

2013 | ENVIRONMENTAL STATISTICS COMPENDIUM



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FOREWORD

The Department of Statistics is pleased to release its fourth issue of the Environment Statistics Compendium. In alignment with the Department's mission to collect, process and analyze relevant statistical information; and, in keeping with its mandate to collaborate with Government Ministries and Departments for the collation and distribution of statistics to the general public; this publication is produced annually and reflects the collation of existing data sourced from the activities of both Government and non-Governmental entities that are involved in either monitoring, controlling or promoting awareness about issues affecting Bermuda's environment.

Additionally, the delivery of this report supports the combined efforts of the United Nations Statistics Division (UNSD) and the Caribbean Community (CARICOM) to strengthen capacity and harmonize the compilation of social, gender and environmental statistics and indicators in the CARICOM Region for the achievement of the UN Millennium Development Goals by 2015.

The Compendium is structured in 13 sections which include:

1. Population and Households
2. Tourism
3. Environmental Health/Weather
4. Natural and Environmental Disasters
5. Energy, Minerals and Transport
6. Agriculture
7. Land Use
8. Coastal and Marine Resources
9. Biodiversity
10. Forestry
11. Air
12. Waste
13. Water

The Department gratefully acknowledges the continued support of all subject area experts and stakeholders who committed to providing the statistical data and information needed to compile and publish this report.

Valerie Robinson-James

Director

Department of Statistics

November 2013

Data Notes

.. not applicable	ha hectares
.. not available	km kilometre
- less than half of the unit specified or nil	km ² square kilometre
'000 thousands	kWh kilowatt-hour
° degrees	mio m ³ /y million cubic meters per year
% per cent	mT metric tons
\$ Bermuda dollar	No. number
F Fahrenheit	µg/m ³ microgram
ppb parts per billion	

*Percentages may not sum to totals due to rounding.

Measuring Units Conversion Table

METRIC	IMPERIAL	IMPERIAL	METRIC
LENGTH			
1 millimetre (mm)	0.03937 inch (in)	1 inch (in)	2.54 centimetre (cm)
1 centimetre (cm)	10 mm	0.3937 inch	1 yard (yd)
1 metre (m)	100 cm	1.0936 yards (yds)	3 feet (ft)
1 kilometre (km)	1,000 m	1 mile	1,760 yds
			1.6093 kilometre (km)
AREA			
1 square meter (m ²)	10,000 cm ²	1 acre	4,840 yd ²
1 hectare (ha)	10,000 m ²	2.4712 acres	1 acre
1 square kilometer (km ²)	100 ha	0.3861 square mile (mile ²)	1 square mile (mile ²)
			640 acres
			2.59 square kilometer(km ²)
MASS			
1 kilogram (kg)	1,000 grams (g)	2.2046 pounds (lbs)	1 pound (lb)
1 metric tonne (mT)	1,000 kg	0.9842 ton	16 ounces (oz)
			2,240 lbs
			1.016 metric tonne (mT)
TEMPERATURE			
°C = [5/9 x (°F-32)]		1 degree Celsius (°C)	33.8 degrees Fahrenheit (°F)
°F = [(9/5 x °C) + 32]			

Contributors

Bermuda Electric Light Company (BELCO) Ltd. • Bermuda Fire Services • Department of Conservation Services
 Department of Environmental Protection • Department of Health • Department of Planning
 Department of Statistics • Department of Tourism • The Bermuda Weather Service • Transport Control Department
 Department of Works and Engineering — Water Section
 Department of Works and Engineering — Waste and Enforcement Section

POPULATION AND HOUSEHOLDS



Section 1: Population and Households

Population

Bermuda's population has continued to grow over time. This is attributed in part to natural increase, that is, when the number of births exceeds the number of deaths. According to the Population Projections for 2012, Bermuda's civilian population was estimated to be 64,867 persons. It is estimated that the population density of Bermuda for 2012 was 1,194 persons per square kilometer. The civilian population does not include persons in institutions or who were non-sheltered. The population density has gradually increased year on year (see Table 1.1).

Households

The 2010 Census reported 26,923 households in Bermuda (see Table 1.2). The 7.06% increase in the number of households since 2000 can be attributed to Bermuda's growing population. However, the high cost of housing may lead to environmental concerns such as, overcrowding and homelessness.

Table 1.1

Population and Population Density

Year	Population	Population Density (per km2)
2000	62,059 ¹	1,142
2008	64,209 ²	1,181
2009	64,395 ²	1,185
2010	64,237 ¹	1,182
2011	64,722 ²	1,191
2012	64,867 ²	1,194

Source: Department of Statistics

According to the Department of Planning (2008), Bermuda is 54.34 km²

¹The 2000 and 2010 Census year population totals excludes the non-sheltered and institutionalized population.

²Based on the 2000 Population Projections.

Chart 1.1

Population Density

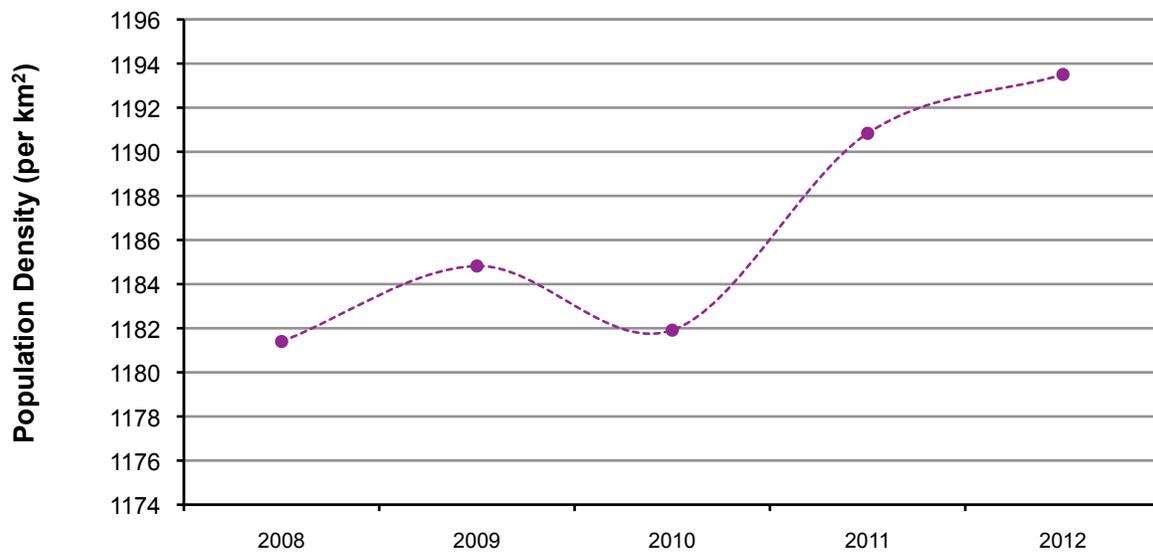


Table 1.2**Number of Households by Type of Dwelling**

Type of Dwelling	2000		2010	
	No.	%	No.	%
Undivided private house (cottage)	6,717	27	6,280	23
Two apartments	8,679	35	8,870	33
Three apartments	4,396	17	4,639	17
Four or more apartments	4,580	18	5,024	19
Residential/commercial premises	306	1	281	1
Group dwellings	385	2	696	3
Other/not stated	85	-	27	-
Total	25,148	100	26,923¹	100

Source: 2010 Population and Housing Census

Group dwellings include hotel staff quarters, nurses' hostels, and police barracks.

Percentages may not sum to totals due to rounding.

¹ Includes 1,106 households for which there is no data by type of dwelling.

Table 1.3**Number of Households by Type of Tenure**

Type of Tenure	2000		2010	
	No.	%	No.	%
Own	10,863	43	12,238	45
Rent	12,854	51	11,719	44
Rent-Free	1,006	4	1,004	4
Other/Not Stated	425 ¹	2	856 ²	3
Total	25,148	100	26,923³	100

Source: 2010 Population and Housing Census

¹ Includes 385 group dwellings

² Includes 696 group dwellings and 27 boats.

³ Includes 1,106 households for which there is no data by type of tenure.

Table 1.4**Number of Households by Number of Bedrooms**

Number of Bedrooms	2000		2010	
	No.	%	No.	%
Studio dwelling (0 bedrooms)	1,188	5	790	3
Households with one bedroom	6,385	26	6,101	24
Households with two bedrooms	8,964	36	8,944	36
Households with three bedrooms	6,866	28	7,473	30
Households with more than 3 bedrooms	1,319	5	1,645	7
Not stated	41	-	144	-
Total number of households	24,763	100	25,094¹	100
Average number of bedrooms per household²	2.03		2.12	
Average size of the household³	2.47		2.42	
Average number of persons per bedroom⁴	1.23		1.14	

Source: 2000 & 2010 Population and Housing Census

¹ Excludes 696 group dwellings and 27 boats since the number of bedrooms is not collected for these types of dwellings.

² Excludes 1,106 households for which there is no data on the number of bedrooms.

³ In calculating the average size of household, the population of 875 persons from the group dwellings and boats was subtracted from the total population.

⁴ In calculating the average number of persons per bedroom, the population of 875 persons from the group dwellings and boats was subtracted from the total population.

Table 1.5**Number of Households by Size of Household**

Size of Household	2000		2010	
	No.	%	No.	%
One person	7,358	29.26	7,341	29.25
Two persons	7,539	29.98	7,902	31.49
Three persons	4,489	17.85	4,498	17.92
Four persons	3,683	14.65	3,536	14.09
Five persons	1,436	5.71	1,234	4.92
Six persons	408	1.62	385	1.53
Seven persons	151	0.60	112	0.45
Eight persons	47	0.19	52	0.21
More than eight persons	37	0.15	34	0.14
Total number of households	25,148	100.00	25,094 ¹	100.00
Average size of household	2.47		2.42	

Source: 2010 Population and Housing Census

¹ Excludes 696 group dwellings and 27 boats since the number of bedrooms is not collected for these types of dwellings.

Millennium Development Goal 7

Indicator 32

Proportion of households with access to secure tenure

100%

The percentage of the population that do not live in slums. A slum household is a group of individuals living under the same roof who lack one or more of the following conditions: security of tenure, structural quality and durability of dwellings, access to safe water, access to sanitation facilities, and sufficient living area.

Secure tenure refers to household persons who own or are purchasing their homes, renting privately or are in social housing or sub-tenancy. Households without secure tenure are defined as squatters (whether or not they pay rent), homeless and households with no formal agreement.

TOURISM



Section 2: Tourism

Bermuda's tourism industry serves as one of the largest sources of revenue to the economy after international business. The recurrent global economic crisis has had a negative impact on Bermuda's tourism industry.

Tourist Arrivals

Tourist arrivals in 2012 saw a decrease of 6.36 per cent over 2011 with the number of visitors to the island increasing gradually over the last three year period. 2012 showed a decrease in visitors which hasn't been seen since 2008. This decrease was attributed mainly to the drop in cruise ship passengers (see Table 2.1).

Visitor Expenditure

Visitor expenditure fluctuated during the past six years. Aggregate expenditure peaked to \$513.2 million in 2007 but fell to \$392.1 million in 2012 (see Table 2.2).

Tourist Properties

In 2012, there were 2,531 rooms with a total of 5,243 beds, located on 48 properties around Bermuda. The occupancy rate of 55.70 per cent in 2012 was a 0.6 per cent decrease from the previous year (see Table 2.3).

Visitor Accommodation

In 2012, 71.72 per cent of all tourists chose accommodations at one of Bermuda's larger hotels (see Table 2.4). There were 27.62 per cent staying in other types of accommodations, while 0.66 per cent stayed at a guest house. The average length of stay to the island for a tourist was 6.1 days which has been consistent as of 2009. Estimated electricity consumption in 2012 was 4,767 kWh (see table 2.6).

Origin of Tourists

Visitors from the United States, Bermuda's largest tourism market, totalled 168,178 in 2012 representing a decrease of 2.73 per cent over 172,890 visitors in 2011 (see Table 2.5). Overall, Bermuda has seen a decrease in air arrivals of 1.68 per cent over the previous year. The number of cruise ship passengers decreased 9.01 per cent in 2012 (see Table 2.1).

NOTE TO READER

Average Length of Stay: intended length of stay or number of nights spent, unless otherwise stated.

Estimated Electricity Consumption by Tourists: a more direct tourism pressure indicator. It is estimated as the national daily per capita electricity consumption times the number of tourist arrivals by the average length of stay, per one million population.

Index of Social Pressure or Ratio of Tourists (or Visitors) to the Local Population: measures the number of tourists (or visitors) to one resident of the country at any given point in time.

Number of Hotel Rooms per km²: commonly accessible indirect proxy to measure tourism's imprint on the physical environment. It is the number of hotel rooms available divided by the total land area (53.35 km²).

Occupancy Rate: it is calculated by dividing the monthly or yearly sum of room nights used by the number of room nights available for use, then multiplying the quotient by 100 to express as a percentage.

Tourism: the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes.

Tourist: a person travelling to and staying in places outside his or her usual environment for not more than one consecutive year but who stays for more than 24 hours in a destination for leisure, business, and other purposes.

Tourist Arrivals: all stay-over visitors, not cruise passenger arrivals, given most cruise ships stop at multiple destinations, the total number of arrivals at all destinations is considerably larger than the number of cruise passengers visiting the region.

Tourism Expenditure: the total expenditure made by a visitor or on behalf of a visitor for and during his/her trip and stay at a destination.

Tourism Intensity/Density Ratio: measures the average daily tourist density per km². It is the number of tourists per unit of land area at any given point in time. That is, number of tourists times average stay divided by land area (53.35 km²) times 365. It shows how tourists are spread on the territory on average, and gives a general indication of pressures on land use due to tourism, with regard to a reference period (e.g. year) or in peak season.

Tourism Penetration Ratio: measures the average daily tourist density per 1,000 population. It is number of tourists per 1,000 inhabitants of the country at any given point in time. That is, the number of tourists multiplied by the average length of stay divided by the population times 365.

Visitor: any person travelling to a place other than his/her usual environment for less than 12 months and whose main purpose of the visit is other than the exercise of an activity remunerated from within the place visited.

Table 2.1**Tourist, Cruise Ship Arrivals, Tourist Nights Spent, Tourism Intensity and Penetration Ratios**

Indicator	2008	2009	2010	2011	2012
Total visitors¹	550,021	554,394	580,193	651,749	610,325
Growth rate (%)	-16.60	0.80	4.65	12.33	-6.36
Tourists	263,613	235,866	232,262	236,038	232,063
Growth rate (%)	-13.70	-10.53	-1.53	1.63	-1.68
Tourist arrival index	67.50	60.40	59.48	60.44	59.43
Cruise ship passengers	286,408	318,528	347,931	415,711	378,262
Growth rate (%)	-19.10	11.21	9.23	19.48	-9.01
Cruise ship arrivals	134	135	149	177	157
Growth rate (%)	-31.30	0.75	10.37	18.79	-11.30
No. of tourists nights spent	6.40	6.09	6.21	6.06	6.09
Population	65,462	65,811	64,319	64,722	64,867
Tourists to residents ratio	4.03	3.58	3.61	3.65	3.58
Cruise passengers to residents ratio	4.38	4.84	5.41	6.42	5.83
Visitors to residents ratio	8.40	8.42	9.02	10.07	9.41
Tourism intensity ratio	85.05	72.41	72.71	72.10	71.24
Tourism penetration ratio	70.61	59.80	61.44	60.55	59.69

¹ Does not include yacht passengers.

Source: Department of Statistics and Department of Tourism

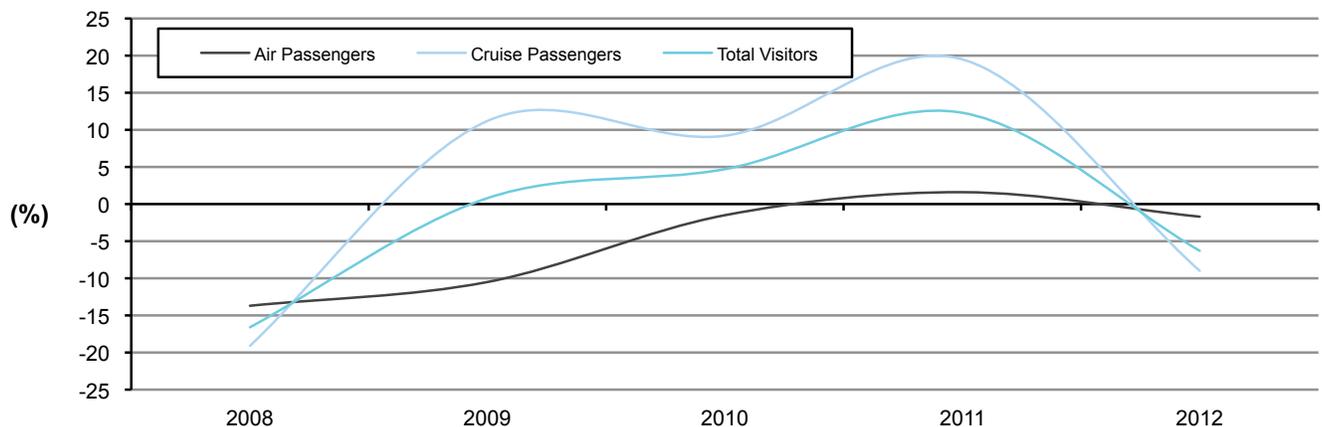
Chart 2.1**Growth in Air Passengers, Cruise Passengers and Total Visitors**

Chart 2.2

Tourist to Residents, Cruise Passengers to Residents and Visitors to Residents Ratios

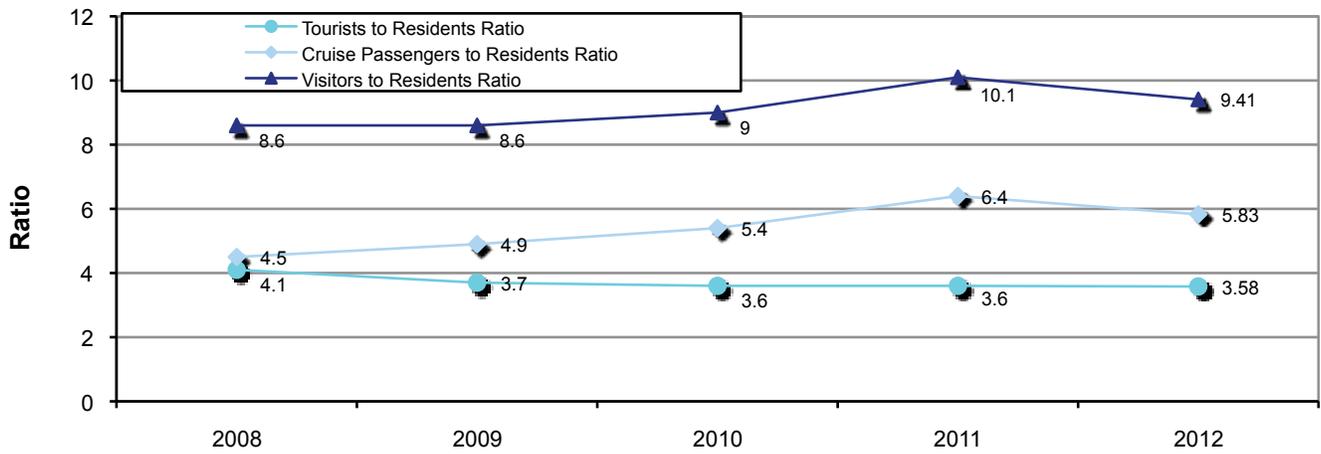


Chart 2.3

Tourist Intensity and Penetration Ratios

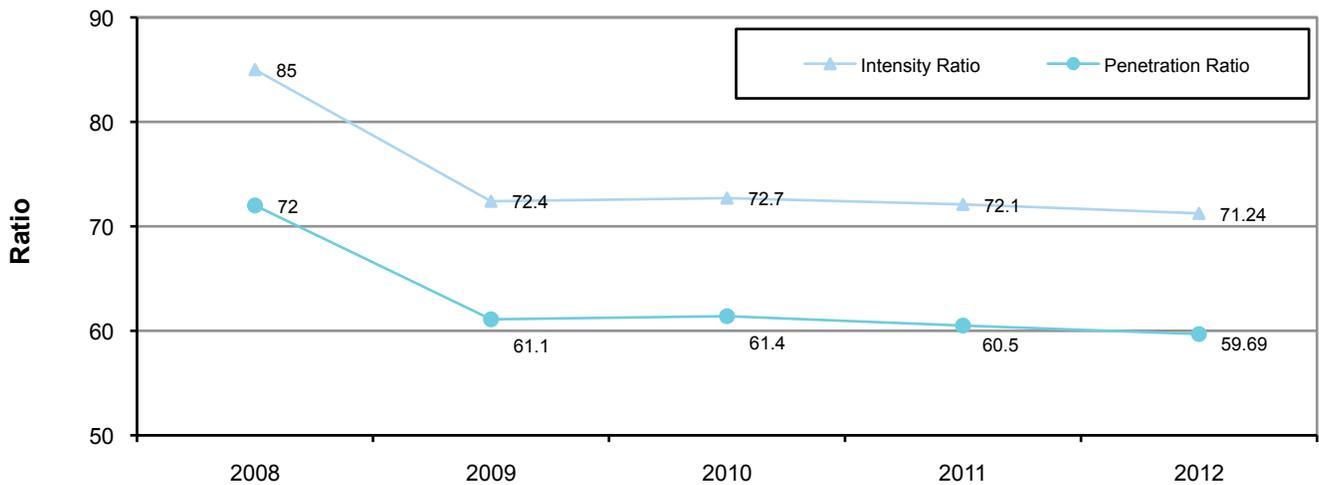


Table 2.2**Visitor Expenditure and Number Employed in Tourism**

Item	2008	2009	2010	2011	2012
Visitor expenditure (in US\$'000)	401,800	321,200	385,500	434,900	392,100
Expenditure on same-day visits	57,700	54,800	62,600	86,400	80,100
Expenditure on accommodation, meals and drinks, shopping, entertainment etc.	344,100	266,400	322,900	348,500	312,000
Total directly employed in tourism					
Women	1,966	1,838	1,759	1,872	1823
Men	2,903	2,836	2,590	2,661	2562
Total	4,869	4,674	4,349	4,533	4,385

