterranean, lower order streams are amongst the best preserved and act as reservoirs of biodiversity and ecosystems processes and services.



Mediterranean streams are characteristically unpredictable, with dramatic variations in flow conditions between years, between seasons or even in the course of a single day (Dr Jose Prenda)

Mr Audrius Sepikas of the Environmental Protection Agency, Lithuania, presented a **case study covering a range of projects for the protection of small water bodies in Lithuania**, where 354 out of 8700 lakes and ponds, and 14000 out of 77000 river lengths are covered by the WFD. One of the projects he reported on was a pilot ecological network restoration project in South Lithuania, where a range of practical measures to improve the water environment have been applied. Measures include creating corridors to improve connectivity, restoring the hydrological regime of wetlands by blocking drains, improving plant diversity in marshes and fens by re-introducing cattle and/or suitable cutting regimes, and reducing diffuse pollution by creating sedimentation ponds and wetlands. Overall the work aims to improve the long-term viability of Annex II and IV species of the Habitats Directive, with special programmes to protect small and isolated populations of the European Pond Turtle (*Emys orbicularis*) and the European Tree Frog (*Hyla arborea*), including the creation and restoration of shallow ponds.

⁴ www.iucn.org/about/work/programmes/species/our_work/about_freshwater/what_we_do_freshwater/

3. Discussion sessions

The participants were organised into three groups for more detailed discussions on possible ways to monitor and protect small waters without excessive costs, integration of water and nature policies, the ecosystem services provided by small waters, and the role of small waters in spreading knowledge of freshwater issues and engaging citizens in their management. Each session was structured with a set of questions presented to participants by a facilitator before opening the discussion more widely. A summary of the discussions that took place in each of the three sessions is given below.

3.1 How should we protect small waters practically?

The first session was chaired by Dr Jeremy Biggs of the Freshwater Habitats Trust and was focused on management and monitoring of small water bodies. The group suggested that a comparison of small waters conservation and the WFD implementation across EU countries would be useful to feed into policy work. There seemed to be considerable variation between Member States on the level of protection afforded to small water bodies. In the Andalucía province of Spain, for example, some small water bodies are already protected and monitored under the WFD.

Clear definitions are needed for different types of small water bodies to facilitate practical conservation. Some countries, like the UK, have standard definitions for small water bodies. It was suggested that those already developed definitions could be used more widely throughout Europe. It was noted that some small water bodies are difficult to define (e.g. flushes) because of their small size.

Participants suggested that remote sensing techniques may help identify small water bodies. The information collected, together with biological data, could then be held nationally in a publicly accessible database, which would be particularly valuable for their conservation in the context of land use planning and development.

The group broadly supported the idea of developing standardised, WFD-compatible, European monitoring and classification methods for small water bodies, so that the results of evaluation in different countries could be compared, in a similar way to larger water bodies. The relative dearth of biological and environmental data currently available for small water bodies, and the potential cost of collecting this data, was seen by participants as one of the main barriers to method development. For larger water bodies, the datasets used for setting typologies and baseline conditions were collected by water agencies over decades and it would be very resource-intensive to replicate this for small waters. However, not all countries had sufficient data in the WFD intercalibration process and therefore alternative techniques were explored in setting typologies, including the use of expert knowledge. The expertise gained from the development of existing WFD monitoring and classification methods, and from the intercalibration process, could inform similar method development for small waters. This would minimise resource needs by effectively providing



Cover page from the Small Stream Risk Score (SSRS) training manual, a risk-based approach to assess the condition of streams (extract from Mr McGarrigle's presentation)

a better understanding of the amount and type of data required to provide reference conditions and when expert knowledge can be used.

The heterogeneity of small water bodies was identified as another potential issue which may hinder the development of a WFD assessment and classification method, particularly given the current lack of available data and resources. In Malta, for example, small karstic limestone pools were included at the outset of the WFD monitoring programme but they were found to be too heterogeneous to be integrated in classification systems, even though a range of techniques was explored to achieve this. It was also impossible to include them in the intercalibration process. Because of these issues, they were subsequently retracted from the WFD implementation, but they are still included in monitoring activities. It was noted that small water bodies have dynamic succession, and this needs to be taken into consideration when developing typologies and setting conservation objectives for different biological groups. Landscape connectivity was also highlighted as particularly important for dispersal processes because of the relative isolation of small water bodies.



