2018 ENVIRONMENTAL STATISTICS COMPENDIUM

GOVERNMENT OF BERMUDA

Department of Statistics

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GOVERNMENT OF BERMUDA

Department of Statistics

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CONTENTS

FOREWORD

The Department of Statistics is pleased to release its ninth issue of the *"Environmental Statistics Compendium"*. In alignment with the Department's mission to collect, process and analyze relevant statistical information; this publication reflects the collation of existing data sourced from stakeholders and awareness about issues affecting Bermuda's environment.

Additionally, the delivery of this report supports the combined efforts of the United Nations Statistics Division and the Caribbean Community to strengthen capacity and harmonize the compilation of social, gender and environmental statistics and indicators.

The Environmental Statistics Compendium is structured into thirteen (13) sections which include:

1. Population and Housing
2. Tourism
3. Environmental Health and 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 figures in the Environmental Statistics Compendium are mainly totals for calendar months for the period 2013 to 2017.

The Department 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.

Melinda Williams
Director
Department of Statistics

October 2018

EXPLANATORY NOTES

-	Not applicable	km	Kilometer
..	Not available	km^2	Square kilometer
**	Less than one percent	kWh	Kilowatt-hour
r	Revised figure	mio m^3/y	Million cubic meters per year
e	Estimated figure	mT	Metric tonnes
—	Nil or negligible	No.	Number
'000	Thousands	$\mu g/m^3$	Microgram
°	Degrees	NO_2	Nitrogen Dioxide
%	Percent	SO_2	Sulfur Dioxide
$	Bermuda dollar	ppb	Parts per billion
F	Fahrenheit	TSP	Total Suspended Particles
ha	Hectare	$PM_{10}/PM_{2.5}$	Fine Particulate Matter
kg	Kilograms	mg/nm^3	Milligrams per cubic meter
//	Axis scale has a discontinuity	NTR	Note to Reader

Note: In some tables, figures may not add 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)	3 feet (ft)	0.9144 metre (m)
1 metre (m)	100 cm	1.0936 yards (yds)	1 mile	1,760 yds	1.6093 kilometre (km)
1 kilometre (km)	1,000 m	0.6214 mile			
AREA					
1 square meter (m^2)	10,000 cm^2		1 acre	4,840 yd^2	4,046.9 square meter (m^2)
1 hectare (ha)	10,000 m^2	2.4712 acres	1 acre		0.4047 hectare (ha)
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)	16 ounces (oz)	0.4536 kg
1 metric tonne (mT)	1,000 kg	0.9842 ton	1 ton	2,240 lbs	1.016 metric tonne (mT)
TEMPERATURE					
1 degree Celsius (°C)		33.8 degrees Fahrenheit (°F)	1 degree Fahrenheit (°F)		-17.2 degrees Celsius (°C)

CONTRIBUTORS

Ascendant Group Limited
Bermuda Fire and Rescue Services
Bermuda Hospitals Board
Bermuda Tourism Authority
Department of Environmental and Natural Resources, Marine Management Section
Department of Environmental Protection
Department of Health
Department of Planning
Department of Statistics
Department of Works and Engineering - Waste and Enforcement Section
The Bermuda Business Development Agency
The Bermuda Weather Service
Transport Control Department

SECTION 1

POPULATION AND HOUSING

The Population and Housing Section contains information on the number of persons in Bermuda and the type of households they occupied.

Population

• In 2017, the population of Bermuda was projected to be 63,892 persons, a 0.2% increase from the 63,779 persons counted in the 2016 Population and Housing Census (Table 1.1).

• Population projections were used to estimate the population for 2013-2015 and 2017. A Population and Housing Census was conducted in 2016.

Households

• During the period 2010 to 2016, there was a 4.7% increase in the total number of households (Table 1.2).

• In 2016, over one-third (35.4%) of the households were two-apartment dwellings (Table 1.2).

• One-person households accounted for 34.1% of the total households in Bermuda in 2016 (Table 1.3).

• The average size of a household continued to drop from 2.39 persons in 2010 to 2.26 persons in 2016 (Table 1.3).

• Home ownership fell 1.7 percentage points over the seven-year period 2010-2016 to 47.1% (Table 1.4).

• In 2016, private dwelling units with two bedrooms accounted for over one-third (36.0%) of households in Bermuda (Table 1.5).

• The average number of persons per bedroom was 1.07 persons in 2016 (Table 1.5).

