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NEWS AND VIEWS

REPLY

The advocate and the scientist: debating the commercial exploitation of endangered hawksbill turtles

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> 'An advocate knows the answer and looks for evidence to support it; a scientist asks nature how much support there is for competing hypotheses.' — Hilborn (2006)

Recently we published a paper on the migrations of hawksbill turtles in the Caribbean basin based on mtDNA markers, and concluded that turtles from nesting colonies could be detected in multiple feeding habitats across the Caribbean. In a final passage we noted that exploiting turtles in feeding areas would deplete nesting populations throughout the region. This was a straightforward conclusion that passed the rigorous review process for *Molecular Ecology*. A companion piece by Mortimer *et al*. (2007) put our findings in the context of contemporary conservation issues.

Before addressing the criticisms raised by Godfrey *et al*. (2007), we introduce the scientists on each side of the debate, to help readers frame the dispute in terms of advocacy and science. All are accomplished researchers. Authors on Bowen *et al*. (2007) are affiliated with the US Park Service and US-based universities. Authors on Godfrey *et al*. (2007) are affiliated with the North Carolina Wildlife Resources Commission, University of Toronto, and Wildlife Management International (WMI), a consulting firm in northern Australia. WMI previously championed a Cuban harvest of hawksbill turtles at the 10th and 11th Conference of Parties for the Convention on International Trade in Endangered Species (CITES) in 1997 and 2000, and was funded by either the Japanese Bekko Association (the leading purchaser of hawksbill shell) or the government of Cuba. Apart from the hawksbill shell trade, WMI has a history of opposing protective measures for wildlife (www.fisheries.ifcnr.com/article.cfm?NewsID = 345).

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The critique by Godfrey *et al*. (2007) includes four issues:

1 Phylogenetics cannot inform harvesting.
Godfrey *et al*. (2007) state that our 'phylogenetic' report provides no information on sustainable mortality in Caribbean hawksbills. We agree, because our mixed stock analysis (not a phylogenetic analysis) nowhere mentions sustainable mortality.

2 Our alleged statement that hawksbill turtles cannot be exploited at any level.
Bowen *et al*. (2007) nowhere state that hawksbill turtles cannot be exploited. Our entire discussion of harvest is one sentence: 'Harvest in the Caribbean foraging areas will deplete nesting populations across multiple jurisdictions, and will also reduce the role of this unique spongivore on regional coral reefs.'

3 Our conclusion that exploitation will reduce multiple nesting populations.
If a turtle from the rookery in Antigua is taken, we think it is reasonable to say there will be one less turtle in that breeding population. If turtles from Antigua, Yucatan, and Cuba are present in a feeding population, and that feeding population is exploited, it is reasonable to conclude that all three breeding populations will be impacted. That is the extent of our inference.

4 Our alleged opposition to sustainable use.
Godfrey *et al*. state that the issue of sustainable use 'is a more complex issue than has been presented in ... Bowen *et al*. (2007)'. We agree, because (again) we never mention the subject.

In summary, three of these four criticisms are extraneous to our publication. The reader is invited to review our conservation section, the last two paragraphs of Bowen *et al*. (2007), to verify this.

Since much of the critique by Godfrey *et al*. (2007) is a defence of sustainable use, and since this is not addressed in our original article, we offer some thoughts on the subject. Sustainable use of a biological resource depends on accurately estimating several variables. Above all, sustainable use assumes that future abundances of the resource can be predicted, given recent population histories and knowledge of environmental and biological conditions. These assumptions are at the core of stock assessment methods in fishery management. However, the corresponding environmental variables are famously difficult to estimate.

Godfrey *et al*. (2007) suggest that populations of hawksbills will stabilize because of density-dependent population growth. The idea behind density-dependent recovery is that after a population decline, the resources supporting the population become more abundant (Bjorndal *et al*. 2000). This is a risky assumption for Caribbean hawksbills. First, human encroachment has reduced suitable habitats in the Caribbean by over 80% (Jackson 1997). Second, climate warming will unquestionably stress the reef habitats that sustain hawksbill turtles. Third, valuable wildlife commodities are notoriously difficult to protect from poaching.

Karl & Bowen (1999) and Bowen & Karl (1999) argue that scientists should be cautious about adopting advocacy positions, because of the difficulty in distinguishing an impartial scientific inquiry from a search for data to support a point of view. Godfrey *et al*. (2007) criticize us for positions that are nowhere raised in our report, highlighting the credibility issues that accompany advocacy by scientists.

In this case, Godfrey *et al*. (2007) advocate positions that support resumption of the international trade in hawksbill shell. Previously the Japanese Bekko Association imported many tons of shell in contravention of an international moratorium imposed by CITES Parties (Milliken & Tokunaga 1987). In January 1993, the government of Japan stopped these imports in response to a proposed embargo of Japanese fishery imports by the US government. At the 15th CITES Conference in 2010, an alliance of the Japanese Bekko Association and the government of Cuba may again propose international trade in hawksbill shell. The proposal may include a 'one-time' sale of existing stockpiles, like those approved by CITES Parties in 1997 and 2002 for stockpiles of elephant ivory.

What could be wrong with selling off stockpiled hawksbill shell? Those turtles are long-dead. Could this sale somehow impact hawksbill nesting and feeding populations? The lessons from the 'one-time' sales of ivory are pertinent. Five years later, the ivory business is intact, and poaching continues to threaten some elephant herds. One of us (B.W.B.) asked a wildlife manager in Africa why the trade continues when international sale is banned. The answer: ivory merchants are stockpiling for the next 'one-time' sale (see Thornton *et al*. 2000).

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