Some ditch systems are outstanding freshwater ecosystems, supporting a rich diversity of animals and plants (Evan Jones)

Participants thought the use of biological indicators and key physical features should be further assessed because this may provide relatively cheap and easy ways to monitor small water bodies. On the other hand, it was recognised that focusing solely on protected species was inadequate for monitoring purposes. The development of new techniques may lead to significant changes in the resources needed for monitoring freshwaters in the short to medium term, potentially reducing the need for high level taxonomic skills and complex sampling techniques. For example, environmental DNA (eDNA) methods are currently being developed to survey for selected aquatic species. This requires the collection and analysis of a water sample to establish the presence of a particular species from its DNA. The participants supported the development of a research programme to address ecological knowledge gaps.

With regards to practical measures to protect and manage small water bodies, participants emphasised the difference in the characteristics of small water bodies in different parts of Europe, in particular between the northern and southern regions. With regard to fish ponds specifically, guidance on the management of fish ponds in Natura 2000 sites has already been produced by the European Commission in partnership with

aquaculture associations and NGOs⁵. Pressures on small water bodies vary across Europe and different management techniques are likely to be required to take into account differences between regions, including cultural differences. For example, tree planting to provide shade at the edges of streams is promoted in Germany but not in Denmark. The application of management measures also needs to be assessed in relation to local characteristics. Wholesale tree planting, for example, can impact the hydrology of wetlands in the catchment and, because of shading, aquatic and riparian plant assemblages.



Small waters in low intensity agricultural landscapes, such as this pond in Eastern Poland, can support exceptional biodiversity (Freshwater Habitats Trust)

At the landscape scale management activities should aim to maintain a whole range of small waters, with a focus on protecting water bodies located in semi-natural land uses like woodland or unimproved grassland, where they are more likely to be protected from pollution and provide reservoirs of biodiversity. The importance of landscape connectivity for small water bodies and of managing groups of, rather than single, water bodies was noted. Other key issues which were touched upon during the discussions included species response to environmental change, stream hydro-geomorphology, mitigating the impact of climate change, and the importance of managing catchments and landuse intensity.

Overall, the value of sharing knowledge and resources across Member States to inform the protection and management of small water bodies was recognised, particularly with reference to the conservation of threatened species. The proposal for an advice manual on how to monitor and manage small water bodies was welcomed by the group.

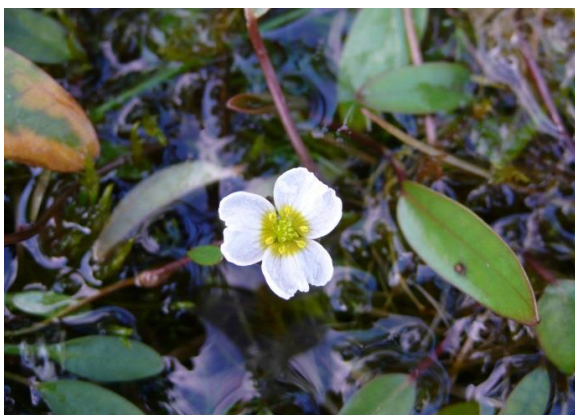
⁵ EC (2012) Guidance on Aquaculture and Natura 2000. European Commission.

3.2 How can we integrate EU legislation and policies to protect small waters?

The second breakout session was chaired by Mr Peter Kristensen of the EEA and focused on integration of water and nature policies, and the possibility of protecting and managing small waters for delivering ecosystems services. The participants specifically discussed small waters protection in relation to achieving the EU 2020 Biodiversity Strategy targets, and the integration of the WFD and Nature Directives.

Participants generally agreed that better implementation of the Birds and Habitats Directives (BHD) and better integration of the WFD and BHD were indeed likely to result in increased monitoring and better protection for small waters. There were, however, uncertainties as to the extent of protection this would confer to small waters *outside* the Natura 2000 network. In addition, linking the WFD water body types and Annex I habitats is far from straightforward, as shown in Mr Peter Kristensen's presentation (see above), and the WFD classifications do not currently cover small water bodies. For example temporary ponds, which tend to be abundant throughout Europe and scattered in the landscape, are too small to be covered by the WFD. Unless they are located in Natura 2000 sites and/or known to support Annex I habitats or Annex II species of the HDs, they would not be covered by the Habitats Directive either. Similarly, small streams falling outside of the scope of the WFD and the Habitats Directive are not protected from small scale hydropower development.