NOTE TO READER

Group Dwelling Unit: where the occupants live collectively for disciplinary, health, custodial, work or other reasons and share the cooking, sleeping and/or sanitary facilities with other households. Generally, group dwellings are available primarily to selected persons, not the general population. They differ from institutions in that occupants movements to and from the premises are less restricted. Examples of group dwellings include hotel staff quarters, nurses' hostels, transitional housing, police barracks and rooming houses catering for six or more paying guest as well as Mid-Atlantic Wellness Institute group homes catering to any number of clients.

Household: a person or group of persons living together in a dwelling unit.

Population Density: a measure of the average population per unit of land area. It is calculated by dividing the de jure cililian non-institutional population by the total land area. Bermuda's land area as of 2010 was 21.01 square miles and as of 2016 was 20.68 square miles (source: Department of Land Title and Registration 26 January, 2018).

$$\frac{\text{De Jure Civilian Non-Institutional Population}}{\text{Total Land Area}}$$

Private Dwelling Unit: a room or group of rooms used, or intended to be used, for living purposes. It must be capable of permanent human habitation and must have its own:

- separate access to the street or common landing or staircase, and,
- cooking, living, sleeping and sanitary facilities which the occupants of the dwelling do not have to share with any persons other than their own household members.

From a structural perspective, a private dwelling may be contained within a one-unit dwelling, a house comprising two or more apartments, an apartment building, or within part of a building which is used for residential as well as business or other purposes.

Source: Department of Statistics

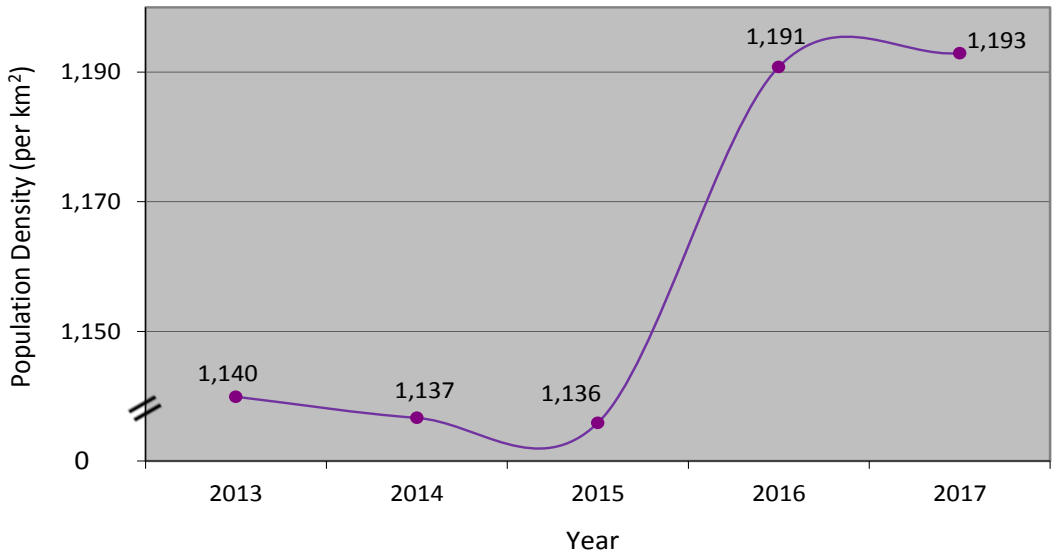
Table 1.1
POPULATION AND POPULATION DENSITY, 2013-2017

Year	Population	Population Density (per km^2)
2013	61,954 [1]	1,140 [4]
2014	61,777 [1]	1,137 [4]
2015	61,735 [1]	1,136 [4]
2016	63,779 r [2]	1,191 r [5]
2017	63,892 [3]	1,193 [5]

Sources: Department of Statistics, Department of Planning and the Land Title and Registration Office

[1] Based on Bermuda's Population Projections 2010-2020.
[2] Based on the 2016 Population and Housing Census.
[3] Based on Bermuda's Population Projections 2016-2026.
[4] Bermuda's land area as of 2008 was 54.35 km^2 (21.01 square miles) Department of Planning.
[5] Bermuda's land area as of 2016 was 53.56 km^2 (20.68 square miles) Land Title and Registration Office.

Chart 1.1
POPULATION DENSITY, 2013-2017



Source: Department of Statistics

The 2013-2015 figures are based on Bermuda's Population Projections 2010-2020.
The 2016 figure is based on the 2016 Population and Housing Census.
The 2017 figure is based on Bermuda's Population Projections 2016-2026.