Source: Department of Statistics and Department of Tourism

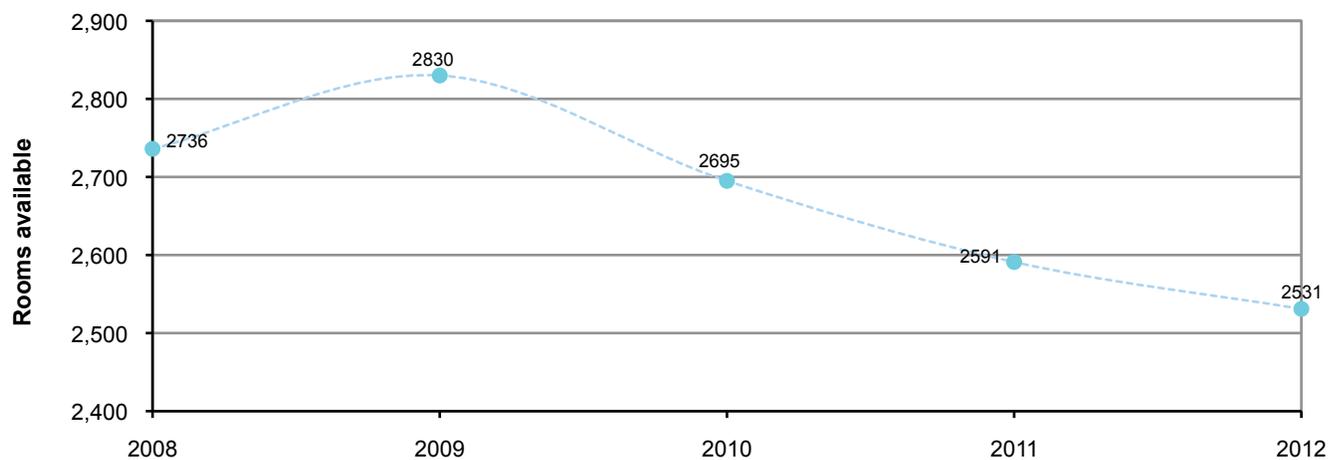
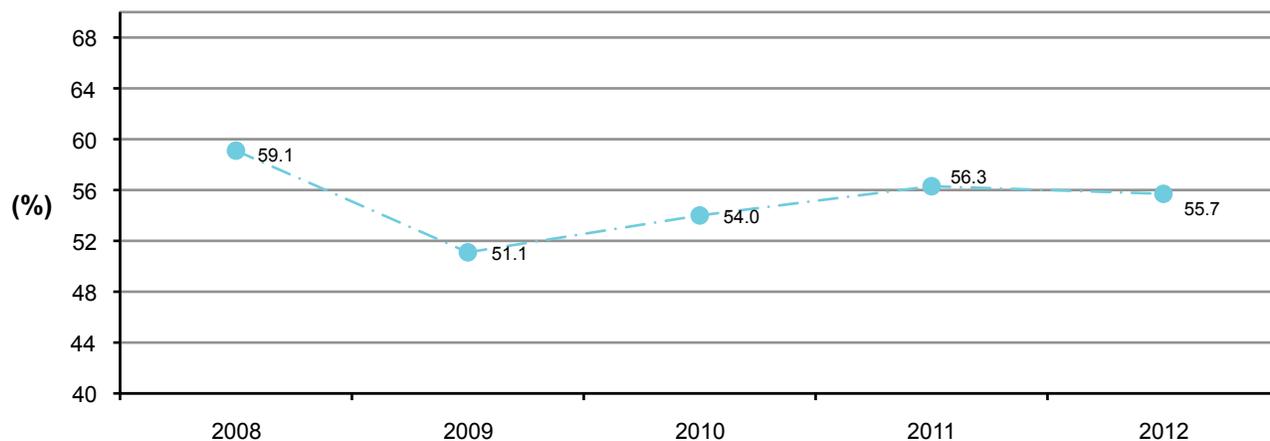
Table 2.3**Number of Properties, Number of Rooms, Per km², and Occupancy Rate**

Item	2008	2009	2010	2011	2012
Number of properties	54	52	50	48	48
Total number of rooms available	2,736	2,832r	2,691r	2,591	2,531
Number of rooms per km²	50.30	52.12r	49.52r	47.68	46.58
Total number of beds	5,538	5,820r	5,69r	5,401	5243
Occupancy rate (%)¹	59.10	51.10	54.00	56.30	55.70

According to the Department of Planning (2008), Bermuda is 54.34 km²

Source: Department of Statistics and Department of Tourism

¹ Occupancy rate is only reported by the Bermuda Hotel Association which accounts for approximately 50% of the total properties and 80% of the total number of rooms and beds available. This figure is sourced from the Visitor Profile Report produced by the Department of Tourism.

Chart 2.4**Number of Hotel Rooms Available****Chart 2.5****Occupancy Rate****Table 2.4****Tourist Arrivals by Type of Accommodation**

Type of Accommodation	2008	2009	2010	2011	2012
Hotels	171,203	159,739	162,011	168,502	166,425
Guest Houses	2,291	1,894	2,067	1,996	1,548
Other	90,119	74,233	68,184	65,540	64,090
Total	263,613	235,866	232,262	236,038	232,063

Source: Department of Statistics and Department of Tourism

Table 2.5**Tourist Arrivals by Country of Origin**

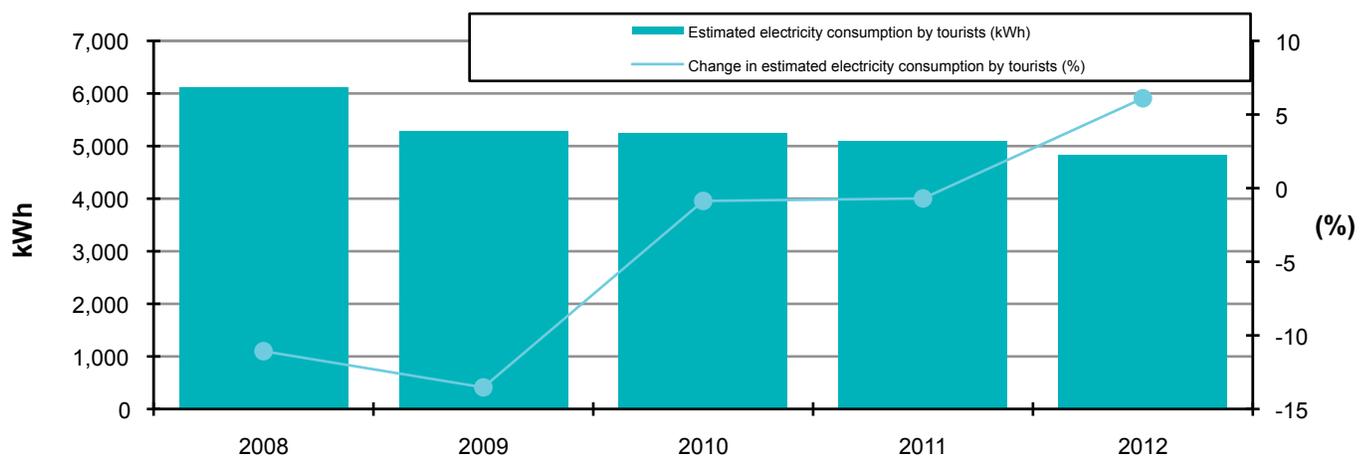
Country of Origin	2008	2009	2010	2011	2012
United States	189,388	172,651	166,016	172,890	168,178
Canada	27,207	24,866	30,402	29,217	30,565
United Kingdom	29,255	23,906	23,240	21,524	21,029
Other	17,763	14,443	12,604	12,407	12,291
Total	263,613	235,866	232,262	236,038	232,063

Source: Department of Statistics and Department of Tourism

Table 2.6**Estimated Electricity Consumption by Tourists**

Type of Accommodation	2008	2009	2010	2011	2012
Tourists	263,613	235,866	232,262	236,038	232,063
Average length of stay	6.40	6.10	6.21	6.06	6.09
Electricity consumption (kWh)	644,954	656,083	650,571	636,517	606,345
Daily per capita electricity consumption (kWh)	3,567	3,608	3,559	3,563	3,373
Estimated electricity consumption by tourists (kWh)	6,019	5,191	5,133	5,096	4,766
Change in estimated electricity consumption by tourists (%)	-11.32	-13.75	-1.12	-0.72	-6.47

Source: Department of Statistics and Department of Tourism

Chart 2.6**Tourists' Estimated Electricity Consumption and Growth**

ENVIRONMENTAL HEALTH/ WEATHER



Section 3: Environmental Health and Weather

Environmental Health

Environmental health refers to all aspects of human health and disease that are determined by factors in the environment. It refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect a person's health (World Health Organization, 2009).

Bermuda's subtropical weather and high humidity contribute to the occurrence of human health conditions on the island such as asthma and bronchitis. In 2012, there were 5,947 reported cases of environmentally-related diseases in Bermuda. A total of 5,097 or 85.71% of these cases were classified as respiratory diseases.

Gastroenteritis is defined as a "condition that causes irritation and inflammation of the stomach and intestines. Viral infection is the most common cause of gastroenteritis, but bacteria, parasites, and food-borne illness (such as shellfish) can be the offending agent. Viruses and bacteria are very contagious and can spread through contaminated food or water." (Emedicinehealth, 2009). In 2012, gastroenteritis accounted for 11.10% or 658 cases of the environmentally-related diseases in Bermuda.

The female gender dominated the distribution of environmentally-related diseases at 60.92% while the males accounted for 39.10% (see Table 3.1).

Weather

The precipitation on Bermuda has increased by 22.20% since 2012, with 49.27inches of rainfall in 2012 from 174 rain days. On record, November is the month with the most rain days and the month of March the least rain days (see Table 3.2).

The month of August was the hottest in Bermuda with an average daily temperature of 82.10 °F and the lowest was February (64.70 °F). Over the last four years, the annual average air temperature in Bermuda has remained around 71.66 degrees Fahrenheit. During that period the average daily maximum temperature was 75.46 °F, and average daily minimum temperature was 67.77 °F in 2012 (see Table 3.3).

Over the past five years, 2008 to 2012, the average humidity was 74%. In 2012, the month with the highest humidity was June (79%) and the lowest was February (70%) (see Table 3.4).

Table 3.1**Number of Reported Cases of Environmentally Related Diseases by Sex**

Cause	Sex	2010	2011	2012
Gastroenteritis	Female	477	349	359
	Male	357	287	299
	Total	834	636	658
Malaria (imported)	Female	-	1	-
	Male	-	2	-
	Total	-	3	-
Dengue (imported)	Female	1	1	-
	Male	1	-	-
	Total	2	1	-
Accidental pesticide	Female	2	2	-
	Male	3	2	1
	Total	5	4	1
Poisoning	Female	66	48	49
	Male	49	44	32
	Total	115	92	81
Diarrhoea	Female	56	58	55
	Male	53	45	55
	Total	109	103	110
Respiratory diseases (all)	Female	2,944	3,026	3,160
	Male	2,588	2,682	1,937
	Total	5,532	5,708	5,097
Acute bronchitis	Female	260	277	311
	Male	210	209	186
	Total	470	486	497
Chronic sinusitis	Female	112	115	91
	Male	45	45	51
	Total	157	160	142
Other	Female	2,572	2,634	2,758
	Male	2,333	2,428	1,700
	Total	4,905	5,062	4,458
TOTAL CASES, all causes	Female	3,546	3,485	3,623
	Male	3,051	3,062	2,324
	Total	6,597	6,547	5,947
Growth rate (%)	Female	4	(2)	4
	Male	(5)	0	(24)
	Total	(1)		(9)

2010-2012 includes inpatient discharges and emergency encounters.

All years were calculated using appropriate ICD-9 codes (International Standard Classification of Diseases - 9th Edition)

Chart 3.1

Growth in Reported Cases of Environmentally Related Diseases by Sex and Total

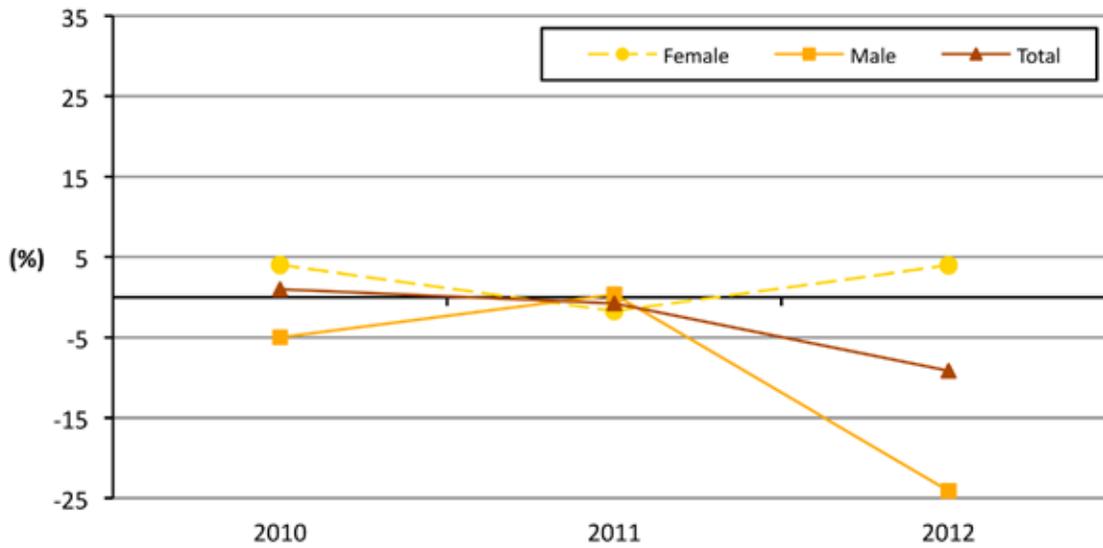


Chart 3.2

Reported Cases of Environmentally Related Diseases by Cause 2012

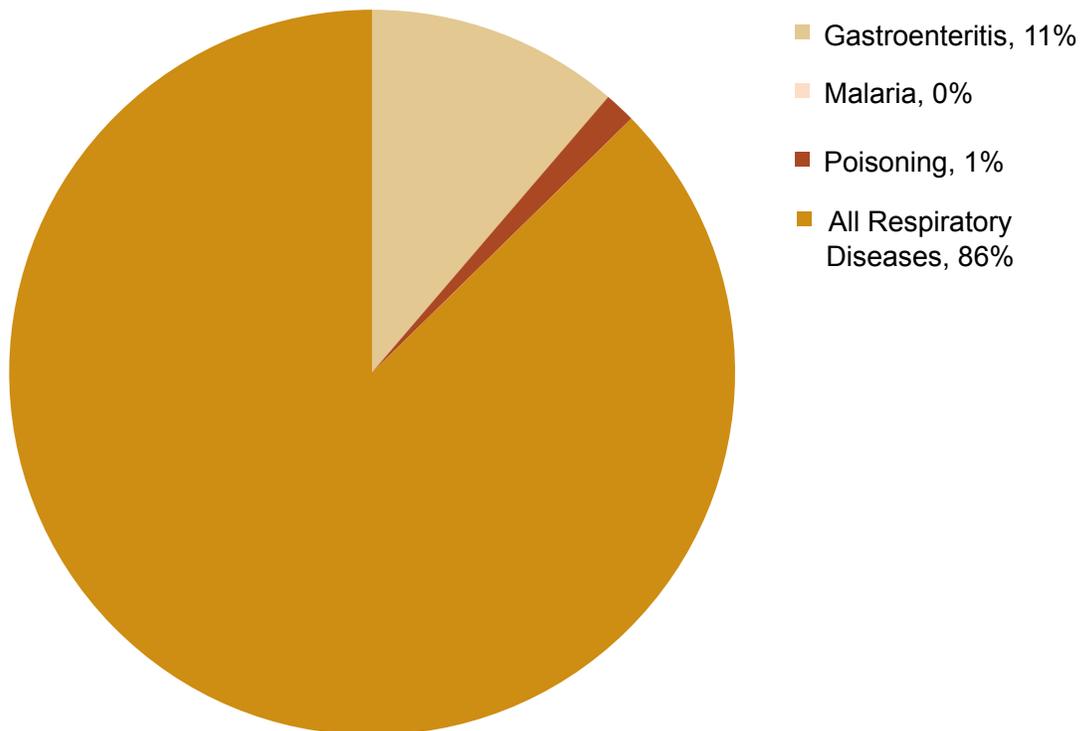


Table 3.2**Rainfall in Inches and Days by Month of Year and Total**

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2008	2.85	3.28	5.37	6.45	10.21	1.07	6.76	5.33	3.30	5.73	1.97	3.50	55.82
	21	12	13	15	17	10	11	16	14	15	14	9	167
	Rain Days												
2009	4.02	4.72	2.74	2.54	1.31	12.70	3.10	3.32	6.54	8.84	3.41	2.60	55.90
	18	15	15	10	9	25	12	10	18	17	15	15	179
	Rain Days												
2010	6.00	3.60	5.13	1.11	1.21	0.70	5.30	4.10	9.21	4.00	1.40	4.00	46.20
	23	20	17	11	8	5	12	17	15	10	16	26	180
	Rain Days												
2011	5.19	1.87	2.51	2.13	0.62	0.97	5.02	7.16	3.22	5.94	3.36	2.58	40.57
	20	12	16	6	16	8	15	24	14	17	19	15	182
	Rain Days												
2012	3.88	2.13	0.79	1.87	4.36	5.50	2.89	4.50	9.28	5.12	6.16	2.79	49.27
	18	13	8	13	10	14	11	17	16	16	23	15	174
	Rain Days												

Source: The Bermuda Weather Service

Table 3.3

Mean Air Temperature

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Yearly Average
2008	Mean Daily Max.	68.30	70.50	68.20	71.90	73.10	79.80	83.40	83.90	77.70	72.70	70.50	75.40
	Mean Daily Min.	59.60	63.30	60.50	64.20	65.30	72.90	75.90	77.00	69.80	64.80	64.20	67.90
	Mean Daily	64.10	66.70	64.40	67.70	69.10	75.80	79.80	80.70	73.90	69.00	67.30	71.60
2009	Mean Daily Max.	69.10	66.30	67.60	70.60	75.90	80.50	84.40	84.00	79.70	75.20	69.60	75.80
	Mean Daily Min.	60.20	57.70	60.00	62.60	68.70	72.40	77.20	76.30	72.10	68.00	62.30	68.00
	Mean Daily	65.00	62.30	63.70	66.70	71.80	76.60	80.70	82.30	80.10	71.70	66.30	72.00
2010	Mean Daily Max.	65.90	64.70	67.20	69.80	74.50	81.30	84.50	82.70	79.30	73.30	66.50	74.60
	Mean Daily Min.	57.60	56.30	59.70	62.70	67.00	72.80	76.90	75.10	72.40	66.30	57.80	66.90
	Mean Daily	62.10	60.90	63.40	65.90	70.20	76.70	80.40	81.90	79.00	69.70	63.10	70.80
2011	Mean Daily Max.	66.70	67.30	67.80	71.30	74.70	80.40	85.00	84.10	79.60	75.20	71.20	75.68
	Mean Daily Min.	58.70	58.80	59.60	64.30	67.10	72.50	76.70	77.10	72.10	68.80	63.80	68.06
	Mean Daily	62.90	63.20	63.70	67.40	70.50	76.00	80.70	81.50	76.00	71.90	67.80	71.86
2012	Mean Daily Max.	69.10	68.50	69.90	71.20	74.00	77.90	84.50	82.90	80.30	74.70	71.30	75.85
	Mean Daily Min.	60.10	60.20	61.20	62.80	67.20	70.70	77.00	75.20	73.80	67.00	62.50	68.01
	Mean Daily	65.10	64.70	65.50	66.90	70.50	74.40	80.40	82.10	79.30	71.10	67.40	72.04

Source: The Bermuda Weather Service

Chart 3.3

Total Number of Inches of Rainfall and Rain Days

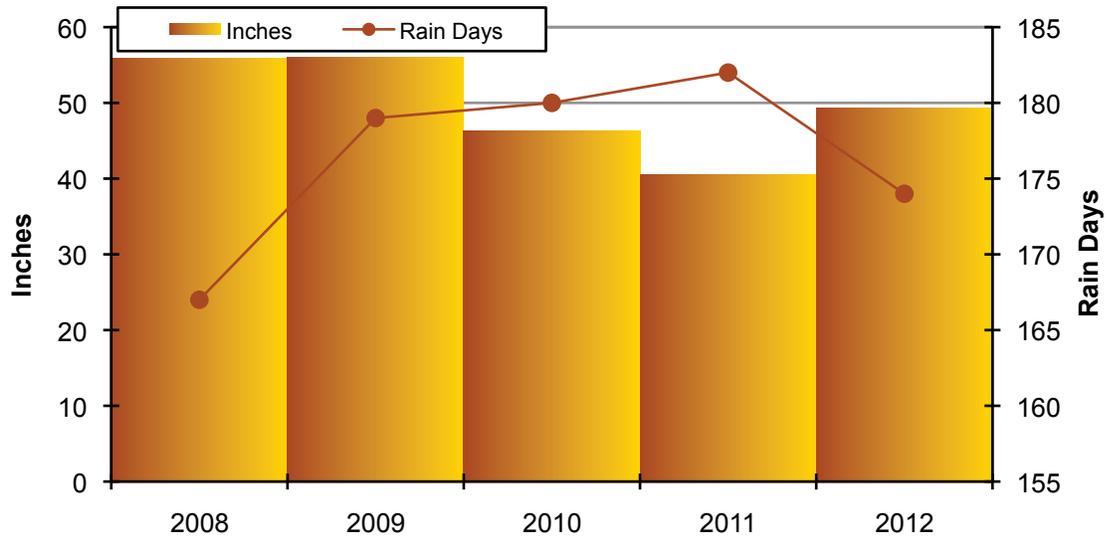


Chart 3.4

Mean Daily Maximum, Minimum and Mean Daily Air Temperature

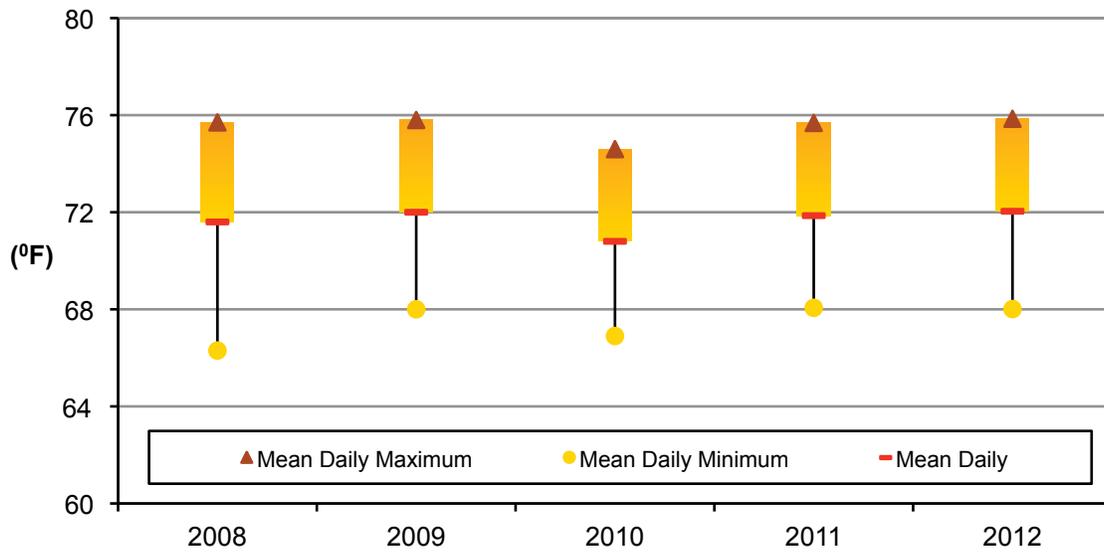


Table 3.4

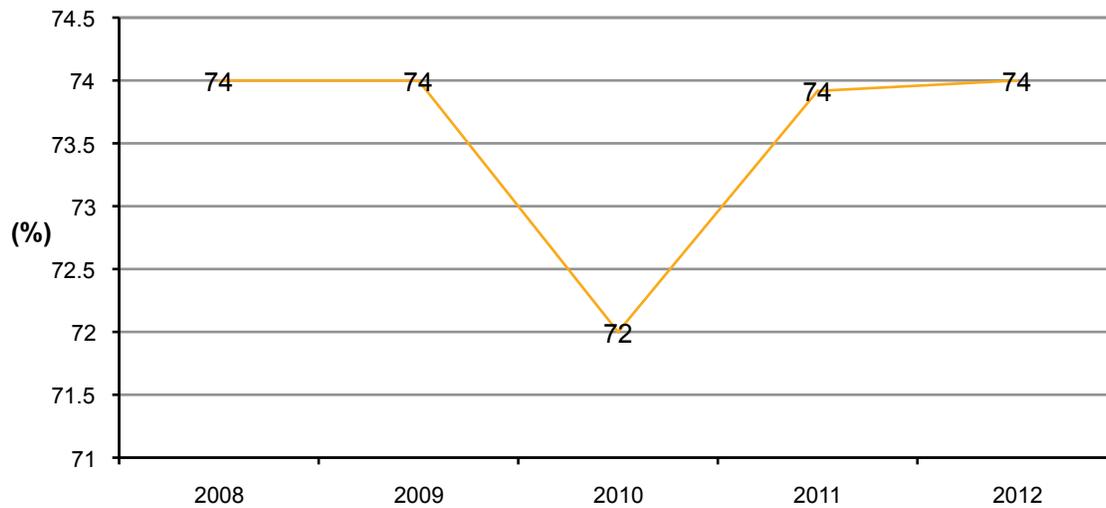
Mean Relative Humidity

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	(%)
													Yearly Average
2008	73	76	69	75	76	80	77	78	76	68	69	70	74
2009	75	67	70	70	75	82	79	74	76	73	75	68	74
2010	70	66	72	71	78	78	75	76	75	70	68	67	72
2011	71	72	74	77	74	75	76	79	78	72	70	69	74
2012	72	70	71	72	77	79	78	74	73	75	72	71	74

Source: The Bermuda Weather Service

Chart 3.5

Yearly Average Relative Humidity



Millennium Development Goal 7

Indicator 30

Proportion of population with sustainable access to an improved water source

100 %

The percentage of the population who use any of the following types of water supply for drinking: piped water, public tap, borehole or pump, protected well, protected spring or rainwater to the total population, expressed as a percentage. Improved water sources do not include vendor-provided water, bottled water, tanker trucks or unprotected wells and springs.

