Memo Overview: The Ethics Behind the Conservation Techniques at the Pacuare Reserve

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General Introduction to Leatherbacks

- Modern day sea turtles are reptiles that emerged from the Cretaceous Period. There are Seven Species, 6 in the Cheloniidae family and one in the Dermochelyidae family (Lutz & Musick, 2003, p. 9).
- Leatherback Sea Turtles (*Dermochelys coriacea*) are the only turtle in the Dermochelyidae family. They are the largest of all the sea turtles.
- Leatherbacks are characterized by having a leathery carapace with seven white ridges. They are found in all oceans around the world (Eckert, Bjorndal, Abreu-Grobois, & Donnelly, 1999, p. 1).
- Pacuare Nature reserve is an important nesting beach for the leatherback sea turtles

Sea Turtles and Society

- Sea turtles and people have intersected in many different ways throughout history
  - Turtles and their eggs have been used for food and fuel
  - They have also been used as symbols for nature and conservation
    - Jack Fraiser calls species that are symbols “flagship species”, and argues their social importance to people makes them important members of their ecosystems. (Fraiser, 2004, p. 15)
- Sea turtles have economic value for people, and are worth more alive than dead (Troëng, S., & Drews, C., 2004).
- Ecotourism generates money for research, conservation, and the well-being of people in Costa Rica and other countries

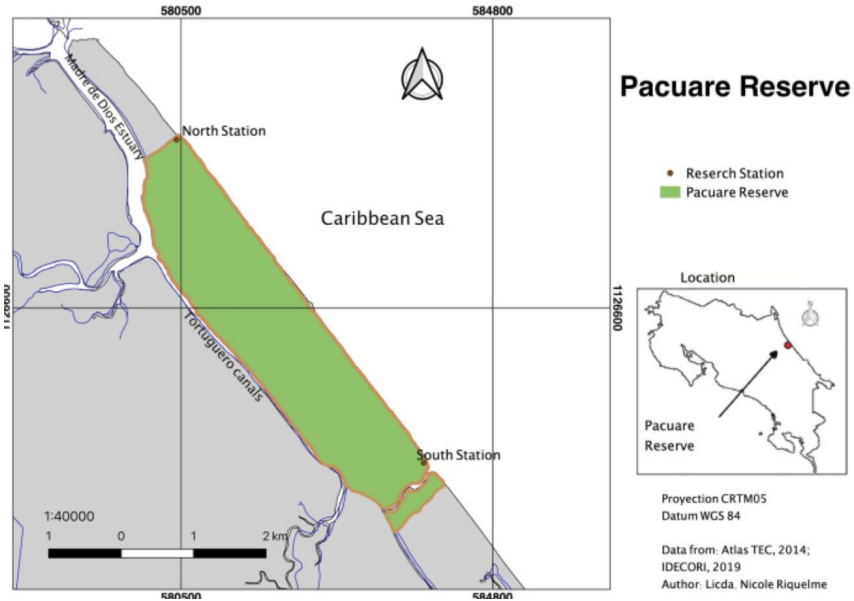
Ethical Conservation and the framework of Contractualism

When do people have the right to intervene on natural processes?

- Contractualism: “The social contracts will determine the actions that are proper in any given context. One can evolve faith that binds parties to a contract about environmental care in such a matter that no one is worse off with every body improving to some extent” (Gupta, A, & Sinha, R, 2002, p. 2)
- The nesting process at pacuare is certainly manipulated, does it follow the framework of contractualism?

Humans have a right to intervene to fix human caused problems, and also have a right to intervene when nobody is worse off, and everyone benefits to a certain extent.

