

*Response to Torgersen et al. (2011): Reply to Diggles et al. (2011): Ecology and welfare of aquatic animals in wild capture fisheries*

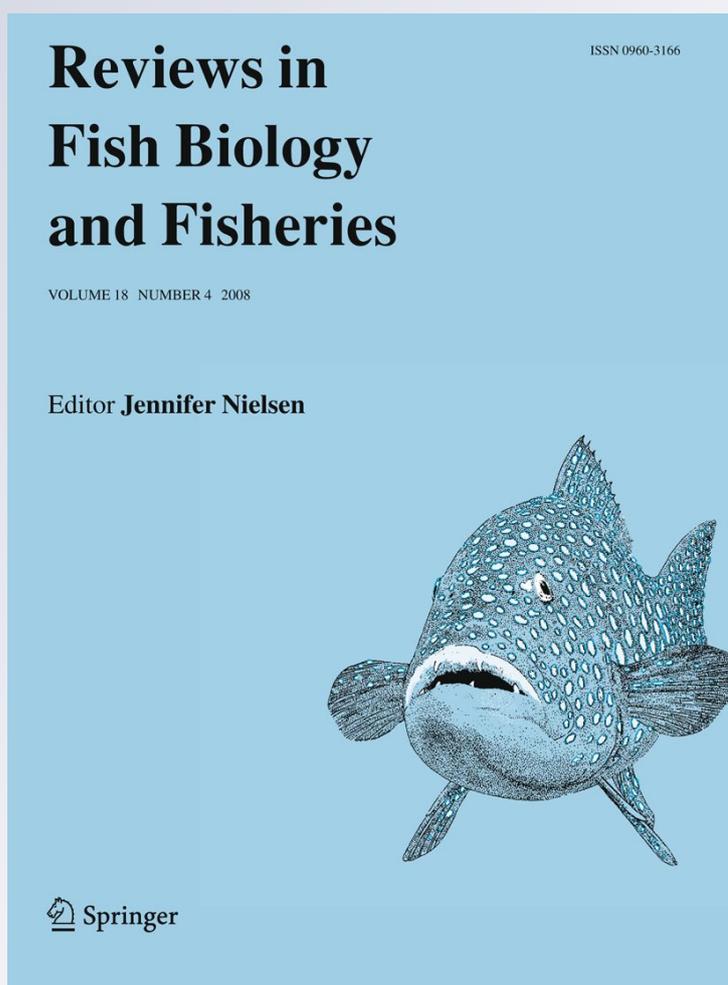
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## Response to Torgersen et al. (2011): Reply to Diggles et al. (2011): Ecology and welfare of aquatic animals in wild capture fisheries

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We welcome feedback on our paper that examined the ecology and welfare of aquatic animals in wild capture fisheries (Diggles et al. 2011), and agree with Torgersen et al. (2011) that the issue is an important one. However we must question statements such as “The basis for the interest in animal welfare is man’s capacity for empathy and the assumption or suspicion that animals have an experience of life.” We believe that interest in the welfare of animals in their natural environment should be founded on objective data, rather than anthropomorphic “empathy” and the vaguely founded “assumption or suspicion that animals have an experience of life.” This one example

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This is the Rebuttal to the article, Torgersen et al. (doi:10.1007/s11160-011-9221-y).

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demonstrates how different people can interpret concepts of aquatic animal welfare in quite different ways, highlighting how views on these issues vary depending on external influences such as the culture, education, socio-economic status, dietary preferences, gender or even political and religious persuasion of the individuals involved (Furnham et al. 2003). As pointed out recently by Browman and Skiftesvik (2011), welfare issues blur the lines between science and ethics, morals and philosophy. As scientists publishing in a scientific journal, we believe the overriding constant that should be applied in the field to inform decision making is the scientific method, and therefore use of words that cannot be operationally defined, (such as empathy and experience) is incompatible with the scientific process. Instead, we consider the functional definition that an organism “is in good health with its biological systems (and particularly those involved in coping with challenges to stasis) functioning appropriately and not being forced to respond beyond their capacity” to be sufficient basis for interest in maintaining an animals welfare.

Torgersen et al. (2011) challenged our statement that an implication of the nature based definition of welfare is that “[asphyxiation] may be an acceptable method of slaughter for commercial fishing if a nature based definition of welfare is used.” This is simply a reality of the nature based definition, and in stating “in that case the nature-based approach has little to offer” Torgersen et al. (2011) are encouraging a double standard by suggesting that some aspects of the nature