Table 1.2
NUMBER OF HOUSEHOLDS BY TYPE OF DWELLING, 2010 AND 2016

Type of Dwelling	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,923 [1]	28,192	100.0 [2]	100.0
Undivided private house (cottage)	6,280	6,767	24.3	24.0
Two apartments	8,870	9,972	34.4	35.4
Three apartments	4,639	4,849	18.0	17.2
Four or more apartments	5,024	5,253	19.5	18.6
Group dwellings	696	751	2.7	2.7
Residential/commercial premises	281	577	1.1	2.1
Other/not stated	27	23	**	**

Sources: 2010 and 2016 Population and Housing Censuses

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

[2] The denominator for percentage distribution is 25,817 (26,923 - 1,106).

Table 1.3
HOUSEHOLDS BY SIZE OF HOUSEHOLD, 2010 AND 2016

Persons in Household	Number		Percentage Distribution	
	2010	2016	2010	2016
Total households	26,923	28,192	100.0	100.0
Average size of household	2.39	2.26		
One	7,341	9,611	29.3	34.1
Two	7,902	8,841	31.5	31.4
Three	4,498	4,802	17.9	17.0
Four	3,536	3,317	14.1	11.8
Five	1,234	1,141	4.9	4.0
Six	385	329	1.5	1.2
Seven	112	99	**	**
Eight	52	35	**	**
More than eight	34	17	**	**

Sources: 2010 and 2016 Population and Housing Censuses

Table 1.4
PRIVATE DWELLING UNITS BY TYPE OF TENURE, 2010 AND 2016

Type of Tenure	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,200 r[1]	27,418	100.0 [2]	100.0
Own	12,238	13,267	48.8 r	47.1
Rent	11,719	13,006	46.7 r	46.1
Rent Free	1,004	1,134	4.0 r	4.0
Other/Not Stated	133 r	11	** r	2.8

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of tenure.
[2] The denominator for percentage distribution is 25,094 (26,200 - 1,106).

Table 1.5
PRIVATE DWELLING UNITS BY NUMBER OF BEDROOMS, 2010 AND 2016

Type of Household	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,200 r[1]	27,418	100.0 [6]	100.0
Average number of bedrooms per household	2.15 [2]	2.14 [4]		
Average number of persons per bedroom	1.13 [3]	1.07 [5]		
None (studio)	790	1,145	3.2	4.2
One	6,101	6,469	24.4	23.6
Two	8,944	9,857	35.8	36.0
Three	7,473	7,928	29.9	28.9
Four or more	1,645	2,018	6.6	7.4
Not Stated	141	1	**	**

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of dwelling.
[2] The calculation is 53,544 bedrooms ÷ 24,953 households.
[3] The calculation is 60,503 persons ÷ 53,544 bedrooms.
[4] The calculation is 58,604 bedrooms ÷ 27,417 households.
[5] The calculation is 62,668 persons ÷ 58,604 bedrooms.
[6] The denominator for percentage distribution is 24,953 (26,200 - 1,106 - 141).

SECTION 2

TOURISM

Bermuda's tourism industry is the largest source of revenue to the economy after international business.

Visitor Arrivals

• The total number of visitors to Bermuda increased by 7.0 percent from 642,395 in 2016 to 687,625 in 2017 (Table 2.1).

• Air passenger arrivals increased 10.2 percent from 244,491 in 2016 to 269,576 in 2017 (Table 2.1).

• Cruise ship arrivals increased 15.8 percent from 2016 to 2017 (Table 2.1).

• In 2017, the average length of stay for air passengers increased to 6.3 days (Table 2.1).

Air Passengers

• Year-over-year, air passengers from all origins increased across the board likely due to the America's Cup which attracted visitors from around the world. (Table 2.2).

• In 2017, two-thirds (66.5%) of all air passengers stayed at hotel properties (Table 2.3).

Tourist Properties

• The total number of tourist properties (42) in Bermuda has remained the same since 2015 (Table 2.4).

• The total number of rooms available increased by 3.2% from 2,334 rooms in 2016 to 2,409 rooms in 2017 (Table 2.4).

• There was a 5.2% increase in the total number of beds from 4,866 in 2016 to 5,120 in 2017 (Table 2.4).

• The occupancy rate increased 5.4 percentage points from 57.7% in 2016 to 63.1% in 2017 (Table 2.4).

Section Cont'd.

Visitor Expenditure

• Visitor expenditure increased from $398.2 million in 2016 to $468.0 million in 2017 (Table 2.5).

• In 2017, there were 4,371 persons directly employed in the tourism industry; an increase of 5.9% over 2016. Males accounted for 2,649 persons compared to 1,722 females (Table 2.5).

NOTE TO READER

Air Passenger Arrivals: includes all stay-over (overnight) visitors. It does not, however, include cruise passenger and yacht arrivals.

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 1 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

Number of Hotel Rooms per km^2: 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 (53.56 km^2).

