

A large, colorful Queen Conch shell is the central focus, resting on a sandy beach. The shell's surface is iridescent, showing shades of pink, orange, and yellow. In the background, there are palm trees and a clear blue sky with a few clouds. The overall scene is a tropical beach setting.

God Save the Queen!

An Approach to the Sustainable Management of Trinidad And Tobago's Queen Conch Resources

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Outline

- Distribution & Role
- Biology
- Status of the Queen Conch Fishery
- Aim & Objectives
- Method
- Challenges to the Fishery
- Management Approach



The Queen Conch



Distribution

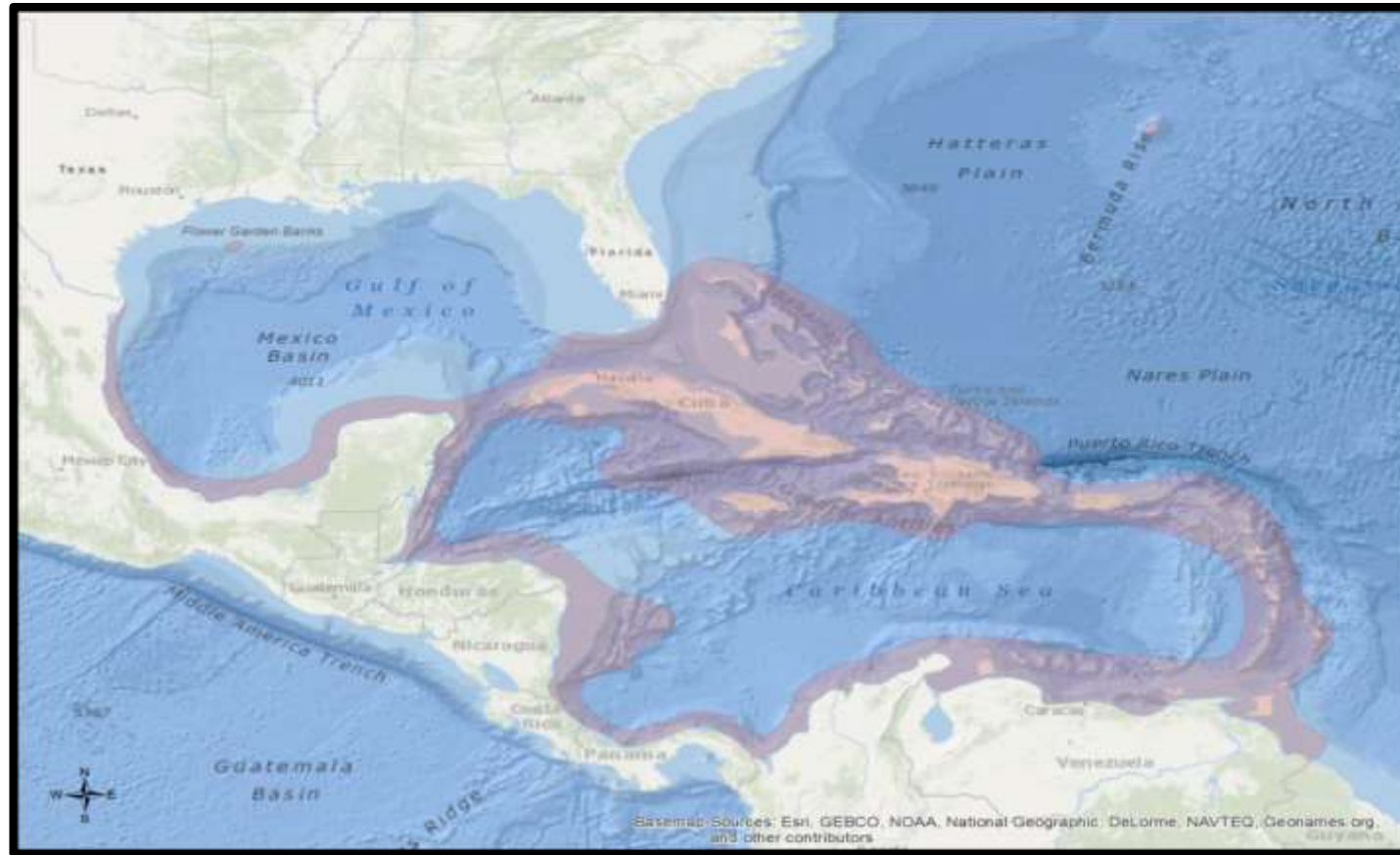


Figure 1: Geographic range of the queen conch (*Lobatus gigas*). Habitat includes shoreline to insular or continental shelf throughout the indicated range. National Marine Fisheries Service (2014)

Importance

Considered the region's most important mollusc

Functions:

- Food source
- Ornamental use (shell)
- Manufacture of lime & porcelain
- Production of conch pearls



Figure 2: Conch pearls, one of the export products of the queen conch.

