INŠTITUT ZA VODE REPUBLIKE SLOVENIJE | Institute for Water of the Republic of Slovenia

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Poročilo o delu Inštituta za vode Republike Slovenije

PROGRAMSKI SKLOP: I. SKUPNA EU POLITIKA DO VODA

PROJEKT I/1: Priprava in zagotovitev strokovnih podlag za izvajanje vodne direktive (2000/60/ES)

Sodelovanje pri pripravi CEN standarda za vrednotenje hidromorfološke spremenjenosti jezer

(Poročilo o realizaciji naloge I/1/2/7/1)

Koordinator naloge:
Dr. Gorazd Urbanič
Ljubljana, december 2014

NASLOV NALOGE:	Priprava in zagotovitev strokovnih podlag za izvajanje vodne direktive (2000/60/ES) Sodelovanje pri pripravi CEN standarda za vrednotenje hidromorfološke spremenjenosti jezer
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SODELAVCI:	
DIREKTOR IZVRS:	Igor Plestenjak
	(žig)
KRAJ IN DATUM:	LJUBLJANA, december 2014

KAZALO VSEBINE

1 UVOD

V prilogi V Vodne direktive (Direktiva 2000/60/ES) je navedeno, da vrednotenje ekološkega stanja mora biti izvedeno v skladu z obstoječimi CEN oz. ISO standardi ali tistimi standardi, ki bodo objavljeni v prihodnje. Obvezna uporaba metodologij v skladu s standardi je navedena za biološke, fizikalno-kemijske in hidromorfološke elemente kakovosti. Nekateri CEN standardi metod vrednotenja stanja voda so že objavljeni, medtem ko so drugi še v pripravi. V okviru evropske skupine za standardizacijo metod vrednotenja stanja voda, poteka tudi priprava evropskega standarda za vrednotenje hidromorfološke spremenjenosti jezer.

2 ZAPISNIK S SREČANJA

V letu 2014 smo se udeležili delovnega srečanja srečanja v Dundee v Združenem Kraljestvu. Kratek zapisnik srečanja je podan v nadaljevanju.

Srečanje evropske skupine za standardizacijo metod vrednotenja hidromorfološke spremenjenosti jezer

Datum srečanja: 19.3.-20.3. 2014

Kraj srečanja: Dundee, Združeno Kraljestvo

Udeleženec: dr. Gorazd Urbanič, dr. Monika Peterlin

Organizator: European Commiteee for Standardisation

Namen: Priprava predlogov za dopolnitev predloga standarda

Delovna skupina pri CEN za vrednotenje hidromorfološke spremenjenosti jezer pripravlja Smernice za oceno HM obremenitev jezer. Skupina je bila ustanovljena z namenom koordinacije med državami in vzpostavitev standardov na nivoju EU, ki bodo ustrezno upoštevali raznolikost jezer v EU.

Na sestanku smo po posameznih vsebinah pregledali draft standarda EN 16039: June 2013. *Water quality – Guidance standard on assessing the hydromorphological features of lakes*. Na podlagi podatkov posredovanih s posameznoih držav smo opravili evalvacijo standarda. Pregledali smo rezultate evalvacije in na podlagi rezultatov sprejeli predloge za pripravo končne verzije, ki bo oddana do konca leta 2014.

3 URADNI ZAPISNIK S SREČANJA (V ANGLEŠČINI)

DETERMINING THE DEGREE OF MODIFICATION OF LAKE HYDROMORPHOLOGY: SIXTH WORKSHOP ON DEVELOPING A CEN GUIDANCE STANDARD

University of Dundee, Dundee, United Kingdom
19-20 March 2014

This workshop was arranged under the auspices of the European Committee for Standardization (CEN) to discuss and amend the text drafted by those attending the previous workshops (Verbania, February 2010; Mainz, January 2011; Peterborough, February 2012; Peterborough, November 2012; Aix-en-Provence, June 2013) on a CEN standard for assessing the degree of modification of lake hydromorphology.

