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Facilitate, don't forbid, trade between conservationists and resource harvesters

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We are glad our recent paper in *Ecological Applications* has stimulated new discussion on the role of conservation markets in wildlife management. In their response, Smith et al. identify four important challenges to implementing a whale conservation market. We agree that the details of market-based policies are important and highlighted several challenges in our paper in the market design for whales. But we believe the challenges highlighted by Smith et al. (and indeed by our own analysis) will be present under any institutional regime and are surmountable in a market with appropriate design. The purpose of our paper was to propose a general framework for how a market for wildlife species such as whales might perform in order to stimulate new thinking on the many complexities associated with a market-based approach. We are delighted that our paper has accomplished this so quickly, and remain enthusiastic about the exciting research ahead.

The overall concern raised by Smith et al. is that, because whales are an impure public good, any policy that fails to capture all nonmarket benefits and potential free riding will lead to a suboptimal outcome. We agree that any approach that ignores nonmarket and external benefits could lead to a suboptimal outcome. Importantly, we never claimed that a conservation market would lead to a socially optimal outcome. Rather, we

proposed that it could be Pareto improving (make both sides better off) relative to the status quo. Furthermore, if conservationists purchase all of the shares (which may well occur), then indeed this solution may be socially optimal; an important (and perhaps likely) scenario that Smith et al. failed to recognize. A simple version of the market, which has been mirrored for in-stream flow water rights, is to cap the whale harvest at the current level of take (provided it is biologically safe), and to provide a platform where conservationists can compensate whalers to reduce harvest from that point. If such trade occurs, and we have strong evidence that it could, it would improve the welfare of both sides. More complicated market designs are also possible, and our simulations illustrate several cases. That said, we think the impure public good nature of whales could lead to interesting new research and insights about market design and outcomes (compared to some reasonable counterfactual) in these contexts.

In addition to this general concern about free riding, below we briefly address each of Smith et al.'s four suggested impediments:

- 1) The creation of a whale share would legitimize the international trade in whale meat and expand the whale meat market.

This is an interesting idea that may, or may not, come to pass. The design of the market will matter. If, for example the “market” is set to allow only conservation reductions from current harvest levels, we doubt this

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simple change will stimulate an increase in demand for whale meat. But we agree in principle that a global, fully functioning whale conservation market could to some extent legitimize whaling and could thus increase demand for whale meat. This could raise some interesting challenges of welfare measurement that neither we, nor Smith et al. address. Regardless, if the quota is set in a safe manner (as described in the paper), then conservation cannot be compromised. Our illustrative simulations show that, under a whale conservation market, the actual harvest may be substantially lower than what is caught now by Japan, Norway, and Iceland. That said, we agree that empirical research on consumer behaviors in the legal market and black market resulting from the potentially stimulated demand is an important avenue for future research. These effects could be incorporated into a model used for designing and regulating such a market.

- 2) A legal whale trade creates new monitoring and enforcement challenges similar to those of organizations that manage highly migratory species.

Monitoring and enforcement pose significant challenges whether or not one adopts a market approach. Indeed, one could argue that these challenges are even greater under the current system. Despite the challenges, we suggest that our proposed market may streamline many of the issues, because it would clearly define who was permitted to take whales, what whales they could take, and where they could take them. Furthermore, it is harder to “hide” the illegal harvest of a whale than it is to hide the illegal harvest of a fish: Whales are large and easily observable and whaling ships are specially designed and easier to track. Furthermore, under any governance system, the conservationists will have an incentive to monitor whaling behavior; under a conservation market, they would be able to flag, and presumably spur enforcement over violations.

- 3) Introducing a catch share will likely create a new political economy of management that changes incentives and increases costs for NGOs to achieve the current level of conservation.

It is almost certainly true that the setting of the quota will attract significant political attention from all interested parties. But this is nothing new: These kinds of debates will exist under any system (indeed, even under the existing “moratorium”). Because current harvest levels for most whales are low relative to maximum sustainable yield (MSY) values, we think a practical possibility that may be acceptable to all sides is to adopt a very conservative cap. One possibility is to set the cap at the current level of take (when it is safe); in the paper, we discuss other possible formulas for setting the cap. Once the cap is set, a nongovernmental organization (NGO) could either buy permits from the tradable market or from an auction. We have provided evidence

that this approach will be considerably less expensive (per whale saved) than is the status quo approach to conservation. Clearly, this is an important issue that merits future research.

- 4) A whale share program creates new logistical challenges for quota definition and allocation regardless of whether the market for whale products expands or contracts.

We agree that there are important logistical challenges that will need to be debated, analyzed, and overcome to design and operate any effective conservation market. However, many of these challenges have already been addressed in other contexts, such as air pollution, wetlands, and water quality trading programs. There is a wealth of experience that could, and should, be drawn from these programs.

Overall, in addition to the many issues highlighted in our paper, Smith et al. have raised some important challenges in the design and operation of a conservation market that must be addressed in any plan that moves forward. Importantly, though, most of those challenges will exist under any governance regime, so it would be a mistake to view those challenges as evidence against the adoption of a conservation market. Nevertheless, we do not cavalierly believe that conservation markets will miraculously solve all of the world’s wildlife management challenges. Rather, we are motivated by the basic economic intuition that providing a platform for trade between commercial interests and conservation interests can make both sides better off than by forbidding trade. For example, under the current system, suppose a United States-based NGO and a Japanese whaling company wanted to make a private agreement in which the NGO paid the whaler \$10 000 to reduce their whale harvest by one whale. This is a simple manifestation of the market mechanism we have proposed. Surely Smith et al. would agree that such a private contract should be allowed. Unfortunately, this kind of transaction is unlikely in the current system, because no firm cap exists against which to judge reductions in harvest. Thus, we proposed a formal market structure.

In summary, we agree in principle with Smith et al. that for whale conservation markets to become a practical, politically feasible solution that respects all stakeholders will indeed require much continued thought. Naturally, we encourage continued discussion about the role of conservation markets in managing wildlife. And while we appreciate Smith et al.’s insights, and think they could help improve the design of conservation markets, we question the relevance of these concerns to moving beyond the current stalemate in whale conservation. In our view, our paper’s original message is unchanged: Conservation markets for wildlife are certainly no panacea, but can likely be designed to improve substantially on the status quo.