

Trade Data Analysis: a tool for improved transparency and management of South African abalone (*Haliotis midae*)

Brian Ahlers¹, Markus Burgener², Gil Sylvia³, Michael Harte⁴

¹ M.S. Candidate, Oregon State University, ² Programme Officer, TRAFFIC, ³ Director, Coastal Oregon Marine Experiment Station, ⁴ Professor, College of Earth, Ocean, and Atmospheric Sciences

Background

Seafood is arguably one of the most perishable and highly traded food commodities in the world. Approximately 40% of the global seafood market is traded internationally^[4]. In the last ten years seafood consumption has increased nearly 17% worldwide, increasing in value from \$60 billion to \$120 billion from 2000 to 2011, respectively^[2]. Despite this growth, estimated losses tied to IUU fishing alone are \$10-23 billion a year^[7].

Due to intense poaching effort and market demand in Asia, South African (SA) resource stocks of abalone, *Haliotis midae*, have steadily declined in recent years^[8]. In China, abalone is highly valued given customary beliefs in its ability to decrease senility and increased fertility, as well its aphrodisiac properties. In 1999, Chinese black market syndicates paid a real price of \$65 per kilogram of abalone, and SA abalone is probably much higher today given the increases in export price^[5] ^[8]. While the SA MPA system remains a series of tiny "refugia" for abalone stocks, increased enforcement of MPA's alone will not recover the species. Many fishery control officers report continued poaching inside SA extensive MPA system^[6].



Figure 1. A recent investigation from South African law enforcement resulted in the seizure in May of 2016 of over 8,397 dried abalone^[9] (Photo credit: Geldenhuys 2016). As legal fishing quota has decreased, estimated IUU harvest still continues to increase^[8].

Objective

Given the status of *H. midae* and the CITES Appendix III listing and subsequent delisting in 2007 and 2010, our goal is to illustrate broader trends in trade behavior between sub-Saharan nations and Hong Kong (HK), and to demonstrate the merits of Trade Data Analysis for greater transparency and improved management.

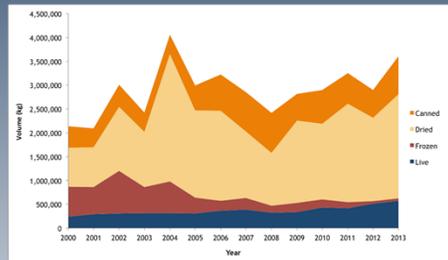


Figure 2. Total import of *H. midae* in all forms into Hong Kong, Japan, and Taiwan from South Africa, Namibia, Swaziland, and Zimbabwe. Dried product has increased substantially, from roughly 40% in 2008 to 60% in 2013. Live product has also increased steadily.

Methods

Harmonized system (HS) codes used by customs officials around the world have increasingly gained attention as a retrospective monitoring tool. 9.9% of HS codes are classified at the species level, including *H. midae*^[1]. Given the growth in dried product as a proportion of all abalone traded, we focused solely on dried product (Fig 2). Trade data from UN Commtrade and the International Trade Center (ITC) were obtained between sub-Saharan countries and Hong Kong, a major importer of *H. midae*. HS codes used were 03079920 and 03078990, which classify dried abalone before and after the 2012 HS revisions, respectively. Data were analyzed from 2002-2015, and focused on dried imports to Hong Kong from country of origin.

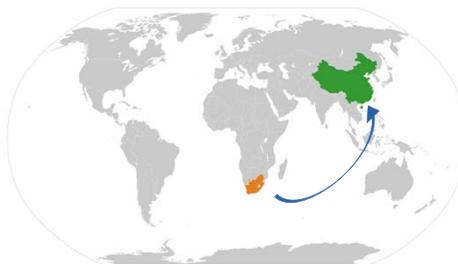


Figure 3. The focus of this research highlights trade practices between South Africa and Hong Kong, and the decentralization of abalone trade originating in SA.

Findings

Over the last ten years, data revealed a substantial increase in *H. midae* arriving in Hong Kong from sub-Saharan Africa. Trade activity has become much more complex since the CITES listing in 2007, with increasingly higher volume of dried abalone reported arriving into Hong Kong from Namibia, Zimbabwe, and Zambia in recent years (Fig 4). Hong Kong repeatedly reported higher volumes and value relative to developing sub-Saharan countries. Discrepancies between dried abalone received in Hong Kong and dried abalone exported to Hong Kong reveal potential evidence for IUU (Fig 5).

