



Non-Detrimental Findings for the Queen Conch (*Strombus gigas*) in Colombia

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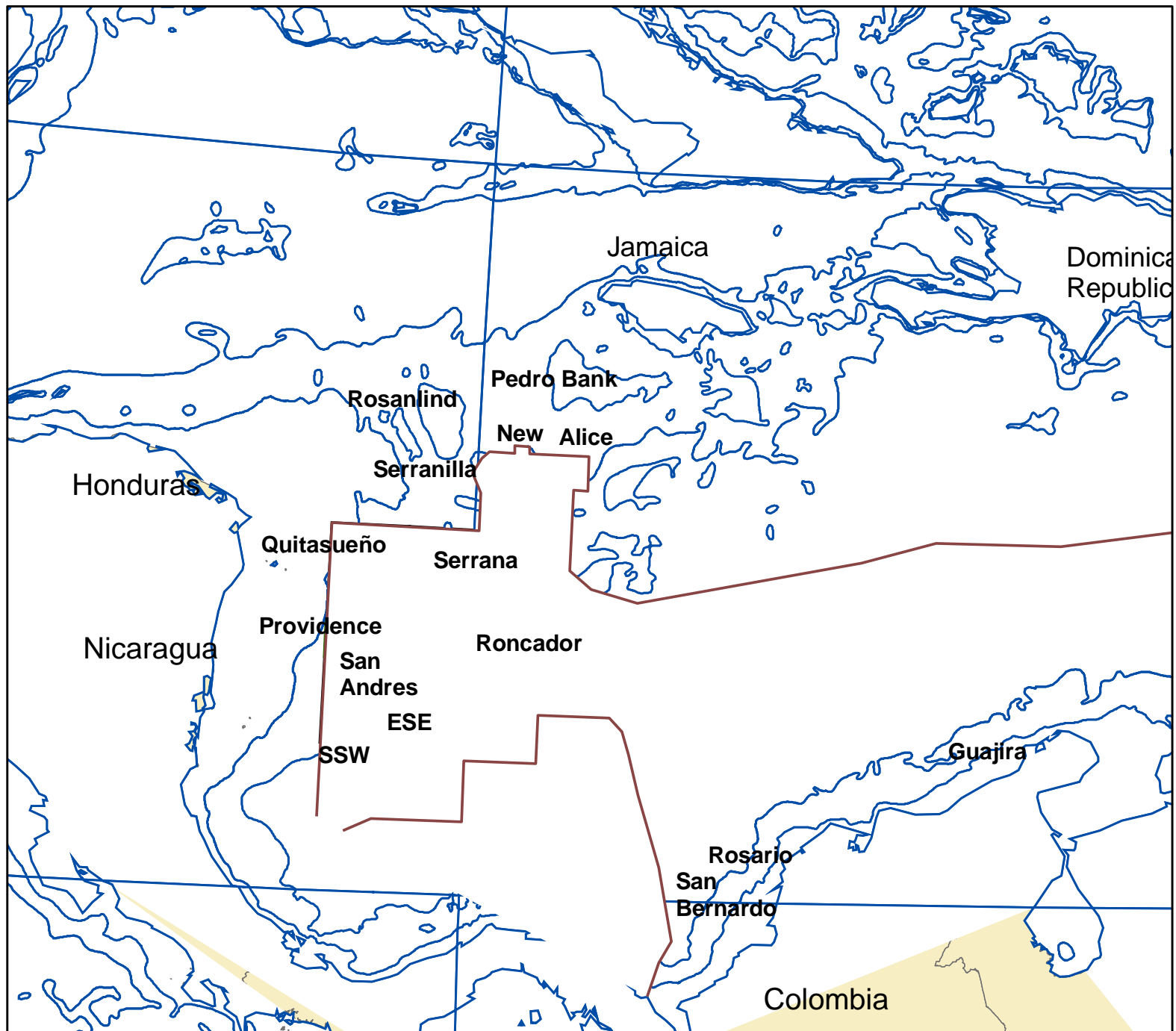


Departamento Archipiélago de San Andrés,
Providencia y Santa Catalina
SECRETARÍA DE AGRICULTURA Y PESCA



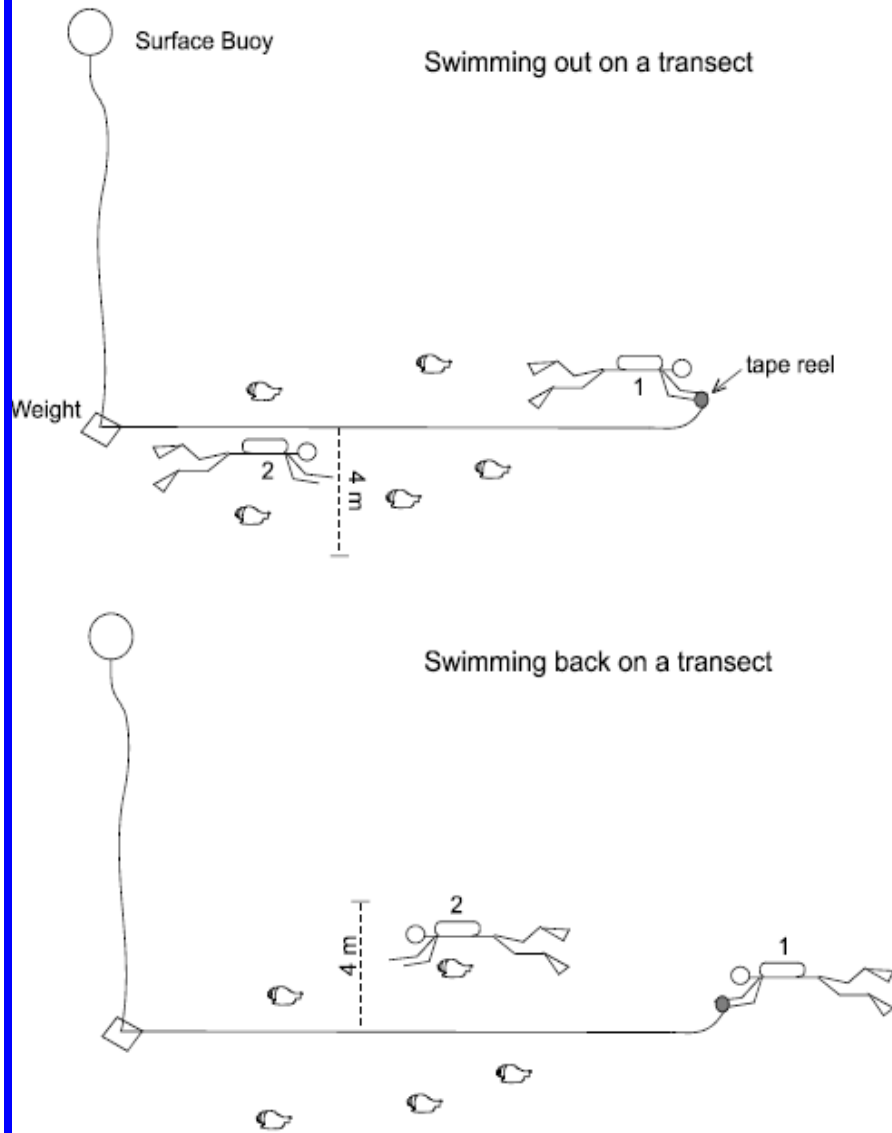
Libertad y Orden
MINISTERIO DE AMBIENTE,
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REPÚBLICA DE COLOMBIA