Present:

	Name	**Country**	**Affiliation**
1	Phil Boon (PB) (Chair)	UK, Scotland	Scottish Natural Heritage
2	Alison Lee (AL)	UK, Scotland	Scottish Natural Heritage
3	Chris Bromley (CB)	UK, Scotland	Scottish Environment Protection Agency
4	John Rowan (JR)	UK, Scotland	University of Dundee
5	Judy England (JE)	UK, England	Environment Agency
6	Roger Sweeting (RS)	UK, England	Freshwater Biological Association
7	Christine Argillier (CA)	France	Irstea
8	Jean-Marc Baudoin (JB)	France	Irstea
9	Delphine Nicolas	France	Irstea
10	Hanna Soszka (HS)	Poland	Institute of Environmental Protection
11	Monika Peterlin (MP)	Slovenia	Institute for Water, Republic of Slovenia
12	Gorazd Urbanič (GU)	Slovenia	Institute for Water, Republic of Slovenia
13	Marzia Ciampitiello (MC)	Italy	CNR – Institute for Ecosystem Study
14	Angela Boggero (AB)	Italy	CNR – Institute for Ecosystem Study
15	Snežana Radulović (SR)	Serbia	University of Novi Sad

Session 1: Introduction and context

1.1 Welcome and introduction

PB opened the workshop and welcomed the 15 delegates, representing six countries. He also thanked JR and the University of Dundee for supporting the workshop. He then gave an update on the procedures and timetable with CEN for completing the work on the lake hydromorpholgy standard.

The aim of the workshop was to complete the text of the draft standard and use the results from lake assessments to refine the scoring system as necessary. In February 2014, the draft standard was accepted as a 'new work item'. This requires further development of the text with a final draft ready for public consultation by December 2014. The next meeting of CEN/Technical Committee 230/Working Group 2/Task Group 5 (TG5) will take place in Oslo on 22nd May 2014. PB hopes to take a revised draft of the standard to that meeting for approval.

Session 2: Presentation of completed assessments of lakes using the CEN protocol

The aim of this session was to present the results of fully scored lake assessments and to highlight areas of the scoring protocol that need to be adjusted. This took the form of brief presentations by participants followed by discussion.

2.1 England (Judy England)

LHS was carried out at a number of lakes and JE applied the scoring protocol using the four different options in Table 2. JE presented detailed scores for Barton Broad and Stanborough Lake. Results showed a good match between what was expected (on the basis of expert judgement) and what was indicated by the scores.

Conclusions, areas of uncertainty or suggested improvements to the method:

- JE found that it was more difficult to score artificial water bodies than natural lakes. Decision making was quite subjective on occasion, especially in the absence of a natural lake in the same geographical area with which to make comparisons. JE raised this point in relation to two attributes: 'slope profile of shore zone' and 'depth distribution'.

2.2 Scotland (Chris Bromley)

CB applied the scoring protocol to Loch Leven and Loch Lomond; the latter being divided into two distinctly different basins, the north basin and the south basin. Comprehensive data were available from LHS and other sources including details on depth distribution from the Murray and Pullar bathymetric survey of the early 1900s. The Roy Military Survey maps (1747-1755) were also a useful source showing historical maps for these lakes prior to any major development and modifications. CB misunderstood the scoring protocol and assessed the lakes using quantitative and then also qualitative data, thus producing two separate scores. For most features the scores were the same, no matter which type of data were used.

Conclusions, areas of uncertainty or suggested improvements to the method:

- CB (and others) requested revisions to clarify that that quantitative data should be used when available, and if not then qualitative data can be used.
- CB stressed the need for ensuring access to all available data and filling these gaps if necessary with additional surveys. Access to reference and historical data are equally as important as collecting new survey data.

2.3 France (Delphine Nicolas)

Two reservoirs were chosen based upon the availability of data: Bariousses (used for hydroelectric power) and Bimont (a water source for irrigation). In France, six different protocols (including LHS) have been used to characterise hydromorphology, each producing data on different features at different scales but contributing to the overall assessment. A mixture of quantitative and qualitative data was used in the assessment.

Conclusions, areas of uncertainty or suggested improvements to the method:

- Interpretation of the scoring system was a problem with many scores being low (1) despite the fact that the two reservoirs are actively regulated. JR said that he would have given much higher scores for features such as 'water level variability' and 'slope profile of the shore zone'. SR suggested that clearer guidance on how to assess reservoirs is needed, especially in the absence of historical data.
- There was also uncertainty in assessing connectivity, e.g. for 'migratory movement and sediment transport'. It is not clear how far upstream (or downstream) in the catchment that the effects of drawdown or structures should contribute to the assessment.