It was noted that effective integration of the WFD and Nature Directives would require including measures for reaching favourable conservation status in RBMPs' programmes of measures. The WFD requires a programme of measures to achieve compliance with standards and objectives for water-dependent Natura 2000 sites and species of Community interest (see WFD Article 11). Effective implementation will require improved synergy and cooperation between various departments in each Member State.



Small waters are critical habitats for HD Annex II and IV species Floating Water-plantain (*Luronium natans*) and European Tree Frog (*Hyla arborea*) (left: Ian Ralphs, right: Olivier Scher)

Consistency and coherence are needed in linking the directives because, conceptually, the WFD is more dynamic and holistic in its approach to managing waters than the BHD. The latter seeks to maintain a particular stable state with a focus on designated areas, whereas the WFD covers the whole of the European territory, and seeks to address all pressures. Any potential conflicts arising from implementing the water and nature legislation should be assessed on a case by case basis and should again require considerable cooperation between different government departments. Conflicts, for example, may arise if a heavily modified water body needed to be restored to reach GES, but the population of a species listed under Annex II of the Habitats Directive would be negatively affected by the proposed restoration measures.

Regarding the role of small waters, and their maintenance and restoration for delivery of ecosystem services, the group reported that there are currently too many gaps in knowledge to be able to assess their potential or to prioritise which services would be best delivered by small waters rather than by larger waters. The group recommended to identify and evaluate additional benefits and ecosystem services that small water bodies might bring compared to larger water bodies (e.g. improving connectivity/stepping stones), as this would aid in their protection.

The group explored whether small waters should be included in MAES (Mapping and Assessment of Ecosystem Services) to better establish their value in terms of delivering specific ecosystem services. It was however noted that although highlighting the value of small water bodies for specific ecosystem services may help convince policy makers of their importance, putting too much emphasis on ecosystem services may not be beneficial for the protection of small water bodies and the biodiversity they support. Such approach namely disregards the multifunctionality of ecosystems. For example, if small water bodies are used for water treatment of nutrients and sediment, leading to poor water quality, this would compromise the overall functioning of a small water ecosystem by impacting its other functions, including reducing its biodiversity and compromising the delivery of other relevant ecosystem services. Moreover, it would potentially detract from addressing the actual cause of the problem. The natural multifunctionality of small waters should be maintained, rather than jeopardised (e.g. biodiversity *and* water retention rather than biodiversity *or* water retention).



Headwater streams in intensive arable landscape are vulnerable to pollution by pesticides, sediment and nutrients (Nathalie Marten)

The group discussion also touched on the monitoring of small waters and noted that a ‘light’ approach should be taken to minimise the costs, as, for example, the risk-based approach presented earlier by Mr Martin McGarrigle. Monitoring should focus on where it is assumed that action needs to be taken, or by grouping small water bodies into types, according to landuse or vulnerability. A number of participants were keen to prioritise the monitoring of small waters in agricultural landscapes, where pressures are likely to be particularly high, rather than those in semi-natural landscapes where impacts are likely to be minimal, such as in extensively managed woodland or heathland.

With respect to the Common Agricultural Policy (CAP), participants agreed that in principle elements of greening, and in particular the setting up of Ecological Focus Areas (EFAs), could be beneficial for improving the status of small water bodies in agricultural landscapes. However, there are still uncertainties about how this will be implemented practically and how much it will actually benefit biodiversity. It is also unclear whether there will be mechanisms in place which may be used to monitor small waters. The distinction between ‘artificial’ standing water bodies specifically created, for example, as sediment traps and ‘natural’ water bodies was also discussed. Note that the group was keen that funding for greening should be prioritised for the protection of small water bodies, rather than for the creation of small water bodies for the mitigation of diffuse pollution from agriculture.

Overall, the group agreed that improved implementation of the current legislative framework and policies should lead to better protection of small waters and that additional resources should only be invested strategically. The knowledge gaps highlighted need to be addressed to fully understand the value of small waters for delivery of ecosystem services but their function as reservoirs of biodiversity should be prioritised.

3.3 What is the role of small waters in spreading knowledge of freshwater issues and engaging citizens?

The third breakout session was chaired by Dr Nicholas Davidson, Deputy Secretary General of the Ramsar Convention on Wetlands, and looked at the role of small waters in spreading knowledge of wider freshwater issues, and in engaging citizens in their monitoring and management. All participants agreed that further public participation would be beneficial in protecting and monitoring small water bodies and in raising awareness of water quality issues. It was recognised that people tend to have strong feelings of ownership for small waters near their dwellings and highly value the cultural services they provide (e.g. recreation and leisure, including natural history).