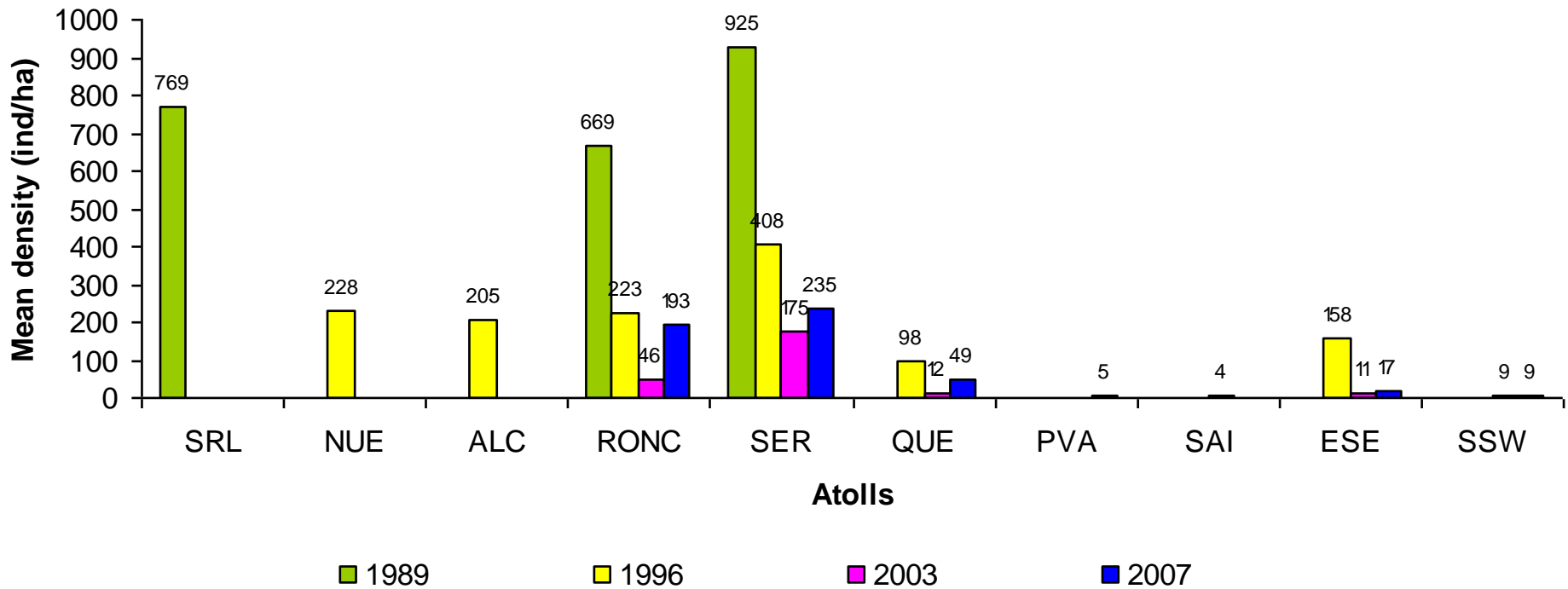


Colombia Queen Conch Population

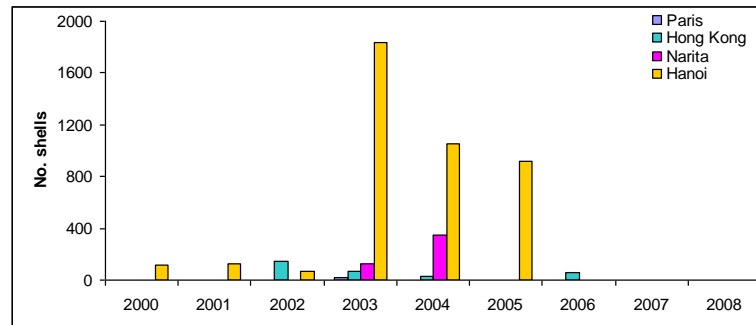
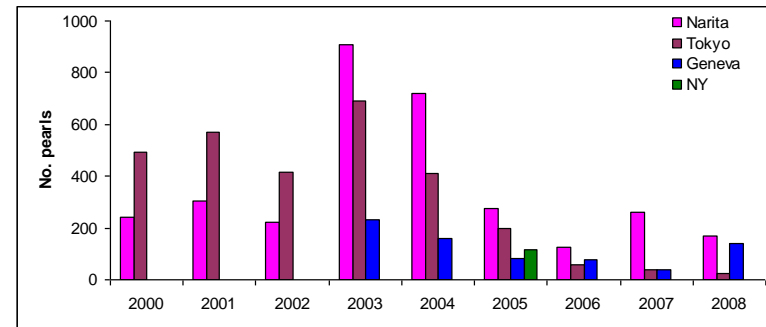
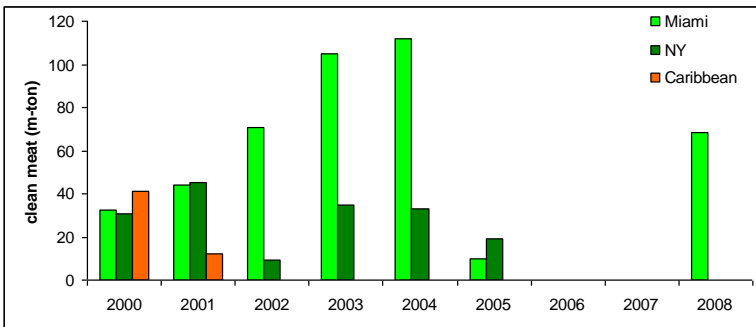
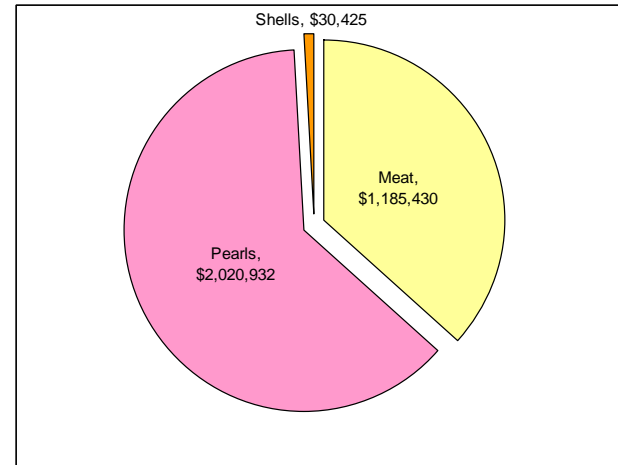
1. 2007 scientific expeditions.
2. 282 stations six atolls revisited & 69 additional stations.
3. Methods 2003 surveys (Appeldoorn et al. 2003).
4. ≥ 10.7 millions conchs & total of 1,674 mt clean meat,
5. 56% adults & 44% juveniles (varies atoll).
6. 8 Habitat strata: sand & algae, sand & rubble, channels, sparse corals, mixed corals, lagoons, bioturbated sediments, lagunal terrace, pre-reef terrace.