2.4 Italy (Marzia Ciampitiello)

Three lakes were chosen for assessment: Lake Maggiore, Lake Candia and Lake Bidighinzu in Sardinia (a reservoir). Results showed a good match between what was expected (on the basis of expert judgement) and what was indicated by the scores.

Conclusions, areas of uncertainty or suggested improvements to the method:

- The scoring protocol was easily applied to features which rely upon LHS data as full LHS surveys had been carried out at each lake.
- Planform was difficult to assess due to a lack of historical maps and a lack of information on the morphological evolution of these lakes. Similarly, a lack of information on hydraulics made it difficult to assess the 'lake volume' feature.

2.5 Serbia (Snežana Radulović)

SR gave a summary of the situation with data in Serbia. There are few natural lakes in the country and most of them are reservoirs or naturalised gravel pits. Also, regular monitoring of lakes did not occur until recently. Consequently the availability of historical data and reference data (from natural lakes) are both very limited.

Conclusions, areas of uncertainty or suggested improvements to the method:

- Parts of the method are difficult to apply in the absence of historical or reference data. SR stressed the need for clarity on how to assess and score artificial lakes for which there is no natural analogue nearby.

2.6 Slovenia (Monika Peterlin and Gorazd Urbanič)

Four contrasting lakes were chosen for assessment: two natural alpine lakes and two lowland artificial lakes. Assessments were carried out using both quantitative and qualitative data to compare the two approaches. Of the two alpine lakes, Lake Bohinj was scored as 1 overall (near-natural) while Lake Bled scored a 3 (moderately modified) due to modifications for hydrology and pressures associated with recreational use.

Lakes Velenje and Druzmirje were created following subsidence of a coal mine, so are entirely artificial in origin, have smaller catchments and greater pressures from industry and agricultural land use. MP and GU found it much more difficult to score the artificial lakes due to a lack of reference data and uncertainty about how to interpret the score bands. Consequently they had less confidence in the results for these lakes.

Conclusions, areas of uncertainty or suggested improvements to the method:

- MP and GU requested that better guidance is given on how to interpret the score bands for artificial lakes. The group agreed that the guidance should be improved in this respect to ensure better consistency in interpretation.

2.7 Poland (Hanna Soszka)

Twelve lakes were chosen for assessment, each with full LHS data from 2007-2009. All 12 have a lowland setting and a natural (post-glacial) origin with high alkalinity and shallow depth. Recreation and fishing are the dominant pressures. Water level fluctuation is less than 50 cm and there have been no changes in mixing behaviour or lake volume at any of the lakes.

Conclusions, areas of uncertainty or suggested improvements to the method:

- All lakes were scored low (near-natural to slightly modified) giving a good reflection of the low levels of modification at each lake.

2.8 General discussion: overall balance of scores and case study examples

The overall balance of scores for different features was discussed. GU raised the point that a score for one feature may be very high, whereas all other scores may be low and so the final result is also quite low. Consequently the final score does not reflect the fact that one feature may be highly modified. Alpine lakes are a good example where the hydrology may be severely altered but all other aspects of the lake remain natural. It was suggested that the scores could be weighted differentially, so that features with a greater impact on hydromorphology have a greater influence on the final combined score. However, PB reminded the group that all scores are currently treated equally as there is insufficient evidence to justify differential weightings of the scores allocated. The group agreed that the best option is to keep scores separated rather than combined into a single score, as this highlights more clearly which features of the lake are natural or modified.

JR suggested that the scoring system might be too harsh on natural lakes and too generous to artificial lakes and confusion in interpretation of score bands has also been problematic. AL suggested that the addition of some case study examples would help in the

understanding and interpretation of the scoring system. The group agreed to include an additional Annex in the guidance which will include five case studies from the following countries:

- Italy: a large lake with mountainous setting and some urban development (Lake Maggiore)
- Italy: a dammed river, i.e. reservoir (Lake Bidighinzu in Sardinia)
- Poland: a natural lake
- Serbia: an artificial lake
- Slovenia: an artificial lake (Lake Velenje or Lake Druzmirje)

Case studies will be no longer than 1 page and will include a short description of the lake, a map or photo, a summary of the scores and a brief interpretation/short conclusion.

