MR1: TOTAL AND PROTECTED MARINE AREA

DK

Concepts and Definitions

Marine Protected Area (MPA) is any area of intertidal or subtidal terrain together with its overlying water and associated flora, fauna, historical and cultural features, which have been reserved by law or *other effective means to protect part or all of the enclosed environment. (Please refer to the IUCN Centre for Mediterranean Cooperation's website at http://www.uicnmed.org/web2007/documentos/Rapport_ final_AMP_en.pdf [last accessed: July 11, 2009]*

A *Marine area* is defined as the foreshore, seabed, coastal water, and air space above the water (i) of which the seaward boundary is the outer limits of the territorial sea; and (ii) of which the landward boundary is the line of mean high water springs, except that where that line crosses a river, the landward boundary at that point shall be whichever is the lesser of one kilometre upstream from the mouth of the river or the point upstream that is calculated by multiplying the width of the river mouth by 5. (*Please refer to the Greater Wellington Regional Council's website at http://www.gw.govt.nz/story1210.cfm*.)

Method of Computation

Data for this indicator, total and protected marine area, were obtained from Member States and Associate Members and classified according to the categories defined above.

Indicator Relevance

Marine protected areas (MPAs) are used as management tools to protect, maintain, or restore natural and cultural resources in coastal and marine waters. New MPAs are designated worldwide every year, and it is becoming more and more difficult to make a current analysis of the coverage offered by MPAs. Nevertheless, inventories are necessary for effective planning, and regional MPA databases are becoming more common. MPAs have different shapes, sizes, and management characteristics, and have been established for different purposes.

In the CARICOM region a significant number of the MPAs, particularly in the insular states, have been established as fisheries management tools, with the recognition of their utility as tourism attractions. MPAs are often unique ecosystems that make them attractive to tourists, for scuba diving, sight seeing and other activities. Without proper management, however, tourists can quickly degrade the very resources that they have travelled to see. Although there are an increasing number of MPAs in the CARICOM region, the amount of tourists visiting the region is also growing; hence the carrying capacities of the existing MPAs may be soon exceeded by the numbers of tourists utilizing them.

Data Assessment

Data for this indicator were collected for six Member States and two Associate Members. The six Member States were the Bahamas, Belize, Dominica, Jamaica, Saint Lucia, and St. Vincent and the Grenadines. The Associate Members were Bermuda and The Turks and Caicos Islands.

Data was requested for five years: 1970, 1980, 1990, 2000 and 2004. For the Member States, only The Bahamas provided data for all the years requested—Jamaica and Saint Lucia provided data for 2000 alone, Belize and Dominica provided data for 2000 and 2004 and St. Vincent and the Grenadines provided data for 1990, 2000 and 2004. Like the Bahamas, both reporting Associate Members provided data for all the years requested.

It should be noted that the protected area for The Turks and Caicos Islands was legally/formally established in 1992. As such, 1970, 1980 and 1990 data points are not applicable for protected marine area.

No definition was provided for this indicator from reporting Member States/Associate Members. It is therefore impossible to assess the degree of harmonisation for this indicator.

Data Sources

Please refer to **Appendix 2.7.1 (a)** for the sources of the data on the total and protected marine areas of Member States and Associate Members.

Evaluation

The data in **Table 7.**1 were compiled for six member States and two Associate Members on total and protected Marine Area for the period 1970 to 2004. Most Member States reported a small percentage of protected total marine area with the exception of Jamaica with almost 82 per cent of the total marine of 1,815 squared kilometres protected in 2000. Bermuda reported the largest marine area at 428,738 squared kilometres of which 0.7 per cent was protected in 2004 with the total protected marine area increasing by 0.04 per cent since 1970. Belize and The Turks and Caicos Islands reported the second and third largest proportions of marine protected area of total marine area for the years 2000 and 2004 at 10.4 per cent and 10.3 per cent respectively with total areas of 23,654 squared kilometres and 7,200 squared kilometres respectively. The Bahamas with a total marine area of 266,667 squared kilometres reported increases in the total protected area from 4.67 squared kilometres in 1970 to 4.77 squared kilometres for the period 1980 to 2004 finally to 16.75 squared kilometres in 2004 representing an increase of almost 16 per cent. Total protected marine area for Saint Vincent and the Grenadines remained at 83 squared kilometres out of a total area of 27,500 squared kilometres for the period 1990 to 2004. Dominica reported a total protected area of 10.72 squared kilometres for 2000 and 2004 while Saint Lucia reported that there were 24 marine protected areas.