Population Trends



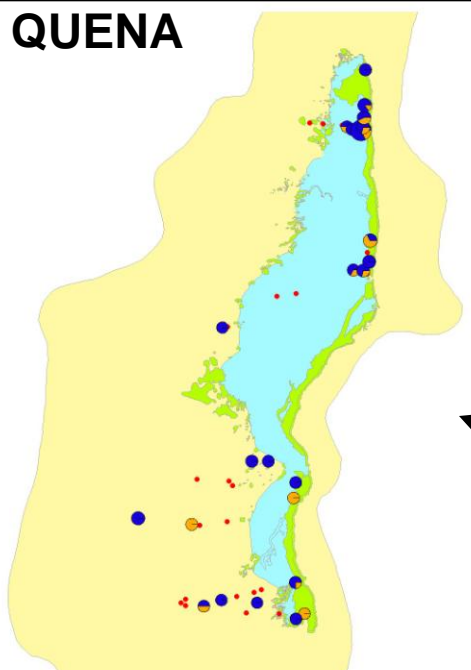
Queen Conch Products



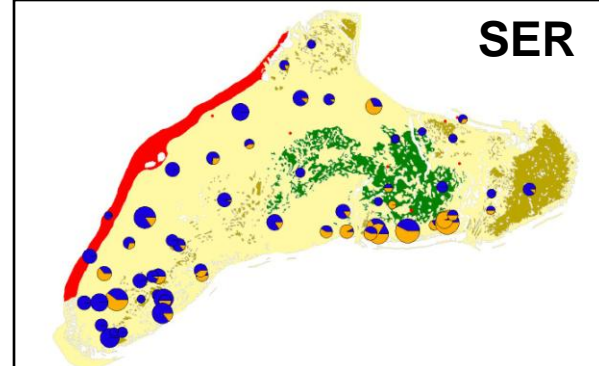
Queen Conch NDFs: Colombia

1. Stock with spatial variability & benthic habitats.
2. Methodology, data analysis and evaluation protocols.
3. Individual non-transferrable quotas to industrial fishers in industrial zones, valid one season & require reporting.
4. TAC introducing precautionary principles
 - Only two atolls fishing (Serrana and Roncador).
 - TAC Serrana 107 mt, use only 15% stock.
 - TAC Roncador 7 mt, use only 9% stock. Benefit regional larval long-distance.