Access to safe water refers to the percentage of the population with reasonable access to an adequate supply of safe water in their dwelling or within a convenient distance of their dwelling.

Millennium Development Goal 7

Indicator 31

Proportion of population with access to improved sanitation

100 %

The percentage of the population with access to improved excreta disposal. Facilities such as sewers or septic tanks, pour-flush latrines and simple pit latrines are assumed to be adequate, provided that they are not public. To be effective, facilities must be correctly constructed and properly maintained.

NATURAL & ENVIRONMENTAL DISASTERS



Section 4: Natural and Environmental Disasters

Hurricanes

Natural and Environmental disasters, although they occur, are very rare in Bermuda. The last major natural disaster was Hurricane Fabian, a category 3 hurricane, which made landfall on 5 September 2003. The hurricane resulted in four deaths and an estimated \$300 million in damages across the Island (see Table 4.1).

Fires

The number of fires reported in 2012 fell to 1,777 after seeing a steady climb during the past four years (see Table 4.2). This represents a decrease of 3.48% over total fires in 2011. The majority of fires (751) were classified in the “other” category.

Table 4.1**Natural Disaster**

Item	2003
Type of disaster	Hurricane
Date started ¹	September 5th 2003
Total casualties:	4
of which: dead	4
Total population affected ²	50,000
Damage (\$ million) ³	300

Source: Department of Statistics

¹ Date of the first call for national assistance.

² Persons in households who lost electricity.

³ Estimated value of all damages and economic losses directly related to the occurrence of the hurricane

NOTE TO READER

Natural Disaster: a natural event which overwhelms local capacity, necessitating a request for national or international assistance, or is recognized as such by a multilateral agency, or by at least two sources, such as national, regional or international assistance groups and the media. There are two types: sudden-impact disasters e.g. earthquakes; or those that develop gradually, e.g. drought.

Type of disaster: Avalanches, floods, earthquakes, cyclones, torrential rains, volcanic eruptions, typhoons, droughts, landslides, mudslides, fires, blizzards, tsunamis, etc.

Table 4.2**Incidences of Fires by Type**

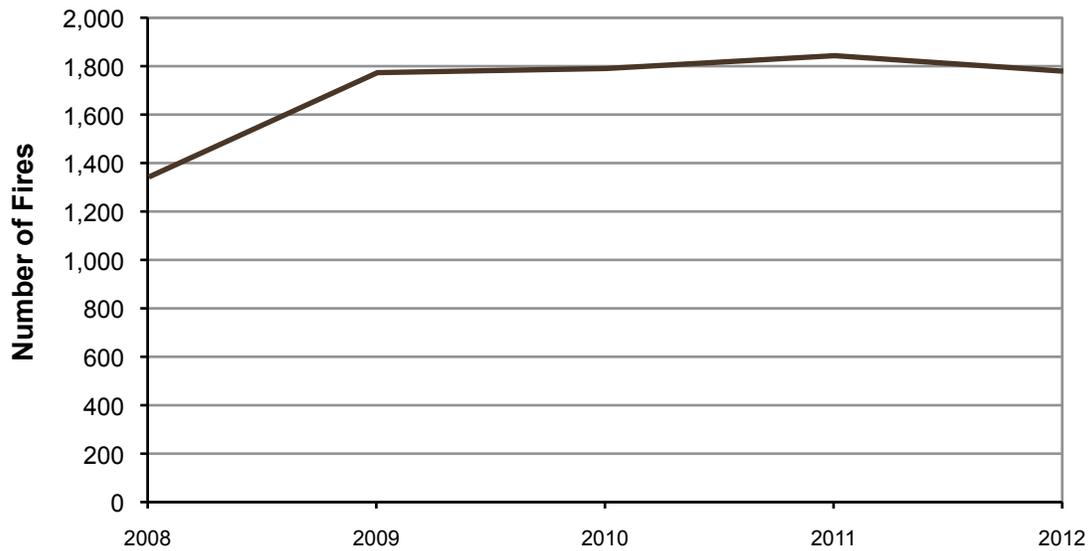
Year	Total	Other ¹	Minor Incidents ²	Structure ³	Island Fires	Vehicle	Boat Fires
2008	1,340	514	..	795	..	31	..
2009	1,771	521	381	825	4	35	5
2010	1,788	542	485	729	1	28	3
2011	1,841	786	372	655	0	26	2
2012	1,777	751	412	597	..	17	..

Source: Bermuda Fire Services

¹ Reflects the activities of the Crash and Fire Rescue Services in other emergency duties such as Airport Operations Division incidents, foreign object debris checks, hot refuel, aircraft standby, etc.

² From 2006 there was a different reporting system by the Bermuda Fire Service which now categorizes brush, trash, gas cylinder leaks, etc. as "minor incidents".

³ Includes false alarms.

Chart 4.1**Total Incidences of Fire**

ENERGY, MINERAL & TRANSPORT



Section 5: Energy, Minerals and Transport

The section on Energy, Minerals and Transport comprises information on the types of fuels imported to Bermuda such as, gasoline, diesel and propane. It also contains data on electricity consumption by type of consumer and the types of vehicles operating on Bermuda's roads.

Fuels

In 2012, the value of petroleum oils and oils from bituminous mineral, other than crude imported into Bermuda was \$96.6 million, an increase of 12.85 per cent from the total value imported in 2011 (see Table 5.1).

Mineral Fuels

Of the other types of mineral fuels and oils imported to Bermuda, petroleum oils and gases were the most consumed with a combined import value of \$98 million in 2012 (see Table 5.2).

Electricity

The volume of electricity consumption in 2012 was just over 606 million kilowatt-hours (kWh), 4.74% lower than the 637 million kWh consumed in 2011. The commercial sector accounted for over half (307 million kWh) of all electricity consumed in Bermuda (see Table 5.3).

Transport

Bermuda's unique traffic laws permit drivers to have only one car per dwelling unit. In 2012, there were 47,367 registered road vehicles on Bermuda's roads, with private cars accounting for almost half (46.00%) of this total. Motorcycles accounted for 31.43 per cent or 14,887 vehicles (see Table 5.6).

Table 5.1**Value of Imported Fuel¹ by Type**

Type	2009r	2010r	2011r	2012
	Value (\$)	Value (\$)	Value (\$)	Value (\$)
Light oils & preparations (i.e. motor spirits)	19,964,134	19,085,734	19,064,278	11,703,867
Gas oils (diesel)	6,836,057	12,975,113	8,400,691	6,307,623
Gas oils (heavy atmospheric)	1,553	388	152,006	8,170,259
Kerosene & other medium oils (not including gas oils)	4,316,467	712,494	6,398,003	6,485,207
Fuel oils not elsewhere specified	61,324,540	56,420,291	47,620,445	60,161,139
Other lubricating oils & greases, etc.	5,461,269	3,931,518	3,893,602	3,676,570
Other waste oils	579,559	503,130	110,435	130,544
Total	98,483,580	93,628,668	85,639,459	96,635,208

Source: Department of Statistics

¹ Petroleum oils and oils obtained from bituminous minerals, other than crude.

Table 5.2**Value of Imported Mineral Fuels, Mineral Oils and Related Products Consumed by Type**

Type	2009	2010	2011	2012
	(\$)	(\$)	(\$)	(\$)
Coal, briquettes	22,938	31,638	20,949	9,552
Lignite	71	203	1,648	540
Peat	100,961	102,642	70,076	65,675
Coke and semi coke	107,963	108,648	107,284	72,643
Coal gas, water gas	615	222	589	750
Tar distilled	8,343	3,608	4,198	1,032
Oils and other products	27,202	8,037	10,401	323
Pitch and pitch coke	19,775	1,151	3,578	-
Petroleum oils	11	324	193	-
Petroleum oils other than crude	109,655,112	93,628,668	73,428,750	96,635,208
Petroleum gases & other gaseous hydrocarbons	2,305,416	3,140,447	2,932,380	1,614,583
Petroleum jelly	178,059	128,999	43,886	37,887
Petroleum coke	47,773	3,846	15,105	1,588
Other bitumen and asphalt	18,886	2,868	25,923	1,061
Bituminous mixtures	654,786	607,499	514,230	612,298
Electrical energy	2,201	..	2,212	42,703
	113,150,112	97,768,800	77,181,402	99,095,843

Source: Department of Statistics

Table 5.3**Electricity Consumption by Type of Consumer**

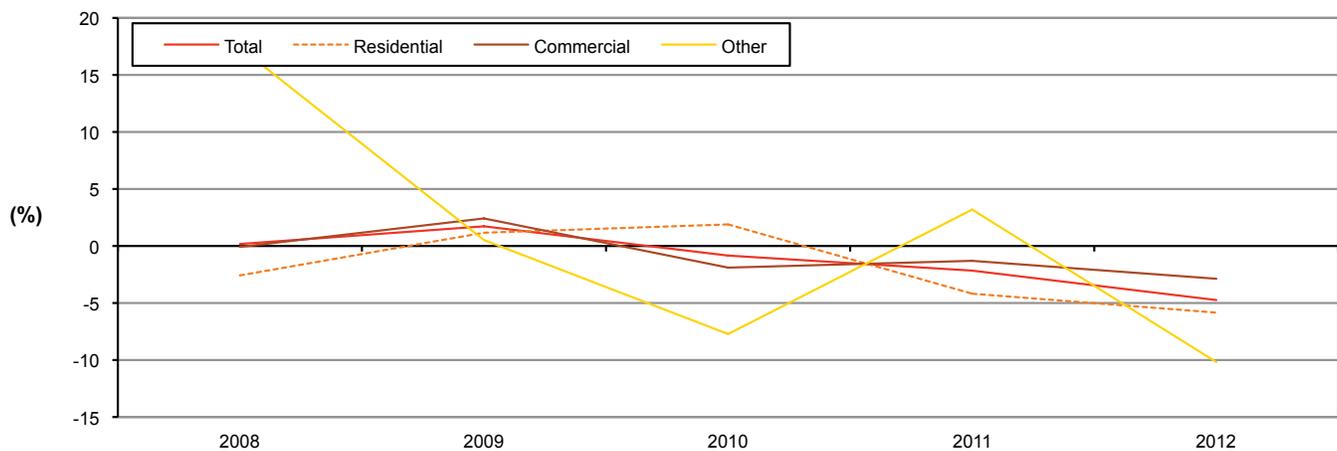
Year	Per Capita Electricity Consumption (kWh)	Total (‘000 kWh)	Type		
			Residential (‘000 kWh)	Commercial (‘000 kWh)	Other ¹ (‘000 kWh)
2008	10,045	644,954	268,563	319,018	57,373
2009	10,188	656,083	271,682	326,728	57,673
2010	10,076	650,571	276,824	320,527	53,220
2011	9,835	636,517	265,243	316,356	54,918
2012	9,348	606,346	249,749	307,269	49,328

Source: Bermuda Electric Light Company Ltd.

¹ Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.² Starting in 1995, commercial and total amount of electricity consumed figures are inclusive of the baselands.

Table 5.4**Growth in Electricity Consumption by Type of Consumer Percentage Change at Annual Rate**

Year	Growth Total Electricity Consumption	Type		
		Residential %	Commercial %	Other %
2008	0.20	-2.60	-0.10	17.40
2009	1.70	1.20	2.40	0.50
2010	-0.80	1.80	-1.80	-7.70
2011	-2.20	-4.20	-1.30	3.20
2012	-4.70	-5.80	-2.90	-10.10

Chart 5.1**Growth in Electricity Consumption by Type of Consumer and Total Consumption****Table 5.5****Percent of Total Electricity Consumption by Type of Consumer**

Year	Total	Type		
		Residential %	Commercial %	Other %
2008	100	41.60	49.50	8.90
2009	100	41.40	49.70	8.70
2010	100	42.50	49.20	8.10
2011	100	41.70	49.70	8.60
2012	100	41.20	50.70	8.10

Percentages may not sum to totals due to rounding.

Table 5.6**Registered Road Vehicles**

Type	2008	2009	2010 r	2011	2012
Private cars	22,730	22,626	22,315	21,991	21,707
Buses, taxis & limousines	759	776	720	767	764
Trucks & tank wagons	4,196	4,026	4,287	3,870	3,746
General haulage	47	53	43	313	321
Agriculture	19	23	23	22	26
Ambulances & fire engines	39	48	48	46	41
Construction vehicles	103	81	77	52	72
Forces vehicles	43	34	36	33	36
Tractors & trailers	460	434	334	406	393
Auxiliary cycles ¹	4,611	4,407	5,586	5,232	4,754
Motor cycles & scooters	15,089	15,514	15,317	15,163	14,887
Other ²	182	207	622	519	455
Government private (GP) vehicles ³	105	127	176	167	165
Total	48,571	48,356	49,584	48,581	47,367

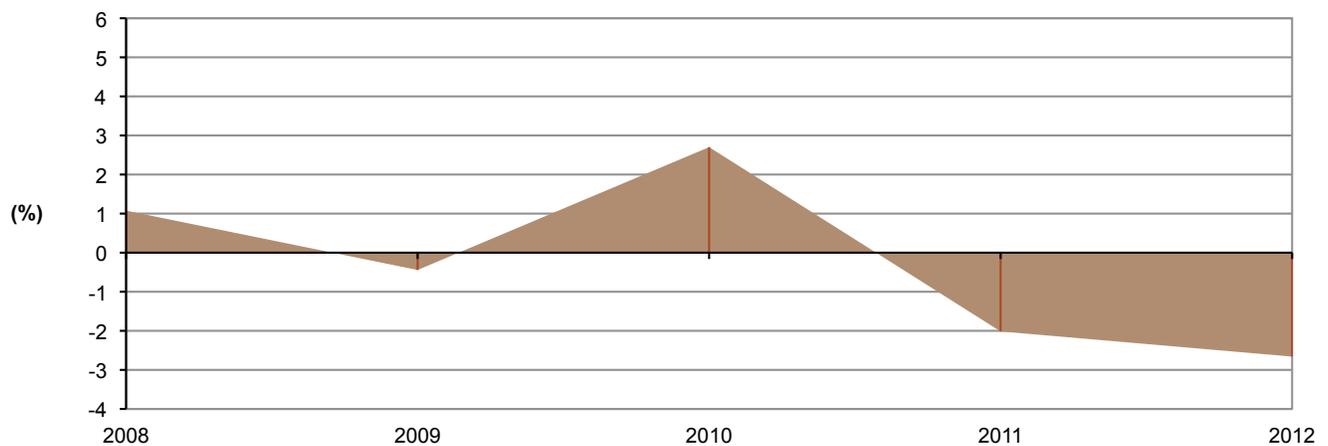
Source: Transport Control Department

¹ Includes livery cycles

² Increase is due to the inclusion of categories such as, community service vehicles, instructional vehicles, doctor's cars, loaner vehicles, classic cars, garbage trucks, sporting association, etc.

³ Includes cars, classes A-G and minibuses. Excludes class H.

^r Revision has been made to previous year

Chart 5.2**Growth in Registered Road Vehicles**

AGRICULTURE



Section 6: Agriculture

The Agriculture section includes tables, charts and information on the use of fertilizers and pesticides in Bermuda.

Fertilizers and Pesticides

In 2012, the aggregate value of fertilizers imported into Bermuda totaled \$716,493 representing a decrease of 13.05% from the previous year (see Table 6.1). The total value of pesticides imported in 2012 stood at \$1,818,202 representing a major increase of 21.00% compared to 2011 (see Table 6.2)

Table 6.1**Use of Fertilizers by Type**

Category	2008	2009	2010	2011	2012
Animal/Vegetable fertilizers	200,729	237,853	231,180	284,041	267,024
Nitrogenous fertilizers	140,439	99,614	119,543	182,686	105,071
Phosphate fertilizers	75,870	13,169	63,854	249	29
Potash fertilizers	40,551	13,778	4,128	3,516	116
Other fertilizers	529,918	488,135	389,117	353,556	344,253
Total	987,507	852,549	807,822	824,048	716,493
Growth rate (%)	40.00	-13.70	-5.20	2.00	-13.05

Source: Department of Statistics
Data on quantities imported are not available.

Table 6.2**Use of Pesticides by Type**

Category	2008	2009	2010	2011	2012
Insecticides ^a	250,914	612,986	744,680	815,541	801,569
Herbicides	150,772	227,217	148,754	146,616	238,032
Fungicides, bactericides and seed treatments ^c	62,677	78,906	126,015	163,484	111,941
Disinfectants	40,027	187,463	262,917	228,717	431,708
Others (including mineral oils)	999,235	529,456	382,246	148,722	234,952
Total	1,503,625	1,636,028	1,664,612	1,503,080	1,818,202
Growth rate (%)	4.00	8.80	1.70	-9.70	20.96

Source: Department of Statistics
Data on quantities imported are not available.

According to Food and Agriculture Organization (FAO), the following should be included in the above:

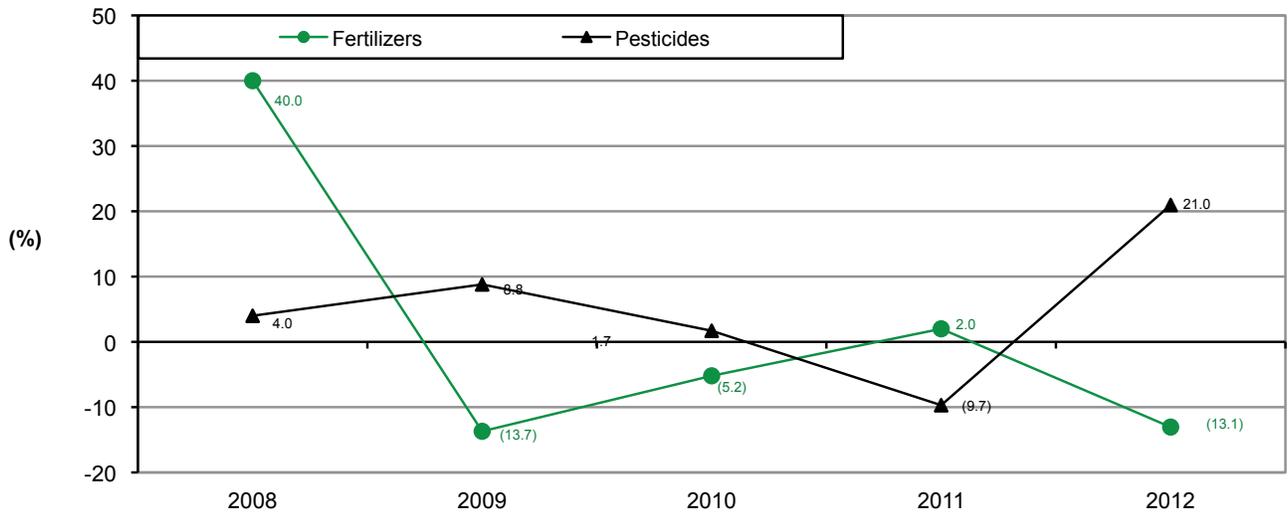
a: Include chlorinated hydrocarbons, organo-phosphates, carbonates-insecticides, pyrethroids, botanical products and biological, and others.

b: Include phenoxy hormone products, triazines, amides, carbonates-herbicides, dinitroanilines, urea derivatives, sulfonyl urea, bipiridils, uracil, and others.

c: Include inorganic, dithiocarbamates, benzimidazoles, triazoles, diazoles, diazines, morpholines, and others.

