



Shark Finning in the Galapagos Marine Reserve

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BACKGROUND

In 1959, the Government of Ecuador declared the Galapagos Islands a National Park. These Islands are among the world's top destinations for nature tourism and represent 55% of the total revenue in tourism for the Ecuadorian economy. The 97% of the archipelago's landmass is protected area, while 3% is assigned for a growing human population from 6.000 inhabitants in 1982 to around 25.000 in 2012. In 1979, UNESCO declared Galapagos a World Natural Heritage site, safeguarding its conservation for local and visitor future generations. This declaration holds the challenge of conserving the natural resources as well as ensuring the local population well-being. In 1998, the Galapagos Marine Reserve (GMR) was established as a protecting border around the Islands, constituting among the world's largest marine protected areas and giving origin to the *Galapagos Management Plan*. Marine protected areas declaring 'no-take areas' are rare, but they are established aiming to confront global ecosystem threats for its regenerating capacity of resources. However, illegal shark finning in the GMR is a constant threat for the marine resources conservation.

AN ILLEGAL PRACTICE

There are 400 species of sharks worldwide. Unlike bony fish, sharks present a slower rate of growth and maturity, plus low fecundity. These facts worsen their populations to recover from overfishing. The GMR holds thirty species of sharks, such as the hammerheads (*Sphyrna lewini*), Galapagos (*Carcharhinus galapagensis*), white-tipped (*Triaenodon obesus*), and also whale sharks (*Rhincodon typus*) (Hearn et al., 2008). Around 90% of those sharks are considered 'threatened' or 'near-threatened' under IUCN Red List (Cahmi et al., 2009).

Shark finning is an unsustainable fishery practice, which consists of removing and retaining the shark fin while discarding the carcass at the sea. In the GMR, this activity with under-reported catches has not ceased since the 1950s, dominating in the 1980s and growing ever since (Jacquet et al., 2008). Thousands of shark fins are traded for the East Asian markets to be sold for a traditional shark-fin soup. Illegal tuna fishing boats from mainland Ecuador, Colombia, Costa Rica, Taiwan, Korea and Japan have been fishing and targeting sharks. From 1950 to 2010, 797.000 tons of seafood were extracted within the GMR and its contiguous Galapagos Exclusive Economic Zone (EEZ) (Schiller et al, 2015). Mid-August 2017, the Chinese boat Fu Yuan Yu Leng 999 was detained transporting 300 tons of illegal catch belonging to 6.000 individuals of endangered species of sharks.

SHARK-VALUE AWARENESS

The total revenue from underwater tourism in the GMR is US\$154 million per year versus the US\$4.4 million annual revenue from illegal fisheries in Galapagos (Figure 1) (Lynham et al., 2015). The cost-effective analysis (CEA) of sharks in the Galapagos tourism industry report a net present value (NPV) of US\$5.4 million. This corresponds to the US\$360.000 annual spending per shark sighting compared to the US\$158 value per shark carcass. In fact, sharks alive in the GMR are the most valuable compared to other marine tourism destinations with similar ecosystems (de León et al., 2016) (Figure 2).

LOCAL EMPOWERMENT FOR DECISION MAKING

The *Galapagos Management Plan* considered principally environmental studies but did not include considerations on human and interdisciplinary issues. From their insight, local fishermen felt underrepresented during the process of participation. Until current days, they find the *Galapagos Management Plan* a constraining legal instrument instead of one providing social-environmental alternatives; since benefits rest mostly upon the conservation NGOs and the large-scale tourism sector. In addition, there is a negative local, national and international connotation constructed upon the Galapagos fishing sector as “predators”; obscuring any of its positive actions related to environmental practices supporting the marine conservation through community engagement.

ACTION REQUIRED

There is an urgent need for political and scientific trust-building efforts combined with legitimate public participation. Therefore, for further decision-making processes it is fundamental to include the fishing and local community in each step of the construction of legal tools for conservation. Consequently, the consultation members could apply a Multi Criteria Analysis (MCA). This technique assesses the different categories of outcomes under management scenarios of the GMR to choose the best. By implementing the MCA the outcomes are not converted into monetary values but based according to the weighting given by the members’ aggregated sensitivity. As a result, MCA pursues a distribution of social welfare among the stakeholders, which relies upon a legitimate participation (Smart, 2017).