First order stream in Wales (Jeremy Biggs)

The group emphasised that engaging citizens is not a straightforward process and needs a long-term approach, for several reasons including:

- Volunteers have varied levels of experience and expertise. They require technical training to ensure that data collected for monitoring is of sufficient quality for the given objective of the programme, and health and safety training.
- Volunteer participation can be difficult to maintain in the long-term. Continuing participation can be affected by the motivation of individuals or, simply, by outdoor conditions when a particular activity is taking place. For example, in Norway, a campaign of public engagement ran for over eight years before an efficient and sustainable volunteer monitoring network could be established.

- Sustainable sources of funding need to be identified to support long-term volunteer monitoring initiatives, and the cost-effectiveness of public engagement and citizen science programmes needs to be clearly demonstrated.
- When developing management and monitoring methodologies for high quality volunteer data collection, the volunteers themselves should be involved at the development stage to ensure that the methodologies can be applied and to enhance volunteer ownership of the process.

Local involvement and representation by key organisations (governmental or non-governmental) was highlighted as a condition of success, and to provide a link between the public and national environmental protection agencies and ministries. Local authorities can play a particularly important role in data management to ensure effective communication with national statutory organisations, and local organisations are likely to have a pivotal role to play in providing training and implementing consultation processes. A local approach would also allow small waters management plans to be adapted to the local context.



Creating new clean water ponds is a cheap and easy way to help restore the freshwater landscape and enhance populations of a range of Annex II species (Julia Drage)

In the context of the WFD, it was noted that in many countries, public participation in the WFD process can be hampered by the lack of feedback from relevant authorities in the consultation process. The WFD’s ‘bottom-up’ approach has, in practice, been of limited success.

Public engagement techniques should be adapted to their specific audiences and are likely to be different between communities in the countryside and those in urban or peri-urban areas. Farmers and land owners, in particular, are key stakeholders in water management, particularly in Mediterranean countries but also in other parts of Europe. For example, in Greece as much as 80% of water supplies are allocated to agricultural activities and consequently issues of water scarcity can only be addressed in close cooperation with farmers.

Farmers and landowners can play a pivotal role in monitoring small waters. However, they may be reluctant to collect data that may show a negative impact of their activities on water quality, or if the data might lead

to restrictions in water availability in future. A *positive* approach should be adopted when addressing landowners and farmers, showing the benefits from protecting and managing the water environment rather than focusing on their responsibilities in environmental degradation.

A large-scale 'citizen science' programme with individuals or landowners volunteering to monitor and be involved in protecting a particular pond or stream, if well designed and implemented, could potentially provide cost-effective ways of monitoring small water bodies. Despite recent advances in technologies such as remote sensing and Geographic Information Systems (GIS), the effectiveness and reliability of these methods for local-scale monitoring is still limited and a presence on the ground is likely to be even more important for small water bodies than larger ones because of the inherent small size of ponds, streams and ditches.

Examples of existing initiatives included a monitoring programme in Great Britain where volunteers are allocated a pond to monitor, generally within 16 km of their household. Volunteers are not only contributing to monitoring the state of their particular pond, but have also developed a "personal connection" with that water body. The fact they are living nearby is considered a determining factor for the success of the programme.



Ponds and other small wetlands help maintain a link between people and the water environment, particularly in urban areas (Anita Weatherby)

School education programmes were also discussed, with examples provided from Spain, Greece and the United Kingdom. In these countries, national or local programmes engage pupils and students to participate in assessments of the ecological status of water bodies, or in biological monitoring. In all the examples discussed, the assessment methods were simple and easily accessible to a wide public audience. In Spain some universities have implemented a programme which aims to give a one-week training course to volunteers, mainly students.

Finally, participants highlighted the weight of scientific evidence now showing the link between upper and lower reaches of catchments, emphasising the crucial need to adopt a truly landscape-scale approach to water management, including small waters. The current approach to WFD implementation, which largely excludes small waters, can be seen in the communication of water management issues to the general public which tends to focus on larger waters, potentially contributing to the degradation of small waters.

