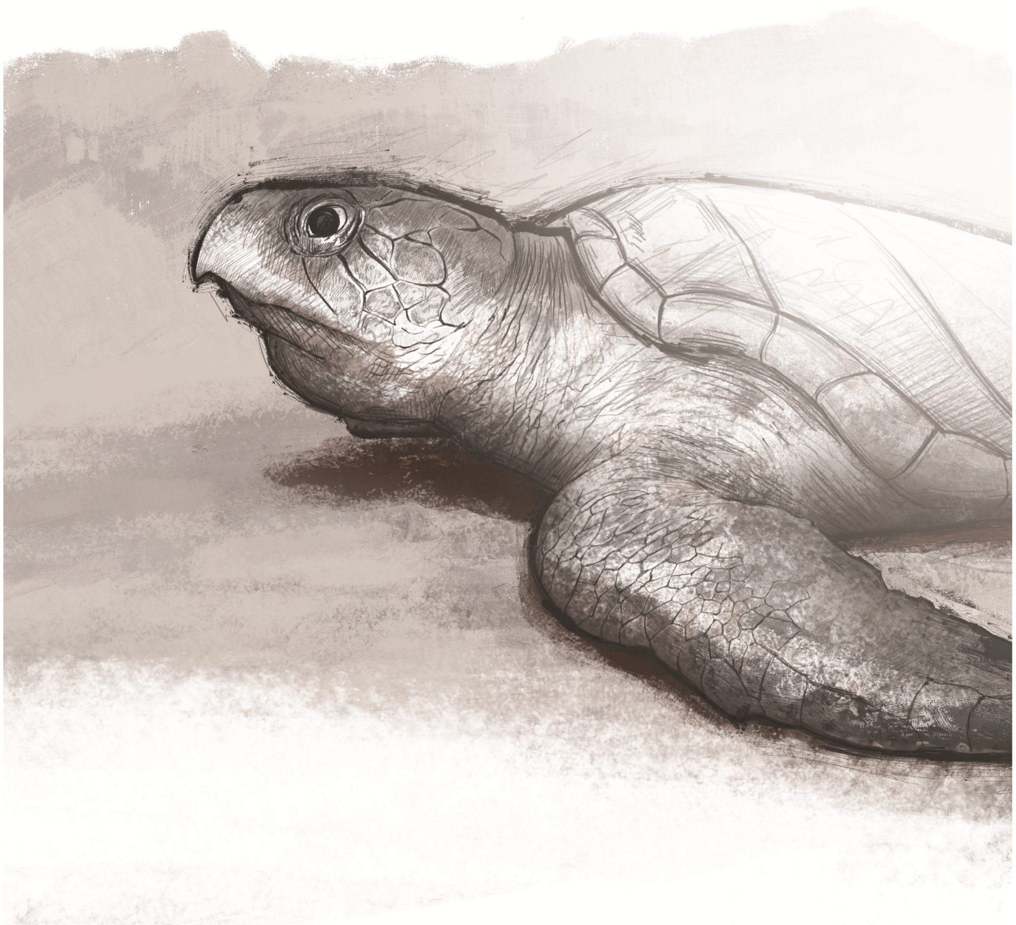

Seascape Genetics and Conservation Management of the Olive Ridley Turtle (*Lepidochelys olivacea*) in the Eastern Pacific

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to the divine energy that creates and sustains all within us

to my mum that accompanied every moment of this journey

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DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Clara Jimena Rodríguez Zárate

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SUMMARY

The assessment of the conservation status of olive ridley turtles (*Lepidochelys olivacea*) in the eastern Pacific remains poorly known due to a lack of information about solitary nesting sites and due to inadequate definition of population boundaries. This dissertation contributes to the evaluation of the status of olive ridley nesting colonies in the eastern Pacific, including those that experienced substantial demographic declines. The main aims of the thesis are to use nuclear DNA datasets from a large sample (n = 634 individuals collected at 28 nesting sites) and a combination of population and seascape genetics approaches to (i) clarify population structure and recent demographic history in olive ridley turtles at various spatial scales and (ii) assess environmental factors influencing population connectivity in this species. In addition, the genetic findings of this work are combined with information from the literature and from data of interviews with relevant stakeholders to review current conservation practices and propose ways to tackle challenges associated with large-scale conservation management. The analysis of the genetic consequences of demographic declines revealed signatures of a recent bottleneck along Mexico's eastern Pacific coast. The bottleneck signal was strong across the highly connected metapopulation and also apparent in six nesting sites in a pattern consistent with the history of demographic disequilibria produced by their overexploitation. This likely represents the first report of recent signatures of anthropogenic-driven population declines in sea turtles based on genetics. On a much larger geographic extent, olive ridley turtles were used as a model system to investigate the role of space in assessing and understanding processes shaping population divergence in highly mobile marine species. The prevailing hypothesis of panmixia for this species in the eastern Pacific was rejected. A seascape genetics approach showed that meso-scale features and associated oceanographic variability likely promote and maintain population divergence in olive ridley turtles, allowing us to propose a new paradigm of isolation-by–ecology for sea turtles. The combined results highlight the importance of reframing management policies and actions to pursue large-scale conservation actions for this taxon. They also provide a framework that enables reconciliation between biological phenomena and conservation management. The Mesoamerican region has the opportunity to assume the challenges of large-scale conservation management based on the multiple capacities developed in recent decades. To achieve this target, a list of perceived limitations that must be sufficiently addressed is presented and a series of management recommendations are made.

Keywords: conservation genetics, isolation-by-ecology, seascape genetics, anthropogenic harvest, sea turtles, eastern Pacific.