Chart 6.1

Growth in Use of Fertilizers and Pesticides



LAND USE



Section 7: Land Use

The Land Use section includes tables and charts pertaining to land usage in Bermuda. The data in this section was collected in 2001 by the Department of Planning and has not been updated since then.

Land Use

In 2001, residential properties occupied 45.1 per cent of all land in Bermuda, covering roughly 5,984 acres of land. Nearly 4,417 acres were dedicated to open space land use, which comprises golf courses, nature reserves, other recreation and rural areas. This represented about 33.3 per cent of Bermuda's land. Land used for commercial purposes (such as retail and office space) accounted for nearly 1.7 per cent of all occupied land space in Bermuda (see Table 7.1).

A comparison of land use by parish showed that St. George's holds the largest share of land with 2,162.70 acres. Of this total, one-third covered open space. The parish of St. George is known for its golf courses, nature reserves, recreational and other rural open spaces. In contrast, the City of Hamilton occupies the least amount of land in Bermuda (176.34 acres), with less than 4.49 per cent deemed open space (see Table 7.2.2). This is reflected in the large concentration of commercial, institution and utility activity located within the City limits (see Table 7.2.1) Map 7.1 displays the land usage by category in Bermuda.

Table 7.1**Land Use as of 2001**

Main Use	Sub-Category	Total Area (Acres)	Percentage Distribution
Commercial	Mixed-use	36.45	0.30
	Office	63.03	0.50
	Retail	126.16	1.00
	Total	225.64	1.70
Industrial	General	200.42	1.50
	Light industrial	64.37	0.50
	Quarry	56.81	0.40
	Total	321.61	2.40
Institutional	Education	254.2	1.90
	Government	63.97	0.50
	Hospital	30.32	0.20
	Police	59.07	0.40
	Prison	16.76	0.10
	Religious	87.48	0.70
	Social	12.24	0.10
	Total	524.03	3.90
Open space	Golf courses	808.77	6.10
	Nature reserve	1,258.08	9.50
	Other	946.23	7.10
	Recreation	240.92	1.80
	Rural	1,162.82	8.80
	Total	4,416.82	33.30
Residential	Condos	162.25	1.20
	Housing	5,799.45	43.70
	Institutional	22.18	0.20
	Total	5,983.89	45.10
Tourism	Cottage colonies	204.68	1.50
	Hotels	127.61	1.00
	Total	332.29	2.50
Utilities	Airport	548.42	4.10
	Docks	36.82	0.30
	BELCO	37.95	0.30
	Transport	44.04	0.30
	Waste	67.07	0.50
	Total	734.29	5.50
Vacant	Vacant buildings	119.9	0.90
	Vacant land	610.27	4.60
	Total	730.17	5.50
Total		13,268.74	100.00

Source: Department of Planning, Land Use Survey 2001

The 2001 Land Use Survey was based on the 1997 digital survey of the islands, whose coastline was probably taken at the high water mark hence the discrepancy in total area which now stands at 13,430.39 acres (low tide mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

Map 7.1
Land Use Survey

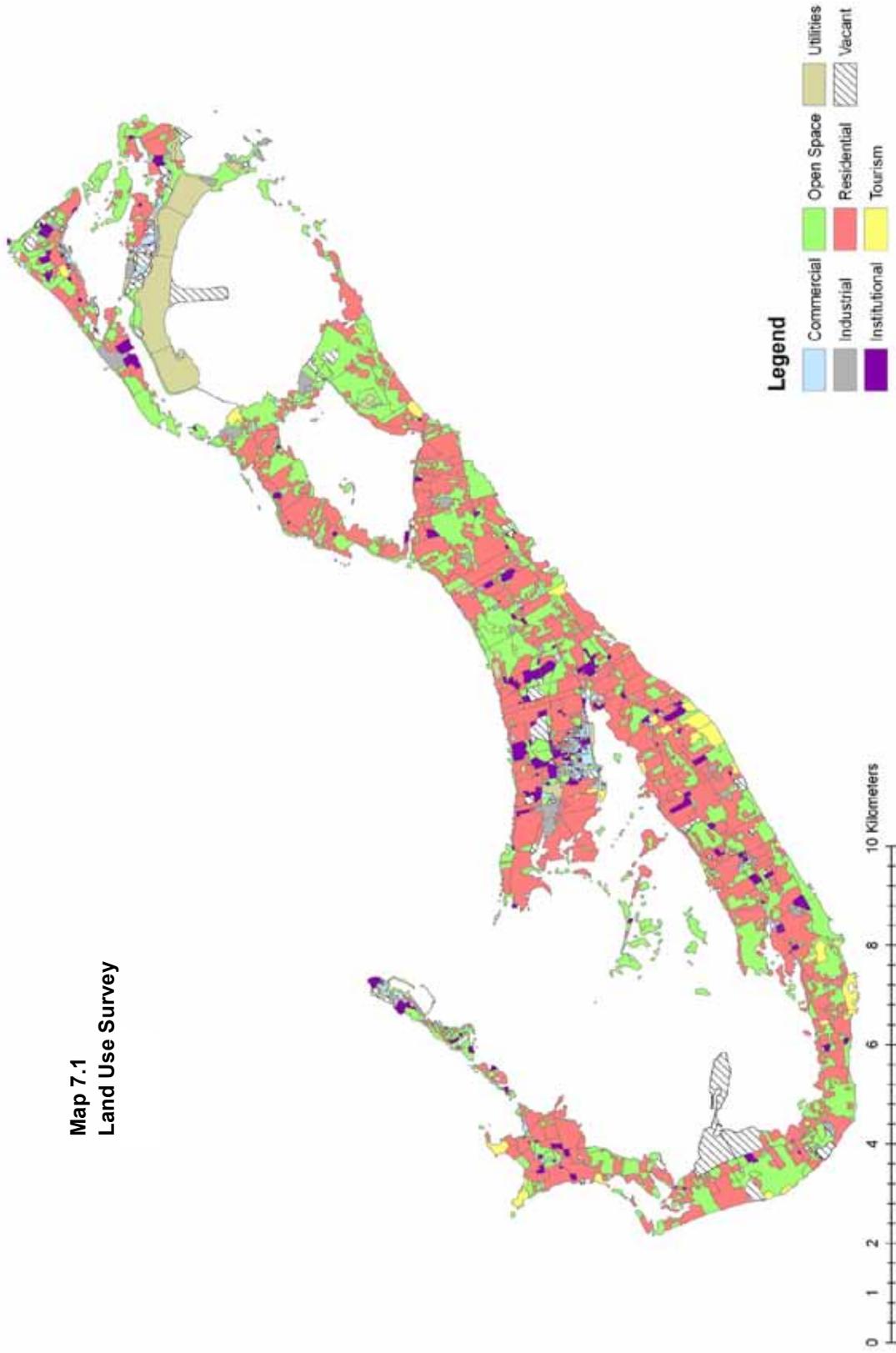


Table 7.2.1
Land Use by Parish, City and Town in Acres, as of 2001

Main Use / Sub-Category	The City of Hamilton	Devon-shire	Hamilton	Paget	Pembroke	Sandy's	St. George's	Smith's	Southampton	The Town of St. George	Warwick
Commercial	66.79	10.82	11.01	16.39	27.16	26.95	32.50	2.92	10.16	11.05	9.89
Mixed-use	32.18	-	-	-	-	-	-	-	-	4.27	-
Office	16.93	4.19	-	6.57	15.11	-	18.96	-	-	0.45	0.83
Retail	17.68	6.63	11.01	9.82	12.05	26.95	13.54	2.92	10.16	6.33	9.06
Industrial	12.34	18.85	47.45	4.12	55.59	13.91	99.55	21.10	21.79	8.91	18.00
General	5.96	11.34	11.49	0.74	52.94	13.91	66.59	9.46	18.91	1.30	7.78
Light industrial	6.38	7.51	-	3.38	2.65	-	32.96	-	2.88	7.62	1.00
Quarry	-	-	35.96	-	-	-	-	11.63	-	-	9.22
Institutional	30.65	72.62	12.95	66.43	96.85	60.58	48.08	15.81	30.66	34.29	55.10
Education	4.35	35.96	8.89	27.93	47.78	25.28	27.30	11.29	16.96	20.42	28.04
Government	12.54	11.03	-	8.87	25.49	1.15	1.48	-	-	2.94	0.47
Hospital	0.51	11.26	-	14.74	0.62	3.18	-	-	-	-	-
Police	1.14	9.33	-	-	1.30	15.43	15.47	-	6.83	0.54	9.02
Prison	5.25	-	-	4.59	2.81	-	1.53	-	-	-	2.57
Religious	6.58	5.04	4.06	10.30	15.67	11.85	2.31	4.52	6.87	10.00	10.28
Social	0.28	-	-	-	3.18	3.68	-	-	-	0.39	4.71
Utilities	26.88	23.83	11.43	-	23.77	20.35	606.21	6.71	5.07	9.81	0.22
Airport	-	-	-	-	-	-	548.42	-	-	-	-
Docks	10.28	0.36	-	-	0.29	15.08	6.54	-	0.33	3.70	0.22
BELCO	0.46	4.37	-	-	20.32	0.12	4.10	6.71	1.43	0.44	-
Transport	16.14	4.97	0.58	-	3.16	2.48	10.18	-	3.31	3.22	-
Waste	-	14.13	10.84	-	-	2.67	36.98	-	-	2.44	-

Source: Department of Planning, Land Use Survey 2001.

The 2001 Land Use Survey was based on the 1997 digital survey of the islands, whose coastline was probably taken at the high water mark hence the discrepancy in total area which now stands at 13,430.39 acres (low tide mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

Table 7.2.2
Land Use by Parish, City and Town in Acres, as of 2001

Main Use / Sub-Category	The City of Hamilton	Devon-shire	Hamilton	Paget	Pembroke	Sandy's	St. George's	Smiths	Southampton	The Town of St. George	Warwick
Residential	27.40	562.37	585.43	803.56	758.13	669.53	450.30	709.70	610.69	98.99	707.79
Condos	-	27.99	15.34	21.81	11.86	20.39	6.12	10.58	24.64	2.70	20.81
Housing	25.73	527.16	570.09	779.98	742.79	645.42	444.18	696.02	586.05	95.89	686.15
Institutional	1.67	7.22	-	1.76	3.47	3.72	-	3.10	-	0.41	0.83
Tourism	-	14.17	18.68	112.14	15.72	44.70	3.95	15.29	88.74	10.16	8.74
Cottage colonies	-	14.17	18.68	62.36	3.03	44.70	3.95	15.29	23.59	10.16	8.74
Hotels	-	-	-	49.78	12.68	-	-	-	65.15	0.00	-
Open space	7.91	499.31	611.26	296.83	132.29	383.01	715.60	432.66	614.39	138.74	584.83
Golf courses	-	76.64	127.69	10.82	-	5.35	139.50	-	198.05	79.72	171.01
Nature reserve	6.44	163.71	156.15	70.33	73.99	107.83	296.43	106.00	104.32	8.39	164.50
Other	1.48	56.96	167.89	59.25	25.38	123.99	218.85	75.27	121.68	30.21	65.29
Recreation	-	35.37	9.11	4.23	27.27	33.92	35.97	24.83	16.85	-	53.37
Rural	-	166.63	150.42	152.20	5.65	111.93	24.86	226.56	173.49	20.43	130.66
Vacant	4.36	19.46	13.98	3.48	60.75	219.39	206.52	12.15	130.19	29.05	30.84
Vacant buildings	0.74	-	13.98	3.11	0.27	22.31	51.16	-	-	18.79	9.54
Vacant land	3.62	19.46	-	0.37	60.47	197.09	155.36	12.15	130.19	10.26	21.30
Total	176.34	1,221.43	1,312.18	1,302.95	1,170.24	1,438.43	2,162.70	1,216.35	1,511.69	341.00	1,415.42

Source: Department of Planning, Land Use Survey 2001

The 2001 Land Use Survey was based on the 1997 digital survey of the islands, whose coastline was probably taken at the high water mark hence the discrepancy in total area which now stands at 13,430.39 acres (low tide mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

COASTAL & MARINE RESOURCES



Section 8: Coastal and Marine Resources

Bermuda's coastal and marine resources are valued entities to its inhabitants. This is primarily because a large percentage of the population lives on coastal land and use Bermuda's waterways for transport or commercial fishing.

This section includes information on various marine areas by name, locations, activities permitted in these areas and the date they were established in Bermuda. It also provides information about Bermuda's fishing industry.

Marine Protected Areas by Category and Area

In 2012, the total marine area of Bermuda was 4,236.11 km², of which 6.96% or 294.74 km² was classified as protected marine area (see Table 8.1 and Chart 8.1). There are 29 protected dive sites located in Bermuda covering an area of 13.70 km². A total of 12 marine parks are established in Bermuda covering an area of 1.858 km², two seasonal fisheries protected areas that measure 153.36 km² and two coral reef preserves, (one each on the north and south shores) which occupy a total of 131.07 km² (see Table 8.2).

Tables 8.3.1 and 8.3.2 list the various marine protected areas around Bermuda by the year they were established, whether anchoring or scuba diving is permitted and limitations with respect to fishing and extraction of plants and animal species.

Map 8.1 displays the outline of Bermuda's terrestrial area and identifies the protected seasonal fisheries areas, protected coral reefs and protected dive sites.

Fisheries

The total quantity of fish landings by species from the years 2008 to 2012 are shown in Table 8.4. In 2012, the total catch was 463.30 metric tons (mT) with the tuna and pelagic species by far the most popular catch at 187.89mT. In 2012, a total of 356 registered fishermen in Bermuda spent 85,729 hours at sea (see Table 8.5).

Table 8.1

Total and Protected Marine Area

Indicator	2012
Total area (km ²)	4,290.46
Total marine area (km ²)	4,236.11
Protected marine area (km ²)	294.74
Protected marine area as a % of total marine area	6.96
Protected marine area as a % of total area	6.87

Source: Department of Planning

Chart 8.1

Protected Marine Area as a Percentage of Total Marine Area 2012

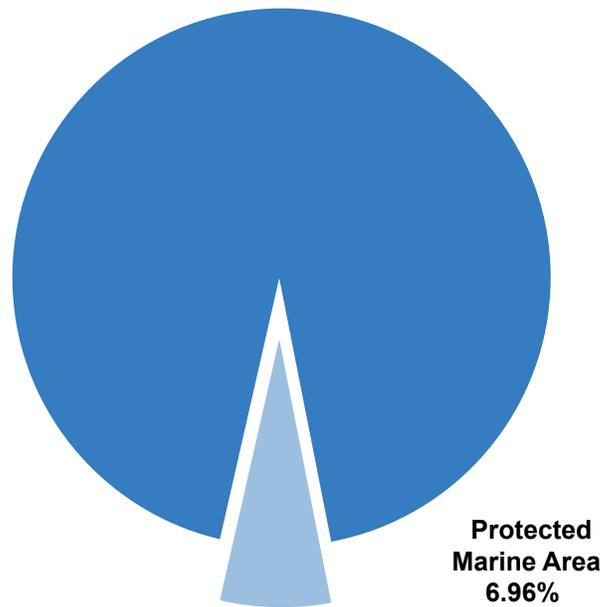


Table 8.2

Marine Protected Areas By Category And Area 2012

Marine Protected Areas	Area (km²)	Marine Protected Areas	Area (km²)
Coral Reef Preserves		Protected Dive Sites	
North Shore Coral Reef Preserve	126.25	North Rock	3.14
South Shore Coral Reef Preserve	4.82	SW Breaker	1.13
Subtotal	131.07	Eastern Blue Cut	1.13
		Pelinaion	0.79
Fisheries Seasonal Protected Areas		Hermes	0.79
North Eastern Area	38.67	Constellation	0.79
South Western Area	114.69	Cristobal Colon	0.28
Subtotal	153.36	NE Breaker	0.28
		Taunton	0.28
Marine Parks		Aristo	0.28
Somerset Long Bay Marine Park	0.008	Mills Breaker	0.28
Church Bay Marine Park	0.034	Cathedral	0.28
John's Smiths Bay Marine Park	0.079	Kate	0.28
Shelly Bay Marine Park	0.016	Tarpon Hole	0.28
South Shore Marine Park	0.368	Marie Celeste	0.28
Castle Island Marine Park	0.688	North Carolina	0.28
Astwood Bay Marine Park	0.023	Airplane	0.28
Walsingham Marine Park	0.216	Blanche King	0.28
Daniel's Head Marine Park	0.011	Darlington	0.28
Cooper's Island Marine Park	0.279	L'Herminie	0.28
Tobacco Bay Marine Park	0.076	Lartington	0.28
Spittal Pond Marine Park	0.062	Montana	0.28
Subtotal	1.858	Snake Pit	0.28
		Hog Breaker	0.28
		Caraquet	0.28
		Madiana	0.28
		Commissioner's Point	0.13
		Xing Da	0.13
		Vixen	0.03
		Subtotal	13.70

Marine Protected Areas	Area (km²)
Merged marine protected areas (no overlaps) ¹	294.74
Territorial area (net) ²	4,236.11

Source: Department of Planning

¹ Total marine protected area does not equal to the sum of the sub-totals as it excludes any overlapping areas (5.26 km²) to avoid double counting.

² Territorial area (net) means total water area and does not include the land area of 54.35 km².

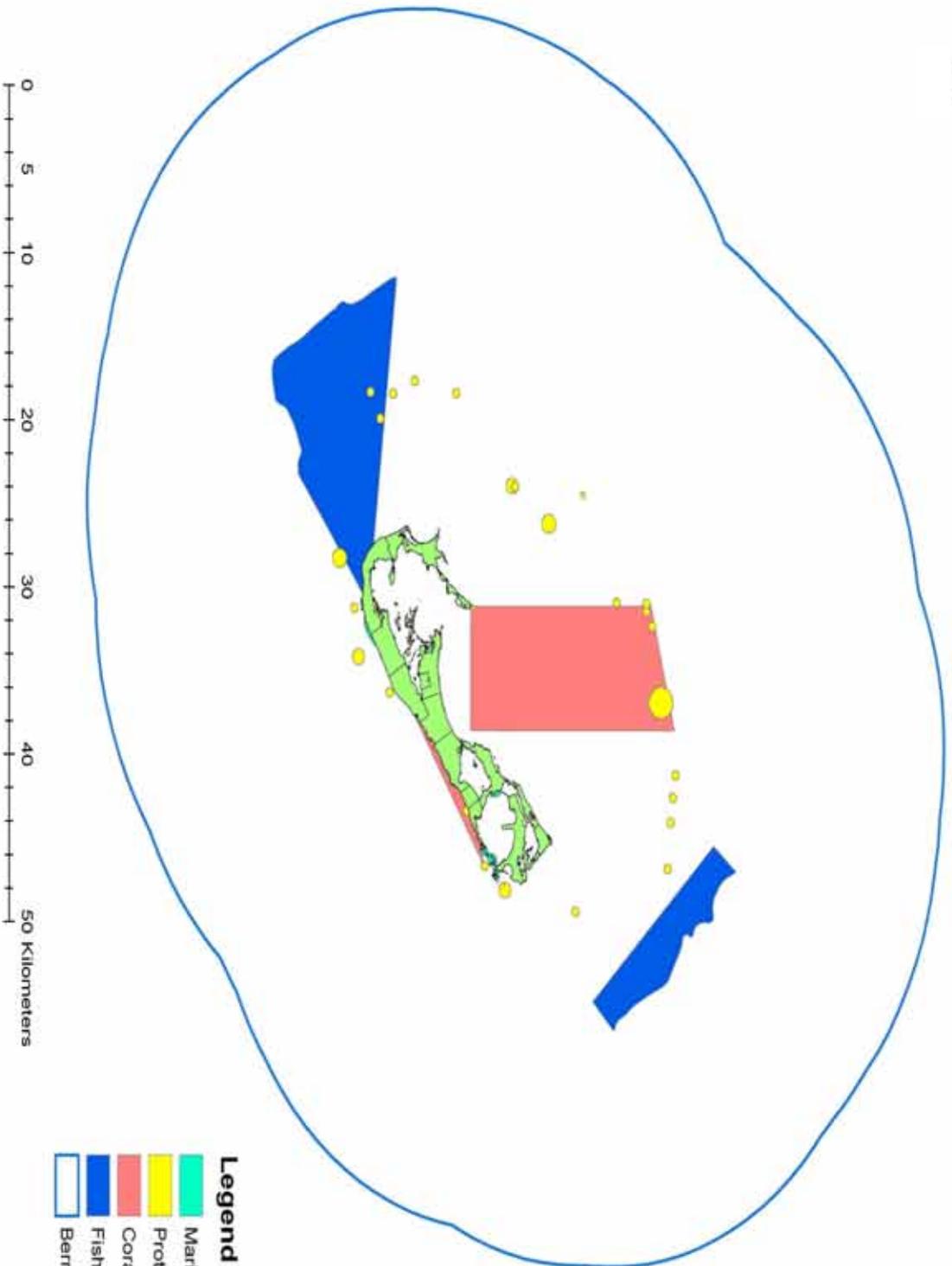
Table 8.3.1**Marine Protected Areas Around Bermuda**

Marine Protected Area/ No-Take Reserve	Year Established	Anchoring Permitted?	Scuba Diving Permitted?	No-Take Reserve?
North Shore Coral Reef Preserve	1966	Yes	Yes	Line fishing is permitted throughout this Preserve, as is lobster diving and spear fishing provided they are within the limits of the prevailing fisheries regulations. It is an offence to remove, damage or be in possession of plants or animals, whether dead or alive, which are attached to the coast, the seabed or any reef in this preserve.
South Shore Coral Reef Preserve	1966	Yes	Yes	Line fishing is permitted throughout this Preserve, as is lobster diving and spear fishing provided they are within the limits of the prevailing fisheries regulations. It is an offence to remove, damage or be in possession of plants or animals, whether dead or alive, which are attached to the coast, the seabed or any reef in this preserve.
Vixen (Wreck)	1973	No	Yes	Yes
The Eastern Area	Established in 1974 but in 1990 the area was expanded to the current size.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. First act (1974) stated no fishing between 1 May and 15 August. This was amended in 1975 to 24 May and 15 August, in 1976 it was amended to 1 May-15 August, in 1990 it was amended to 1 May and 30 September and finally in 1993 it was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.
The South Western Area	Established in 1974 but in 1990 the area was expanded to the current size.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. First act (1974) stated no fishing between 1 May and 15 August. This was amended in 1975 to 24 May and 15 August, in 1976 it was amended to 1 May and 15 August, in 1990 it was amended to 1 May and 30 September and finally in 1993 it was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.