Occupancy Rate: is calculated by dividing the monthly or yearly sum of room nights utilized 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 traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other

Note to Reader Cont'd.

Tourism Density Ratio (TDR): ratio attempts to show the density of tourist in the country at any one time on average. Its value is limited by the fact that tourists flows are seasonal and tourism activity tends to be concentrated in specific geographical areas. *(Cabibbean Tourism Organization)* Tourism Density Ratio is calculated as:

$$\text{Tourism Density Ratio} = \frac{\text{Number of visitors} * \text{average length of stay}}{\text{land area } (53.56\,\text{km}^2) * 365}$$

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

Tourism Intensity Rate (TIR): the indicator 'arrivals/population' provides an estimate of tourism intensity in the country of reference. This indicator is calculated by World Tourism Organization (UNWTO) based on the available basic data on inbound and domestic tourism, which can be be either the number of visitors or the number of tourists. *(UNWTO Methodological Notes to the Tourism Statistics Database at http://cf.cda.unwto.org/sites/all/files/pdf/2015_meth_notes_eng_0.pdf)* Tourism Intensity Rate is calculated as:

$$\text{Tourist Intensity Rate} = \text{Number of visitors/1,000 population/land area } (53.56\,\text{km}^2)$$

Tourism Penetration Ratio (TPR): the penetration ratio quantifies the average number of tourist arrivals by air, per thousand local inhabitants, in the country at any one time. *(modified Caribbean Tourism Organization definition)* Tourist Penetration Ratio is calculated as:

$$\text{Tourism Penetration Ratio} = \frac{\text{Average length of Stay} * \text{number of air visitors} * 1{,}000}{365 * \text{mid-year population estimates}}$$

Tourist: a person traveling 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.

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

Source: CARICOM Environment Program

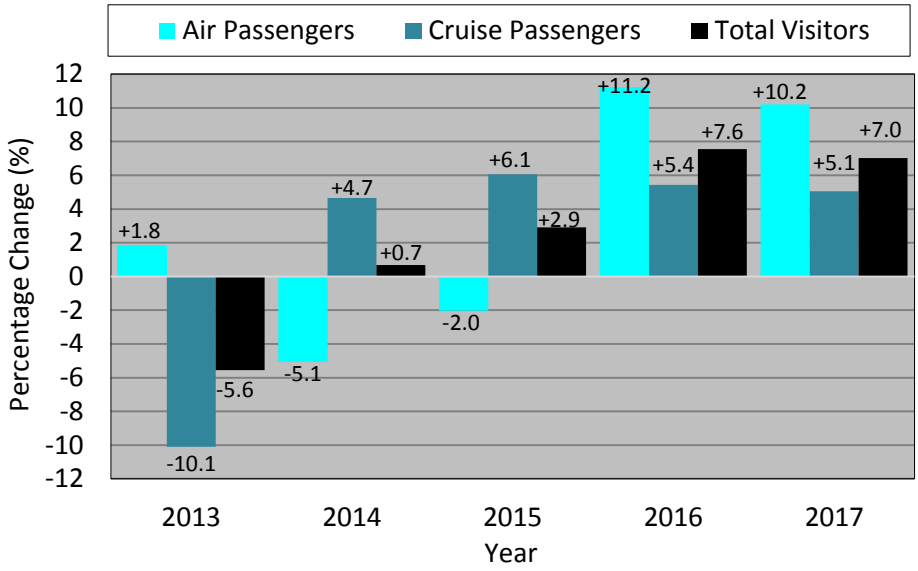
Table 2.1
AIR PASSENGER ARRIVALS, CRUISE SHIP ARRIVALS, AVERAGE LENGTH OF STAY, TOURISM INTENSITY RATE AND PENETRATION RATIO, 2013-2017

Indicator	Year				
	2013	2014	2015	2016	2017
Total visitors[1]	576,373	580,260	597,212	642,395	687,625
Percentage change (%)	-5.6	**	+2.9	+7.6	+7.0
Air passengers	236,343	224,380	219,814	244,491	269,576
Percentage change (%)	+1.8	-5.1	-2.0	+11.2	+10.2
Average length of stay for air passengers[2]	5.3	6.3	6.3	6.0	6.3
Air passengers to residents ratio	3.8	3.6	3.6	3.8 r	4.2
Tourism density ratio	63.1	71.3 r	69.8	75.0 r	86.9
Cruise ship passengers	340,030	355,880	377,398	397,904	418,049
Percentage change (%)	-10.1	+4.7	+6.1	+5.4	+5.1
Cruise ship passengers to residents ratio	5.5	5.8	6.1	6.2 r	6.5
Cruise ship arrivals	125	126	132	139	161
Percentage change (%)	-20.4	**	+4.8	+5.3	+15.8
Population	61,954 [3]	61,777 [3]	61,735 [3]	63,779 [5]	63,892 [7]
Visitors to residents ratio	9.3	9.4	9.7	10.1 r	10.8
Land area km^2	54.35 [4]	54.35 [4]	54.35 [4]	53.56 [6]	53.56
Tourism intensity rate	171.0 r	172.2 r	177.2 r	187.4 r	200.6
Tourism penetration ratio	55.4	62.7 r	61.5	63.0 r	72.8