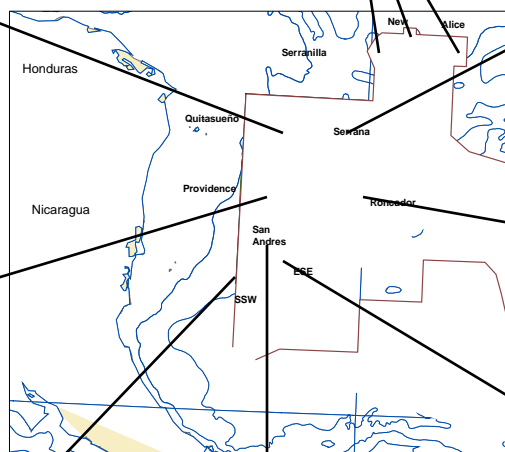
QUENA



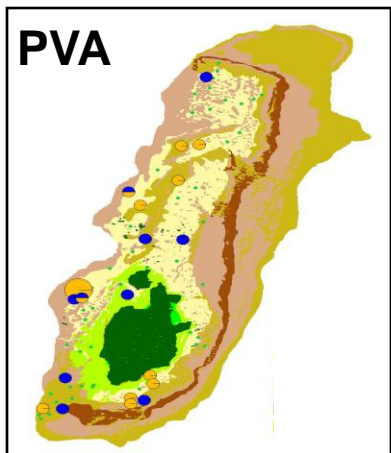
SER



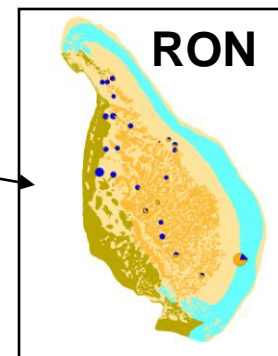
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PVA



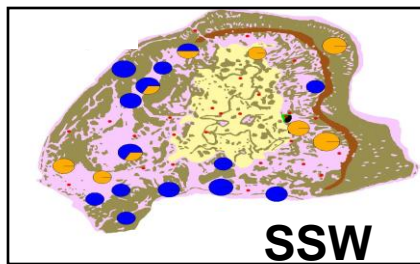
RON



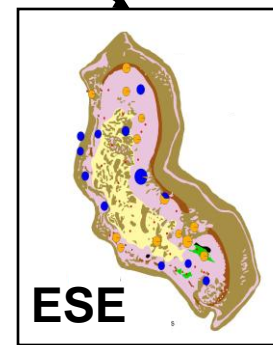
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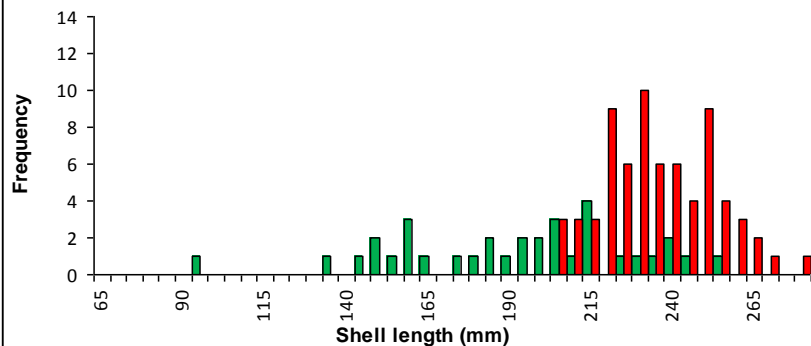
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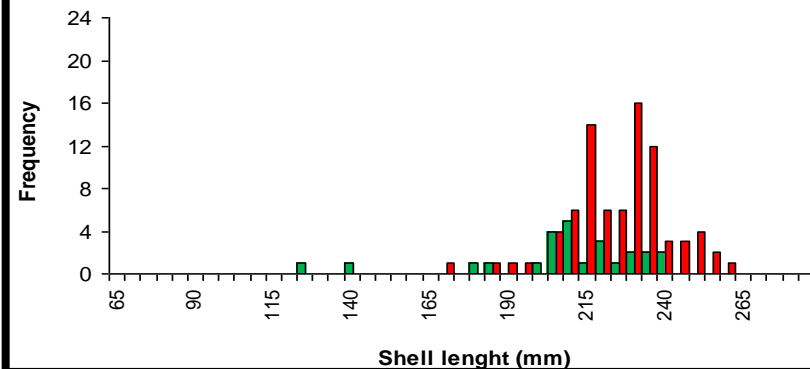
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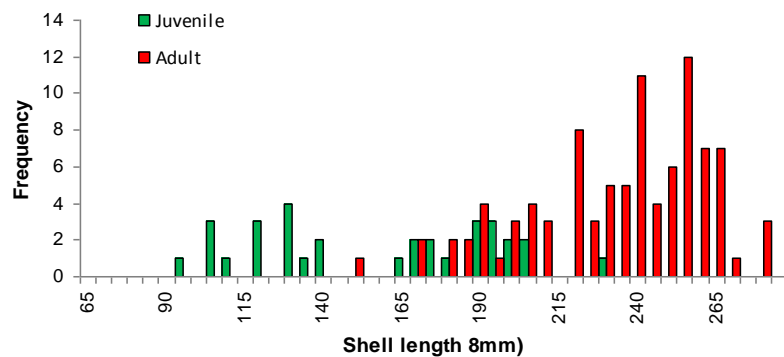
Queena 2003