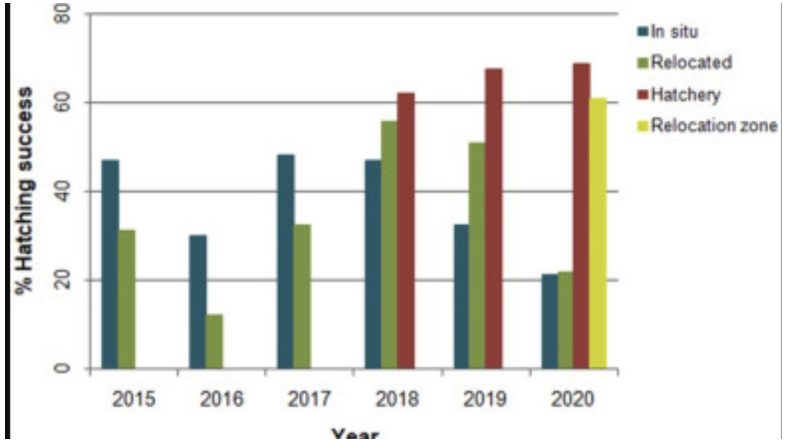
Social Contracts at Play in Pacuare: Poaching Prevention



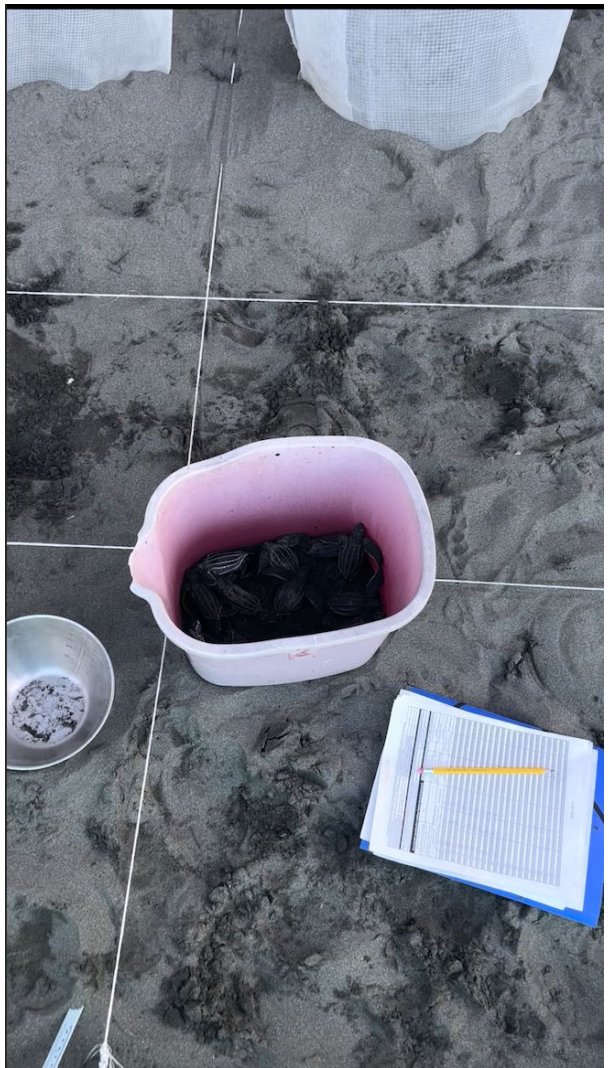
- One major breach to the social contract with the environment is poaching.
- Excessive poaching has contributed to the decline of leatherback populations over time.
- The Pacuare Reserve was dedicated to benefiting everyone by hiring poachers to conduct conservation work through the censuses and patrols.
- Nightly censuses on the Pacuare Reserve have reduced poaching of nests from 98% to just 2% (Quesada-Rodríguez, Orientale, Diaz-Orozco, & Sellés-Ríos, 2021)
- Reducing poaching helps improve the chances of survival for the leatherback sea turtles.

Social Contracts at Play in Pacuare: Hatching Success

Human activities such as poaching, foot traffic (soil compaction), toxic runoff and nonnative plant implementation have reduced the hatching success of in situ nests (Richardson, p. 3)

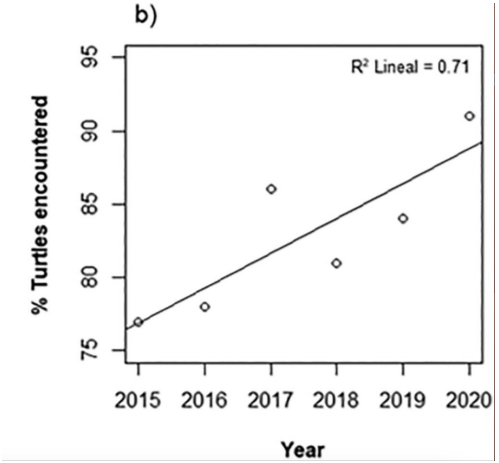


Hatcheries at the Pacuare reserve in 2020 had the greatest hatching success compared to in situ nests and relocated nests (Quesada-Rodríguez, Orientale, Diaz-Orozco, & Sellés-Ríos, 2021)