Table 7.1 Total and protected marine area: 1970, 1980, 1990, 2000, 2004

Unit = km^2

Country	Year	Marine Area	
		Total	Protected
BS			
	1970	**266,667**	**4.67**
	1980	**266,667**	**4.77**
	1990	**266,667**	**4.77**
	2000	**266,667**	**4.77**
	2004	**266,667**	**16.75**
BZ			
	2000	**23,655**	**2,452**
	2004	**23,655**	**2,452**
DM			
	2000	**. . .**	**10.72**
	2004	**. . .**	**10.72**
JM			
	2000	**1,815**	**1,483**
LC			
	2000*	**. . .**	**24**
VC			
	1990	**27,500**	**83**
	2000	**27,500**	**83**
	2004	**27,500**	**83**
ASSOCIATE MEMBERS			
BM			
	1970	**428,738**	**135**
	1980	**428,738**	**288**
	1990	**428,738**	**315**
	2000	**428,738**	**321**
	2004	**428,738**	**321**
TC			
	1970	**7,200**	**0**
	1980	**7,200**	**0**
	1990	**7,200**	**0**
	2000	**7,200**	**741**
	2004	**7,200**	**741**

MR2: FISH LANDINGS BY TYPE AND BOAT DAYS

DK

Concepts and Definitions

Fish landings are the part of the fish catch that is put ashore. (*Please refer to the European Environmental Agency's website at http://glossary.eea.europa.eu/terminology/concept_html?term=fish%20landing [last accessed: June 19th 2009]).*

A *boat day* is a measure of fishing effort (e.g. example, ten vessels in a fishery, each fishing for fifty days, would have expended five hundred boat-days of effort).
(*Please refer to the Ocean Atlas's website at http://www.fao.org/fi/glossary/default.asp [last accessed: June 19th 2009])*

Method of Computation

Data for this indicator were obtained from Member States/Associate Members and were classified according the categories: Finfish, Fish Fillet, Tilapia, Lobster Head Meat, Lobster Tail, Whole Lobster, Conch, Stone Crab Claws, Grouper Roe, White Farmed Shrimp, Pink Sea Shrimp, Squid, Turtle, King Crab Claws, Post Larvae Shrimp, Farm Lobster, Whole Fish and Other.

Indicator Relevance

The biggest impact that fishing has on the environment is the removal of individuals from the population. Fish landing statistics do not, however, take into account those organisms that are caught but not landed—discards. These may be commercially valuable target species that are discarded for regulatory or marketing reasons, or non-target species. Most discarded species, especially fish and marine mammals, do not survive. Landing statistics, therefore, underestimate the total catch of fishing vessels and, thus, the impact on the environment. Despite this underestimation, however, fish landing statistics assessed against the state of the stock and its ability to recover do give an estimate of the environmental impacts of fishing that would have not been otherwise possible if landing statistics were not available.

Data Assessment

Data for this indicator were provided by eight Member States and two Associate Members: Bahamas, Belize, Dominica, Guyana, Jamaica, Saint Lucia, St. Vincent and the Grenadines, Suriname, Bermuda and The Turks and Caicos Islands. Despite this, however, there is very little detailed data for this indicator.

None of the reporting countries provided definitions used in the collection of this indicator and therefore it is impossible to assess the degree of harmonisation within the Region.

Data Sources

Please refer to **Appendix 2.7.2 (a)** for the sources of the data on the fish landing by type and boat days of Member States and Associate Members.

Evaluation

Data on Fish landings by type and Fish landings by boat days are presented below. It was difficult to compare fish landings given the vast differences in the species groups represented for the different time periods hence the data being presented by country below. It can be seen from the tables presented below that reported fish landings were highest for Guyana, Suriname and Belize in the Region. Data on number of boat days spent and total catch was captured for one Member State and one Associate Member State and this does not therefore allow for much comparison.