Action 1: MC/AB, HS, SR and **MP/GU** to complete the case studies by 9th May.

Session 3: Modifications to the CEN standard

The aim of this session was to discuss and modify the draft text for each section in the proposed standard. The principal focus was to revise and expand the scoring protocol based on the results of the scored assessments and the issues that were raised during session 2.

3.1 Assessment category 1 - Hydraulics

Water level variability

JR recently added Annex C to support interpretation of the scoring system for this feature. Quantitative ranges are given to help in decision-making, and for natural lakes these figures represent the degree of alteration relative to the natural mean annual range. Reservoirs are treated separately and figures are based on the observed magnitude of variation according to the operational requirements of the reservoir.

CB suggested that the score band should be based on percentages rather than absolute figures so that the relative significance of water level variations could be better recorded. JR disagreed stating that it is necessary to assess absolute change in water level as, for example, a small change in a shallow lake will have greater significance (e.g. for macrophytes) than a small change in a deeper lake. This was discussed and the group agreed to trial a percentage-based 5-point score band to be used in support of the quantitative results.

Action 2: JR and GU to develop a percentage-based 5-point score band to be used as an alternative to the absolute figures and in support of the quantitative results.

Action 3: All to test the alternative option for their lakes. After May, a tele-conference will be set up to discuss the results and agree whether or not to include the alternative as an option.

GU suggested that reservoirs should be treated in the same way as natural lakes as the impact of water level variations will be the same, no matter what the mode of lake origin. This would treat the impacts of alterations more consistently between lakes and the implementation of measures (financial investment and restoration) could be more simply related to impacts. JR explained that he separated out the reservoirs as they have a much greater range of water level variation than natural lakes, e.g. 42 m was recorded in a Spanish reservoir. Therefore, use of a different score band better highlights the differences between severely modified and less affected reservoirs. The group discussed the options and agreed to keep the separate score band for reservoirs unless further testing (action 3) indicates that it should be removed.

The problem of assessing artificial lakes (with no natural analogue) was discussed. Often there may not be a natural analogue in the local setting with which to compare and make decisions on departure from naturalness. It was agreed that comparison can be made with water bodies that are remote from the lake, as long as the geographical context is similar. Comparisons should focus on first principles; for example, the character of the lake, the configuration of landforms and planform, the dynamic state of the lake, e.g. is it fully functioning and in equilibrium with the dominant wave pattern, sediment regime, etc? Text in the last column of the table for Morphometry (shore zone) gives helpful guidance on comparison with a reference site and it will be incorporated in the main body of the standard.

Action 4: CB and **JR** to add some text to the main body of the standard to give better guidance on how to assess features of artificial lakes in comparison to reference sites.

Lake volume

The description for score 1 will be changed to 'very limited or no change' so that it is consistent with the description for water level variability. The word 'modified' in the guidance column will be replaced with 'different from a suitable natural analogue'.

Action 5: AL to make changes to the 'lake volume' text as set out above.

3.2 Assessment category 2 - Morphometry

Slope profile of shore zone

Some people found it difficult to assess this feature. CB explained that in the Scottish lakes he checked for the presence of hard or soft shore engineering and looked for any imbalance in substrates. Historical data/information should also be reviewed when available as this gives a better indication of what may have occurred in the past, e.g. dredging of lake substrates. CB agreed to summarise his explanation in a few sentences and add these to the 'guidance' column to help interpretation of the qualitative score band.

Action 6: CB to write a few sentences for the 'guidance' column highlighting what to consider when assessing slope profile of the shore zone.

Planform

Some participants were unsure how to assess planform in the absence of historical map data. It was agreed that cross-reference will be made to the first lakes standard which includes a list of potential data sources for assessing planform and other features.

Action 7: AL to add a reference to the first lakes standard to indicate potential data sources.

Depth distribution

CB explained that in the Scottish lake examples he used changes in planform as a proxy for artificial changes in depth distribution. He agreed to write some explanatory text to help in the interpretation of the qualitative score band.