CONCLUSION

Local empowerment is crucial to reach the effectiveness in the establishment and the implementation of the policies for protection management of common pool resources. Incorporating local approaches helps to understand the linkage between natural ecosystems, its people and the feasible solutions as a counterpart of foreign agendas. Likewise, it is key to communicate the existing awareness from the local populations regarding the value of their protected zones, their lifestyle and their priorities. The GMR resources conservation and the wellbeing of its local communities could be achieved by integrating a multi-disciplinary approach with a legitimate participation from all the sectors involved. In a globalized and dynamic world it is necessary to grant the democratization of both science and local knowledge as valuable assets for decision-making.

REFERENCES

Camhi, M. D., Valenti, S. V., Fordham, S. V., Fowler, S. L., & Gibson, C. (2009). The conservation status of pelagic sharks and rays: report of the IUCN shark specialist group pelagic shark red list workshop. *IUCN Species Survival Commission Shark Specialist Group*. Newbury, UK.

de León, P. S., Acuña-Marrero, D., Rastoin, E., Friedlander, A. M., Donovan, M. K., & Sala, E. (2016). Largest global shark biomass found in the northern Galápagos Islands of Darwin and Wolf. *PeerJ*, 4, e1911.

Hearn A, J Ketchum, G Shillinger, P Klimley & E Espinoza. (2008). Programa de investigación y conservación de tiburones en la Reserva Marina de Galápagos. Reporte Anual 2006-7. Charles Darwin Foundation, Santa Cruz, Galapagos, Ecuador. 114 pp.

Jacquet, J., Alava, J. J., Pramod, G., Henderson, S., & Zeller, D. (2008). In hot soup: sharks captured in Ecuador's waters. *Environmental Sciences*, 5(4), 269-283.

Jones P.J.S, Qiu W, De Santo E.M. (2013). Governing marine protected areas: social-ecological resilience through institutional diversity. *Mar Policy* 41:5-13.

Lu, F., Valdivia, G., & Wolford, W. (2013). Social Dimensions of 'Nature at Risk' in the Galapagos Islands, Ecuador. *Conservation and Society*, 11(1), 83.

Lynham, J., C. Costello, S. Gaines, E. Sala. (2015). Economic valuation of marine- and shark-based tourism in the Galápagos Islands: Report to the Galápagos National Park.

Quiroga, D. (2009). Crafting nature: the Galapagos and the making and unmaking of a "natural laboratory". *Journal of Political Ecology*, 16(1), 123-140.

Schiller, L., Alava, J. J., Grove, J., Reck, G., & Pauly, D. (2015). The demise of Darwin's fishes: evidence of fishing down and illegal shark finning in the Galápagos Islands. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 25(3), 431-446.

Smart, J. (2017). Week eleven: Multi Criteria Analysis [7-14]. Unpublished manuscript. 7401ENV, University of Griffith, Nathan Campus, Australia.

Usseglio, P., Schuhbauer, A., & Friedlander, A. (2014). Collaborative approach to fisheries management as a way to increase the effectiveness of future regulations in the Galapagos

archipelago. In *The Galapagos Marine Reserve* (pp. 187-202). Springer International Publishing.

Williamson, A. R., & Scicchitano, M. J. (2014). Dimensions of Public Meeting Participation: Evidence from Florida's Truth-in-Millage Act. *Urban Affairs Review*, 50(1), 134-146.