Table 7.2 (a) Fish landings by type: 1990, 1995 - 2004

The Bahamas Fish landings by type: 1990, 1995 - 2004

(in mT.)

Country	Year	Fish Landings by Type			
		Crustacean	Mollusc	Scalefish	Total
BS					
	1990	1,935	335	1,340	3,610
	1995	2,636	589	1,271	4,496
	1998	2,621	670	1,610	4,902
	1999	2,783	472	1,439	4,694
	2000	3,050	668	1,332	5,050
	2001	2,282	658	1,534	4,473
	2002	3,422	523	1,597	5,542
	2003	3,508	620	1,604	5,731
	2004	3,079	580	1,397	5,055

Belize Fish landings by type: 1995, 1998 - 2002

Tonnes

Country	Year	Fish Landings by Type						
		Finfish	Fish Fillet	Lobster Head Meat	Lobster Tail	Whole Lobster	Conch	Stone Crab Claws
BZ								
	1995	280,762	43,386	30,842	508,408	324,336	301,951	13,137
	1998	193,757	50,408	36,861	516,279	556,713	13,535	. . .
	1999	183,110	38,666	47,968	609,523	309,377	16,164	. . .
	2000	109,575	28,205	50,637	555,254	513,469	8,671	. . .
	2001	. . .	41,498	45,150	432,884	. . .	579,561	4,258
	2002	526,912	86,191	12,877	477,904	66,420	462,421	7,482

Belize Fish landings by type Cont'd: 1995, 1998 - 2002

Tonnes

Country	Year	Fish Landings by Type						
		Grouper Roe	White Farmed Shrimp	Pink Sea Shrimp	Squid	King Crab Claws	Whole Fish	Total Quantity
BZ							. . .	
	1995	882	1,048,431	107,956	213	2,104	. . .	2,662,408
	1998	74	3,620,151	89,185	172	. . .	. . .	5,077,135
	1999	352	6,974,120	76,616	214	. . .	. . .	8,256,110
	2000	. . .	8,002,118	99,285	555	. . .	. . .	9,367,769
	2001	. . .	9,812,135	151,750	. . .	. . .	81,528	11,148,764
	2002	321	1,083,158	106,312	. . .	. . .	. . .	2,829,998

Belize Fish landings by type Cont'd: 1995, 1998 - 2004

(in mT.)

Country	Year	Fish Landings by Type						
		Lobster Tail	Conch	Farmed Shrimp	Shrimp	Whole Fish	Other	Total Quantity
BZ								
	1995	392	137	768	79	147	7	1,530
	1998	251	253	1,871	40	111	6	2,532
	1999	298	140	3,170	35	101	8	3,752
	2000	275	233	3,630	45	62	4	4,249
	2001	217	263	4,451	69	56	2	5,057
	2002	288	187	4,345	121	83	1	5,025
	2003	271	241	11,134	52	34	1	11,734
	2004	278	282	11,042	74	27	3	11,706

Dominica Fish landings by type: 2000 - 2004

Country	Year	Fish Landings by Type				
		Coastal Pelagic Fishery	Offshore/large Pelagic Fishery	Reef Fishery	Other	Total Quantity
		(in mT.)	(in mT.)	(Tonnes)	(in mT.)	(Tonnes)
DM						
	2000	. . .	. . .	. . .	. . .	495
	2001	172	297	56	56	525
	2002	303	338	. . .	. . .	641
	2003	169	196	39	39	404
	2004	108	250	45	45	403

Guyana Fish landings by type: 1997 - 2003

(in mT.)