Sources: Bermuda Tourism Authority, Department of Statistics, Department of Planning and the Land Title and Registration Office.

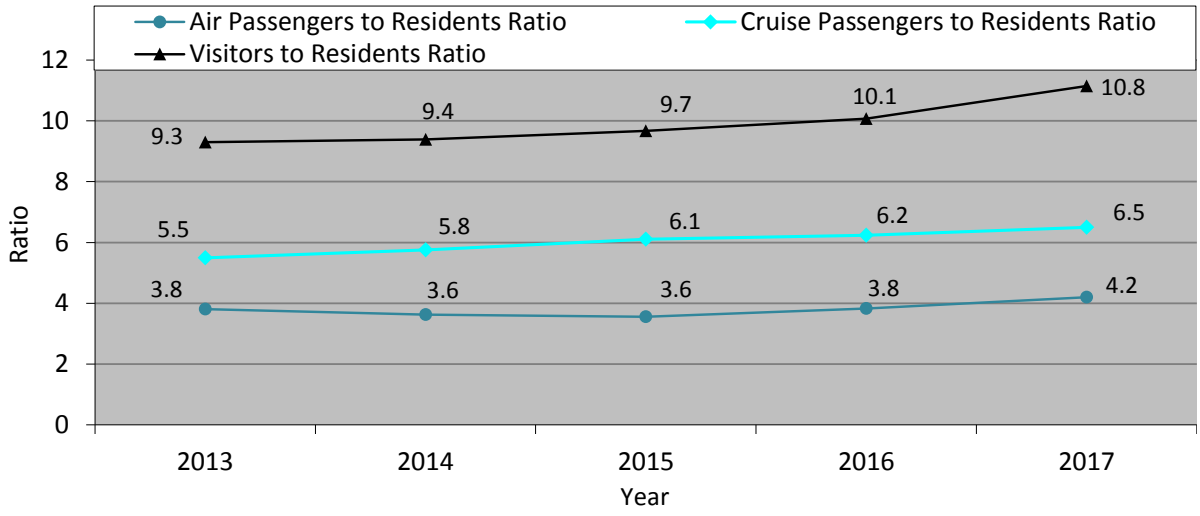
[1] Does not include yacht passengers.
[2] Bermuda Tourism Authority.
[3] Bermuda's Population Projections 2010-2020.
[4] Bermuda's land area as of 2008 was 54.35 km^2 (21.01 square miles) Department of Planning.
[5] 2016 Population and Housing Census.
[6] Bermuda's land area as of 2016 was 53.56 km^2 (20.68 square miles) Land Title and Registration Office.
[7] Bermuda's Population Projections 2016-2026.

Chart 2.1
GROWTH IN AIR PASSENGERS, CRUISE SHIP PASSENGERS AND TOTAL VISITORS, 2013-2017



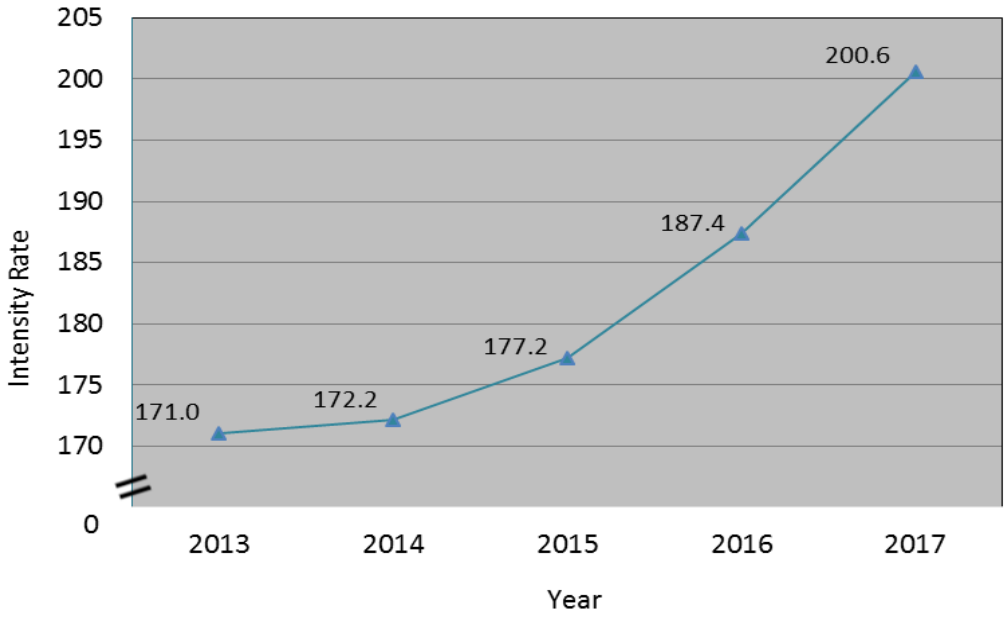
Sources: Bermuda Tourism Authority and Department of Statistics