FIGURES



Fig. 1. Economic values of legal fisheries vs. marine tourism (Lynham et al., 2015)

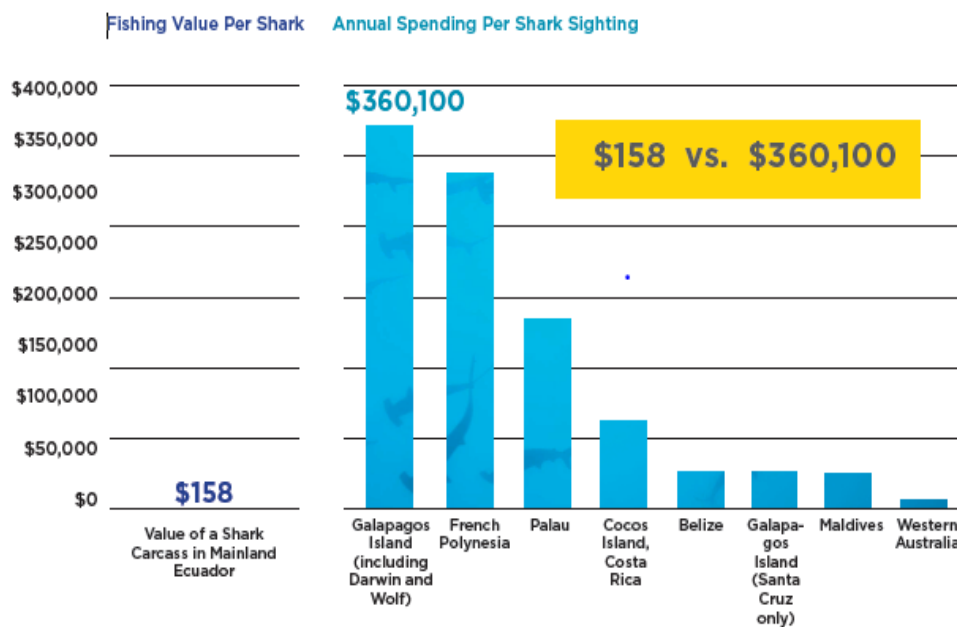


Fig. 2 Cost-effect analysis of sharks alive in the tourism industry (Lynham et al., 2015)

Shark Finning in The Galapagos Marine Reserve



Photo: BBC, 2017

Maria Daniela Cox Rueda - Galapagos, Ecuador

31 October 2017

Wellington, New Zealand

OUTLINE

1. Purpose of Presentation
2. Background: The Galapagos Marine Reserve
3. Study Area: Galapagos Islands
4. An Illegal Practice
5. Shark-Value Awareness
6. Local Empowerment for Decision-Making
7. Action Required
8. Conclusion
9. References

