

Spinning our wheels and deepening the divide: Call for an evidence-based approach to the fish pain debate

Commentary on [Key](#) on *Fish Pain*

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Abstract: There is vigorous ongoing debate about whether fish feel pain and have the capacity to suffer. The body of literature dedicated to the topic is increasing but what is particularly problematic is that the majority of the contributions represent opinion pieces and thus fall within the realm of advocacy. Many of the empirical research papers purporting that fish do or do not feel pain have problems with cavalier use of definitions, poor experimental design, or statistical/technical issues and tend to include advocacy statements in their interpretations. Rather than continuing to spin our wheels and deepen the divide, I would advocate our community undertake a balanced, transparent and rigorous appraisal of all available evidence to help guide us and provide more clarity on pain and suffering in fish. This could be done through the use of evidence synthesis techniques such as systematic review and should be done by a reputable independent body such as a learned society or scholarly organization. Our continued emphasis on littering the peer-reviewed literature with opinion and advocacy is only confusing the matter for the public, media, policy makers and the rest of the scientific community.

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When I was first asked some six months ago whether I was willing to contribute a commentary on pain in fish, I pondered the opportunity and then declined given that I felt I had nothing new to contribute to the debate. Fast-forward to today and there are now thirty-some commentaries that play off Key's (2016) synthesis – the target article for this suite of commentaries – a clever and engaging way to launch the new journal *Animal Sentience*. I have slowly read the various commentaries written by scholars that span the divide. The divide to which I refer is based on opposing views that posit (1) that fish feel pain and have the capacity to suffer or (2) that fish do not feel pain and lack the capacity to suffer. With so much discourse and thought from clearly intelligent people one would think that clarity might emerge. Unfortunately, I think that we are instead spinning our wheels and deepening the divide.

When reading the recent commentaries, I searched for a voice of reason, a refreshing moderate perspective, yet I failed to find it. The polarized views remain polarized. The commentaries are hardly dispassionate and emphasize that this debate has moved further and further from science and evidence into a realm where personal values (and the many factors that shape them) are the drivers of opinion.

As a scientist who works in the realm of resource management and biological conservation, I am not a stranger to seeing passionate opinion and advocacy when considering difficult decisions or developing policies and practices. There is much debate in the conservation literature on whether advocacy by the scientific community is good or bad – whether it is a practice that we should engage in or avoid entirely (see Lackey 2007). The prevailing view is that advocacy *will* happen (whether we intend it or not; Nelson and Vucetich 2009), so it is critical that scholars be forthright about whether the perspectives presented are based on objective, balanced and impartial assessment of evidence or are simply a reflection of personal values and opinion (Scott et al. 2007). I would accordingly encourage the authors of the various commentaries to reflect on their individual contributions. Are they dispassionate and balanced assessments of the science or do they represent advocacy? It is my *opinion* that the commentaries are rife with bias and represent a potentially dangerous form of advocacy.

Imagine a naïve reader (member of the public, journalist or fisheries manager) stumbling upon the suite of commentaries and trying to negotiate through them to understand the state of the science on whether fish feel pain. The reader would be assaulted by various opinions, many opposing or contradictory, and be left utterly confused. I am confused. None of the commentaries attempt to provide transparent evidence-based synthesis; nor do they call for such activities. That is what I call for here.

Going back to conservation science and resource management: When conflict exists and there are divergent perspectives, structured approaches for synthesizing the evidence base can be used to inform decision making (e.g., Pullin et al. 2009). Consider the example of marine protected areas. The topic is contentious because implementing protected areas has the potential to directly affect livelihoods (Charles and Wilson 2009). The science is certainly mixed about the costs and benefits of such conservation strategies. However, there have been a number of highly transparent and balanced attempts to synthesize available evidence. One of the best examples is the report that was developed by the US National Research Council (NRC 2001) with participants drawn from the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. As stated in the preamble, the members of the committee responsible for the report were chosen for their special competences with due regard for appropriate balance. The end product “represents the culmination of a two-year, in-depth examination of this controversial approach to marine resource management that required analysis of issues in both marine ecology and fisheries science.”