Table 8.3.2**Marine Protected Areas Around Bermuda**

Marine Protected Area/ No-Take Reserve	Year Established	Anchoring Permitted?	Scuba Diving Permitted?	No-Take Reserve?
Constellation (Wreck)	1988	No	Yes	Yes
South West Breaker Area	1988	No	Yes	Yes
Eastern Blue Cut	1989	No	Yes	Yes
Pelinaion and Rita Zovetta (Wrecks)	1989	No	Yes	Yes
Kate (Wreck)	1989	No	Yes	Yes
Hermes and Minnie Bressleur (Wrecks)	1989	No	Yes	Yes
North Rock	1990	No	Yes	Yes
	1990			
The North Eastern Area	It was merged in 2005 with the Eastern Area and redesigned.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. Initially there was no fishing between 1 May and 30 September, but in 1993 this was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.
Walsingham Marine Reserve	1991	No	Yes	Yes
Commissioner's Pt. Area	1996	No	Yes	Yes
Xing Da (Wreck)	1997	No	Yes	Yes
Cristobal Colon (Wreck)	2000	No	Yes	Yes
North East Breaker	2000	No	Yes	Yes
Taunton (Wreck)	2000	No	Yes	Yes
Aristo (Wreck)	2000	No	Yes	Yes
Mills Breaker	2000	No	Yes	Yes
The Cathedral	2000	No	Yes	Yes
Tarpon Hole	2000	No	Yes	Yes
Marie Celeste (Wreck)	2000	No	Yes	Yes
North Carolina (Wreck)	2000	No	Yes	Yes
Airplane (Wreck)	2000	No	Yes	Yes
Blanche King (Wreck)	2000	No	Yes	Yes
Darlington (Wreck)	2000	No	Yes	Yes
L'Herminie (Wreck)	2000	No	Yes	Yes
Lartington (Wreck)	2000	No	Yes	Yes
Montana (Wreck)	2000	No	Yes	Yes
Snake Pit	2000	No	Yes	Yes
Hog Breaker	2000	No	Yes	Yes
Caraquet (Wreck)	2000	No	Yes	Yes
Madiana (Wreck)	2000	No	Yes	Yes

Map 8.1
Marine Protected Area



- Legend**
- Marine Parks
 - Protected Dive Sites
 - Coral Reef Preserves
 - Fisheries Seasonally Protected Areas
 - Bermuda Territorial Area

Source: Department of Planning

Table 8.4**Quantity of Fish Landings by Type**

Species Group	(mT)				
	2008	2009	2010	2011	2012
Groupers	53.47	48.45	44.64	44.47	74.09
Jacks and related species	48.86	49.93	55.70	49.28	77.04
Snappers	36.69	32.46	30.55	33.52	39.13
Tuna and pelagics	162.72	178.36	158.38	239.73	187.89
Sharks	20.05	5.44	4.58	5.71	6.40
Miscellaneous	6.55	30.50	30.19	28.63	36.91
Total	328.34	345.14	324.04	401.34	421.46
Bait	35.75	36.72	25.78	35.97	41.84
Total including bait	364.09	381.86	349.82	437.31	463.30
Shellfish ¹	36.89	42.31	41.55	45.26	46.58
Including bait & lobsters	400.98	424.17	391.37	482.57	509.88
Growth rate (%)	-4.90	5.80	-7.70	24.05	5.70

Source: Department of Environmental Protection, Marine Resources Division

¹ Shellfish includes spiny lobster. Size of fish is not measured.

Totals may not sum due to rounding.

Table 8.5**Total Catch by Hours at Sea, Average Catch of Fishing Area, and Number of Registered Fishermen**

Indicators	2008	2009	2010	2011	2012
Total catch¹ (mT)	400.98	424.17	391.37	437.47	463.30
Average catch of fishing area ² (mT per km ²)	0.09	0.10	0.09	0.10	0.11
Total hours at sea	67,563	70,546	68,528	83,616	85,729
Growth rate (%)	-4.30	3.70	-2.20	22.02	2.50
Hours at sea per vessel	466	446	387	475	429
Registered fishermen	306	306	305	305	356
Growth rate (%)	-7.60	..	-0.30	..	16.70

Source: Department of Environmental Protection, Marine Resources Division

Notes:

¹ Total catch include fish landings in addition to bait and lobster catches.

² Total fishing area is estimated as 4236.11 km² (Department of Planning, see 8.1). Fishing area includes the fisheries seasonal protected areas (153.36 km²) which are closed between May 1st and August 31st.

Computation: Average catch of fishing area = Total catch (mT) / Total estimated fishing area of 4236.11 km²

Chart 8.2

Growth in Total Catch and Total Hours at Sea

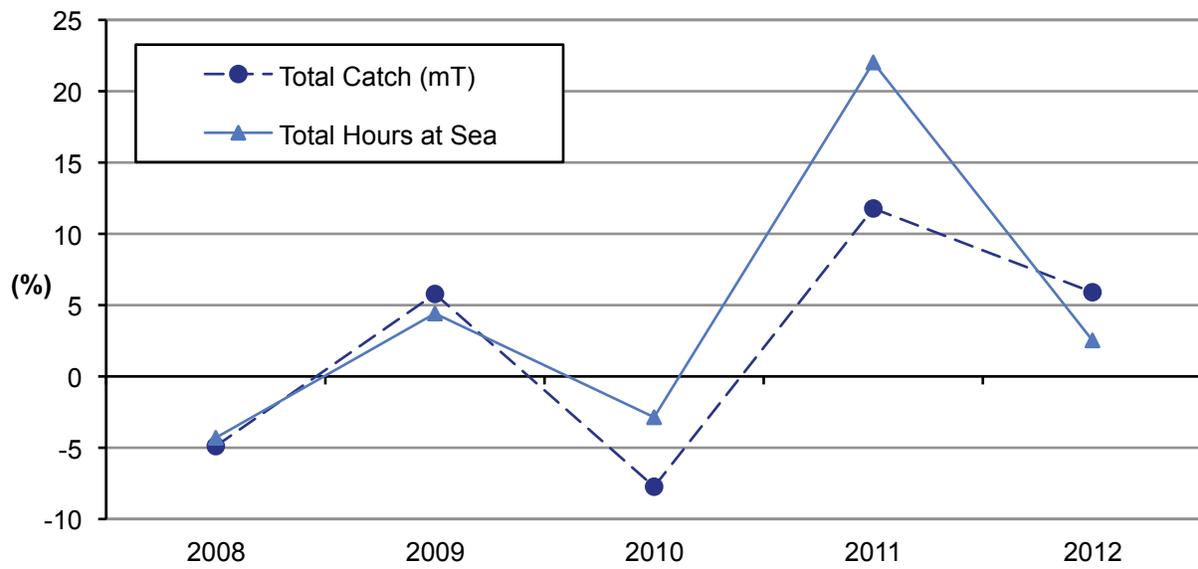


Chart 8.3

Number of Registered Fishermen

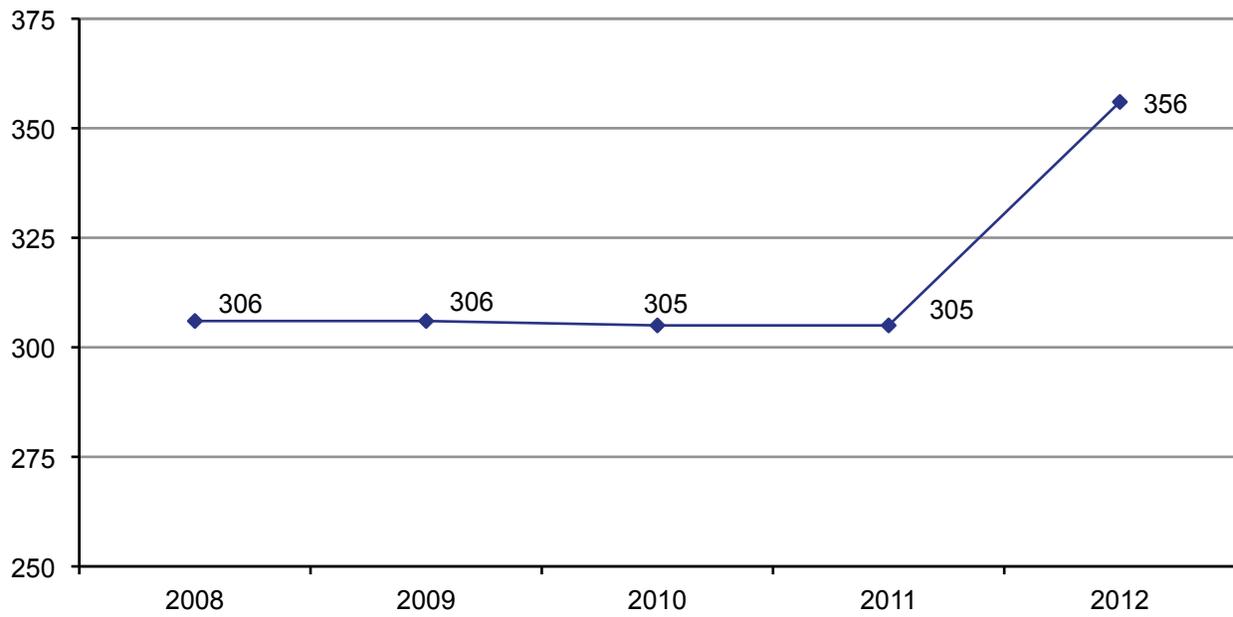
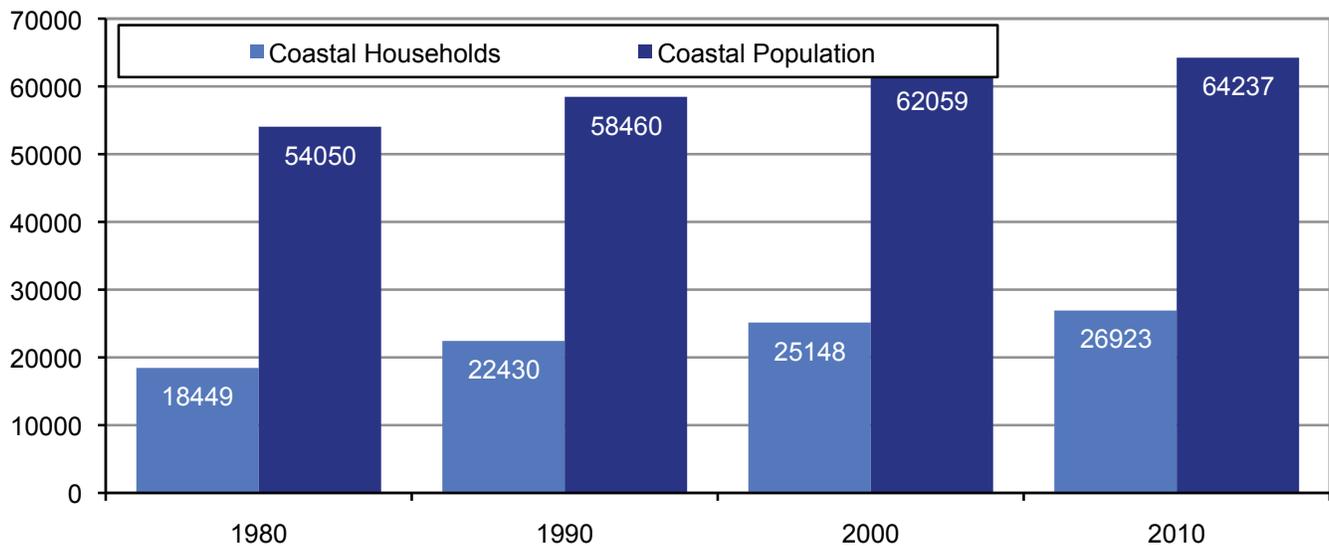


Table 8.6**Number of Households and Population of Coastal Areas**

Indicators	Census Years			
	1980	1990	2000	2010
Number of households in coastal areas	18,449	22,430	25,148	26,923
Ten-year growth rate (%)	..	21.60	12.10	7.10
Population in coastal areas	54,050	58,460	62,059	64,237 ¹
Ten-year growth rate (%)	..	8.20	6.20	3.50

Source: 2010 Census of Population and Housing
 Bermuda measures 1 mile at its widest point. Based on the standard definition of coastal area, the entire island will be considered coastal.

¹ Does not include the non-sheltered and institutionalized populations

Chart 8.4**Number of Registered Fishermen**

BIODIVERSITY



Section 9: Biodiversity

Biodiversity refers to the number and variety of species of plant and animal life within a particular ecosystem. It also encompasses variation in the genetic makeup of each species and the different ecosystems that they form. Biodiversity has direct consumptive value in food, agriculture, medicine and industry and has aesthetic and recreational value. This section contains information on the protected land areas in Bermuda such as protected coastal reserves, protected open space, historical cave areas and parks.

Protected Area: Land and Water

In 2012, Bermuda's total protected area inclusive of land and water was 319.66 square kilometers (km²). This represented almost 8 per cent of the total area (7% water and 1% land) (see Table 9.1).

As a proportion of the total land area (54.35km²), protected land area represented 45.84 per cent or 24.92 km² while protected water areas represented 6.96 per cent or 294.74 km² of total water area (see Table 9.1).

A breakdown of protected land area shows that conservation base zones (open space, waste reserves, nature reserves and parks) totalled 19.28 km². Conservation areas (agriculture and woodland reserves) accounted for 7.19 km², cave protection areas occupied 4.48 km² and historical protected areas less than 1 km² (see Table 9.2).

Map 9.1 displays the terrestrial protected areas including marine parks by category across Bermuda

Table 9.1**Protected Area**

Category	2012
Total area (km ²)	4,290.46
Total land area (low tide mark) (km ²)	54.35
Total water area (km ²)	4,236.11
Protected land area (km ²)	24.92
Protected land area as a % of total land area	45.84
Protected land area as a % of total area	0.58
Protected water area (km ²)	294.74
Protected water area as a % of total water area	6.96
Protected water area as a % of total area	6.87
Total protected area (land and water)	319.66
Total protected area as a % of total area	7.45

Source: Department of Planning

NOTE TO READER

Biodiversity: the range of genetic differences, species differences, and ecosystem differences in a given area.

Protected Area: legally established land or water area under either public or private ownership that is regulated and managed to achieve specific conservation objectives. A protected area, as adopted by the International Union for Conservation of Nature (IUCN), is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means. It includes six categories which are:

- Category Ia: Strict Nature Reserve
- Category Ib: Wilderness Area
- Category II: National Park
- Category III: Natural Monument
- Category IV: Habitat/Species Management Area
- Category V: Protected Landscape/Seascape
- Category VI: Managed Resource Protected Area

Total Area: Total area (of country) including area under inland water bodies, but excluding offshore territorial waters (= total land area + water).

Land Area: is the total surface area of the country less that area covered by inland waters.

Chart 9.1

Number of Households and Population of Coastal Areas (Census Years)

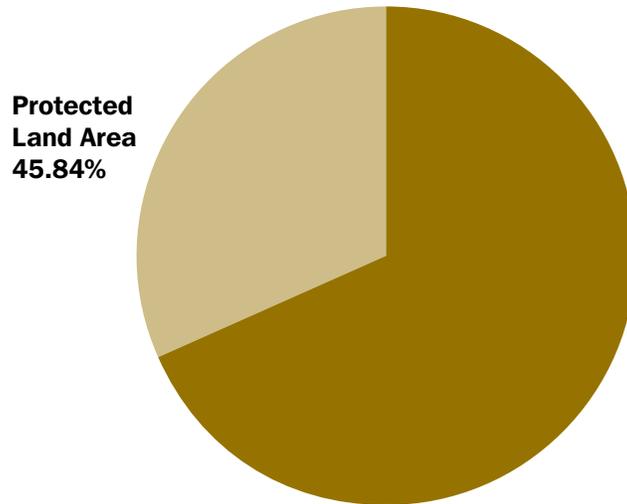
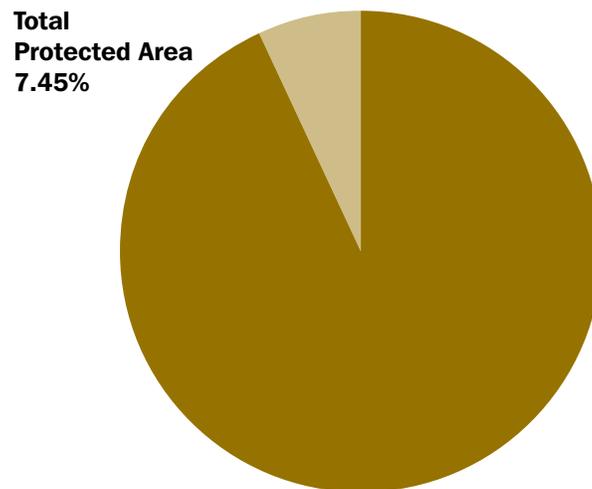


Chart 9.2

Total Protected Area as a Percentage of Total Area 2012



Map 9.1

**Terrestrial Protected Areas
Including Marine Parks**

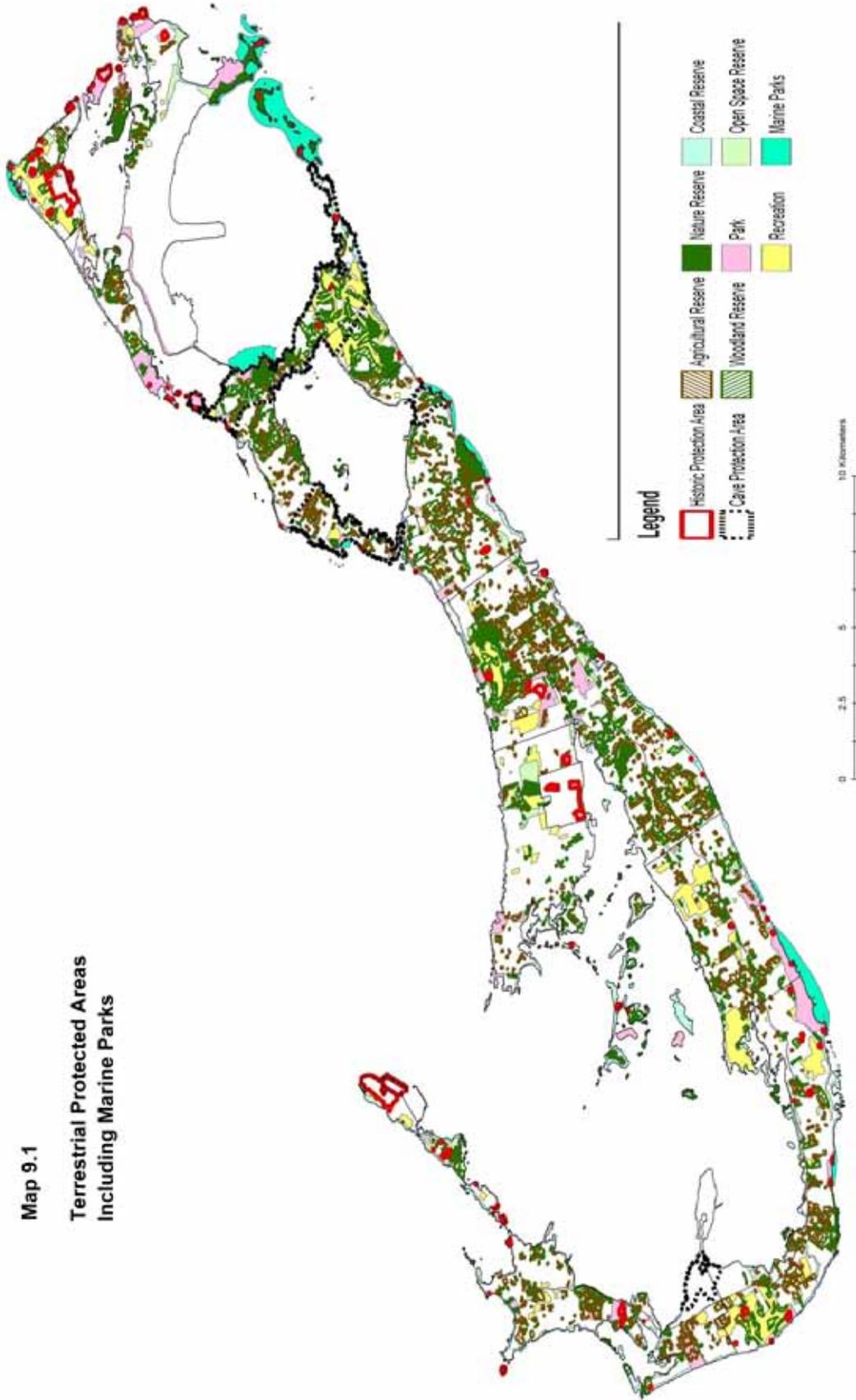


Table 9.2**Protected Areas by Category and Area 2012**

Protected Area Category	Area	
	Acres	km ²
Conservation base zones		
Open space reserve	1,298.10	5.35
Coastal reserve	823.29	3.57
Nature reserve	770.09	3.05
Park	884.57	3.33
Recreation	963.92	4.00
Sub-total	4,739.97	19.28
Conservation areas		
Agricultural reserve	731.59	3.03
Woodland reserve	983.94	4.16
Sub-total	1,715.53	7.19
Cave protection area	1,107.20	4.48
Historic protection area	201.05	0.74
Conservation base zone and conservation areas (no overlap)¹	6,156.79	24.92
Overlapping area	1,670.11	6.77
Total terrestrial area (low tide mark) Total land area	13,430.39	54.35
Water resources protection area²	4,000.61	16.19

Source: Bermuda Plan 2008, Department of Planning, Bermuda

¹ Total protected area does not equal to the sum of the sub-totals as it excludes any overlapping areas (6.77 km²) to avoid double counting.

² The Water Resources Protection Area is not considered as a "protected area" and hence has not been included in the 24.92 km² of protected area but is contained in the total terrestrial area of 54.35 km².

Millennium Development Goal 7

Indicator 26

Ratio of area protected to maintain biological diversity to surface area

7.45%

Nationally protected areas, both terrestrial and marine, are totalled and expressed as a percentage of the total surface area of the country. The total surface area of the country includes terrestrial area plus any territorial sea area (up to 12 nautical miles).

FORESTRY



Section 10: Forestry

The forest section of the Environmental Statistics Compendium includes a table with information on forest area in Bermuda.

Forest

In 2012, Bermuda's total forest area was 4.16 square kilometers (km²). This represented 7.65% of Bermuda's total land area.

NOTE TO READER

Forest: Land under forestry or no land use, spanning more than 0.005km² (0.5 hectares); with trees higher than 5 meters and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. Please include mangroves and forests on wetlands according to the above height and canopy coverage.

Protected Area: A protected area, as adopted by the International Union for Conservation of Nature (IUCN), is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

Total Area: Total area (of country) including area under inland water bodies, but excluding offshore territorial waters (= total land area + water).

Land Area: is the land area excluding area under inland or tidal water bodies.