4. Concluding remarks and next steps

The workshop was well attended by a wide range of stakeholders from across Europe and showed the current interest in the issues around small waters' protection and management. There was a general consensus that small waters are important for biodiversity and ecosystem services, and that their protection through existing legislation and policies would be a challenge both from a resource point of view, and because small waters are inherently heterogeneous at catchment scale, let alone at biogeographical scale. The technical information presented throughout the day highlighted similarities between conservation issues for both small *standing* and *running* waters, such as the importance of working at catchment scale to maintain their heterogeneity and their importance as refuges of biodiversity in otherwise impacted landscapes.

During the day major gaps in knowledge and the scarcity of assessment and management tools emerged as one of the major issues holding back the integration of small waters within the existing legislative framework. However, approaches to minimise the resources needed to monitor and manage small waters are already being proposed and implemented in various Member States. Further resources need to be identified and collaborative projects developed in order to move forward and develop adequate WFD-compatible assessment and classification methods for small waters, informed by the knowledge gained since the introduction of the WFD.

The next step now is to develop an advisory manual for management and protection of small waters, which reflects the diversity of small waters throughout Europe and leads to better protection of small water bodies.

Annex 1. List of participants

Title	Name	Surname	Organisation	Country
Mr	Frédéric	Arnaboldi	Office National des Forêts	France
Dr	Simonetta	Bagella	University of Sassari	Italy
Dr	Jeremy	Biggs	Freshwater Habitats Trust	United Kingdom
Ms	Esther	Boer	Vewin-Unie van Waterschappen	Germany
Mr	Thomas	Bruckmann	Bund für Umwelt- und Naturschutz Deutschland e.V	Germany
Dr	Laurentiu	Burlacu	University of Bucharest, Faculty of Geography	Romania
Dr	Martina	Bussettini	ISPRA	Italy
Dr	Antonio	Camacho	University of Valencia	Spain
Ms	Claudine	Cardona	Malta Environment and Planning Authority	Malta
Prof.	Gordon	Copp	Centre for Environment, Fisheries & Aquaculture Science (CEFAS)	United Kingdom
Dr	Carla	Corazza	Museum of Natural History of the Municipality of Ferrara	Italy
Dr	Pierre-Alain	Danis	ONEMA	France
Prof.	Nick	Davidson	Ramsar Convention Secretariat	
Mr	Mario	de Block	Agentschap voor Natuur en Bos Provincie Antwerpen	Belgium
Ms	Lucile	de Boisson	WWF EPO	
Ms	Francesca	Dunn	Freshwater Habitats Trust	United Kingdom
Dr	Naomi	Ewald	Freshwater Habitats Trust	United Kingdom
Mr	Bernhard	Feneis	VDBi	Germany
Dr	Nikolai	Friberg	Aarhus University	Denmark
Mr	Peter	Gammeltoft	European Commission	
Dr	Pablo	Garcia Murillo	University of Seville	Spain
Miss	Helen	Greaves	University College London	England
Dr	Patrick	Grillas	Fondation Tour du Valat	France
Mrs	Liisa	Hämäläinen	Finnish Environment Institute (SYKE)	Finland
Ms	Gabriella	Jelinek	Ministry of Rural Development of Hungary	Hungary
Dr	Thomas	Kaletka	Centre for Agricultural Landscape Research of Germany	Germany
Mr	Ivan	Karottki	Danish Ministry of the Environment, Nature Agency	Denmark
Mr	Lawrence	King	European Crop Protection Association (ECPA)	
Mr	Dalius	Krinickas	Ministry of Environment	Lithuania
Mr	Peter	Kristensen	European Environment Agency	
Mr	Thibaud	Lalanne	European Environmental Bureau (EEB)	
Mr	Richard	Lansdown	IUCN SSC Freshwater Plant Specialist Group	
Ms	Laura	Martinov	Ministry of Rural Development of Hungary	Hungary
Mr	Martin	McGarrigle	Environmental Protection Agency (EPA)	Ireland