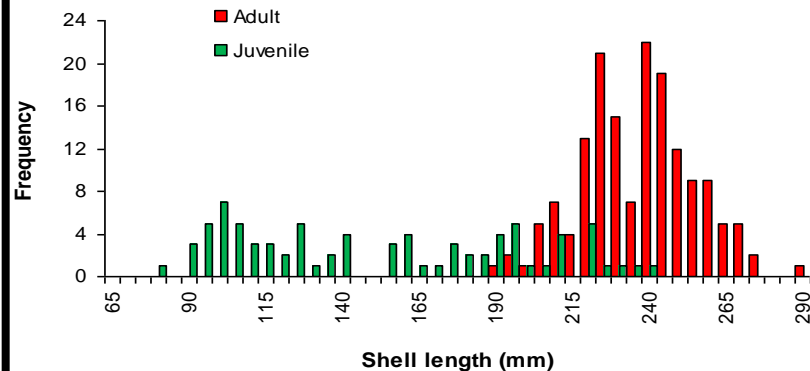
Roncador 2003



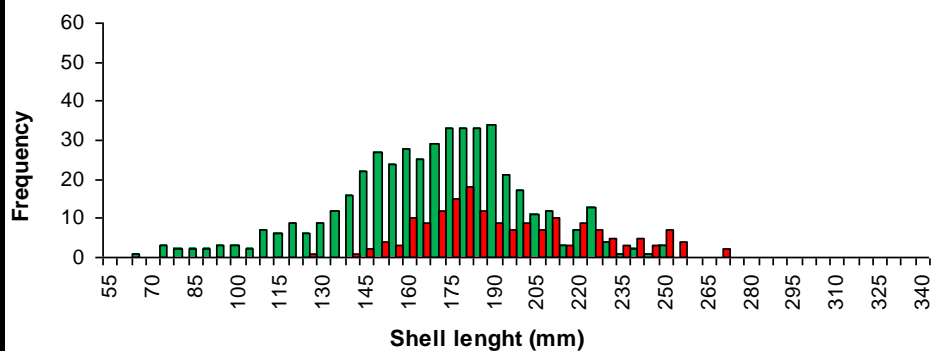
Queena 2007



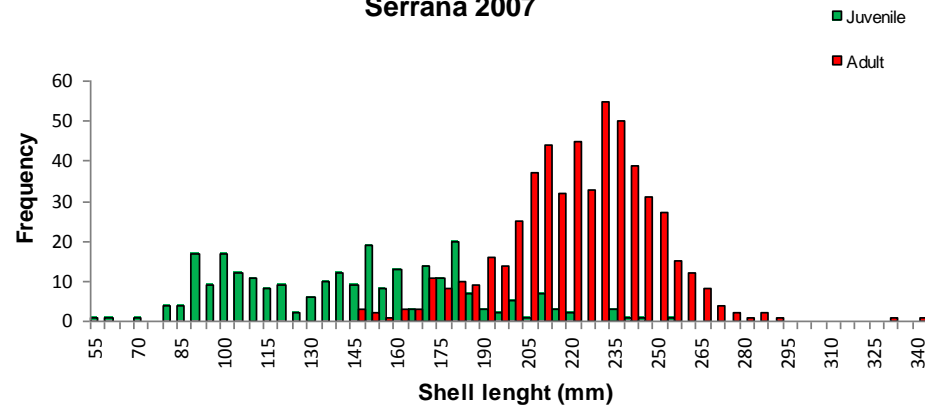
Roncador 2007

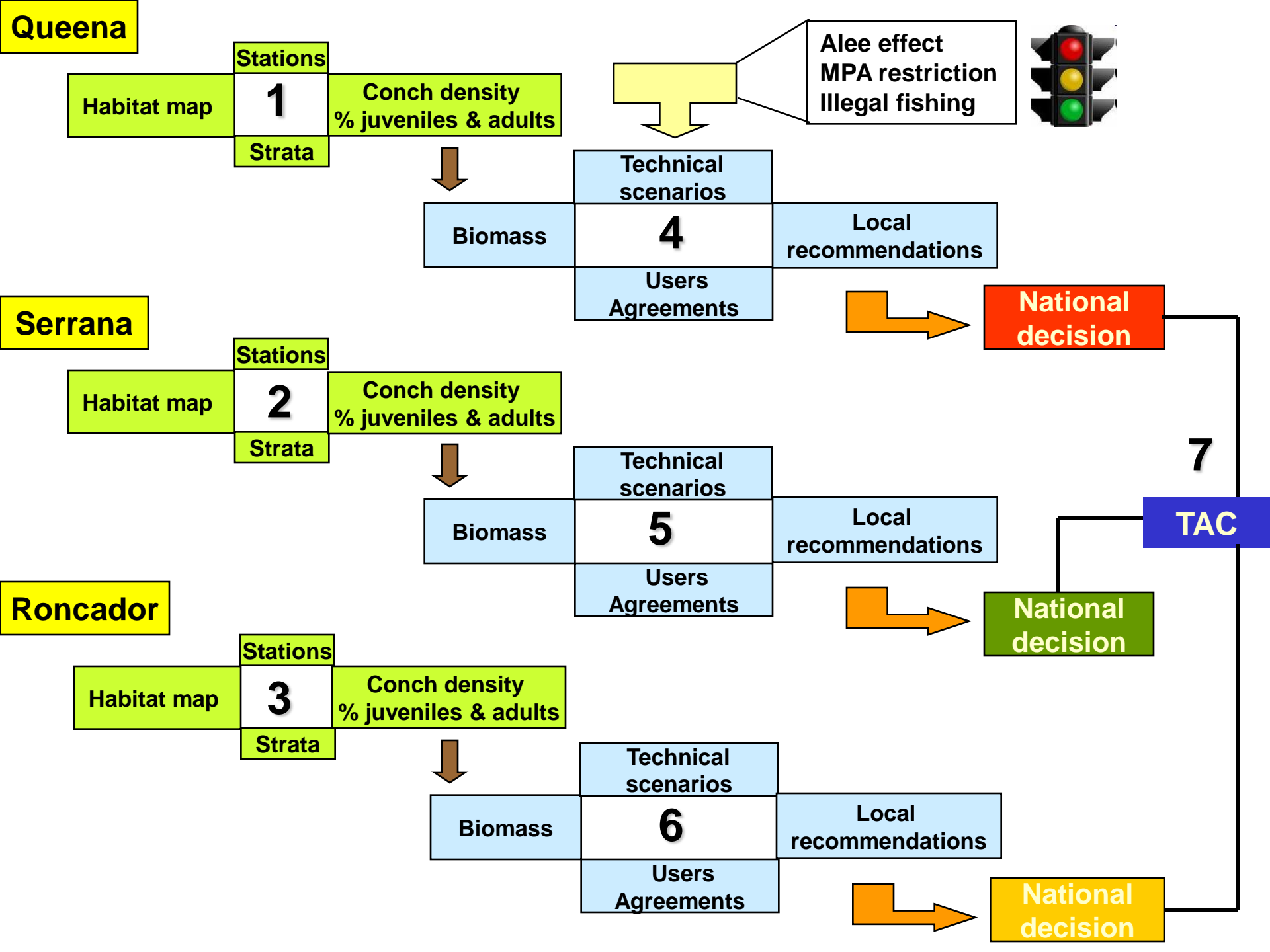


Serrana 2003



Serrana 2007





Atoll	Estimated No. Individuals	Mean adult density (ind/ha)	Mean % adults		Adult Biomass	Technical Recommendation (mt clean meat)			TAC (mt)	% stock
						Precau tory	Highly Precau tory	Very high precau tory		
Roncador	513,171	110.0	25.7		80	14	7	4	7	9
Serrana	5,929,310	151.0	64.3		725	130	75	33	105	15
Quitasueño	4,008,248	37.5	77.2		667	120	60	30	0	0
Providence	138,542	1.8	57.0		37	na	na	na	na	na
San Andres										
East-South-East	84,501	8.7	51.1		6	na	na	na	na	na
South-South-West	55,037	5.1	59.0		9	na	na	na	na	na
Total	10,728,809				1,674				112	

M = 0.45 by Riter y Efanove (Sparre & Venema, 1989)
3.6 years old, 24 0 mm TL size maturation



Illegal conch Fishing



1. Spiny lobster assessment (Nowlis et al. 2008)
2. ~ 2 to 14% of illegal lobster; ~ 1.4 to 21.8 mt meat.
3. From 3 illegal Hondurans vessels (Steeward Ariel, captain Jones and Tony Jr.), assuming 50% Colombian waters.
4. Interviews experienced captains.
5. Near borders.
6. Use SCUBA (or hookah) & suffer serious decompression sickness.
7. Mother boats & ~ 30 canoes & ~ 60 divers.
8. Honduras (~50%), Nicaragua, Jamaica and the Dominican Republic.
9. Illegal divers ~ 400 (Prada et al 2004), duplicate industrial legal divers.



Queen Conch NDFs: Colombia

5. Participative decision-making to reduce fishing, broader artisanal fishers participation, better conch pearl trade.