Table 10.1

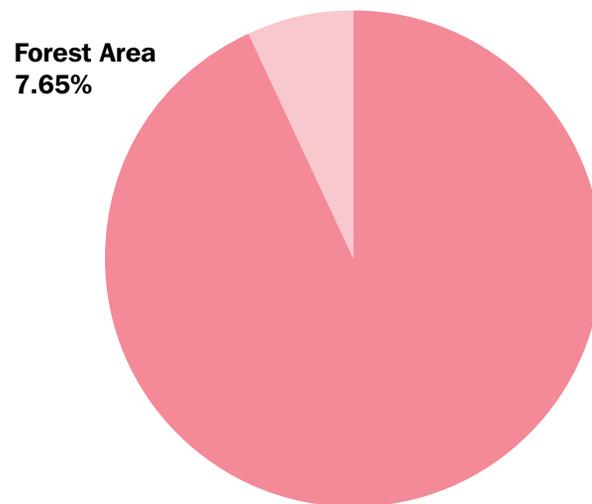
Protected Forest Area as a Percentage of Total Land Area 2012

Protected Area Category	Area km2
Total forest area	4.16*
Total land area	54.35
Protected forest area as a % of total forest area	100
Protected forest area as a % of total land area	7.65

Source: Department of Planning
* This includes woodland reserves.

Chart 10.1

Protected Forest Area as a Percentage of Total Land Area



AIR



Section 11: Air

The air quality in Bermuda is a valued part of its natural resources. Five ambient air monitoring sites have been set up island-wide to monitor air quality and keep levels of pollutants within the Bermuda limit (Clean Air Regulations 1993). This section includes information on air emissions by pollutants from the various ambient air monitoring sites. Table 11.2 provides the average hourly and daily concentrations of the various pollutants from the different monitoring sites.

Table 11.3 illustrates the maximum concentration for pollutants at the various collection sites. In 2012, Prospect recorded a daily maximum concentration of total suspended particles (TSP) which was the highest amongst the sites, of 178.80 $\mu\text{g}/\text{m}^3$.

Figure 11.1/11.2 highlights the average fine particulate matter (PM10) concentration for 2012 on a daily basis. Note that exceedances of PM10 (i.e. particulate matter $<10\mu\text{m}$ diameter) can arise from natural sources (i.e. pollen, sea aerosols, dust) as well as from combustion of petroleum and other combustibles. Bermuda is currently determining what PM2.5 limit shall be introduced. The data in Figure 11.1 shows that the busy road at East Broadway fails the Clean Air Regulations limit for PM10 more often than other sites. The fact that the Bermuda Institute of Ocean Sciences (BIOS) (i.e. the Control Site) also exceeds PM10 highlights the potential natural sources that can contribute to PM10.

Map 11.3 highlights the locations of the five ambient air monitoring sites in Bermuda.

Unit	Unit Measure
$\mu\text{g}/\text{m}^3$	Micrograms
NO ₂	Nitrogen dioxide
SO ₂	Sulfur dioxide
ppb	parts per billion
TSP	Total Suspended Particles
PM10/PM2.5	Fine particulate matter

Table 11.1**Air Emissions from Tynes Bay Waste to Energy Incinerator**

Pollutant	2010	2011	2012
VOCs (mg/Nm ³)	0.08	0.26	2.35
NO _x (mg/Nm ³)	317.40	316.20	299.50
SO ₂ (mg/Nm ³)	155.70	28.10	36.80
Lead (mg/Nm ³)	0.13	0.01	0.02
Particulate Matter (mg/Nm ³)	5.00	1.30	1.98

Source: Department of Environmental Protection

Table 11.2
Average Concentrations for Government (BIOS) and BELCO-Operated Ambient Air Monitoring Sites

		2010					2011					2012									
		Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Langton Hill (BDA#2)	BIOS	Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Langton Hill (BDA#2)	BIOS	Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Langton Hill (BDA#2)	BIOS		
		(Clean Air Regulations 1993)																			
Units		Bernuda Limit																			
Hourly	NO2	ppb	400	3.76	-	-	-	4.37	-	-	-	-	-	4.51	-	-	-	-	-	-	
	SO2	ppb	450	1.81	-	-	1.09	-	-	-	-	-	-	9.66	-	-	-	-	-	-	
	PM10	µg/m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM2.5	µg/m3	-	8.33	-	-	5.94	-	-	-	-	-	-	4.96	-	-	-	-	-	-	
	TSP	µg/m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24-Hour	NO2	ppb	200	3.70	-	-	4.40	-	-	-	-	-	-	-	-	-	-	-	-	-	
	SO2	ppb	150	1.76	-	-	1.10	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM10	µg/m3	50	17.60	24.70	-	19.90	28.00	-	-	-	-	17.30	30.10	45.20	-	-	-	-	32.60	
	PM2.5	µg/m3	-	7.80	-	-	8.20	-	-	-	-	-	-	9.10	-	-	-	-	-	-	
	TSP	µg/m3	100	21.20	47.20	43.30	24.10	47.70	44.50	29.20	44.00	54.20	54.50	44.00	54.20	54.50	42.50	44.00	54.20	54.50	
1-year	NO2	ppb	60	5.65	-	-	2.50	-	-	16.00	6.76	-	-	<0.4	-	-	16.16	5.65	-	-	
	SO2	ppb	30	2.25	-	-	0.90	-	-	7.69	4.59	-	-	0.20	-	-	4.93	4.88	-	-	
	PM10	µg/m3	30	16.47	24.20	-	17.78	27.20	-	14.91	14.57	15.88	23.70	39.80	-	-	16.66	14.22	24.00	-	
	PM2.5	µg/m3	-	7.23	-	-	7.70	-	-	-	-	-	-	9.06	-	-	-	-	-	-	
	TSP	µg/m3	60	20.00	44.00	39.50	21.81	44.40	40.54	24.04	22.24	25.40	29.20	48.10	45.80	26.18	20.88	30.00	-	-	

- Not Required or Not determined as part of the current protocols

Table 11.3

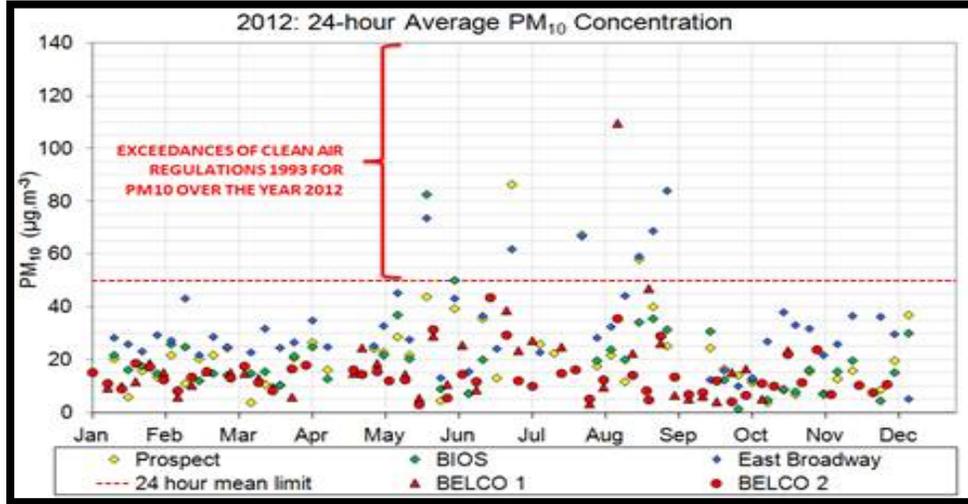
Maximum Concentrations for Ambient Air Monitoring Sites

		2010					2011					2012															
Units	Bermuda Limit (Clean Air Regulations 1993)	Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Belco-Operated ISO14001)	Langton Hill (BDA#2)	Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Belco-Operated ISO14001)	Langton Hill (BDA#2)	Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Belco Site (Government)	Cemetry Lane (BDA#1)	Belco-Operated ISO14001)	Langton Hill (BDA#2)	Belco-Operated ISO14001)	BIOS		
		Hourly		400	49.50	-	223.00	141.00	-	58.40	-	223.00	131.00	-	63.00	-	295.00	165.00	-	63.00	-	295.00	165.00	-	325.60	-	233.00
	ppb																										
	ppb	450	54.20	-	141.00	243.00	-	40.70	-	125.00	280.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	µg/m3																										
	µg/m3	-	31.10	-	-	-	-	61.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	µg/m3																										
	ppb	200	33.20	-	118.00	57.00	-	42.80	-	120.00	61.00	-	18.40	-	126.00	60.00	-	18.40	-	126.00	60.00	-	60.00	-	60.00	-	
	ppb	150	23.50	-	78.00	77.00	-	9.00	-	87.00	102.00	-	3.10	-	76.00	79.00	-	3.10	-	76.00	79.00	-	79.00	-	79.00	-	
	µg/m3	50	39.30	40.60	101.00	45.00	28.00	47.40	47.30	45.00	103.00	39.00	86.30	123.40	47.00	122.40	39.00	86.30	123.40	47.00	122.40	39.00	122.40	39.00	122.40	39.00	
	µg/m3	-	33.90	-	-	-	-	30.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	µg/m3	100	43.70	113.60	125.80	80.00	71.00	61.50	102.70	88.20	49.00	53.00	74.70	178.80	133.10	147.20	74.00	178.80	133.10	147.20	74.00	147.20	74.00	137.90	137.90		
	µg/m3																										

Source: Department of Environmental Protection
 - Not determined as part of the current protocols
 * Marsh Folly Fire (29-30 June 2012)

Figure 11.1

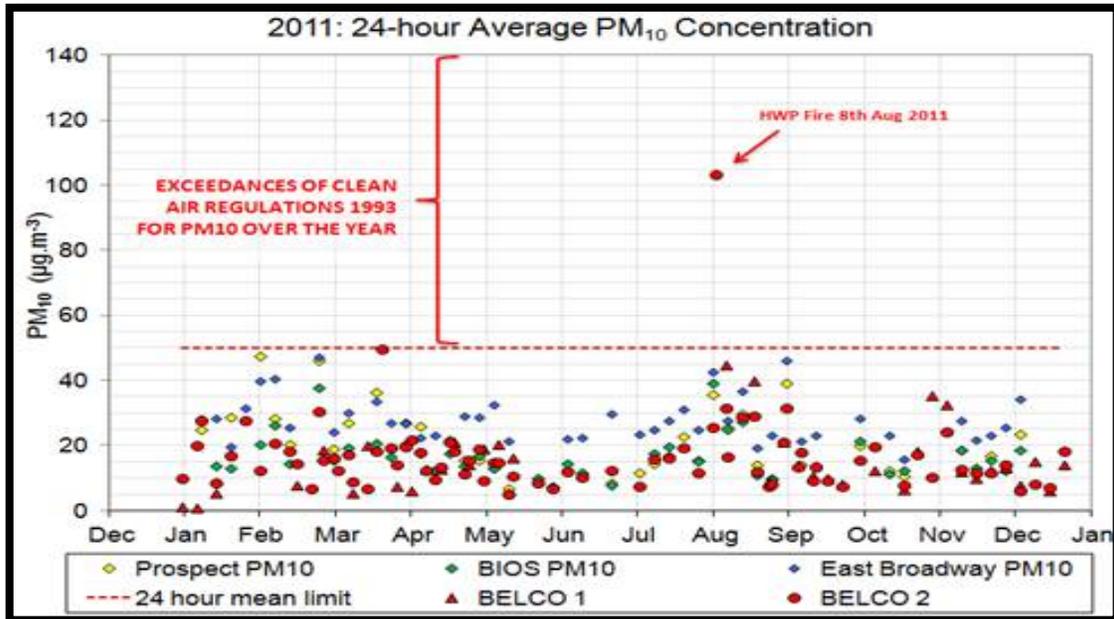
24-hour Average PM₁₀ Concentration 2012



Source: Department of Environmental Protection

Figure 11.2

24-hour Average PM₁₀ Concentration 2011



Source: Department of Environmental Protection

Map 11.1

Bermuda Ambient Air Monitoring Sites



Prospect Site: Located between Tynes Bay Waste to Energy Facility and Belco/Hamilton City.

East Broadway: A busy roadside with commuter traffic into Hamilton City.

BELCO: Bermuda Electric Light Company (BELCO), Electricity generator for Bermuda.

BIOS: Bermuda Institute of Ocean Sciences, St George's. Control Site.

Dockyard: West end of the island monitoring ambient air adjacent to cruise ship terminal. Monitoring started 2011.

Tynes Bay Waste to Energy Facility is located 850 metres due north of the Prospect site on the North Shore coast.

WASTE



Section 12: Waste

The section on waste comprises information regarding the generation and disposal of waste in Bermuda.

Generation

The total waste collected in 2012 was 82,000 tonnes indicating no movement in waste numbers for the year. Household waste accounted for 27,000 tonnes of waste for 2012 while waste from other sources accounted for 55,000 tonnes (Table 12.1).

Management

The Waste Management Section of the Ministry of Public Works follows a Comprehensive Waste Management Strategy (CWMS) to divide waste handling into:

1. Waste reduction
2. Recycling
3. Composting
4. Energy from waste (Incineration)
5. Land creation (Land filling)
6. Special disposal of hazardous waste

In 2012 1,600 tonnes of waste was recycled, 15,000 tonnes of horticultural waste was composted, 55,400 tonnes of waste was incinerated to generate electricity and 10,000 tonnes of waste was land-filled (Table 12.2).

Waste Reduction

Waste reduction aims to limit the amount of garbage that requires collection, processing and disposal. Waste Management is working with the corporate and restaurant sectors to conduct waste audits. Data generated from these waste audits is being applied in businesses as a means to minimize waste. Waste reduction results in lessening the environmental impact of doing business, costs of waste removal and wasteful consumption patterns which can affect bottom line results.

Recycling

Completion of the new Material Recovery Facility (the recycling facility) in 2007, increased capacity and allowed for a broader suite of recyclable materials to be processed for shipment to markets in the United States.

In 2012, the recycling programme remained relatively constant with 122 container loads of materials either exported for the US recycling market or reused on island (Chart 12.1). Additionally, 16 20-foot container loads of steel and aluminium cans were processed for shipment to the US and were held to maximize return received from the US commodities market.

Recycling or the re-processing of materials helps to reduce the burden on the Tynes Bay Waste to Energy incinerator. This is done by removing non-combustible items from the waste-stream which reduces dependence on land-filling and is environmentally friendly.

Special Waste

Items requiring specialized handling and disposal because of their potentially hazardous nature are referred to as Special Waste. These materials are exported to the United States where they are processed for the reuse or recycling markets whenever possible (see starred items, Chart 12.1). Where recycling or reuse is not possible Special Waste is disposed of at US EPA certified controlled landfill disposal sites. The respective amounts are shown in Table 12.3.

In 2012 Bermuda exported 501 tonnes of Special Waste for either the recyclables market or safe disposal.

Household Waste: This is waste that comes from a private dwelling, being a dwelling that is not considered as commercial premises; or waste from premises operated by a charity registered under the Charities Act 1978.

Waste: This is any article or substance (including scrap metal or other surplus arising from the application of a process) which is not liquid and either requires to be disposed of as being unwanted, broken, worn out, contaminated or otherwise spoilt or useless, or in relation to a particular person, has been discarded by.

**These definitions are taken from the Waste and Litter Control Act, 1987*

Table 12.1

Generation of Waste by Source

Indicator	(1,000t)				
	2008	2009	2010	2011	2012
Municipal waste collected from households	31.52	30.16	30.19	27.00	27.00
Municipal waste collected from other origins	63.05	60.33	60.39	54.00	55.00
Total amount of municipal waste collected	94.57	90.49	90.58	81.00	82.00

Source: Public Works

Chart 12.1

**Recyclables exported to the United States By Bermuda In 2012
(20" Container loads)**

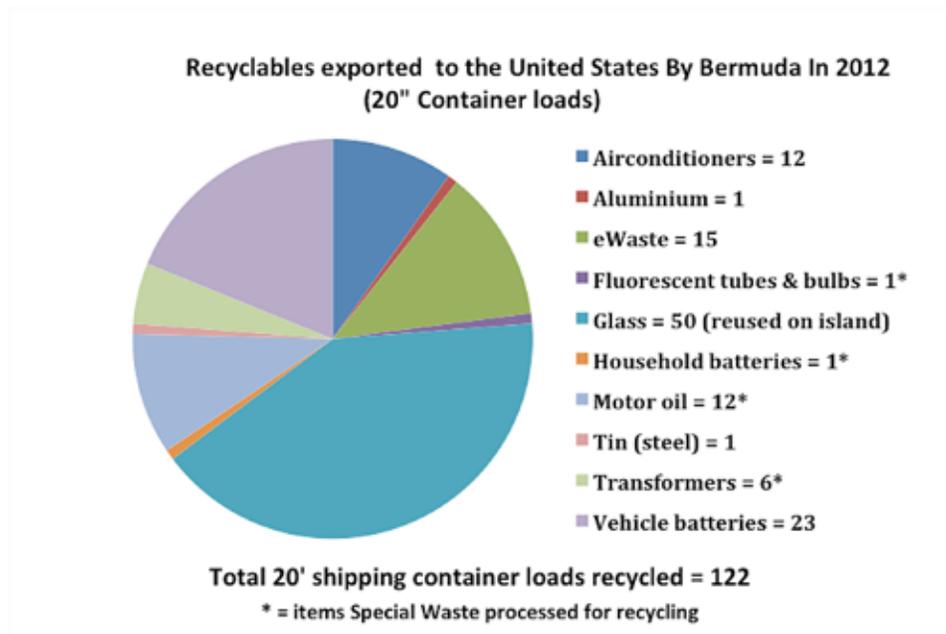


Table 12.2**Management of Municipal Waste**

Indicator	(1,000t)				
	2008	2009	2010	2011	2012
Amounts going to:					
Recycling	1.54	1.58	1.58	1.60	1.60
Composting	15.00	15.00	15.00	15.00	15.00
Incineration	68.03	63.91	64.00	54.40	55.40
Landfilling	10.00	10.00	10.00	10.00	10.00

Source: Public Works

Table 12.3**Management of Special Waste**

Indicator	(1,000t)				
	2008	2009	2010	2011	2012
Stock of hazardous waste at the beginning of the year	35	87	112	109	98
Hazardous waste generated during the year	651	623	582	590	525
Hazardous waste exported during the year	599	598	585	601	501
Amounts going to:	374	370	365	352	362
Recycling					
Incineration	9	6	5	7	5
Landfilling	216	222	215	242	209
Stock of hazardous waste at the end of the year	87	112	109	98	122

Source: Public Works

Table 12.4**Management of Municipal Waste by Type**

Indicator	2006	2008	2010	2012*
Paper, paperboard	32.6	29	29	..
Textiles	5.6	6	17	..
Plastics	13.5	17	13	..
Glass	9.9	11	9	..
Metals	5.8	5	6	..
Other inorganic material	10.6	9	9	..
Organic material	22	23	17	..
Total (%)	100	100	100	..

Source: Public Works

Beginning in 2006 the Waste Management Section of the Ministry of Public Works began conducting a municipal waste audit every two years.

* A waste audit has not been conducted.

WATER



Section 13: Water

Water is an essential ingredient for all life and is used in the production of almost all goods. It is therefore vital to monitor the state of water resources, and to ensure sustainable use of this important commodity.

In 2012, the total volume of atmospheric wet precipitation (rain, dew, etc.) falling on the island was 67.92 mio m³/y (See Table 13.1). The total fresh water made available for use was 3.52 mio m³/y (See Table 13.2).

Map 13.1 shows water resource protection areas in Bermuda as of 2007.

*** Note: At the time of publishing, data for 2010 to 2012 were not available for some tables.**

Table 13.1**Renewable Freshwater Resources**

Category	2010	2011	mio
			m3/y
			2012
Precipitation	63.78	56.05	67.92
Actual evapotranspiration
Internal flow
Renewable freshwater resources
Regular freshwater resources 95% of the time

Source: Department of Environmental Protection

NOTE TO READER

Precipitation: total volume of atmospheric wet precipitation (rain, dew, etc.) falling on the territory of the country over one year.

Actual evapotranspiration: total actual volume of evaporation from the ground, wetlands, and natural water bodies and transpiration of plants.

Internal flow: total volume of river run-off and groundwater generated over the period of a year, in natural conditions, exclusively by precipitation into a territory. It is equal to the precipitation less actual evapotranspiration.

Renewable freshwater resources: equal internal flow plus any inflow of surface and groundwaters.

Regular freshwater resources 95% of the time: portion of the total freshwater resource that can be depended on for annual water development during 19 out of 20 consecutive years, or at least 95% of the years included in longer consecutive periods. This item yields information about the average annual long-term availability of freshwater for use in human activities.

Table 13.2**Water Use Balance**

Category	mio m3/y		
	2010	2011	2012
Net freshwater abstracted	1.74
Desalinated water	1.54
Total freshwater made available for use	3.52
Wastewater generated
of which: Discharged to marine water bodies
Consumptive water use
Water consumption

Source: Department of Environmental Protection

NOTE TO READER

Net freshwater abstracted: water removed from any source either permanently or temporarily less any water returned without use.

Desalinated water: total volume of water obtained from desalination of (that is, removal of salt from) seawater and brackish water.

Total freshwater made available for use: net freshwater abstraction plus desalinated water plus any reused water or import

Wastewater: water which is of no further value to the purpose for which it was used because of its quality, quantity or time of occurrence. However, wastewater from one user can be a potential supply to a user elsewhere. Cooling water is included.

Wastewater generated: the quantity of wastewater generated including wastewater that is delivered to another use for reuse, and wastewater that is discharged after use to inland water bodies or to the sea.

Consumptive water use: water that was abstracted but is no longer available for use because it has evaporated, transpired, been incorporated into products and crops, or consumed by man or livestock. Water losses due to leakages during the transport of water between the point(s) of abstraction and the point(s) of use are not considered a consumptive use and are excluded.

Water consumption: water that was abstracted but is no longer available for use because it has evaporated, been transpired, incorporated into products and crops, consumed by man or livestock, ejected directly to the sea, or otherwise removed from freshwater resources. Water losses due to leakages during the transport of water between the point(s) of abstraction and the point(s) of use are excluded. Total water consumption equals consumptive water use plus discharges to the sea. Water consumption should not be confused with water use which is a different concept in water statistics.

Source: United Nations Statistics Division (UNSD) and United Nations Environment Programme (UNEP)

Table 13.3**Freshwater Abstraction**

Category	mio m3/y		
	2010	2011	2012
Water abstracted			
Gross freshwater abstracted	1.74
Water abstraction by water supply industry (ISIC 36)
Self abstraction for own use by:			
Households
Other economic activities
Surface water abstracted			
Gross fresh surface water abstracted
Self abstraction for own use by:			
Households
Other economic activities
Groundwater abstracted			
Gross fresh groundwater abstracted
Groundwater abstraction by water supply industry (ISIC 36)
Self abstraction for own use by:			
Households
Other economic activities	0.00

Source: Department of Environmental Protection

NOTE TO READER

Fresh surface water: freshwater which flows over, or rests on, the surface of a land mass; natural watercourses such as lakes, streams, etc., as well as artificial watercourses such as irrigation, industrial and navigation canals, drainage systems, and artificial reservoirs. Water obtained through bank filtration and includes as fresh surface water but sea-water, and transitional waters, such as brackish swamps, lagoons, and estuarine areas are not considered fresh surface water.