based definition are useful to define welfare in fish, while others are not. In our paper we give several examples that show that asphyxiation is a natural method of death in fish, and hence by definition, asphyxiation may be acceptable for slaughter if a nature based definition is used. In many cultures around the world, asphyxiation is indeed considered an acceptable method for slaughter of fish for this very reason (Diggles, Cooke, Rose and Sawynok, personal observations). However, we also pointed out in our paper that “death by asphyxiation is not ideal if a function-based definition of welfare is used for species such as teleosts and elasmobranchs, given that it results in a transient physiologically stressed state prior to death that also reduces product quality due to increased lactic acid buildup from anaerobiosis (Harada 1988; Wilkinson et al. 2008). This suggests that improvements to fish welfare may be achievable if commercial fisheries that usually rely on asphyxiation can move towards other slaughter methods such as use of ice slurries (with or without exsanguination), cerebral percussion or iki jime, with the added benefit of a likely improvement in product quality (and the promise of increased market price and shelf life as a result).” We thus demonstrated that a function based definition of welfare can use the scientific method to define where improvements can be made to slaughter strategies that may improve both fish welfare and product quality, without any need to resort to a feelings-based approach which brings in several unscientific principles which unnecessarily inflate the science boundary (Browman and Skiftesvik 2011) with respect to this issue.

Torgersen et al. (2011) stated “There is growing evidence that also teleost fish can feel pain and that they possess functional equivalents of the limbic and dopaminergic nervous systems—systems that are linked with emotion, learning and memory, spatial relationships, primary consciousness, reward, cost-benefit estimation and decision-making.” Regarding their claim that there is growing evidence for pain and consciousness in fishes, we reply that while the claims for such things and uncritical (faith based?, see Browman and Skiftesvik 2011) acceptance of these claims are growing, the scientifically sound evidence base for these capabilities remains nonexistent (Rose 2007). It is paradoxical Torgersen et al. should cite Berridge (2004) because Berridge made a strong case for the existence of unconscious emotional reactions

in organisms like fishes, but without these reactions being accompanied by conscious feelings. We happen to agree with Berridge and Winkielman (2003) and Berridge (2004) on this point (see Rose 2007). We also note recent publications in the scientific literature that claim that some invertebrates may also “feel pain,” and agree with Mason (2011) that, again, there is no real scientific evidence to support these statements.

Torgersen et al. (2011) state “Welfare should not be seen as a property of all entities with good or bad functioning. Thus, extending the use of the term welfare to everything with assessable functionality may make it more versatile, but at the cost of being meaningful. In other words, welfare is not a property of animals with no experience of life.” Unfortunately when discussing welfare in wild fisheries, this approach ignores the reality of how natural aquatic ecosystems and food webs function. If we ignore the relationships between lower trophic levels and higher trophic levels that include fish and elasmobranchs, the welfare of the “higher organisms” many people are most interested in can be severely compromised if the lower trophic levels are ignored. The natural world does not recognize artificial definitions relating to which organisms are considered to “experience life,” and which do not. Advocates of feelings based approaches that seek to define which organisms are deserving of welfare consideration, and which are not, ignore this reality at their own peril whenever they extend their interests from artificial systems into natural ecosystems.

Discussing the utility of functional and nature based definitions of welfare to encompass issues relating to environmental degradation, Torgersen et al. (2011) state “Again, no matter how important such environmental issues may be, and no matter how useful approaches which are not based on the individual animals’ quality of life may be as instrumental tools in studies of e.g. anthropogenic habitat degradation, such approaches do not address questions about the welfare of animals—i.e., they are not meaningful welfare approach.” This comment appears to suggest that Torgersen et al. (2011) consider an animals’ environment should not be taken into account when considering its welfare. This position is completely at odds with the reality of the existence of aquatic animals in their natural environments, as well as those reared in aquaria and aquaculture systems. There are direct and immutable relationships between environmental

quality and aquatic animal welfare, and for Torgersen et al. (2011) to suggest that it is not meaningful to consider these links shows a complete lack of understanding of the functional principles relating to organism health, which is a basic fundamental that underpins aquatic animal welfare. And indeed, later in their note Torgersen et al. (2011) state “we agree that fisheries management, coastal zone management and pollution undoubtedly affect the welfare of wild animals,” which validates our position and contradicts their original stated position.

Torgersen et al. (2011) conclude “If we are to act as moral beings, we cannot look to amoral creatures for ethical guidance. The moral questions (which are normative, not empirical scientific ones) are whether we should allow ourselves to impose suffering on other subjects, and if so, how much and for what reasons.” This feelings based, suffering centred view has overlooked one critical point. Our paper does not look to amoral creatures for ethical guidance at all. Our goal is not to disregard welfare, but to put it on a more rational basis that is predicated on reality and objective scientific standards, rather than emotion. Our paper simply examined and compared the various welfare definitions currently in use within the context of the reality of the natural aquatic environment. In doing this, we reached the conclusion that if science is to be used to define welfare outcomes for aquatic animals in their natural environment, only functional or nature based definitions are able to do this in a manner that does not contradict reality, invite use of double standards, or contravene basic scientific principles through faith based acceptance of ill defined concepts of the existence of pain and consciousness in fishes (or elasmobranchs and invertebrates for that

matter). We therefore stand by our thesis that assurance of the welfare of aquatic animals in their natural environments requires application of not only ecosystem management principles that are based on sound science, but also definitions of welfare that are consistent with the reality of the functional processes of the natural environment and the organisms that live within it.

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