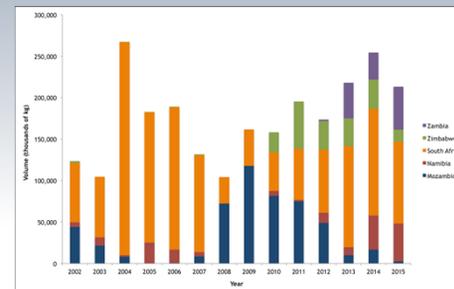


Figure 4. Top importing countries and total imports of dried *H. midae* into Hong Kong from sub-Saharan countries. Dried product has increased substantially, from roughly 40% in 2008 to 60% in 2013

Discussion

Documented imports to HK slowed down substantially in 2008, and then rebounded since (Fig 4). This pattern could be associated with the global recession, or as a result of CITES implementation in 2007. Although *H. midae* is only found naturally in coastal South Africa, many neighboring countries have become increasingly involved in unreported and illegal trade of *H. midae*. To address non-compliance, fishers must consider the likelihood of detection from law enforcement, the economic gains from the harvest, and the severity of sanctions. Data from Oman were excluded given exclusive aquaculture operations, and only top 5 sources of HK imports were analyzed. Nevertheless, our research demonstrates the increasing complexity and geographic decentralization of *H. midae* trade behavior from sub-Saharan Africa to HK.

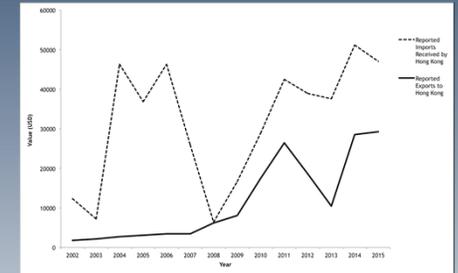


Figure 5. Reported dried abalone traded by value in US dollars. Dried abalone received by customs officials in Hong Kong was consistently higher than reported dried abalone exported by South African officials between 2002 and 2015.

Further Considerations

The SA government must address the lack of proper incentives for legitimate harvesting and trade. Given the continued increase in market demand in HK, the road ahead will be challenging nonetheless. After CITES implementation in 2007, *H. midae* was delisted off Appendix III of CITES. As SA officials push for CITES Appx III listing for dried abalone this September at the 17th Convention of the Parties hosted in Johannesburg, more focus is needed on proper fisheries incentives and property rights, recovery of resource rents for legitimate fishers, and proper enforcement of the law.

References

- B.H. Chan, H. Zhang, G. Fischer. Improve customs systems to monitor global wildlife trade. *Science* (80-81). 348 (2015).
- B. Sterling, M. Gooch, B. Dent, N. Marenick, A. Miller, G. Sylvia. Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective. *Compr. Rev. Food Sci. Food Saf.* 14 (2015) 205-268. doi:10.1111/1541-4337.12130.
- H. Geldenhuys. Poachers' network spread far and wide. *IOL Weekend Arg.* (2016). <http://www.iol.co.za/weekend-argus/poachers-network-spread-far-and-wide-2023220>.
- M. Abensperg-Traun. CITES, sustainable use of wild species and incentive-driven conservation in developing countries, with an emphasis on southern Africa. *Biol. Conserv.* 142 (2009) 948-963. doi:10.1016/j.biocon.2008.12.034.
- M. Hauck, N. a Swejld. A case study of abalone poaching in South Africa and its impact on fisheries management. *ICES J. Mar. Sci.* 56 (1999) 1024-1032. doi:10.1006/jmsc.1999.0534.
- P. Chadwick, J. Duncan, K. Tunley. State of Management of South Africa's Marine Protected Areas. *WWF South Africa Rep. Ser.* (2014) 1-209.
- P. Pritzker, K. D. Sullivan, S. Ruesch. *Fisheries Economics of the United States: Economics and Sociocultural Status and Trends Series*, 2012. <https://www.st.nmfs.noaa.gov/Assets/economics/documents/feus/2012/FEUS2012.pdf>.
- S. Raemaekers, M. Hauck, M. Burgener, A. Mackenzie, G. Maharaj, E.E. Plagányi, et al., Review of the causes of the rise of the illegal South African abalone fishery and consequent closure of the rights-based fishery. *Ocean Coast. Manag.* 54 (2011) 433-445. doi:10.1016/j.ocecoaman.2011.02.001.

Acknowledgements
Special thanks to the South African National Biodiversity Institute (SANBI) in Kirstenbosch for providing research facilities. I thank the College of Earth, Ocean, and Atmospheric Science from OSU for travel assistance, and to the Hatfield Marine Science Center for additional funding support.



TRAFFIC
the wildlife trade monitoring network

Oregon State
UNIVERSITY