Photo Credits: Oscar Ortega and Martha Prada

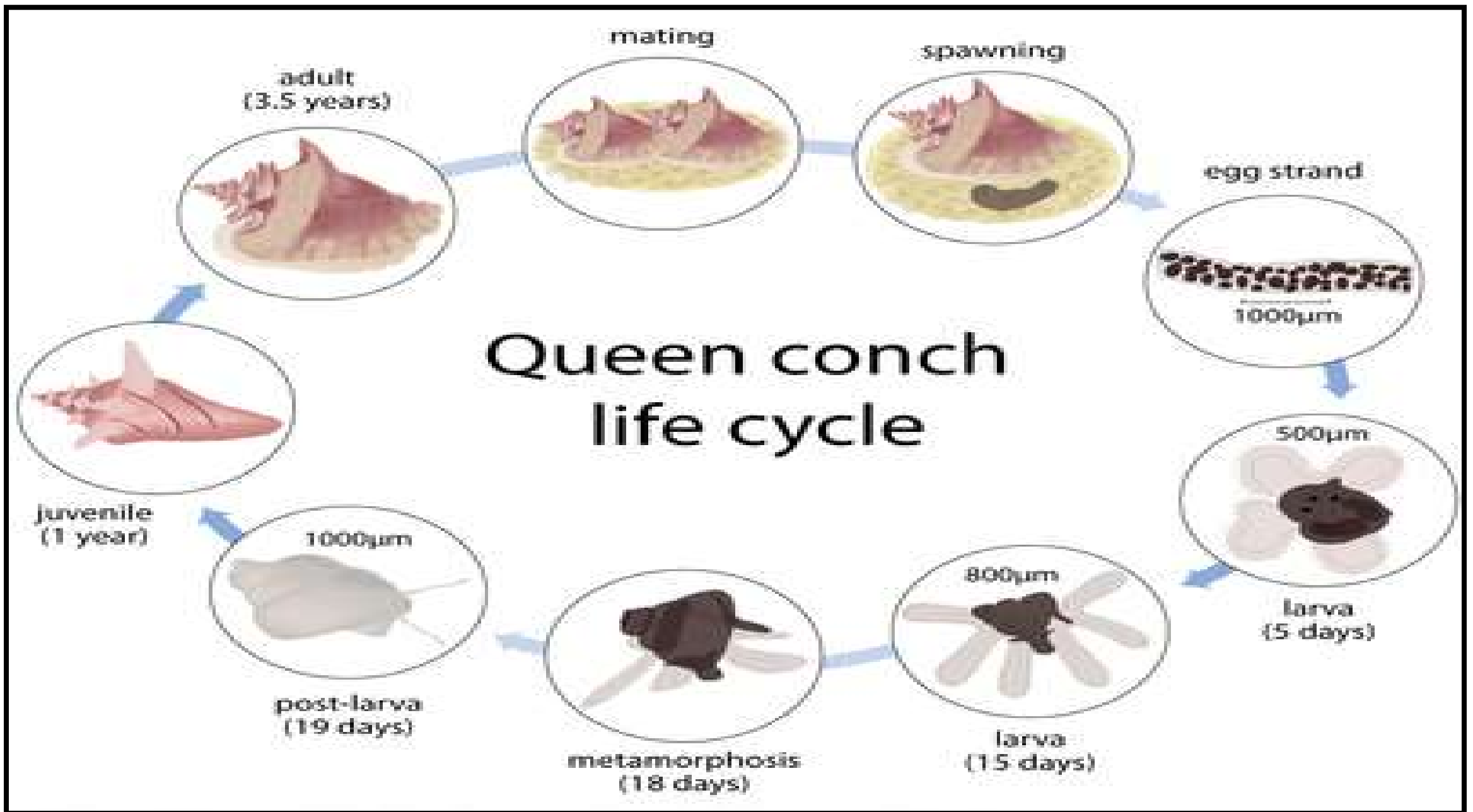


Figure 3: Conceptual diagram of the queen conch life cycle (Kruczynski & Fletcher, 2012).