Title	Name	Surname	Organisation	Country
Ms	Martina	Mlinaric	European Environmental Bureau (EEB)	
Mrs	Klio	Monokrousou	Mediterranean SOS Network	Greece
Dr	Armin	Münzinger	Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein-Westfalen, Recklinghausen	Germany
Dr	Pascale	Nicolet	Freshwater Habitats Trust	United Kingdom
Mr	Mark	Owen	Angling Trust	United Kingdom
Dr	Ludwig	Piskernik	ÖBB-Infrastruktur AG	Austria
Mrs	Catherine	Pons	Federation of European Aquaculture Producers (FEAP)	
Dr	Jose	Prenda	Huelva University	Spain
Dr	Aija	Pupina	Project LIFE-HerpetoLatvia	Latvia
Dr	Mihails	Pupina	1) Project LIFE-HerpetoLatvia, 2) Daugavpils University	Latvia
Mr	Janis	Reihmanis	Latvian Fund for Nature	Latvia
Mr	Jorge	Rodriguez Romero	European Commission DG Environment	
Prof.	Susana	Romo	University of Valencia	Spain
Mr	Lionel	Sager	Info Flora	Switzerland
Mr	Audrius	Šepikas	Environmental Protection Agency of the Republic of Lithuania	Lithuania
Dr	Laura	Serrano	University of Sevilla	Spain
Dr	Janis	Sire	Latvian Environment, Geology and Meteorology Centre	Latvia
Prof.	Chris	Stoate	Game & Wildlife Conservation Trust - Allerton Project	United Kingdom
Ms	Julia	Stubbs Partridge	Scottish Natural Heritage	United Kingdom
Prof.	Marios	Vafeiadis	Aristotle University of Thessaloniki	Greece
Mr	Irmantas	Valunas	Ministry of Environment of the Republic of Lithuania	Italy
Dr	Wouter	van de Bund	European Commission DG Joint Research Centre	
Dr	Marcel	Van den Berg	Ministry of Infrastructure and Environment	Netherlands
Mr	Maarten	Van den Broeck	Lab. of Aquatic Ecology, Evolution & Biodiversity, University of Leuven	Belgium
Dr	Stijn	Van Onsem	Vrije Universiteit Brussel	Belgium
Ms	Charlotte	Vogl	Federal Ministry of Agriculture, Forestry, Environment and Water Management	Austria
Dr	Stephen	Von Keitz	Hessian Environmental Ministry	Germany
Dr	Aline	Waterkeyn	Lab. of Aquatic Ecology, Evolution & Biodiversity, University of Leuven	Belgium

Annex 2. Workshop agenda



Workshop on the Protection and Management of Small Water Bodies 14 November 2013

Venue: The House of Cities, Municipalities and Regions, Square de Meeûs 1, 1000 Brussels

Agenda

09:00-09:30	Registration and coffee
09:30-10:10	Welcome and introduction <i>Session chair: Martina Mlinaric, European Environmental Bureau</i> Welcome <i>By Dalius Krinickas, Water Department, Ministry of the Environment of the Republic of Lithuania</i> WFD and the 2013-2015 CIS work programme <i>By Peter Gammeltoft, DG Environment, European Commission</i> Small Waters and WFD <i>By Jeremy Biggs, Freshwater Habitats Trust</i>
10:10-11:00	Session 1: Why are small water bodies important? <i>Session chair: Peter Kristensen, European Environment Agency</i> Small running waters: value and function for freshwater biodiversity <i>By Nikolai Friberg, Aarhus University</i> The role of small standing waters in maintaining diversity in the freshwater landscape <i>By Pascale Nicolet, Freshwater Habitats Trust</i> Discussion
11:00-11:15	Tea/coffee break
11:15-12.05	Session 2: The policy framework <i>Session chair: Nick Davidson, Ramsar Convention Secretariat</i> Linking Habitat Directive freshwater habitats with WFD water types <i>By Peter Kristensen, European Environment Agency</i> How can you protect small waters without excessive cost? <i>By Martin McGarrigle, Environmental Protection Agency, Ireland</i> Discussion

12:05-12:30	Introduction to the afternoon workshop sessions
12:30-13:30	Lunch
13:30-14:30	<p>Session 3: Application of policy in practice <i>Session chair: Patrick Grillas, Tour du Valat Biological Research Station</i></p> <p>Small water bodies and ecosystem services in agricultural landscape <i>By Chris Stoate, Allerton Project, Game and Wildlife Conservation Trust</i></p> <p>Small water bodies and WFD in the Mediterranean region: case study from Spain <i>By Jose Prenda, Huelva University</i></p> <p>A case study on the protection of small water bodies in Lithuania <i>By Audrius Sepikas, Environmental Protection Agency, Lithuania</i></p>
14:30-14:45	Tea/coffee break
14:45-18:15	<p>Session 4: Workshops</p> <p>Workshop 1: How should we protect small waters practically?</p> <p>Workshop 2: How can we integrate EU legislation and policies to protect small waters?</p> <p>Workshop 3: What is the role of small waters in spreading knowledge of freshwater issues and engaging citizens?</p>
17:15-18:15	Plenary
18:15-18:30	Conclusions and next steps