Chart 2.2
AIR PASSENGERS TO RESIDENTS, CRUISE SHIP PASSENGERS TO RESIDENTS AND VISITOR TO RESIDENTS RATIO, 2013-2017



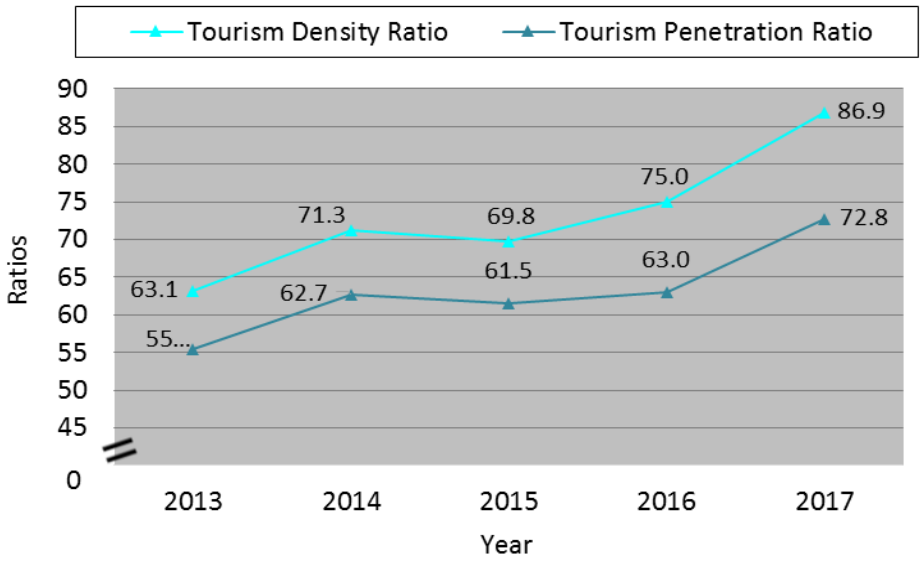
Source: Bermuda Tourism Authority and Department of Statistics

Chart 2.3
TOURISM INTENSITY RATE, 2013 - 2017



Sources: Bermuda Tourism Authority and Department of Statistics

Chart 2.4
TOURISM DENSITY AND PENETRATION RATIOS, 2013 - 2017



Sources: Bermuda Tourism Authority and Department of Statistics

Table 2.2
AIR PASSENGER ARRIVALS BY COUNTRY OF ORIGIN, 2013-2017

	Year				
Country of Origin	2013	2014	2015	2016	2017
Total	236,343	224,380	219,814	244,491	269,576
United States	171,215	159,382	157,158	182,896	198,259
Canada	27,613	29,162	24,986	23,744	27,416
United Kingdom	23,610	22,179	22,511	21,738	22,997
Other	13,905	13,657	15,159	16,113	20,904

Source: Bermuda Tourism Authority

Table 2.3
AIR PASSENGERS BY INTENDED TYPE OF ACCOMMODATION, 2013-2017

Type of Accommodation	Year				
	2013	2014	2015	2016	2017
Total	236,343	224,380	219,814	244,491	269,534
Hotels or similar[1]	167,538	153,758	152,176	171,472	179,257
Friends and Relatives/Rental House or Apt.[2]	59,423	61,705	57,501	54,362	66,194
Bed and Breakfast/Guest House[3]	7,942	7,023	5,575	10,646	10,252
Other[4]	1,440	1,894	4,562	8,011	13,831

Source: Bermuda Tourism Authority

[1] Includes resort hotels, small hotels, cottage colonies and clubs.
[2] Includes private homes.
[3] Includes housekeeping accommodations, guest houses and bed and breakfast.
[4] Includes not stated.