Fresh groundwater: freshwater which is being held in, and can usually be recovered from, or via, an underground formation. All permanent and temporary deposits of water, both artificially charged and naturally, in the subsoil, or sufficient quality for at least seasonal use. It includes springs, both concentrated and diffused, which may be subaqueous.

Gross fresh groundwater abstracted: fresh groundwater removed from the ground, either permanently or temporarily. It includes abstraction by the water supply industry (Industrial Standard Industrial Classification (ISIC) 36) and direct abstraction by other activities, and water abstracted but returned without use, such as mine water and drainage water. Artificial recharge is not deducted.

Water abstraction by water supply industry: water abstraction by economic units engaged in collection, purification and distribution of water (including desalting of sea water to produce water as the principal product of interest, and excluding system operation for agricultural purposes and treatment of wastewater solely in order to prevent pollution).

Table 13.4**Water Supply Industry (ISIC 36)**

Category	mio m3/y		
	2010	2011	2012
Net freshwater delivered by water supply industry (ISIC 36)	1.01
of which delivered to:			
Households	0.75
Other economic activities	0.25
Percentage of population supplied by water supply industry (ISIC 36) (%)	10

Source: Department of Environmental Protection

NOTE TO READER

Net freshwater delivered by water supply industry: water delivered by public water supply industry to the user minus freshwater losses during transport.

Population supplied by water supply industry (ISIC 36): the percentage of the resident population connected to the water supply.

Source: United Nations Statistics Division (UNSD) and United Nations Environment Programme (UNEP)

Table 13.5**Total Water Use**

Category	mio m3/y		
	2010	2011	2012
Freshwater use, total
of which used by:			
Households
Other economic activities

Source: Department of Environmental Protection

NOTE TO READER

Freshwater use: the quantity of freshwater that is actually used in a year by end users including water delivered by the water supply industry (ISIC 36), water directly abstracted for own use and water received from other parties. It excludes freshwater returned without use.

Source: UNSD and UNEP

Source: United Nations Statistics Division (UNSD) and United Nations Environment Programme (UNEP)

Table 13.6**Percentage of Population Connected to Wastewater Treatment**

Category	2010	2011	2012
Population connected to wastewater collecting system
Population connected to wastewater treatment
of which at least secondary treatment
Population with independent wastewater treatment (e.g. septic tanks)

Source: Department of Environmental Protection
There are 4 wastewater treatment plants

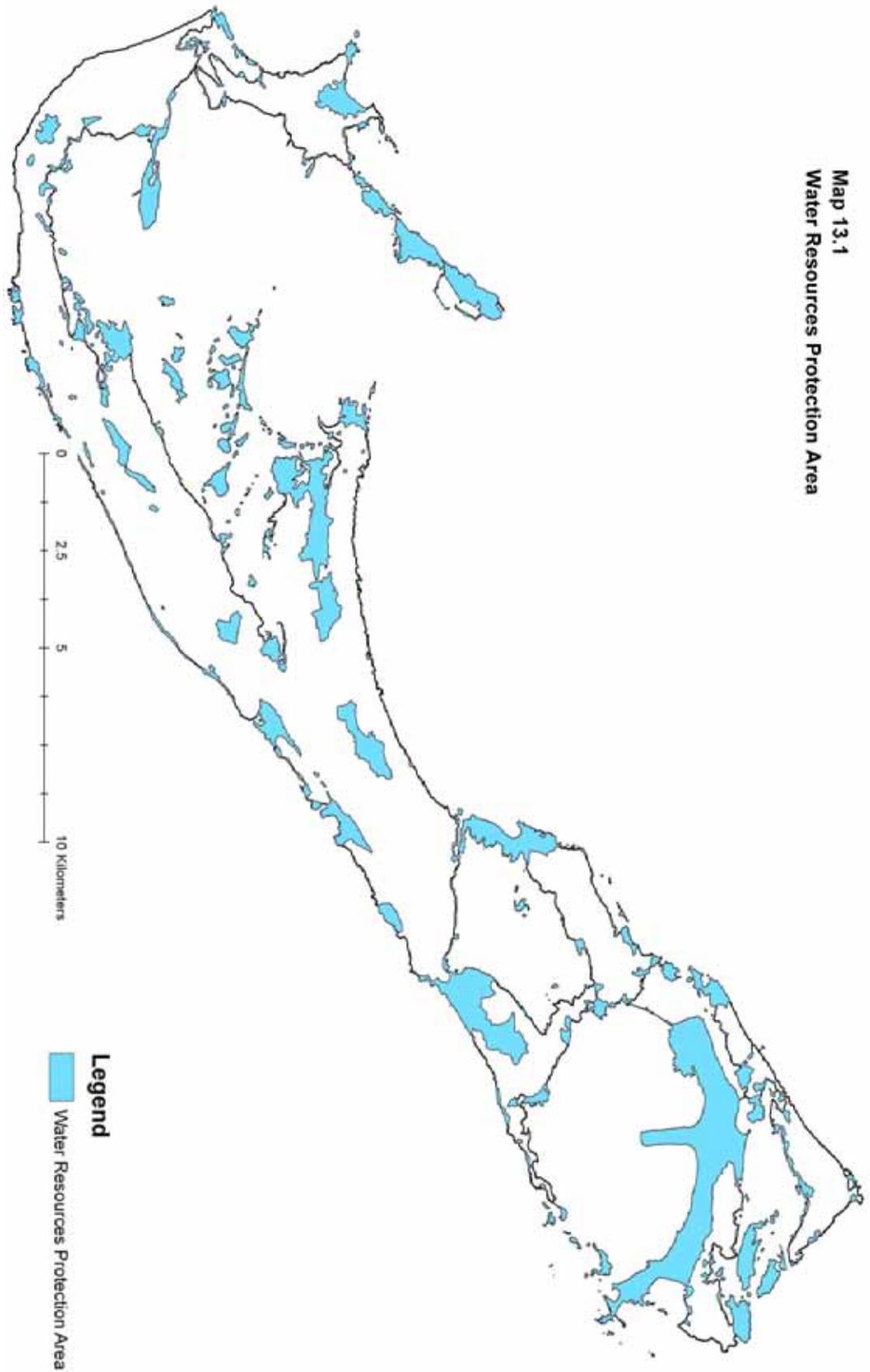
NOTE TO READER

Population connected to wastewater collecting system: the percentage of resident population connected to the wastewater collecting system (sewerage). Wastewater collecting systems may deliver wastewater plants or may discharge it without treatment to the environment.

Population connected to wastewater treatment: the percentage of the resident population whose wastewater is treated at wastewater treatment plants.

Population with independent wastewater treatment (e.g. septic tanks): the percentage of resident population whose wastewater is treated in individual, often private facilities such as septic tanks.

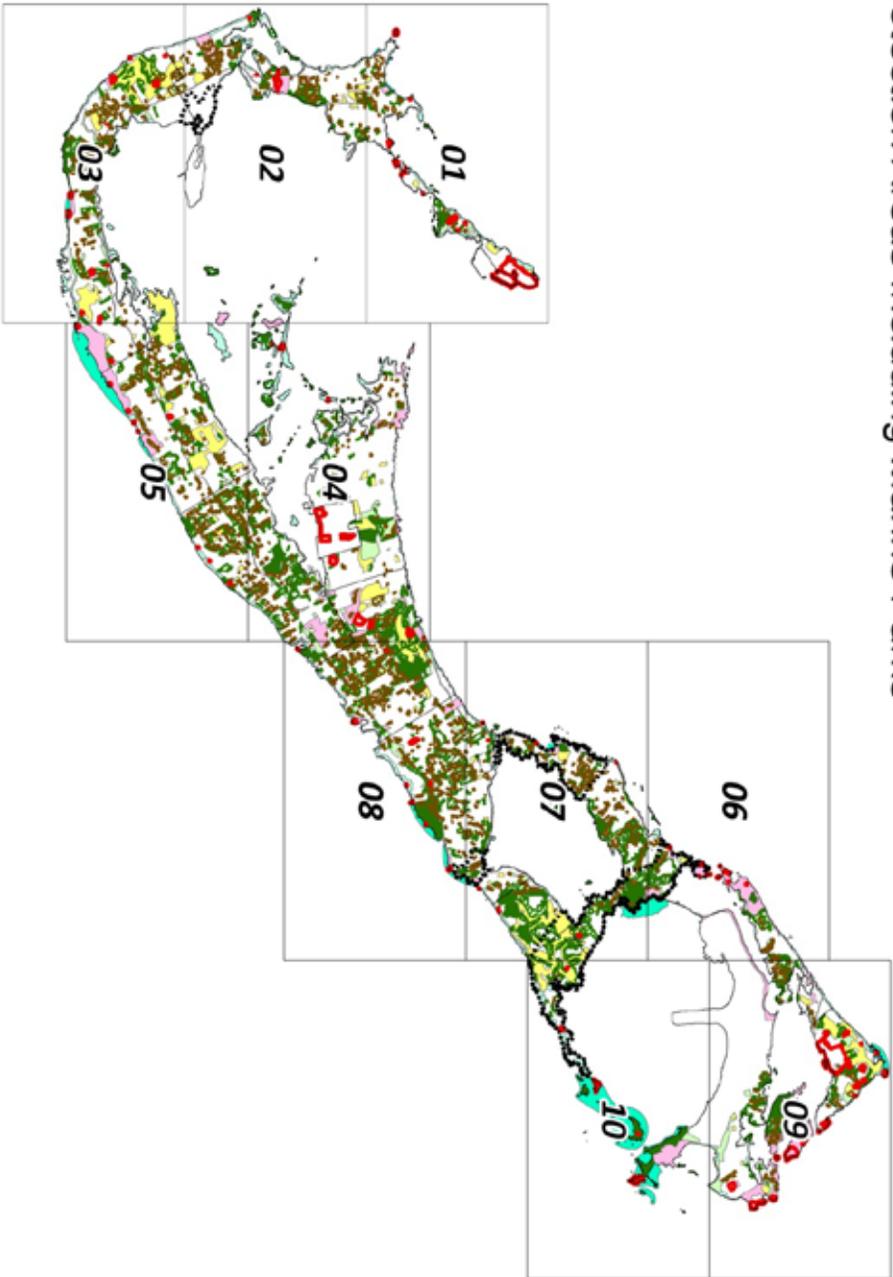
Map 13.1
Water Resources Protection Area



ANNEX

The background of the page features a decorative design with wavy, horizontal bands. The top portion is a light, pale green. Below this, there are three distinct wavy bands of varying shades of green, ranging from a very light, almost white-green to a medium, vibrant green. The bottom half of the page is a solid, muted brown color.

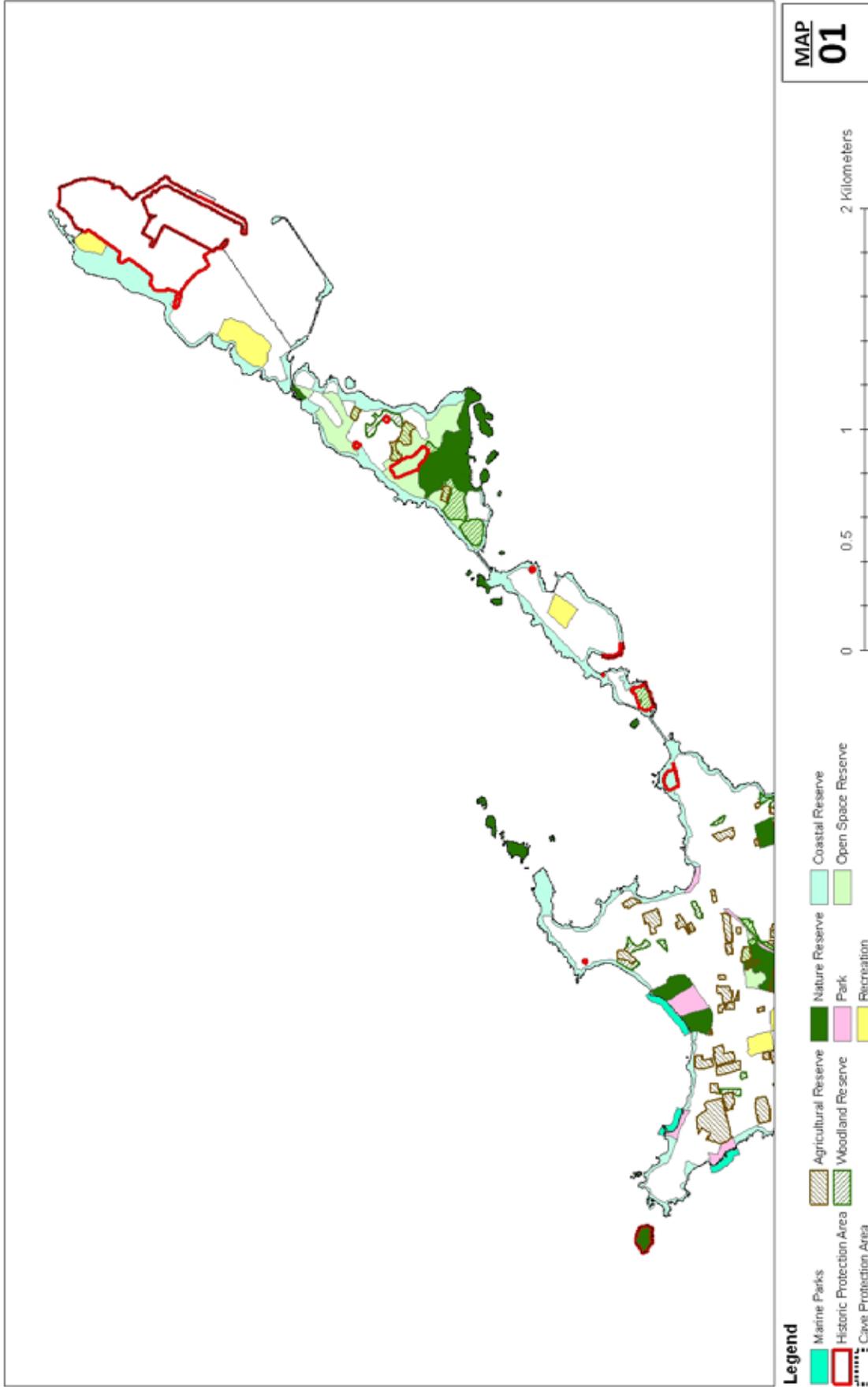
Terrestrial Protection Areas Including Marine Parks



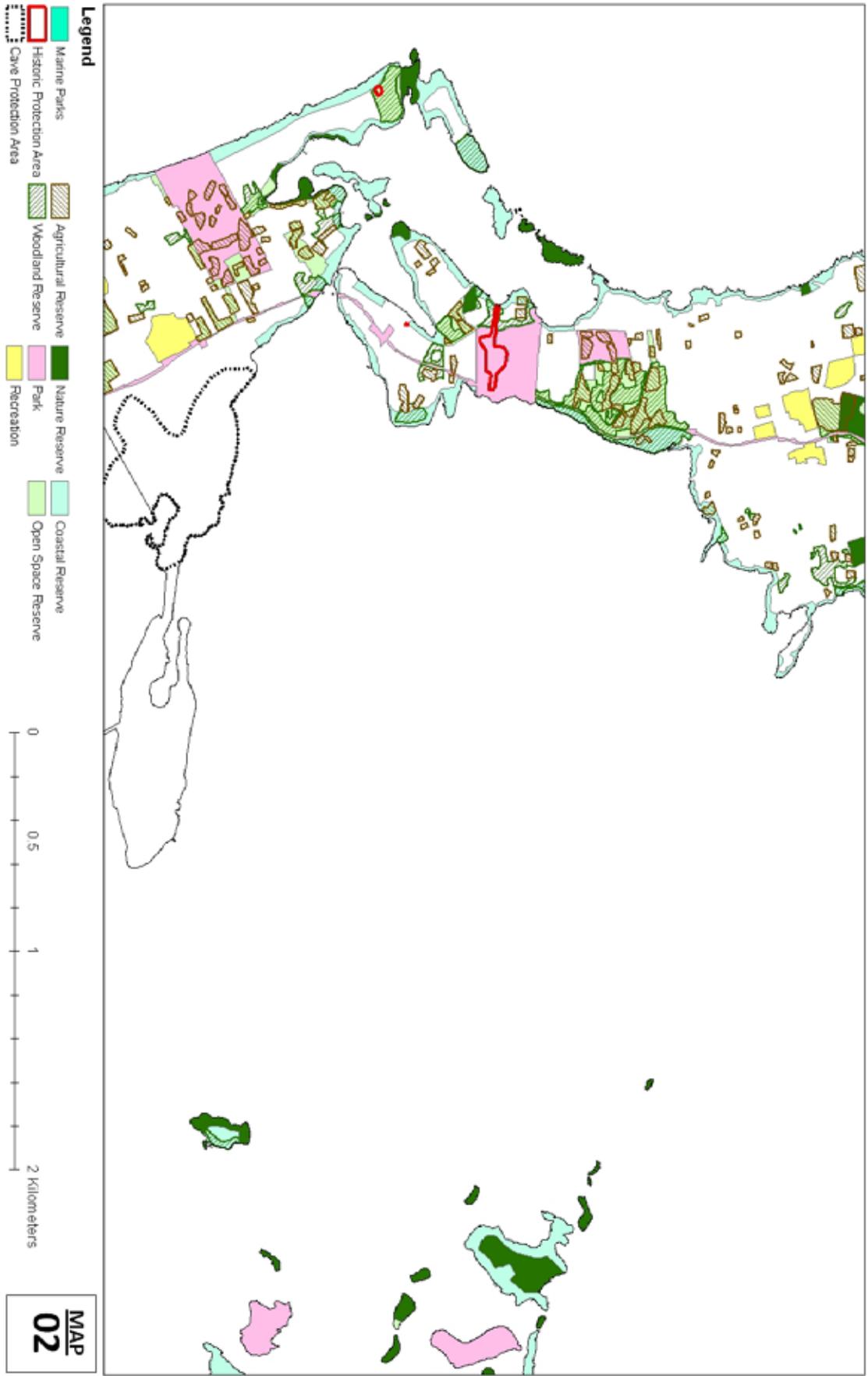
- Legend**
- Historic Protection Area
 - Cave Protection Area
 - Agricultural Reserve
 - Woodland Reserve
 - Nature Reserve
 - Park
 - Recreation
 - Coastal Reserve
 - Open Space Reserve
 - Marine Parks