Action 8: CB to write a few sentences for the 'guidance' column to explain how planform data may be used as a proxy for assessing artificial changes in depth distribution.

3.3 Assessment category 3 - Bedforms/ Landforms and substrate

Landform and substrate characteristics

It was agreed that low frequency, large magnitude natural erosion/deposition events should not be scored as an impact. However, there may be uncertainty if the connection has not been made between these events and increased siltation within Hab-Plots. (This is likely given the low frequency of fieldwork.) Sediment cores could be taken to get a better understanding of changes in sedimentation rates although this would add greater complexity and expense to field monitoring. It was agreed that coring should be mentioned as an option.

Action 9: AL to add text suggesting that coring could be used for lakes where further investigation is required to better understand the sedimentation regime.

Bank structure and modifications

The group discussed situations when multiple small-scale impacts (e.g. jetties) are dispersed around a lake and how to assess these. It was agreed that the impact of each jetty should be combined together into one result for the lake as a whole which can then be scored (with either score band) in the same way as one continuous section of engineering.

Littoral substrate – extent of artificial material/ imported natural material

It was agreed that 'material' will be replaced with 'substrate' at the end of the feature title. The following text will be deleted from the 'guidance' column, 'Note: the diversity of substrates is type-specific' and replaced by, 'The natural range of substrates is lake type and site specific.'

Lake bottom bedforms

The assessment of lake bottom bedforms is not always necessary and most countries scored this feature as 'near-natural' in their examples, due to a lack of evidence to suggest otherwise. The group agreed to keep the feature in the standard as it is an important one to consider in the overall assessment of lake hydromorphology.

The following text will be added to the end of the 'guidance' column, 'In lakes undergoing eutrophication increased sedimentation may also influence bedform structure.' The web-links will be deleted from the 'Features assessed' column. (These were added temporarily by JR as examples of this type of assessment.)

Extent of artificial material/imported natural material

The same changes will be made to the text as for 'littoral substrate'.

Action 10: AL to make changes to the text for 'littoral substrate', 'lake bottom bedforms' and 'extent of artificial material/imported natural material' as set out above.

3.4 Assessment category 4 - Connectivity and continuity

Riparian zone and shore zone connectivity and continuity

The features in the riparian and shore zones are assessed through other feature categories, e.g. hydraulics and land cover. Cross-references will be added to the appropriate sections to clarify exactly which part of the assessment these features relate to.

Action 11: AL to make changes to the text for riparian zone and shore zone connectivity and continuity as set out above.

A query was raised about how to assess longitudinal connectivity along the riparian and shore zones, e.g. assessing continuity in riparian vegetation or maintenance of natural longitudinal processes. The group agreed that these factors are adequately dealt with in Land Cover and Bedforms/Landforms and Substrate so no changes need to be made to the standard.

Natural exchange between groundwater and surface water

Often this feature cannot be assessed due to a lack of data. The group agreed to keep it in the standard as it is important for consideration in the overall assessment of lake hydromorphology.

Migratory movement and sediment transport

It was agreed that this feature will be split into two: i) migratory movement and ii) sediment transport. This will deal better with circumstances when sediment transport has been

interrupted by a large structure yet free passage of fish is maintained via a fish pass. The same scoring system and supporting text will be used for each feature.

Action 12: AL to separate out migratory movement and sediment transport into two features.

3.5 Assessment category 5 - Aquatic vegetation

Aquatic vegetation disturbance (shore zone)

RS gave examples from the English Lake District where boats come into the shore zone to land and may cause considerable disturbance to the aquatic vegetation. This element of human disturbance needs to be captured in the standard alongside vegetation management. The French also gave examples of lakes where water level fluctuations have been artificially reduced causing an increase in vegetation growth. In such cases, vegetation management is a necessary part of site management and should not be scored as a negative impact.

The text will be revised as follows:

- Feature title: 'Human disturbance or active management of aquatic vegetation.'
- Qualitative score band: '1 = No or very little human disturbance or active management of aquatic vegetation', and similar text also for scores 3 and 5.
- Guidance: include 'damage by trampling, boats or boat wash' and also add, 'In some situations vegetation management or human disturbance may be considered beneficial in order to restore or maintain natural vegetation.'