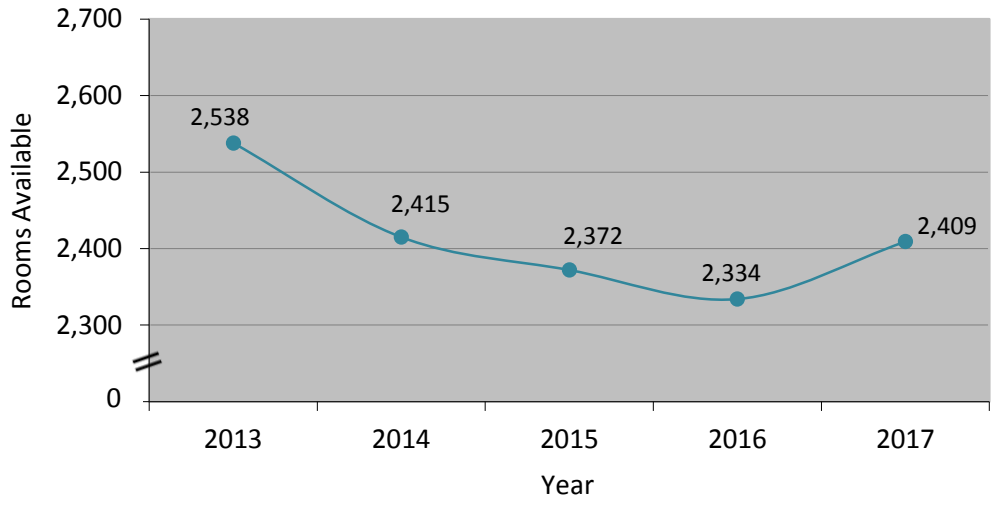
Table 2.4
NUMBER OF TOURIST PROPERTIES, OCCUPANCY RATE AND NUMBER OF ROOMS PER KM^2, 2013-2017

Item	Year				
	2013	2014	2015	2016	2017
Number of properties	47	45	42 r	42	42
Total number of rooms available	2,538	2,415	2,334 r	2,334	2,409
Total number of beds	5,264	5,018	4,852 r	4,866 r	5,120
Total number of room nights sold	342,767	330,393	..	..	..
Occupancy rate (%)[1]	56.7	53.4	52.6	57.7	63.1
Number of rooms per km^2	46.7 [2]	44.4 [2]	43.0 [2]	43.0 [2]	45.0 [3]

Sources: Bermuda Tourism Authority, Department of Planning and the Land Title and Registration Office

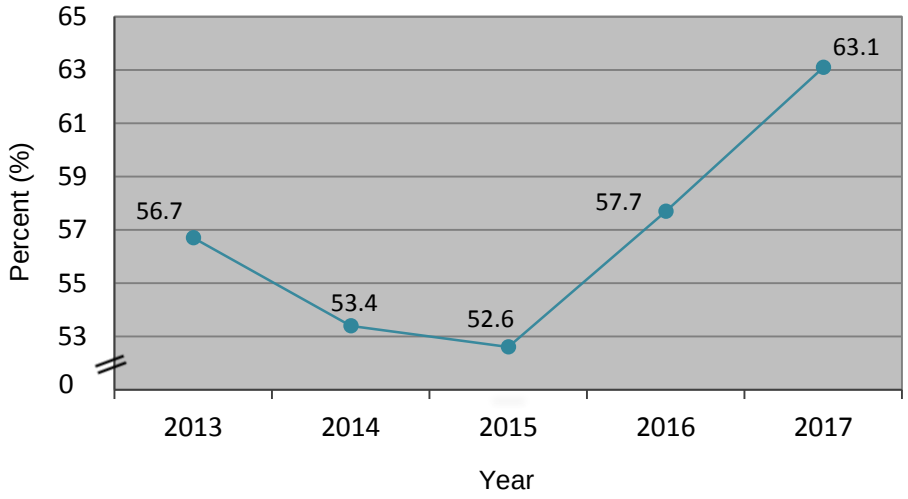
[1] Occupancy rate is only reported by the Bermuda Hotel Association which accounts for approximately 50% of the total properties and 80% of the total number of rooms and beds available.This figure is sourced from the Visitor Profile Report produced by the Bermuda Tourism Authority.
[2] Bermuda's land area as of 2008 was 54.35 km^2 (21.01 square miles) Department of Planning.
[3] Bermuda's land area as of 2016 was 53.56 km^2 (20.68 square miles) The Land Title and Registration Office.

