

ABSTRACT

The fish nursery function of the Caroni Swamp, Trinidad, West Indies

Natasha Alisa Mohammed

A preliminary study revealed that the Caroni Swamp, Trinidad, was conducive to a nursery area for commercially important finfish and shellfish (Mohammed, 1997). The present study into its extent as a fish nursery was conducted during a 14-month period, July 1999 to August 2000 in order to capture seasonal changes in species composition and their distribution. Sample sites as demarcated by Bacon (1968) were utilised with additional sites selected in more southerly and easterly directions. Plankton nets with dimensions 1.0 m long, 0.30 m mouth diameter and 300 and 500- μ m mesh, were towed horizontally, at daytime, and vertically, at night, to collect ichthyofauna. This study revealed that the nursery function continues to be fulfilled and extended as far north as the red mangrove-fringed Blue River mouth, as far south as the Madame Espagnol River and as far inland as the North-South Drain.

Microscopic examination of the zooplankton revealed a total of 23 families of finfish, 11 of which remain unidentified, one family of shrimp, Penaeidae and one family of crab, Portunidae. Different species of finfish peaked at different seasons, while shellfish peaked during the wet season. The dry season, January to May, was dominated by Albulidae/Elopidae, Carangidae, Mugilidae and the unidentified species 5-8, while the wet season, June to December, was dominated by Batrachoididae and the unidentified species 1-4 and 11. Several families present over both seasons included Belonidae, Clupeidae, Sciaenidae, Scombridae and Engraulidae. Statistical correlations were performed for the biotic-abiotic relationships, but were negative. The highest diversity indices were obtained for August 1999 and 2000 and for the Blue River channel and its river mouth.

Recommendations for a more interdisciplinary investigation into the interactions between fauna and ecosystem included: reproductive and molecular biology studies for species that utilize the Swamp, stomach content analyses, biomass estimates, larval transport and drift mechanisms and GIS, which can be used in the Ecopath for Ecosim ecological model, in scenario building, hence aid in more effective management of the Caroni Swamp and the Gulf of Paria in a more sustainable manner.

Keywords: Caroni Swamp, Trinidad, nursery area, finfish, shellfish, ichthyofauna, plankton, red mangrove, Ecopath, scenario, fisheries management, Natasha Alisa Mohammed.

List of Tables

iv
v

List of Plates

vi

List of Appendices

vii

CHAPTER 1

1.0	Introduction	1
1.1	Economic value of mangrove fisheries	2
1.1.1	Factors that enable successful fishing grounds	3
1.2	List of resources by finfishes	6
1.2.1	List of resources by shellfish species	9
1.2.1.1	Crabs	9
1.2.1.2	Shrimp	10
1.2.1.3	Scarid shellfish species	11
1.3	The island of Trinidad	12
1.4	The Gulf of Paria fishing industry	15
1.4.1	Fish productivity estimates	18
1.5	Local mangrove-related fisheries	20
1.5.1	The Caroni Swamp	20
1.5.1.1	Caroni Swamp fisheries	22
1.5.1.2	Economic value of the Caroni Swamp	24
1.6	The nursery area concept	26
1.6.1	Food supplies	29
1.6.2	Protection	32
1.6.3	Physical-chemical parameters	34
1.6.4	Life cycle completion	35
1.7	Physical attributes of the Gulf of Paria system conducive to a 'nursery area'	42
1.8	Physical attributes of the Caroni swamp system conducive to a 'nursery area'	45
1.9	Aims & Objectives	49