Tasks needed to increase implementation of the 3Rs in fish research - personal reflections by Adrian Smith

Introduction
Norway’s consensus-platform for replacement, reduction and refinement of animal experiments, Norecopa (www.norecopa.no) arranged an international consensus meeting on Harmonisation of the Care and Use of Fish in Research 22-24 September 2009. This meeting was a sequel to a similar event in Oslo in 2005. The meeting is in the process of writing a consensus statement summarising the challenges within fish research. This meeting, and the preparations for it, have generated a good deal of discussion about specific tasks needed to increase the implementation of the 3Rs within areas that have not, in the participants’ opinion, been sufficiently addressed since 2005.

Purpose of this document and disclaimer
This document summarises my personal views, at this stage, of those tasks that should be performed to increase implementation of the 3Rs. It is not to be construed as reflecting the opinion of Norecopa or its Board, nor of the participants at the two consensus meetings referred to above, nor of any other institution.

Many of these tasks will require their own expert working groups. It is my hope that this document, or later versions, may be helpful for institutions planning fish research, for working groups, and for those wishing to highlight areas where work remains to be done.

This document may be replaced at a later stage by a revised document representing my views or the views of Norecopa. It is not intended for the public domain, nor should it be cited without consultation with me, in case a newer version exists.

Specific areas needing attention (in no special order of priority):

1. The production of a list of Categories of severity (non-invasive, mild, moderate and severe) for procedures on fish, with an adequate number of relevant examples within each category, to supplement the report of the EU working group from July 2009 (http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf).
2. The production of species-specific guidelines on health monitoring of the commonly used fish species (preferably both for breeding units and experimental units, along the lines of FELASA guidelines, and as a sequel to the general guidelines published by Johansen et al. in 2006 (http://la.rsmjournals.com/cgi/reprint/40/4/323).
3. The production of species-specific recommendations for assessment of humane endpoints and for the detection of positive and negative welfare indicators.
4. The production of science-based, species-specific, recommendations on best practice within, among other areas:
   a. procedures including capture, identification, housing and isolation of individuals, handling, immobilisation, injections, blood sampling and humane killing (these should be supplemented by websites containing film and photographs of the procedures)
   b. telemetry
   c. anaesthesia (including induction and recovery) surgery and analgesia
   d. statistical methods of relevance to research on fish in a farm setting
   e. the care and use of fish species, in a similar format to the literature-based recommendations that now form part of the latest version of Appendix A of ETS 123

5. The development of an English-language handbook and web-based course modules in “Laboratory” Animal Science for fish researchers, that also covers research in the field.

6. Behavioural research to develop better methods for determining optimal water quality and environmental enrichment for each relevant fish species.

7. The re-evaluation of current regulatory requirements for in vivo trials during the development and testing of fish vaccines, both to replace and reduce the use of living animals.

8. The production of a databank of protocols for use in fish research, as an aid to increase the use of the best methods, and to avoid repetition of suboptimal techniques.

9. The production of standardised fish within the most relevant species used in research

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