Photos: 1. Whitman Cox, 2. Daniela Cox, 3. Daniela Cox



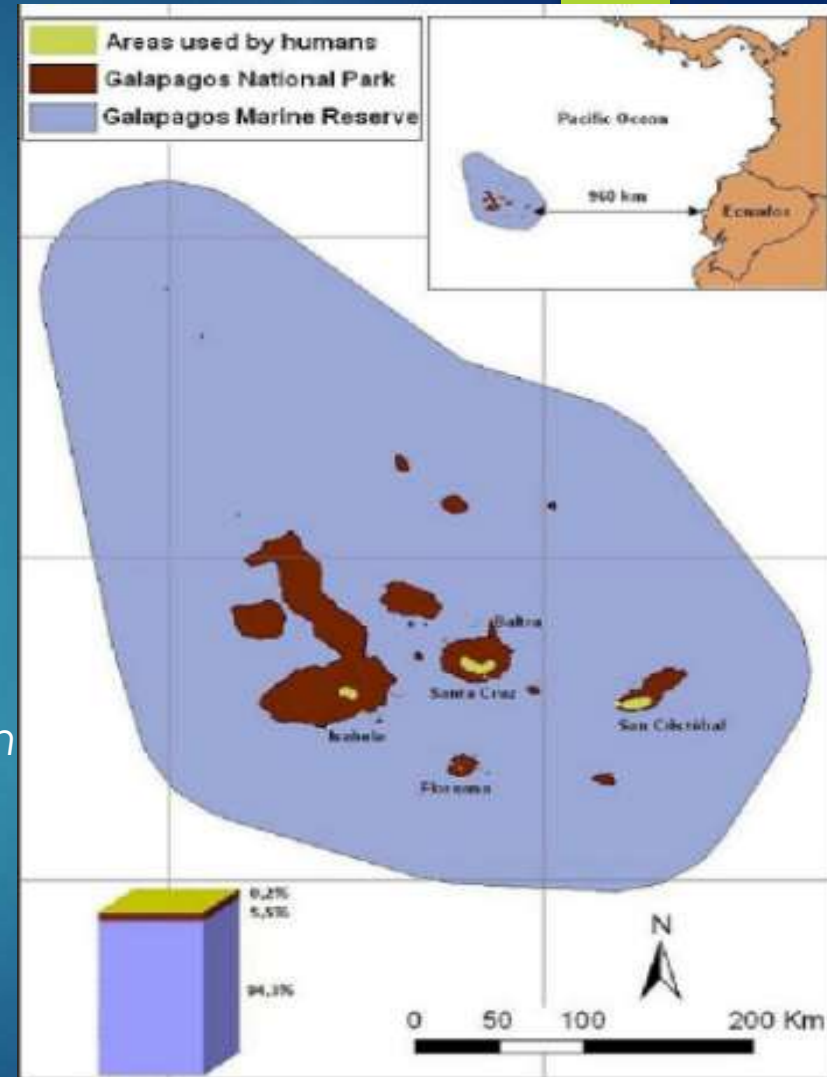
1. Purpose of Presentation

Shark Finning in the Galapagos Marine Reserve
as a study case to state the need of
local participation in decision-making

