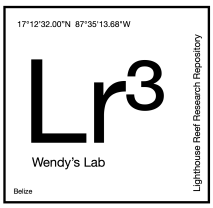

Guardians of the Mangrove Edge

American Crocodile Conservation and Coral Reef Connectivity at Lighthouse Reef

Host Organization:
Lighthouse Reef Research Repository (Lr³)
Location:
Long Caye, Lighthouse Reef Atoll, Belize

Program Summary

This field-based conservation initiative is designed to assess, monitor, and protect the American Saltwater Crocodile (*Crocodylus acutus*) within the Lighthouse Reef Atoll ecosystem. The program will investigate the species' ecological role in mangrove and reef habitats, foster sustainable coexistence between humans and crocodiles, and contribute critical data to regional marine conservation efforts. It integrates habitat condition documentation and behavioral studies into a locally embedded conservation model.

Program Objectives

- Establish baseline population counts and habitat use patterns for *C. acutus* across Lighthouse Reef Atoll.
- Analyze trophic interactions between crocodiles and reef-associated fish species essential to coral reef health.
- Document habitat condition and crocodile behavior during the initial setup phase.
- Reduce potential human-wildlife conflicts through education, safety guidelines, and discouraging feeding of wild animals.
- Train local stakeholders and citizen scientists in crocodile monitoring and wetland protection.

- Publish findings and contribute data to Mesoamerican Reef and IUCN conservation databases.

Measurable Outcomes

- Establish a robust population baseline of *Crocodylus acutus* on Lighthouse Reef Atoll, including estimated numbers, age structure, and habitat use within the first 12 months.
- Complete at least 12 comprehensive monitoring surveys annually, including day and night transects, tagging, and nesting site checks.
- Achieve a minimum 80% success rate in capture-mark-recapture tagging and tracking efforts.
- Document and analyze trophic interactions by collecting and processing at least 100 scat samples and corresponding fish population data within three years.
- Produce GIS-based mangrove habitat maps with detailed vulnerability assessments covering 100% of identified crocodile habitat zones by the end of Year 1.
- Reduce human-wildlife conflicts in monitored areas by 30% through education, safety signage, and messaging discouraging feeding of wild animals, measured via incident reports and surveys.
- Train a minimum of 10 local stakeholders or citizen scientists in crocodile monitoring techniques by the end of Year 3.
- Publish at least two peer-reviewed papers or official reports on crocodile ecology and conservation findings within the program duration.

Core Activities

A. Species Assessment and Monitoring

- Conduct day and night transects using drones, boats, and spotlighting.
- Implement capture-mark-recapture with GPS and PIT tagging.
- Identify nesting sites, monitor clutches, and record incubation temperatures.
- Document habitat conditions and crocodile behaviors during Year 1.

B. Ecological Research

- Conduct diet analysis via scat sampling and direct observation.
- Study lagoon-to-reef fish populations to evaluate crocodile predation effects on reef herbivores.

C. Habitat Protection

- Map mangrove habitats and assess vulnerability using GIS.
- Identify threats including pollution, coastal development, and boat traffic.
- Provide recommendations for habitat restoration and zoning measures.

D. Community Awareness

- Develop and install signage discouraging feeding of wild animals, highlighting risks to humans and crocodiles.
- Include messaging in safety guidelines distributed to local guides, residents, and visitors.
- Monitor changes in behavior and incidents related to wildlife feeding as part of conflict reduction efforts.

Staffing Structure

- Program Director (full-time)
- Field Technician (seasonal)
- Community Liaison Officer (part-time)
- Research Assistant (shared with Lr^3 reef programs)
- Visiting Herpetologist (consultant)

Program Duration

Minimum three years:

- **Year 1:** Program setup, baseline population surveys, habitat condition documentation, behavior studies, relationship building, and initial community awareness rollout.
- **Years 2–3:** Intensive monitoring, ecological research, conflict mitigation, and continued community messaging.

Proposed Budget (Annual Estimate in Belize Dollars - BZD)

Budget Category	Description	Estimated Cost (BZD)
Personnel	Salaries for Program Director, Field Technician, Community Liaison Officer, Research Assistant	$85,000
Equipment & Supplies	GPS/PIT tags, drones, boats, spotlight gear, monitoring tools, safety equipment	$25,000
Field Operations	Fuel, boat maintenance, travel, lodging, food for field teams	$20,000
Education & Safety Materials	Signage and guidelines to reduce human-wildlife conflict and discourage feeding wild animals	$12,000
Data Management	Database infrastructure and analysis software	$10,000
Consulting & Expertise	Visiting herpetologist fees and travel	$8,000
Administration & Overheads	Office costs, communications, insurance	$12,000
Contingency Fund	Unforeseen expenses	$5,000
Total Annual Budget		**$177,000**

Contact Information

Francisco Andre Martinez
Director, Lighthouse Reef Research Repository (Lr³)
Email: Francisco@lighthousereef.bz
Phone (Belize): +501 612 3993
Phone (US/WhatsApp): +1 720 260 8858
Website: www.lighthousereef.bz

Research Associate

Kyle Armstrong Roepke
Underwater Cinematographer, Film Maker, Photographer
KAR Media LLC
US +1 (541) 263-2344