More recently there has been a systematic review on the effectiveness of protected areas (Sciberras et al. 2013). Systematic reviews developed for use in medicine (see [Cochrane Reviews](#)) have since been adopted for use in conservation and environmental management

(Pullin and Knight 2001). These systematic reviews are transparent, highly-repeatable tools for synthesizing evidence (see Pullin and Stewart 2006). What is particularly unique is that the quality of the evidence is assessed to determine whether it is worthy of inclusion in the formal review. For example, consider a study where the experimental design lacks appropriate controls, includes some elements of pseudo-replication or has other technical or analytical problems. Should such papers be considered as part of the evidence base? Some (see Rose et al. 2014 – I am a co-author) question whether “fish really feel pain” based on problems with the existing evidence base (e.g., cavalier use of definitions, misuse of statistical tests, technical problems with experimental treatments). Critical appraisal of *empirical studies* themselves is of the utmost importance to ensure that conclusions derived from individual studies are justified.

In this commentary I will not be an advocate for or against the position that fish feel pain. I am comfortable enough as a scientist to be able to say “I don’t know” – I am utterly confused. Did I see that written in any of the other commentaries? I don’t think so....Most authors seem to know with certainty. The commentaries themselves could not be more diverse in their perspectives (e.g., contrast Manzotti [2016] with Sneddon and Leach [2016]). What I will advocate is that our community undertake a balanced, transparent and rigorous appraisal of all available evidence to help guide us and provide some clarity. Who knows, maybe we lack the evidence base to make such an assessment. If that is the case, it will become clear and we can identify the types of studies needed to help us do so. Such an activity could be led by a professional society (e.g., [Society for Experimental Biology](#), [American Fisheries Society](#)) or by an independent body (e.g., [Royal Society](#), US [National Research Council](#), [Royal Society of Canada](#)). The point is that it needs to happen.

How long are we going to spin our wheels and simply hurl rocks across the divide. It is time to take opinion off the table and let the evidence guide us. We can follow the lead of the evidence-based conservation model (see the [Collaboration for Environmental Evidence](#) as an example) using balanced experts to help guide the process. The only benefit I can see in *not* doing this is that we can all continue to pad our publication list as we continue to advocate on behalf of our varied perspectives. I for one am bloody bored of that. It is time to reach across the divide and follow the evidence. The public deserves this before opinion becomes the primary driver of policies and practices which have the potential to affect livelihoods.

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References

- Charles, A., & Wilson, L. (2009). Human dimensions of marine protected areas. *ICES Journal of Marine Science* 66:6-15.
- Key, B. (2016). [Why fish do not feel pain](#). *Animal Sentience* 2016.003.
- Lackey, R. T. (2007). Science, scientists, and policy advocacy. *Conservation Biology* 21:12-17.
- Manzotti, R. (2016) [No evidence that pain is painful neural process](#). *Animal Sentience* 2016.017.
- National Research Council. (2001). Marine protected areas: Tools for sustaining ocean ecosystems. *Committee on the evaluation, design, and monitoring of marine reserves and protected areas in the United States*. National Academy Press.
- Nelson, M. P., & Vucetich, J. A. (2009). On advocacy by environmental scientists: What, whether, why, and how. *Conservation Biology* 23:1090-1101.
- Pullin, A. S., & Knight, T. M. (2001). Effectiveness in conservation practice: Pointers from medicine and public health. *Conservation Biology* 15:50-54.
- Pullin, A. S., & Stewart, G. B. (2006). Guidelines for systematic review in conservation and environmental management. *Conservation Biology* 20:1647-1656.
- Pullin, A. S., Knight, T. M., & Watkinson, A. R. (2009). Linking reductionist science and holistic policy using systematic reviews: Unpacking environmental policy questions to construct an evidence-based framework. *Journal of Applied Ecology* 46:970-975.
- Rose, J. D., Arlinghaus, R., Cooke, S. J., Diggles, B. K., Sawynok, W., Stevens, E. D., & Wynne, C. D. L. (2014). Can fish really feel pain? *Fish and Fisheries* 15:97-133.
- Sciberras, M., Jenkins, S. R., Kaiser, M. J., Hawkins, S. J., & Pullin, A. S. (2013). Evaluating the biological effectiveness of fully and partially protected marine areas. *Environmental Evidence* 2:1-31.
- Scott, J. M., J. L. Rachlow, R. T. Lackey, A. B. Pidgorna, J. L. Aycrigg, G. R. Feldman, L. K. Svancara, D. A. Rupp, & Stanish, D. I. (2007). Policy advocacy in science: prevalence, perspectives, and implications for conservation biologists. *Conservation Biology* 21:29-35.
- Sneddon, L. U., & Leach, M. C. (2016). [Anthropomorphic denial of fish pain](#). *Animal Sentience* 2016.035.