Aquatic vegetation disturbance (open water zone)

The group agreed to make the same changes to the title and text as for the shore zone.

Action 13: AL to revise the text for 'aquatic vegetation disturbance' as set out above.

3.6 Assessment category 6 - Land cover

The French had difficulty assessing this feature due to a lack of data. They found that remote sensing was unable to differentiate successfully between the land cover categories. Field survey data should be collected in these cases (e.g. via LHS). Only one minor correction will be made to the text: adding the word 'natural' to make it 'non-natural' in the text for score 3.

Action 14: AL to revise the text for 'Land cover' as set out above.

3.7 Annex B – Land cover in the lake catchment

Intensive land-use in upstream catchment area

Most countries used the CORINE land cover classification for this feature which provides context for the scored assessment of a lake. Assessment was generally straightforward if suitable data were available. The group decided to alter the quantitative score band as follows:

Score	Old score band	New score band
1	0-1 % cover	0-2 % cover
2	>1-5 % cover	>2-10 % cover
3	>5-20 % cover	>10-20 % cover
4	>20-50 % cover	>20-40 % cover
5	>50 % cover	>40 % cover

GU suggested that urban and agricultural land cover should be scored separately. JR argued that the two should be assessed together as the mix of land cover has a combined influence on the lake and its catchment, e.g. accelerated erosion, sedimentation, etc. The following text will be added to the 'guidance' column, 'If individual intensive land uses are especially influential on the lake catchment, take a note of it for possible further investigation – e.g. urban'. The word 'coniferous' will also be removed from 'plantation coniferous forestry'.

Action 15: AL to revise the score band and text for 'intensive land use' as set out above.

Upstream catchment area covered by reservoirs

The word 'upstream' will be removed from the title for this feature and the land use feature as it was causing confusion. The score band will also be revised to match the one for land use.

There was also confusion over what is being measured. The question being posed is: How much of the water that *would normally* go into the lake is regulated? The following text will be added to the 'guidance' to clarify, 'The percentage bands refer to the reservoir catchment area as a proportion of the total lake catchment area. Note: any simple topographic analysis could be augmented by discussion with water managers to consider inter-basin transfers.'

Action 16: AL to revise the score band and text for 'catchment area covered by reservoirs'.

3.8 Scoring and interpretation of results (Sections 5 and 6 of the standard)

AL suggested that a table of features should be added to section 5.1 so that users of the guidance can see the list of features in summary form. This will include the six assessment categories and list the features under each one.

Annex A is mentioned in section 5.1 but the other annexes are not mentioned anywhere in the main document. The group agreed that references and brief introductions to these annexes should be included in section 5.

Action 17: AL to add a summary table of assessment categories and features to section 5.1 and add a brief introduction to annexes A-D in section 5.

Section 5.2.1: agreed to change (A) for artificial lakes to (Ar).

Section 5.2.1: agreed to delete the last sentence to avoid misleading results when a user is not confident in allocating a score.

Section 5.2.1: it needs to be made clearer that quantitative data should be used when available, and if not then qualitative data can be used. In some circumstances a mix of both may be used if, for example, quantitative data are unavailable for just a few of the features. The guidance also needs to be revised to ensure that the type of data that has been used (e.g. quantitative, qualitative or both) is reported alongside the assessment scores.

Section 5.2.2: text needs to be added for Table 1 stating that when 5-band scores have been condensed into 3-band scores, this should be made clear with the results.

Section 5.2.3 (line 1): agreed to delete the text in brackets.

Section 5.2.4 (line 1): agreed to change 'geomorphological' to 'hydromorphological'.

Table 2 (option 2, 'procedure' column): need to separate the 11 with a comma – i.e. 1,1. Also replace the xxxx with '1' for hydrological and '2-6' for morphological results.

Section 6.2: the 5-band scores (Table 3) will be labelled 'Score Band A' and the 3-band scoring system (Table 4) will be labelled 'Score Band B'.

GU asked how data should be presented if one or two features have been scored with the 3-band system and the rest have been scored with the 5-band system. How should the data be presented? PB agreed to write some text to describe how the data should be combined and presented in this case and add it as an example to the document.

Action 18: PB to revise sections 5.2.1 to 5.2.4 and 6.2 to reflect the points made above.