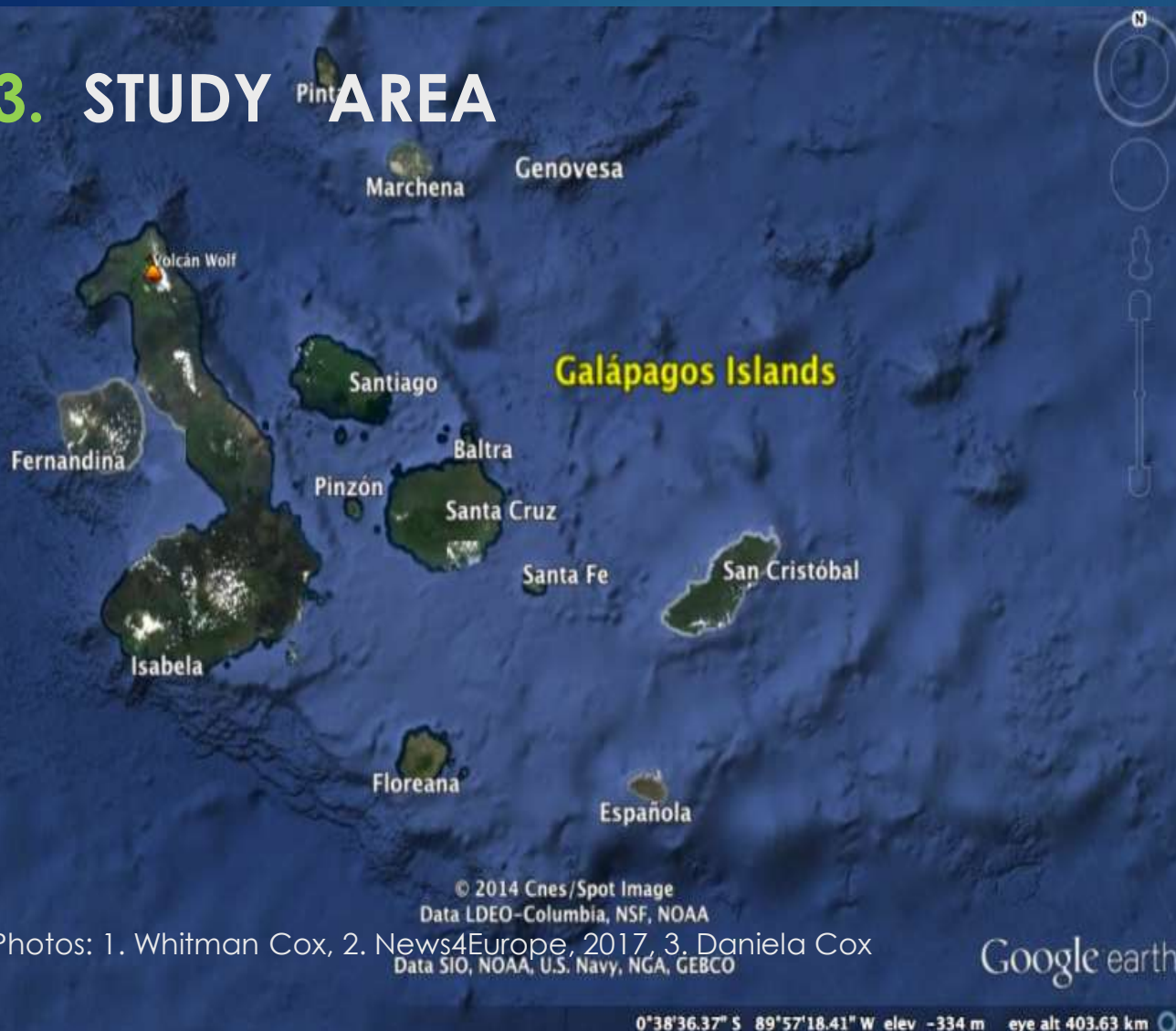


2. BACKGROUND: GMR

- ❖ 1998 => 40 nm
- ❖ among world's largest MPAs
- ❖ confront global ecosystem threats
- ❖ zonification & control => *Management Plan*
- ❖ shark finning constant threat



3. STUDY AREA



© 2014 Cnes/Spot Image
Data LDEO-Columbia, NSF, NOAA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

0°38'36.37" S 89°57'18.41" W elev -334 m eye alt 403.63 km



Photos: 1. Whitman Cox, 2. News4Europe, 2017, 3. Daniela Cox

4. AN ILLEGAL PRACTICE

- 400 shark sp. worldwide => 30 sp. GMR => 90% IUCN (Cahmi et al., 2009)
- Shark finning definition
- GMR shark finning status (Jacquet et al., 2008) => migratory sp. & boundary issue=> local, national, & international challenging
- East Asian markets => fin-soup
- Japan, Korea, Taiwan, Costa Rica, Colombia, mainland Ecuador tuna fishing boats target sharks in the GMR
- 1950-2010: 13% sharks of 797.000 tons of seafood extracted from the contiguous Galapagos Exclusive Economic Zone (EEZ) (Schiller et al, 2015)
- Fu Yuan Yu Leng 999, Chinese => 300 tons 6.000 endangered sharks sp. => first sentence in GMR history => \$5million fine & prison



5. SHARK-VALUE AWARENESS

- US\$ 154 million
annual revenue GMR underwater tourism
- US\$ 4.4 million
annual revenue Galapagos illegal fisheries

- US\$ 360.000
annual spending per shark sighting
US\$158
per shark carcass

- ❖ GMR alive shark => most valuable shark among
marine tourism destinations (de León et al., 2016)



Fig. 1. Economic value of legal fisheries vs. marine tourism (Lynham et al., 2015)

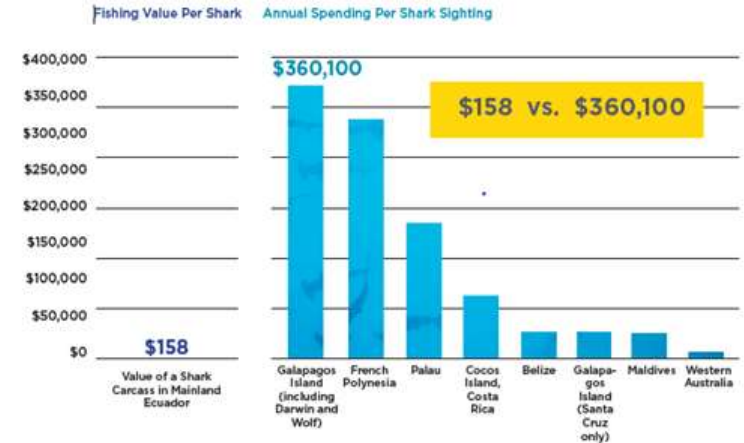


Fig. 2 Cost-effect analysis of sharks alive in the tourism industry (Lynham et al., 2015)