Social Contracts at Play in Pacuare: Educational Outreach and Research

- Despite having only one station open and less people to help, 2020 had the greatest percentage of turtles encountered, likely due to the researchers being able to work quickly (Quesada-Rodríguez, Orientale, Diaz-Orozco, & Sellés-Ríos, 2021).
- Educational outreach slows researchers down, possibly making them less effective. However, outreach greatly increases funding and inspires many to get involved with conservation and endangered species management



Possible Recommendations

- “Removing sea turtles from the beach to incubation boxes placed within protective storage was an accepted management practice for many years until the effect of incubation temperature on sex was determined” (Richardson, J.I., 1999, p. 19).
- If there is major concern that rising temperatures will greatly reduce the number of male leatherbacks, the Pacuare Nature Reserve should look into creating an incubation nesting room in which the room is kept at a cool enough temperature to produce males.
    - More research is needed to determine the necessity of this, and how many nests per season that should be moved to the incubation room
- If educational outreach significantly slows researchers down, then some censuses should be performed without participants each week in order to increase the efficiency of the monitoring project
- It would also be interesting to further explore the native plant biodiversity around the nesting beaches!

Reflective Experience

- Spending two weeks in a biodiversity hotspot was life changing
- BIOMA opened my eyes to the possibility of pursuing conservation and restoration efforts as a career
- After conducting my research for ES 192, there is evidence to suggest that the work done in Pacuare is ethical
- I appreciated and was surprised by the amount of hands on work offered
- Not just about the sea turtles!
- I really enjoyed the cultural talks and experiences that BIOMA and Costa Rica offered us.

References

Lutz, P. L., & Musick, J. A. (Eds.). (2003). The biology of sea turtles (Vol. 2). CRC Press. https://www.google.com/books/edition/_/HXvuzQEACAAJ?hl=en&gbpv=1&bsq=cheloniidae

Eckert, K. L., Bjorndal, K. A., Abreu-Grobois, F. A., & Donnelly, M. (Eds.). (1999). Research and management techniques for the conservation of sea turtles (IUCN/SSC Marine Turtle Specialist Group Publication No. 4). IUCN/SSC Marine Turtle Specialist Group.

Richardson, J. I. (1999). Priorities for studies of reproduction and nest biology. In K. L. Eckert, K. A. Bjorndal, F. A. Abreu-Grobois, & M. Donnelly (Eds.), Research and management techniques for the conservation of sea turtles (IUCN/SSC Marine Turtle Specialist Group Publication No. 4, pp. [page numbers]). IUCN/SSC Marine Turtle Specialist Group.

Troëng, S., & Drews, C. (2004). Money talks: Economic aspects of marine turtle use and conservation. In P. L. Lutz, J. A. Musick, & J. Wyneken (Eds.), The biology of sea turtles (Vol. 3, pp. 203-212). CRC Press.

Robinson, N. (Producer), & Figgener, C. (Director). (2015, June 12). Plastic straw removed from a sea turtle's nostril (short version) [Video]. YouTube. https://www.youtube.com/watch?v=abcdefghijk

Frazier, J. (2004). Marine turtles: The role of flagship species in interactions between people and the sea. Conservation and Research Center, Smithsonian Institution.

Gupta, A. K., & Sinha, R. (2002). Should we save, what serves only human ends? A review on environmental ethics (Working Paper). Indian Institute of Management Ahmedabad
d:\working papers 2002\should we save what serves only human ends.doc

Quesada-Rodríguez, C., Orientale, C., Diaz-Orozco, J., & Sellés-Ríos, B. (2021). Impact of 2020 COVID-19 lockdown on environmental education and leatherback sea turtle (Dermochelys coriacea) nesting monitoring in Pacuare Reserve, Costa Rica. Ecology Project International, Pacuare Reserve, Limón, Costa Rica.