6. Large scale stock enhancement activities.
7. Participative research agenda.
8. Educational & outreach industrial and artisanal fishermen, teachers, students, politicians and general public.
9. Promotion international collaborative management & better communication & information exchange.

Enforcement & Surveillance

1. Low capacity & insufficient funds remote areas. Require multi-source funding.
2. Landing meat difficult for bio-ecological indicators & may affect females.
3. VMS in place, but no direct access real time data. No other countries yet in place.
4. Dwarf conch may not meet minimum weights.
5. Need training and collaborative international efforts to overcome political constraints & poor communication.
6. Pearls high value, illegal trading & difficult to control ports and airports.

Queen Conch NDFs: Jamaica

(Stephen Smikle)

1. Surveys (Pedro Bank) population & TAC. Surveys in 1990's by industry, since 2000 by government or NGO.
2. Assessment surveys & reports managers, national & international experts. Data quality control.
3. Annual adjustment TAC on useable MSY (exclusion illegal fishing). Illegal fishing interviews and workshops.
4. TAC reduced 3,000 mt 992 to 1999 mt in 1997 to 946 mt in 2004 and 500 mt in 2005, to 400 in 2008.

Queen Conch NDFs: Jamaica (Stephen Smikle)

5. Individual non-transferrable quotas to industrial fishers in industrial zones, valid one season & require reporting.
6. The establishment of exclusively artisanal fishing zones, and extension of the closed season.
7. SCUBA & hookah regulated.