3.9 Title

The title was discussed. Currently the document is called, 'Water quality - Guidance standard on determining the hydromorphological condition of lakes'. The group agreed that a title matching that of the second rivers standard would be preferable, i.e. 'Water quality - Guidance standard on determining the degree of modification of lake hydromorphology.' PB offered to discuss this with Ralph Dominik (CEN/TC 230) to see if the title can be amended.

Action 19: PB to ask Ralph Dominik if the title can be changed to 'Water quality - Guidance standard on determining the degree of modification of lake hydromorphology.'

3.10 Introduction, Scope and Principle

These sections were discussed in turn and minor changes were made to the text of the standard during the meeting. The three short paragraphs in the 'Principle' section were merged into one longer paragraph.

3.11 Normative references

Only minor changes were made to the introductory sentences for this section.

3.12 Terms and definitions

Each term/definition was discussed and changes were made to them during the meeting. The numbering now needs to be updated and AL offered to check the document to ensure that all terms/definitions are still being used within the standard. If not, they will be deleted. PB will check the terms/definitions that were listed in the first lakes standard and will add a source (to this standard) for those terms that were defined in EN 16039 (2011).

Action 20: AL to check that all terms/definitions are still being used in this version of the draft standard and delete any that are no longer needed.

Action 21: AL to renumber the list of terms and definitions.

Action 22: PB to check the terms/definitions that were listed in the first lakes standard and add a source (to this standard) for any terms that were defined in EN 16039 (2011).

Session 4: Future work

4.1 Discussion on further work to complete the text

The case study examples must be completed and sent to PB by 9th May so that he can present them at the TG5 meeting on 22nd May to show how the standard will be applied in practice. He will present some supporting photographs and slides also.

Action 23: PB to present the workshop report, case studies and supporting photographs/slides to the TG5 meeting in Oslo on 22nd May.

The standard will be approved for consultation sometime later this year. PB may call a tele-conference with the group should he need to discuss any of the comments received. He will keep group members updated on progress.

4.2 Future international collaboration and funding for lake hydromorphology work

JR reported that he has registered an idea on behalf of the group for a new COST proposal for funding to support international collaboration on lake hydromorphology work. He wanted to discuss ideas so that this could be developed into a pre-proposal by the submission deadline of 28th March. Previous applications to the Earth System Science and Environmental

Management Domain were unsuccessful. SR suggested that the inter-disciplinary Trans-Domain is less competitive and may have a better chance of success.

JR explained that the bid should:

- Focus on a fundamental science question that will contribute to the advance of science.
- Be completely novel; not repeated elsewhere by other initiatives or projects that have been funded previously by COST.
- Demonstrate that international collaboration and networking is crucial in order to complete the work. (If successful, the money will pay for some workshops and associated travel/subsistence, allowing specialists to come together to work on the research question.)
- Involve the six countries represented at this workshop as well as others for which LHS data are available. All contacts can then be added to the potential partners list.

Potential partners were discussed and noted as follows: Finland (Antton Keto), Germany (Mario Sommerhäuser), Ireland (Deirdre Tierney and Ken Irvine), Portugal (Patricia Ferrari) and The Netherlands. JR will invite each of them to be involved.

It was agreed that work should focus on investigating the links between hydromorphological pressure and biological response. Comparisons of LHS and biological data should give a better understanding of cause and effect in ecosystem condition. There is currently no equivalent of the 'Restoring Rivers for Effective Catchment Management' (REFORM) project for lakes, and this is perhaps a gap which the COST proposal could fill to some degree.

Once the pre-proposal has been submitted, everyone should contact their COST National Coordinator (listed on the COST website) to highlight the benefits of the proposal. SR stressed that informal lobbying is recommended in order to ensure the success of the application.

Action 24: JR to submit a pre-proposal to COST by the submission deadline of 28th March and keep the group informed of progress.

Action 25: All group members to contact their COST National Coordinator to highlight the benefits of the proposal, once it has been submitted.

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Direktiva 2000/60/ES evropskega parlamenta in sveta z dne 23. oktobra 2000. Bruselj, 72 str.,11 prilog.

prEN 16039: 2013. *Water quality – Guidance standard on assessing the hydromorphological features of lakes*. (predlog)