Country	Year	Fish Landings by Type	
		Finfish	Shrimp
GY			
	1997	37,600	123,818
	1998	39,541	30,143
	1999	35,257	14,386
	2000	30,277	19,328
	2001	26,892	25,250
	2002	25,186	22,058
	2003	33,724	22,584

Jamaica Fish landings by type: 1997

Country	Year	Fish Landings by Type			
		Finfish	Conch	Pelagic Fish	Total Quantity
		(Tonnes)	(in mT.)	(in mT.)	(in mT.)
JM					
	1997	4,476	1,805	1,116	7,747

Saint Lucia Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Landings by Type				
		Dolphinfish	Wahoo	Flyingfish	Snapper	Shark
LC						
	1990	240	55	34	0	1
	1995	200	20	50	0	6
	1998	271	250	234	0	9
	1999	588	310	67	0	6
	2000	555	243	99	68	5
	2001	427	214	323	82	5
	2002	373	246	170	132	66
	2003	304	170	74	57	5
	2004	376	238	11	39	20

Saint Lucia Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Landings by Type				
		Tunas	Lobster	Conch	Other	Total Quantity
LC						
	1990	127	4	4	97	562
	1995	300	13	15	407	1,011
	1998	395	20	42	304	1,525
	1999	324	23	90	421	1,829
	2000	473	25	40	352	1,860
	2001	404	36	41	435	1,967
	2002	219	58	31	317	1,612
	2003	486	23	60	349	1,528
	2004	419	11	46	362	1,520

Suriname Fish landings by type: 2000-2004

(in mT.)

Country	Year	Fish Landings by Type
		Finfish
SR		
	2000	8,871
	2001	12,202
	2002	10,937
	2003	12,000
	2004	18,647

Bermuda Fish landings by type: 1995, 1998-2004

(in mT.)

Country	Year	Fish Landings by Type								
		Snapper	Jacks	Shark	Tunas	Lobster	Grouper Roe	Bait	Other	Total Quantity
BM										
	1995	41	94	18	200	5	47	48	41	493
	1998	32	53	10	221	14	47	65	44	485
	1999	32	59	11	218	21	54	43	29	467
	2000	38	48	7	166	12	43	45	28	387
	2001	35	45	5	132	13	50	23	25	328
	2002	38	58	5	177	15	57	46	25	421
	2003	34	46	8	178	18	36	44	18	381
	2004	23	54	6	210	14	39	41	16	402

The Turks and Caicos Islands Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Landings by Type			
		Lobster	Queen Conch [1]	Various Reef Fish [2]	Total Quantity
TC					
	1990	328	424	15	767
	1995	284	953	1	1,238
	1998	315	645	. . .	941
	1999	187	737	1	925
	2000	291	817	1	1,109
	2001	323	725	4	1,052
	2002	182	655	3	840
	2003	278	720	. . .	998
	2004	388	680	. . .	1,057

Table 7.2 (b) Fish landings by Boat days: 1990, 1995 - 2004

Country	Year	Fish landings by Boat days	
		Number of boats days spent	Total catch (tonnes)
BS			
	1990	12,333	1,334
	1995	16,534	1,146
	1998	17,818	1,814
	1999	13,505	1,530
	2000	12,838	1,390
	2001	13,940	1,530
	2002	13,354	1,474
	2003	14,501	1,568
	2004	10,930	954
TC			
	1990	8,215	767
	1995	10,097	1,238
	1998	7,271	941
	1999	6,714	925
	2000	8,321	1,109
	2001	8,848	1,052
	2002	7,085	840
	2003	5,460	998
	2004	8,449	1,057

MR3: POPULATION OF COASTAL AREAS

DK

Concepts and Definitions

Population of coastal areas is the percent of the total population living within one hundred kilometres of the coastline. A country might also consider percentage of population in the low elevation coastal zone (<10 meters elevation) or percentage of population in river deltas.
http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets.pdf

A *coastal area* is the part of the land affected by its proximity to the sea, and that part of the sea affected by its proximity to the land as the extent to which man's land-based activities have a measurable influence on water chemistry and marine ecology. (*Please refer to European Environment Agency's website at http://glossary.eea.europa.eu/EEAGlossary/C/coastal_area*.)

Method of Computation

Data for this indicator were collected from Member States and Associate Members according to the categories: population in coastal areas and number of families in coastal areas.