Canadian International
Development Agency

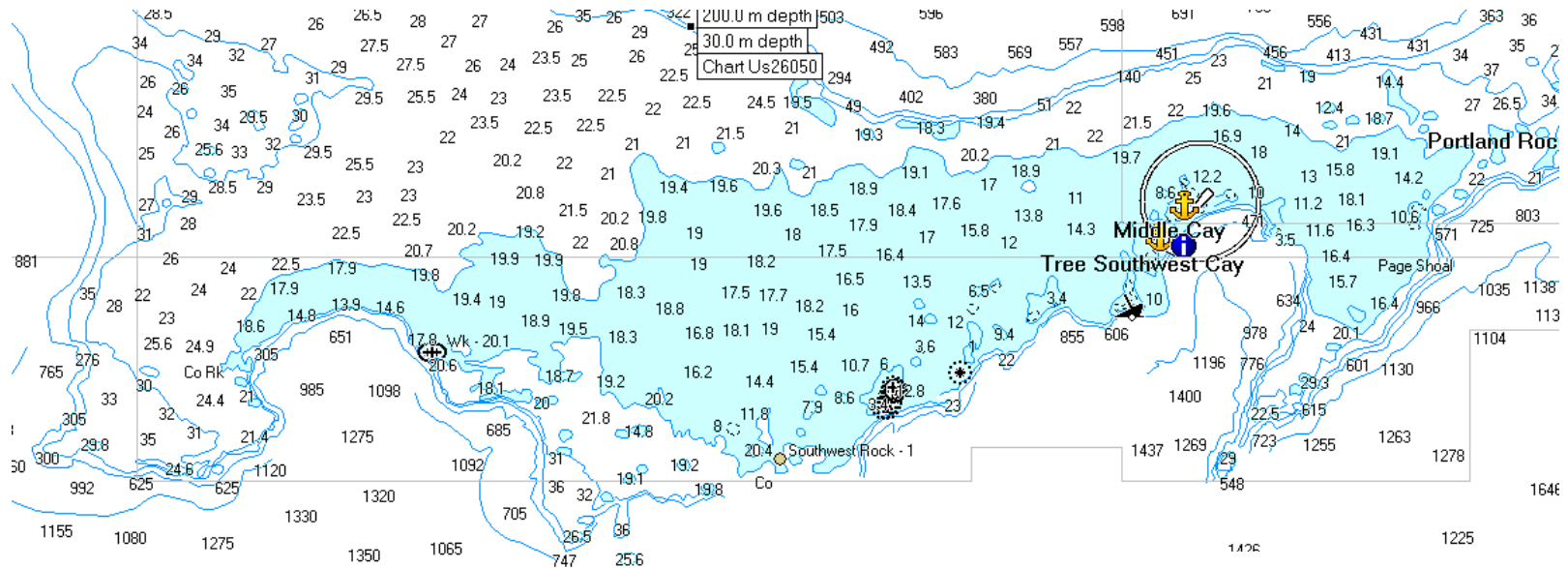


CARICOM
Fisheries Unit

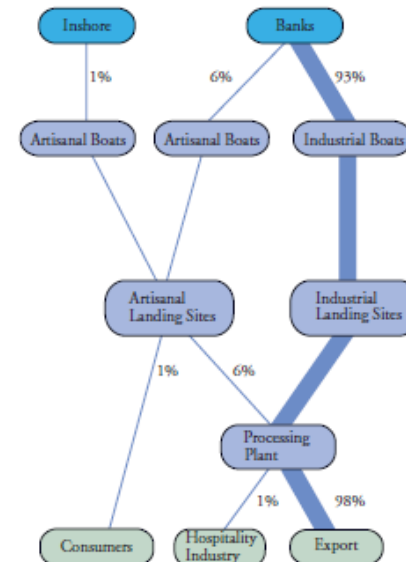


Government of Jamaica

Pedro Bank



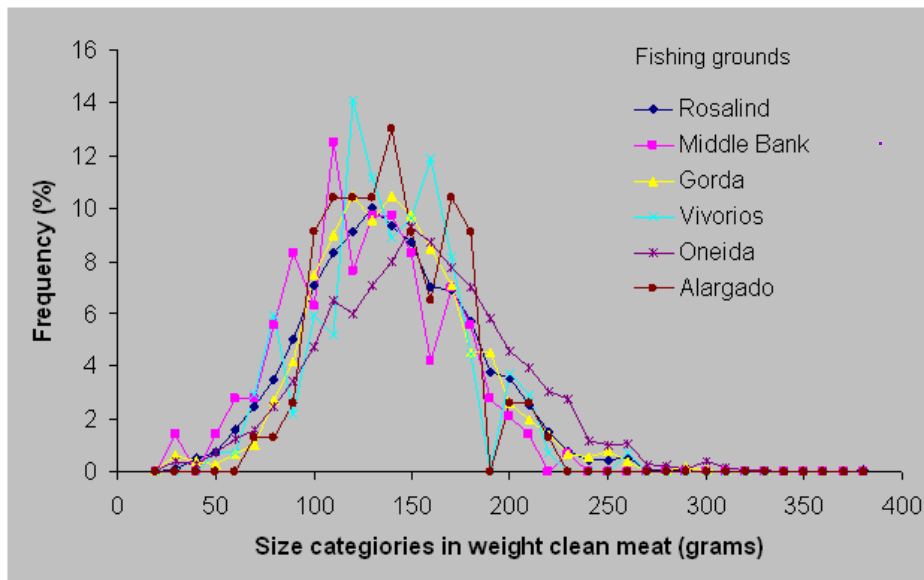
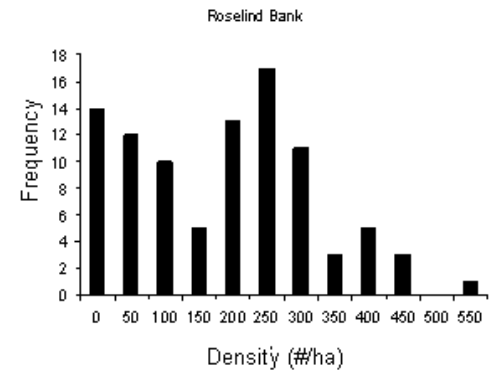
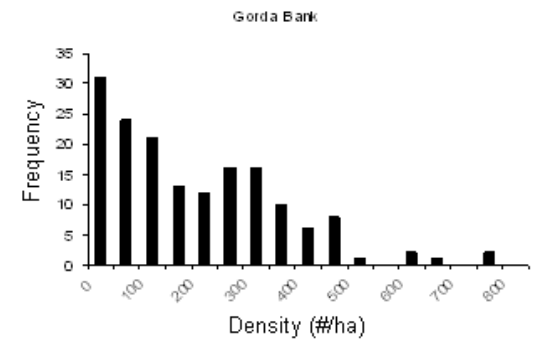
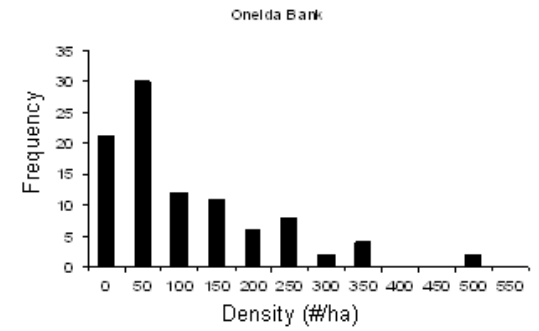
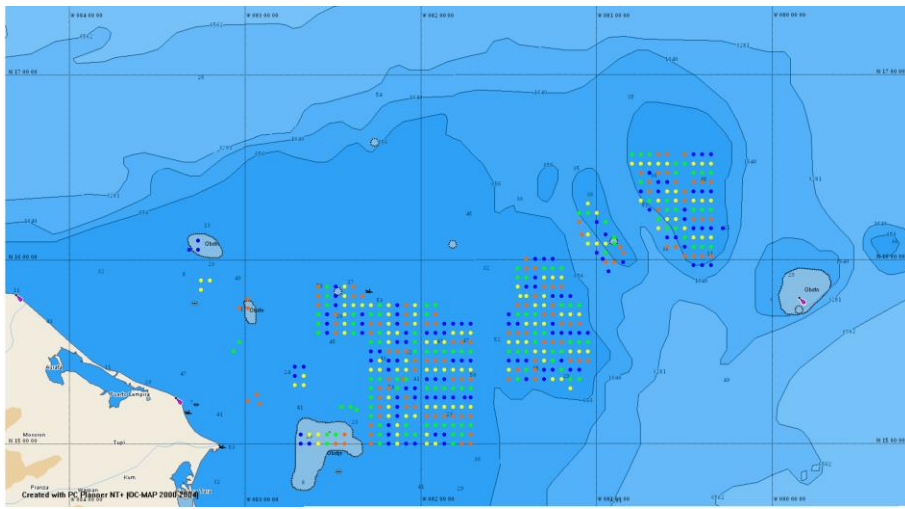
Taken from Jamaica National Marine Fisheries Atlas