6. LOCAL EMPOWERMENT FOR DECISION-MAKING

- ❖ *1998 Galapagos Management Plan:*
environmental studies / human & interdisciplinary issues
- ❖ Galapaguenian fishermen underrepresentation:
constraining legal instrument / alternatives
- ❖ Negative local, national & international discourse:
“predators” > positive practices supporting marine conservation
through community engagement



7. ACTION REQUIRED

- Participation & co-management 1998 *Management Plan* vision:
social legitimate & responsible representation
- Further decision-making processes:
Galapaguenian fishermen & local community
- MCA=> GMR management scenarios best criteria
sensitivity/ monetary value
- Political & scientific trust-building:
MCA=> not consensus but transparency (Smart, 2017)

Photos: 1. Daniela Cox, 2. Yuri Ortiz, 2015, 3. Whitman Cox



8. CONCLUSION

- Democratization of science & local knowledge => decision-making
- MCA multi-disciplinary approach => legitimate participation
- Local awareness diffusion => challenges & achievements
- Local empowerment => effective management CPRs policies protection & local communities wellbeing
- Local approach => foreign agendas counterpart



Thank You!



9. References

Camhi, M. D., Valenti, S. V., Fordham, S. V., Fowler, S. L., & Gibson, C. (2009). The conservation status of pelagic sharks and rays: report of the IUCN shark specialist group pelagic shark red list workshop. *IUCN Species Survival Commission Shark Specialist Group*. Newbury, UK.

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Hearn A, J Ketchum, G Shillinger, P Klimley & E Espinoza. (2008). Programa de investigación y conservación de tiburones en la Reserva Marina de Galápagos. Reporte Anual 2006-7. Charles Darwin Foundation, Santa Cruz, Galapagos, Ecuador. 114 pp.

Jacquet, J., Alava, J. J., Pramod, G., Henderson, S., & Zeller, D. (2008). In hot soup: sharks captured in Ecuador's waters. *Environmental Sciences*, 5(4), 269-283.

Jones P.J.S, Qiu W, De Santo E.M. (2013). Governing marine protected areas: social-ecological resilience through institutional diversity. *Mar Policy* 41:5-13.

Lu, F., Valdivia, G., & Wolford, W. (2013). Social Dimensions of 'Nature at Risk' in the Galapagos Islands, Ecuador. *Conservation and Society*, 11(1), 83.

9. References

Lynham, J., C. Costello, S. Gaines, E. Sala. (2015). Economic valuation of marine- and shark-based tourism in the Galápagos Islands: Report to the Galápagos National Park.

Quiroga, D. (2009). Crafting nature: the Galapagos and the making and unmaking of a “natural laboratory”. *Journal of Political Ecology*, 16(1), 123-140.

Schiller, L., Alava, J. J., Grove, J., Reck, G., & Pauly, D. (2015). The demise of Darwin's fishes: evidence of fishing down and illegal shark finning in the Galápagos Islands. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 25(3), 431-446.

Smart, J. (2017). Week eleven: Multi Criteria Analysis [7-14]. Unpublished manuscript. 7401ENV, University of Griffith, Nathan Campus, Australia.

Usseglio, P., Schuhbauer, A., & Friedlander, A. (2014). Collaborative approach to fisheries management as a way to increase the effectiveness of future regulations in the Galapagos archipelago. In *The Galapagos Marine Reserve* (pp. 187-202). Springer International Publishing.

Williamson, A. R., & Scicchitano, M. J. (2014). Dimensions of Public Meeting Participation: Evidence from Florida's Truth-in-Millage Act. *Urban Affairs Review*, 50(1), 134-146.