Status of the Queen Conch

- Listed in Annex II of the Cartagena Convention's Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol) in 1990 as “a species that may be used on a rational and sustainable basis and that requires protective measures”.
- Listed in Appendix II of Convention on International Trade in Endangered Species of Fauna and Flora (CITES) Convention in 1985 as “a species for which the trade required strict control and management, in order to avoid the potential of extinction”.

(National Marine Fisheries Service, 2014)

Current Status of the Queen Conch Fishery in Tobago

➤ Tobago has traditionally produced enough conchs to supply local needs, but increased demand both there and in Trinidad has led to severe overfishing.

➤ Currently, for Trinidad and Tobago, there is no management plan in effect or regulations governing conch harvesting and sale.

Georges et al. (2010)

➤ Reports suggest an observed decline in the abundance of queen conch within Tobago's waters, while Trinidad has no queen conch fishery.

CITES (2012)

Aim

To first provide an improved understanding of connectivity of queen conch populations throughout the Caribbean, specifically in relation to population structures of queen conch in Tobago and their gene flow. Subsequent to this, suitable methods of sustainable management and recruitment of Tobago's local queen conch population will be sought, through policy implementation.

Objectives

- To describe the larval dispersal patterns of *Lobatus gigas* around Tobago
- To examine larval transport of *L. gigas* within Tobago and analyse gene flow of local samples as a means of differentiating the conch metapopulation.
- To observe the potential transport of Tobago's larval population to regional countries susceptible to larval drift and determine genetic linkages amongst populations.
- Development of local regulations and policies (national queen conch conservation and management plan) as pertains to sustainable management of Trinidad and Tobago's queen conch population

Method

Description of larval dispersal patterns

- Hybrid Coordinate Ocean Model (HYCOM)
- Connecting Modelling System

Quantitative approach in assessing gene flow

- Systematic sampling for collection of conch tissue for DNA testing
- DNA extraction
- PCR testing
- DGGE
- DNA Fingerprinting
- Genotyping and sequencing

Challenges to Local Fishery

Challenges to the Tobago queen conch fishery involve:

- complexity of the species' biology
- habitat degradation
- lack of catch and effort data
- lack of regulations and monitoring
- unsustainable fishing practices

Determining Management Approach

Factors to consider in determining management approach:

- density in association with reproductive potential
- larval dispersal
- population connectivity
- nursery areas
- vulnerability of the fishery to exploitation
- habitat quality

(Prada & Appeldoorn, 2014)

Ecosystem well-being (Biophysical)

- **Habitat protection**
- **Mitigate the effects of pollution on conch fisheries**
- **Implementation and enforcement of national management measures**

Human well-being (Socio-economic)

- **Ensure alternative income sources are available**

Ability to Achieve (Governance)

- **Increase formalized cooperation with other agencies involved in natural resource management.**
- **Generate data collection system, quality assurance and control, and improve existing capacities.**
- **Improve stakeholder awareness and participation**
- **Improve compliance with fisheries management measures**

Sustainable Management of Queen Conch

Ecosystem based approach

An effective management plan would involve:

- Protection of nearshore habitats
- Protection of juveniles and spawning adults
- Establishment of marine reserves in juvenile and adult habitats
- Routine monitoring of the fishery's activity in terms of spatial distribution as well as population status and distribution.

Appeldoorn et al. (2011)

The Way Forward

- Preservation of genetic diversity throughout the Caribbean
- Genetic connectivity among populations is of crucial importance in conservation and management of commercially threatened species such as the *Lobatus gigas*

Acknowledgements



TOBAGO HOUSE OF ASSEMBLY



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Sustainable Fisheries
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A large, colorful, iridescent seashell, possibly a Nautilus, is the central focus of the image. It is resting on a sandy beach. The shell exhibits vibrant, iridescent colors in shades of pink, orange, and yellow. In the background, there is a tropical beach scene with several palm trees and a clear blue sky with a few wispy clouds. The overall atmosphere is bright and sunny.

Thank You!

Questions?

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