Queen Conch NDFs: Honduras

(Dr. Nelson Ehrhardt)

1. Determine level fishing mortality affecting population density to secure reproductive success.
2. In 2005, a 210 mt TAC was authorized to assess annual population densities in 13 fishing banks .
3. Densities appears to be well 56 ind/ha.
4. Future monitoring surveys in conjunction with appropriate statistics to elucidate status of exploitation per fishing bank.
5. Landing supervision, conch inventories processing plants & national trade control.



Taken from: Ehrhardt 2008



Subject	Descriptor	Colombia	Nicaragua	Honduras	Jamaica	D. Republic
Overall status	Actual status	Only two areas open	conch is not directly target	export only from scientific fishing	Only two areas open	no exports permitted
	National production (ton)	96 (2203), expected 112 in 2008	47 (2004), 71 (2005) 113-151 (2006)	1,359 (1991), 1,000 (2003), 210 (2007)	3,000 (1992), 1,999 (1997), 946 (2004), 600 (2007)	~580 -829 (2005)
	% exports	80-90	85-75	90	95	47%?
	Estimates illegal fishing	2 to 14 mt	20% of legal reports		equal or larger than legal reports	
Surveys	stations	351 (2007)	110 (2005)	230 (2006)	63 (2007)	61 (2006)
	station sampling area (m²)	960	2,070	2,094		1,250
	No. conch survey	19,590 (counted)	83,792 (fished)	(fished)	1,398 (counted)	(counted)
	% adults	56	82	70	64	15
	Length shell (mm)	240-350	105-320			
	Lip width (mm)	17	19.9			5.6
	density estimates (ind/ha)	0.63 to 2,250 (2007)	50-950 (2006)	28-511 (2005)	378 ind/ha (0-10 m depth); 50 ind/ha (10-30 m depth)	0.53 to 114.2 (2006)
	mean density (ind/ha)	158.8 North, 7.8 south	123.5 (204), 230 (2005)	198 (2005-.2006)	124 (1998)	53(1998)
	sex ratio (female/male)	1.03	1.17	1		2.25
	population size	10.728.809			75.474.652	1.076.169

Subject	Descriptor	Colombia	Nicaragua	Honduras	Jamaica	D. Republic
Fishery	industrial vessels	5	22	13	7	40
	canoes/industrial vessel	10	40	45		5
	artisanal boats	90	70			200
	trip duration (days)	20 to 25	12 to 15	17 to 22	15 to 20	
	No. divers	8 to 20	26	40-60	10 to 20	
	CPUE	27 kg/diver/day (2003)	1.32 kg/diver/h (1987)			
	No. fishing banks	10	5	13	1	4
	extension fishing areas (km ²)	~3,200	~4,000	~10,000	~8,000	
	processing facilities	2	15		18	
Manage ment	CITES TAC (ton)	112 (2008)	114 (2006)	210 (Scientific)	400 (2008)	n.a.
	closed season	Jun 1 to Oct 31	Apr 1 to Sep 30		Aug 1 to Jan 5	Jul 1 to Oct 31

Recommendations: _____



Population stability

1. Regional control illegal fishing & useable MSY for TAC.
2. Minimum spawning population density in management.
3. Regional connectivity studies larval supply & connectivity.
4. Strengthen precautionary approach if dominance very old adults (low recruitment) or juveniles (reduce reproductive output).
5. Deep water stocks critical to stocks in shallow areas.
6. Promote bi-national agreements to regional management strategies and policies.
7. Coordinated research and collaborative management to ecosystem based management. Need to agree on reference points.
8. CITES may continue acting as a dominant force in enforcement.

Recommendations: Conch Meat



1. Adjust meat weight regulations to equivalent processing categories accepted south-western Caribbean.
2. Facilitate national and international discussion about closed season to include all spawning peaks. compensation measures need to be allocated.
3. Find economic alternatives to promote reduction of fishing pressure in artisanal fishing zones.
4. Introduce essential fish habitat when establishing marine reserves.

conch meat landed	Description	Honduras % losses	Nicaragua % losses	Dominican Republic % losses	Jamaica % losses
50% - 65 clean	Animal gutted and operculum removed.	44	45		12
75 - 85% clean	Additional removal of mantle, eyes, proboscis and skin.	55.8		25	28.2
100% clean	Only clean meat (except in Colombia where the operculum remains).	61.4	60	42	42.9



Recommendations:

Conch Pearls

1. Adopt protocol: TAC, mobilization certificates, strengthen controls, appropriate fees, education & outreach & research.
2. TAC will consider adult population & proportion pearl production. San Andres archipelago 1:1,025 (Ortegón 2006). But, fraction export quality.
3. Need link trade with fishing licenses. Require 100% pearls reported.
4. Strength enforcement mechanisms: a) dedicated hot line; b) special operations at landing sites & jewelry stores; c) ID to legal traders; d) informative campaigns & responsible conch fisheries conducts.