Indicator Relevance

The natural environment of coastal areas, which includes wetlands, estuaries, mangroves and coral reefs, is degraded by agricultural and urban development, industrial facilities, port and road construction, dredging and filling, tourism and aquaculture. Natural landscapes and habitats are altered, overwhelmed and destroyed to accommodate the growing coastal population. Dam construction, even far inland, can alter water flow patterns that support important fisheries, as well as cut off the supply of sediment necessary to maintain deltas and coastlines. As more people gravitate towards the coast, increasing volumes of waste, particularly sewage, are produced and sluiced out into coastal waters, which then causes eutrophication and endanger public health. This indicator, therefore, acts as a measure of population growth in coastal areas to provide an estimation of the pressures on the environment that will arise as a result of habitation of the coast.

Data Assessment

Data for this indicator were obtained from two Member States and two Associate Members. The two Member States were Dominica and Suriname and the two Associate Members, Bermuda and The Turks and Caicos Islands.

Data were requested for six years: 1980, 1985, 1990, 1995, 2001 and 2004. Dominica and Suriname only provided data for one of the years: Dominica for 2001 and Suriname for 2004. Bermuda provided data for two of the requested years: 1980 and 1990, and also

provided data for 2000. Like Bermuda, and The Turks and Caicos Islands provided data for 2000, but they also provided data for all of the requested years save 2001.
It is impossible to assess the degree of harmonisation of this indicator within the Region since none of the reporting countries provided definitions used in the collection of this indicator.

Data Sources

Please refer to **Appendix 2.7.3 (a)** for the sources of the data on the total and protected marine areas of Member States and Associate Members.

Evaluation

Table 7.3 presents data on the number of families and the population of coastal area in reporting Member States Dominica and Suriname and two Associate Members Bermuda and The Turks and Caicos Islands. The data shows that in Dominica 15,500 persons and 5,105 families lived in coastal areas in 2001 whilst Suriname reported a total of 458,822 persons lived on the coast in 2004.

During the three decades, the total population living in coastal areas in Bermuda increased from 54,050 persons in 1980 to 58,460 persons in 1990 and finally to 62,059 in 2000. Bermuda also reported an increase in the number of families inhabiting coastal areas from 22,430 in 1990 to 25,148 in 2000. Associate Member State, The Turks and Caicos Islands reported 100 per cent of the population inhabited coastal area in the years 1980, 1985, 1990, 1995, 2000 and 2004.

Table 7.3 - Number of families and Population of coastal area : 1980, 1985, 1990, 1995, 2000 - 2001, 2004

Country	Year	Population in coastal areas	Number of families in coastal areas
DM			
	2001	**15,500**	**5,105**
SR			
	2004	**458,822**	**. . .**
ASSOCIATE MEMBERS			
BM			
	1980	**54,050**	**. . .**
	1990	**58,460**	**22,430**
	2000	**62,059**	**25,148**
TC		**(per cent)**	
	1980*	**100**	**. . .**
	1985*	**100**	**. . .**
	1990*	**100**	**. . .**
	1995*	**100**	**. . .**
	2000*	**100**	**. . .**
	2004*	**100**	**. . .**

Appendix 1.7
Conversion Table

Metric	to	Imperial
2 hectares (ha)		5 acres
1 km^2 (squared kilometres)		250 acres
8 km^2 (squared kilometres)		3 square miles (mi^2)

Appendix 2.7

2.7.1(a): Sources of Data for Table 7.1 - Total and Protected Marine Area: 1970, 1980, 1990, 2000, 2004

Country	Data Source
THE BAHAMAS	Bahamas National Trust
BELIZE	Land Information Centre
DOMINICA	Fisheries Division, Ministry of Agriculture
JAMAICA	National Environment and Planning Agency
SAINT LUCIA	Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries
ST VINCENT AND THE GRENADINES	Department of Statistics
BERMUDA	Bermuda Biodiversity Country Study
THE TURKS AND CAICOS ISLANDS	Department of Environment and Coastal Resources

2.7.1(b): Notes for Table 7.1 - Total and Protected Marine Area: 1970, 1980, 1990, 2000, 2004