Source: Department of Planning

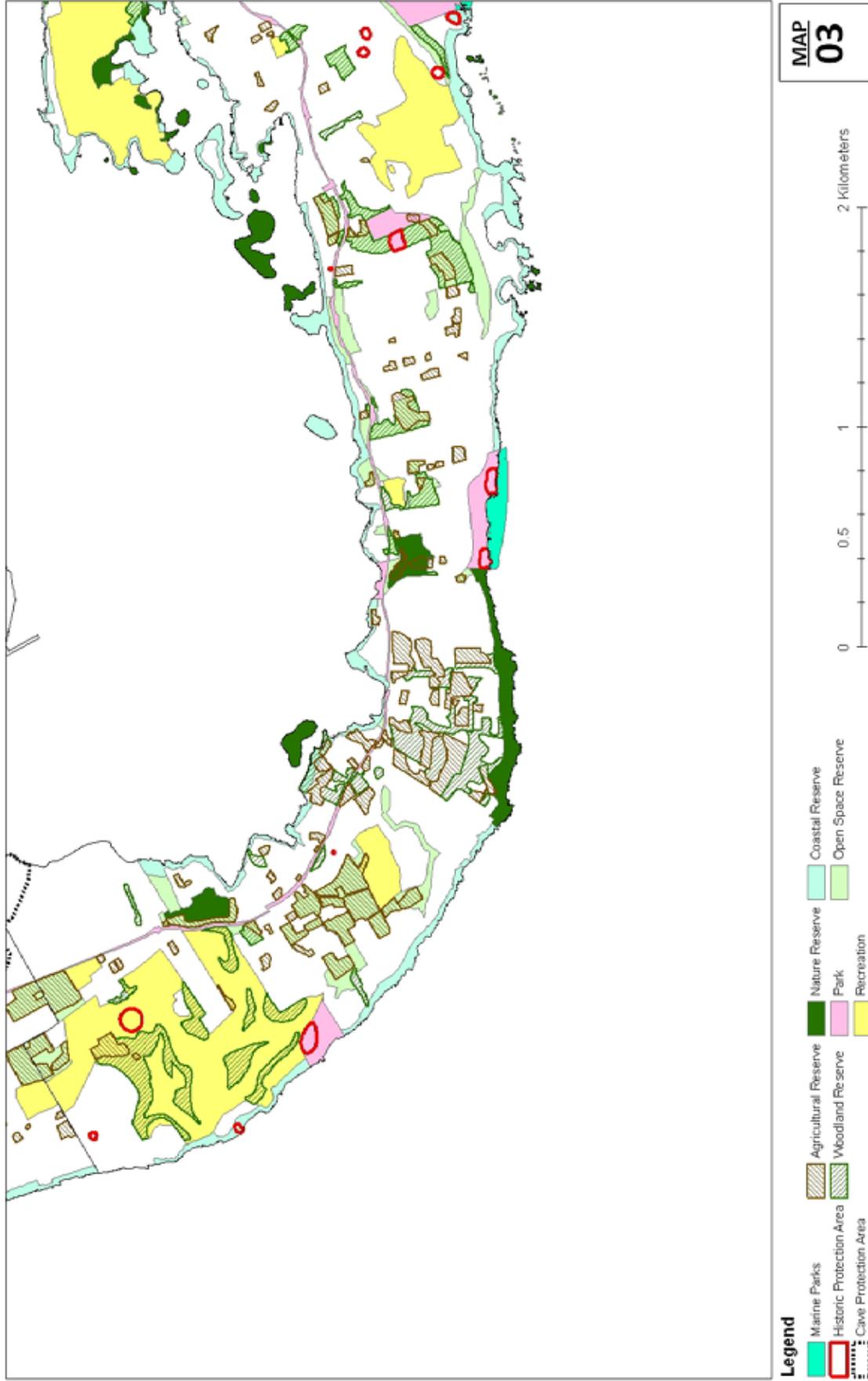




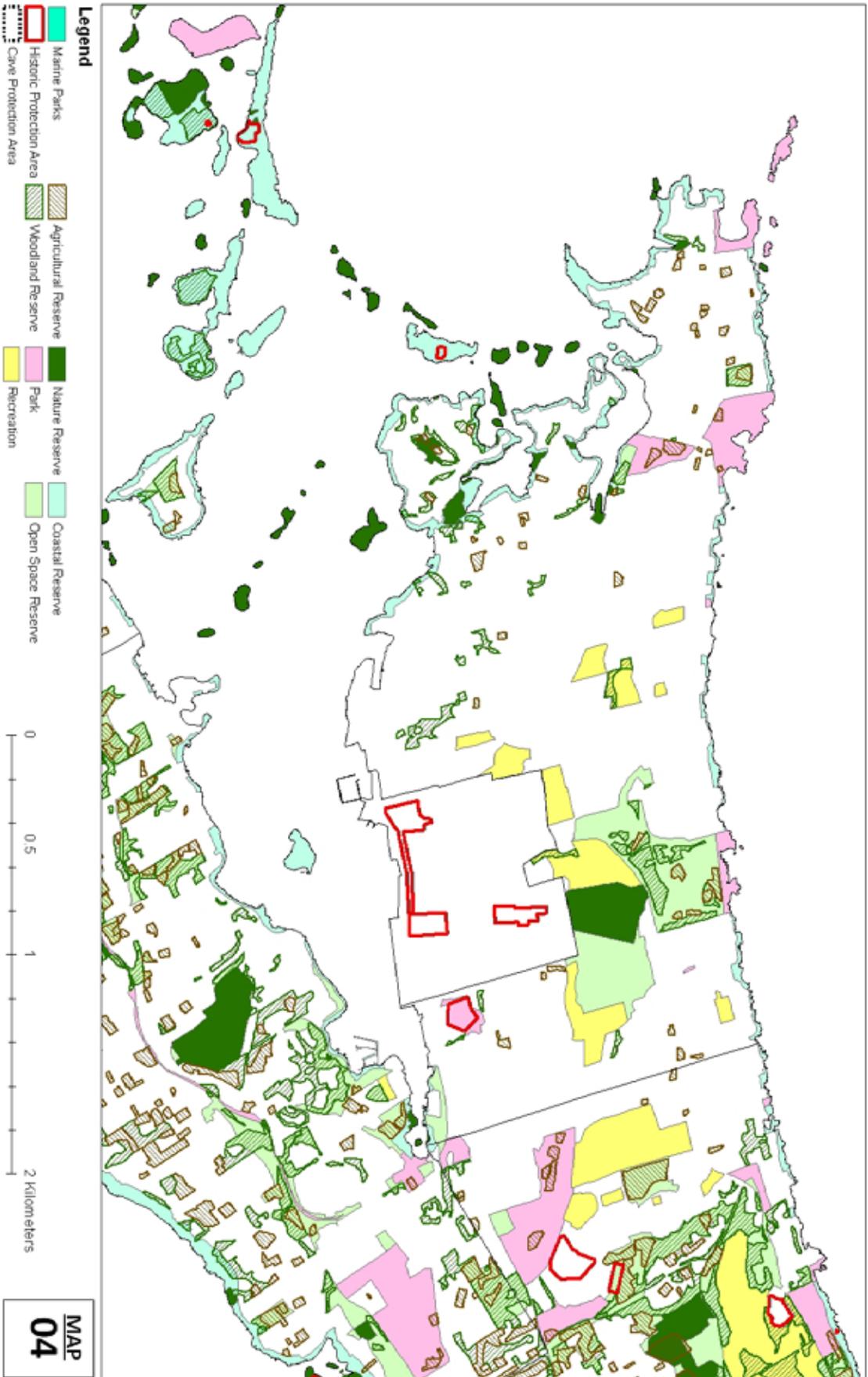
Source: Department of Planning



Source: Department of Planning



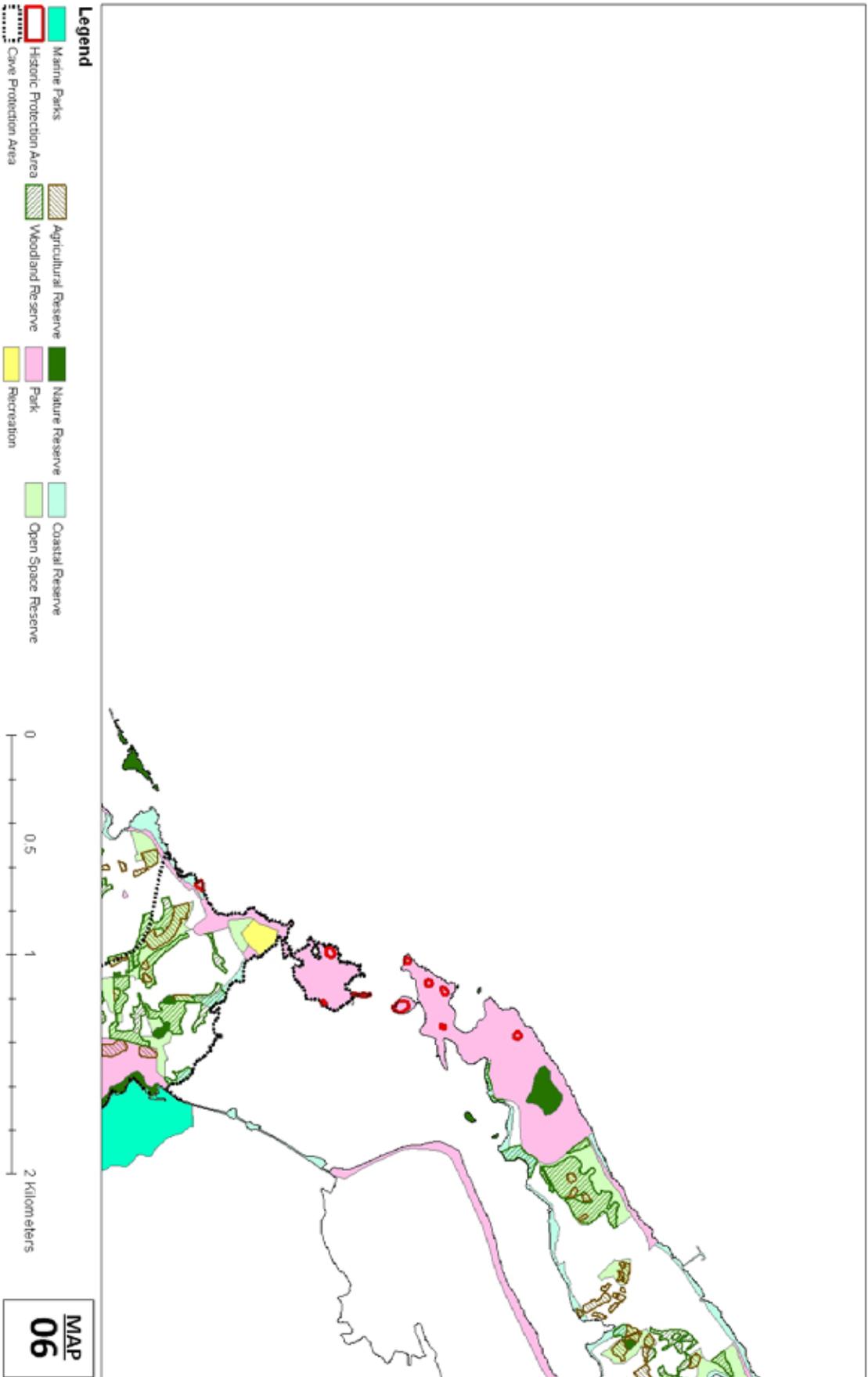
Source: Department of Planning



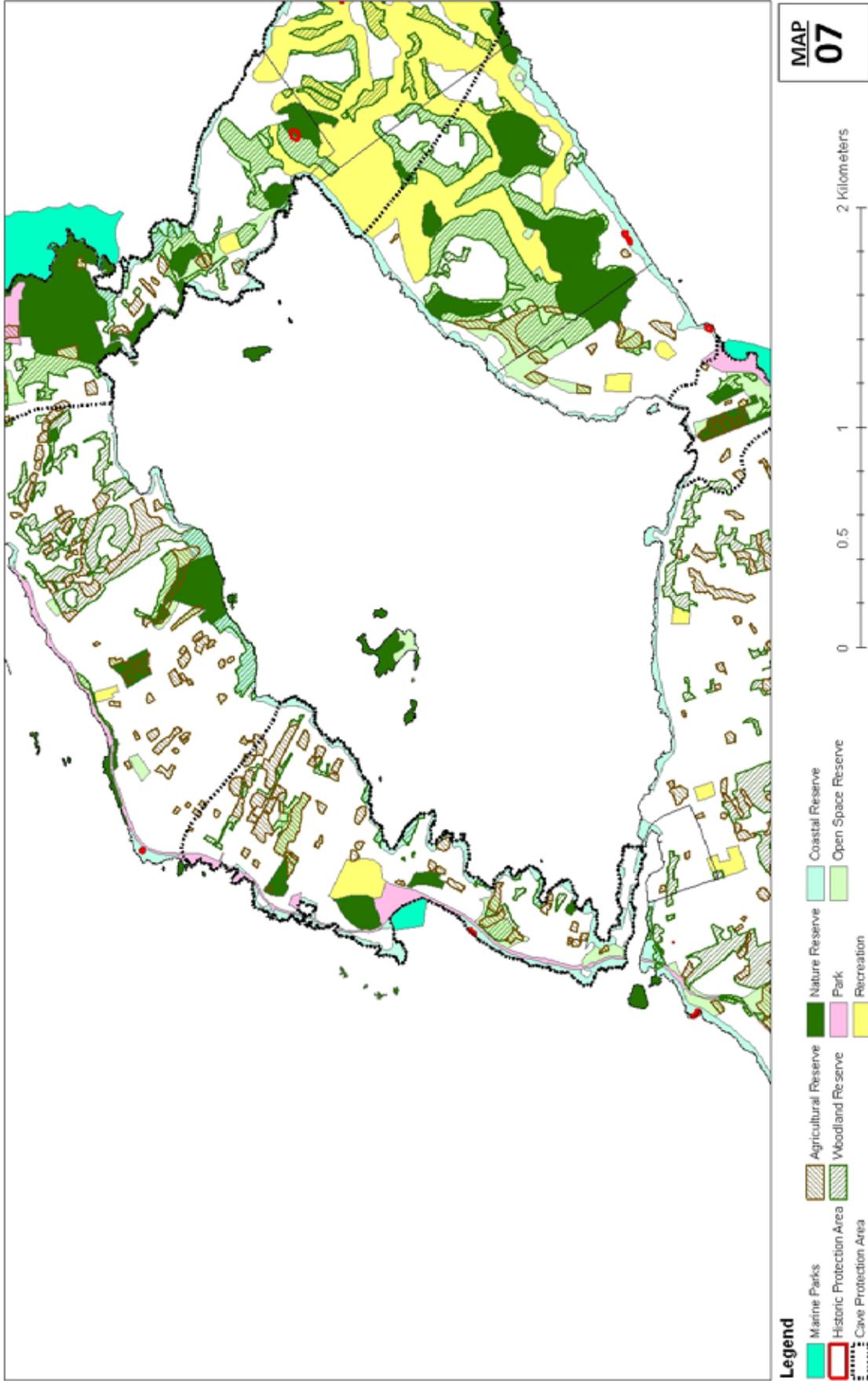
Source: Department of Planning



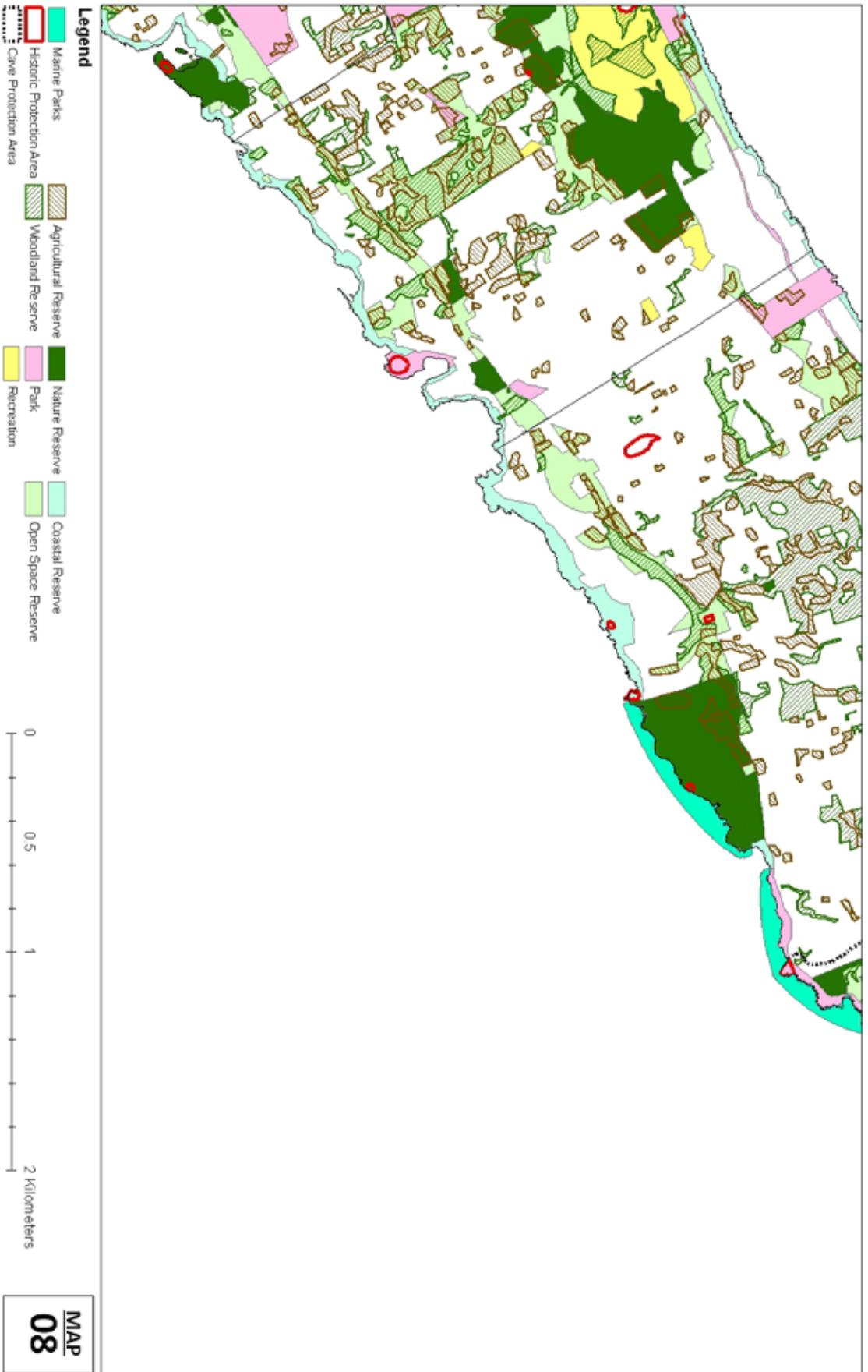
Source: Department of Planning



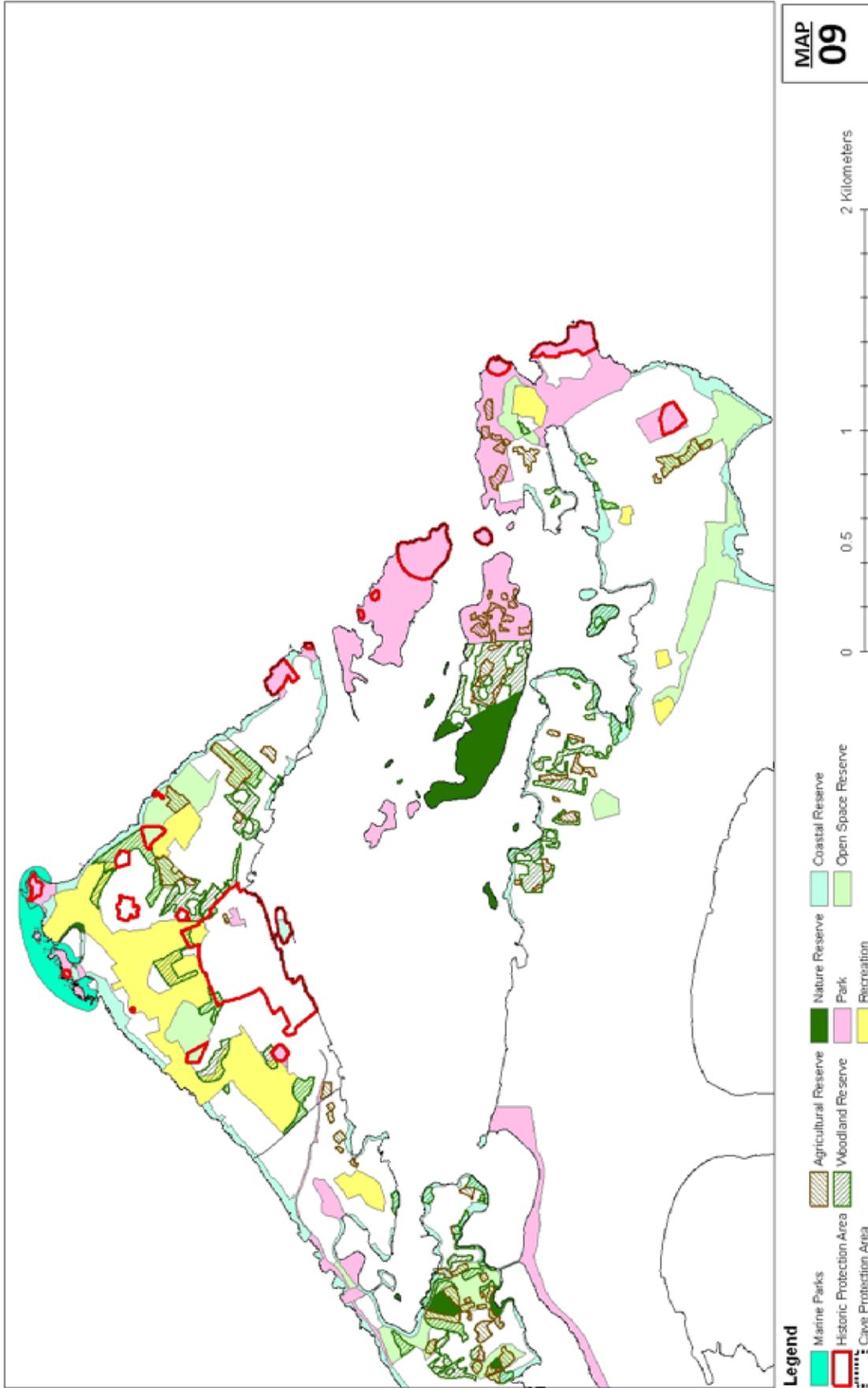
Source: Department of Planning



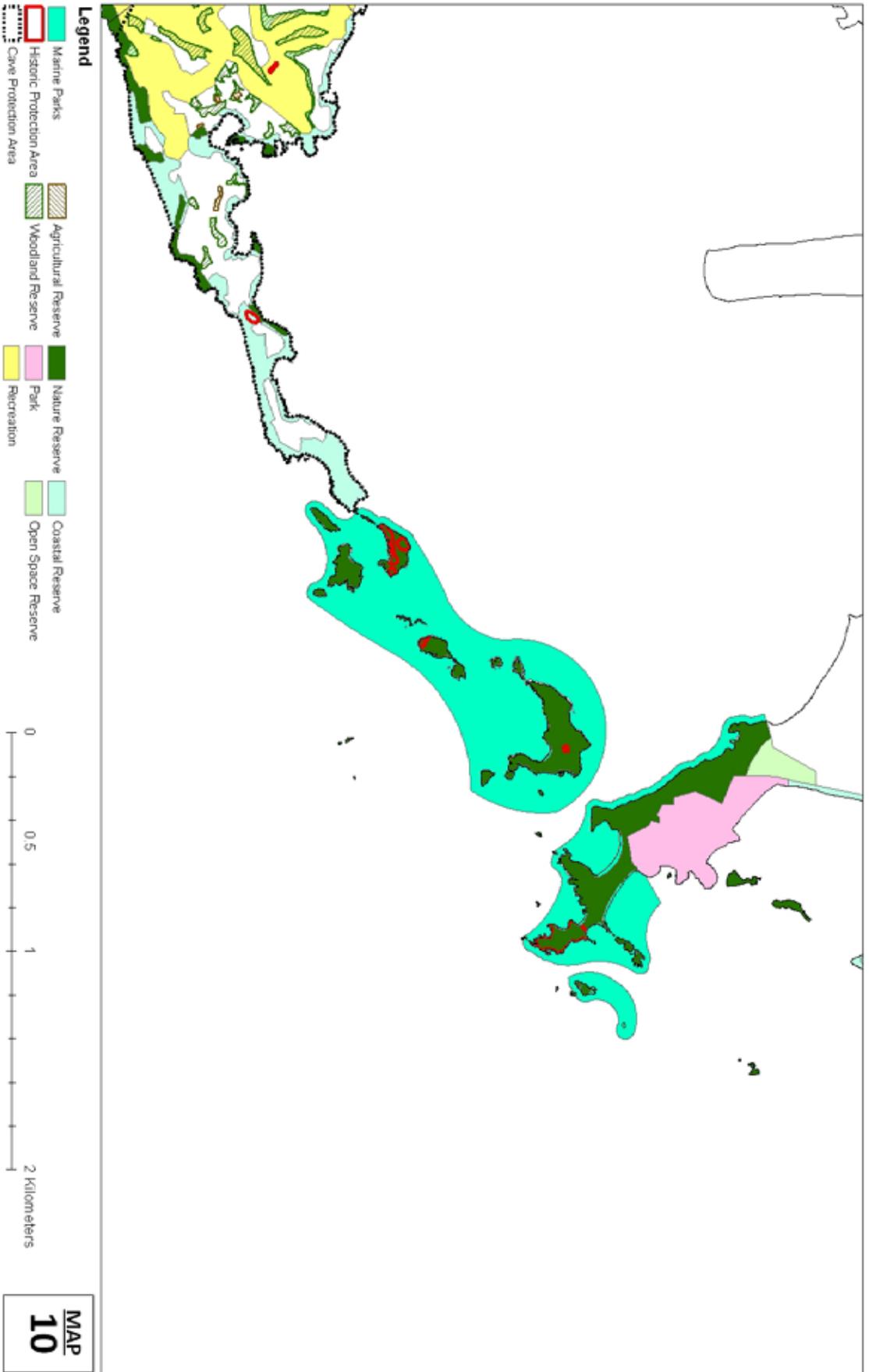
Source: Department of Planning



Source: Department of Planning



Source: Department of Planning



Source: Department of Planning



GOVERNMENT OF BERMUDA
Cabinet Office

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