Country	Notes
BELIZE	Area is GIS area and not the area on the legal statutory instrument.
DOMINICA	Only Two Marine Reserves. Cabrits National Park (Marine Section): 1054 acres and Soufriere/Scott's Head Marine Reserve: 6.5 km²
SAINT LUCIA	* - Area of protected marine area not available. Number of marine protected areas given.
ST VINCENT AND THE GRENADINES	Protected Marine Areas are only in coastal areas, less that five miles from shore. Protected marine areas enacted in 1987. Total marine areas declared according to Law of the Sea Convention.
BERMUDA	The Exclusive Economic Zone around Bermuda was declared in 1996. This gives Bermuda jurisdiction over an area of about 125,000 square nautical miles. This area was declared a marine mammal preserve in 2000.
THE TURKS AND CAICOS ISLANDS	The protected marine area for 2000 and 2004 correspond to 19 Marine National Parks. The protected area was legally/formally established in 1992 hence 1970, 1980, and 1990 data points are not applicable for protected marine area.

2.7.2(a): Sources of Data for Table 7.2: Fish Landings by Type and Boat Days: 1990, 1995 – 2004

Country	Data Source
THE BAHAMAS	Department of Fisheries
BELIZE	Statistical Records, Belize Fisheries Department, Ministry of Agriculture and Fisheries
DOMINICA	Fisheries Division
GUYANA	Bureau of Statistics
JAMAICA	Fisheries Division
SAINT LUCIA	Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries
SURINAME	General Bureau of Statistics
BERMUDA	Department of Statistics.
THE TURKS AND CAICOS ISLANDS	Department of Environmental and Coastal Resources

2.7.2(b): Notes for Table 7.2 - Fish Landings by Type and Boat Days: 1990, 1995 – 2004

Country	Notes
THE BAHAMAS	Fish landings by boat do not reflect total Bahamas landing. These are the landing collected by our data collectors. Conch = Queen Conch. Stone Crab includes spiny lobster. Grouper Roe refers to groupers, jacks, snappers, grunts, etc.
DOMINICA	Whole fish = fish landings at a coastal pelagic fishery and an offshore/large pelagic fishery. Other refers to reef fish
GUYANA	Fin-fish is derived from fin-fish production data. White farmed shrimp refers to shrimp and is derived from shrimp production data. Other refers to all other kinds of fish landings.
JAMAICA	All data represents marine capture by type. Whole fish = tilapia. White Farmed Shrimp = Shrimp
SAINT LUCIA	* Other = dolphin fish + wahoo + flying fish + snapper + shark + tuna + other
SURINAME	General Bureau of Statistics
BERMUDA	Department of Statistics collected quantity information in lbs and converted into mT. Other includes jacks, snappers, miscellaneous, tuna and sharks.
THE TURKS AND CAICOS ISLANDS	The figures in the quantity lines reflect total catch, that is, the quantity sold to the fish processors but exclude any direct sales to local restaurants and hotels. Fluctuations in catch levels are presumed to be resultant of over-fishing in combination with independent factors such as climate change. Conch = Queen Conch: Catch levelled at the current quote or Total Allowable Catch (TAC) level of approximately 1,657,876 (752 mT.). Other refers to various reef fish which include species such as groupers, snappers and large pelagic.

2.7.3(a): Source of Data for Table 7.3 - Number of Families and Population of Coastal Areas: 1980, 1985, 1990, 1995, 2000 – 2001, 2004

Country	Data Source
DOMINICA	Population and Housing Census, 2000 Round
SURINAME	Preliminary Census 2004 Figures
BERMUDA	Population and Housing Census, 2000 Round
THE TURKS AND CAICOS ISLANDS	Department of Environmental & Coastal Resources

2.7.3(b): Notes for Table 7.3 - Number of Families and Population of Coastal Areas: 1980, 1985, 1990, 1995, 2000 – 2001, 2004

Country	Notes
BERMUDA	Data represent total households and total population in Bermuda. Bermuda measures 1 mile at its widest point. Based on the standard definition of coastal area, the entire island is considered coastal.
THE TURKS AND CAICOS ISLANDS	* - Figures are percentages.