Chart 2.5
NUMBER OF HOTEL ROOMS AVAILABLE, 2013-2017



Source: Bermuda Tourism Authority

Chart 2.6
OCCUPANCY RATE, 2013-2017



Source: Bermuda Tourism Authority

Table 2.5
VISITOR EXPENDITURE AND NUMBER EMPLOYED IN TOURISM, 2013-2017

Item		Year 2013	2014	2015	2016	2017
Visitor expenditure (in US$'000)[1]		393,600	327,900	335,600 r	398,200 r	468,000
Expenditure on same-day visits		72,800	52,700	62,200	65,500	65,400
Expenditure on accommodation, meals and drinks, shopping, entertainment, etc.		320,800	275,200	273,400	332,800	402,700
Total directly employed in tourism[2]						
	Total	4,217	4,120	4,012	4,127	4,371
	Male	2,494	2,485	2,396	2,480	2,649
	Female	1,723	1,635	1,616	1,647	1,722

[1] Source: Bermuda Tourism Authority.
[2] Includes hotels, restaurants, cafés and bars.

SECTION 3

ENVIRONMENTAL HEALTH AND WEATHER

The Environmental Health and Weather Section contains information concerning environmentally-related diseases as well as weather data for

Environmental Health

• In 2017, there were 5,567 reported cases of environmentally-related diseases in Bermuda. This represented a 5.3% decrease from the 5,877 reported cases in 2016 (Table 3.1).

• Respiratory diseases accounted for 4,927 (94.3%) of the total reported cases in 2017 (Table 3.1).

• In 2017, females accounted for the largest proportion (53.4%) of environmentally-related diseases (Table 3.1).

Weather

• Total rainfall in Bermuda decreased by 26.5% over the period 2016 to 2017 (Table 3.2).

• In 2017, the month with the most rain days (18) was June while the least (8) was recorded in April (Table 3.2).

• August had the highest mean air temperatures during 2017 with an average daily air temperature of 82.5°F. The lowest mean air temperature during 2017 was recorded in March (62.9°F) (Table 3.3).

• Over the five-year period, 2013 to 2017, the average daily air temperature reported was 72.6°F. The average maximum daily air temperature was 76.3° while the average daily minimum air temperature was 68.6°F for the same period (Table 3.3).

• In 2017, June had the highest average humidity (78.2%), while the lowest was recorded in March (66.4%). The average relative humidity for the five-year period, 2013 to 2017, was 74.0% (Table 3.4).

Table 3.1
REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY SEX, 2013-2017

Cause	Sex	Year 2013	2014	2015	2016	2017
Gastroenteritis [1, 2]	Total	581	584	682	466	446
	Male	244	230	309	202	187
	Female	337	354	373	264	259
Malaria (imported)	Total	1	2	2	—	1
	Male	1	2	2	—	1
	Female	—	—	—	—	—
Dengue (imported)	Total	—	—	2	—	—
	Male	—	—	2	—	—
	Female	—	—	—	—	—
Accidental pesticide	Total	—	2	1	1	1
	Male	—	1	1	—	—
	Female	—	1	—	1	1
Poisoning	Total	10 r	22 r	48 r	69 r	96
	Male	7 r	12 r	24 r	30 r	46
	Female	3 r	10 r	24 r	39 r	50
Diarrhea	Total	108	126	134	116	96
	Male	45	51	53	51	42
	Female	63	75	81	65	54
Respiratory diseases (all) [3]	Total	5,630	5,311	5,367	5,224	4,927
	Male	2,540	2,442	2,492	2,380	2,317
	Female	3,090	2,869	2,875	2,844	2,610
Acute bronchitis	Total	426	368	384	370	407
	Male	195	139	144	137	459
	Female	231	229	240	233	248
Chronic sinusitis	Total	231	111	99	126	88
	Male	50	28	30	37	30
	Female	106	83	69	89	58
Other	Total	5,048	4,832	4,884	4,728	4,432
	Male	2,295	2,275	2,318	2,206	1,828
	Female	2,753	2,557	2,566	2,522	2,304
TOTAL CASES, all causes	Total	6,330 r	6,045 r[2]	6,232 r	5,877 r	5,567
	Male	2,837 r	2,736 r[2]	2,879 r	2,664 r	2,593
	Female	3,493 r	3,309 r[2]	3,353 r	3,213 r	2,974
Percentage change (%)	Total	-3.3 r	-4.5 r	+3.1 r	-5.7 r	-5.3
	Male	-3.0 r	-3.6 r	+5.2 r	-7.4 r	-2.7
	Female	-3.6 r	-5.3 r	+1.3 r	-4.2 r	-7.4

Sources: Department of Health and Bermuda Hospitals Board

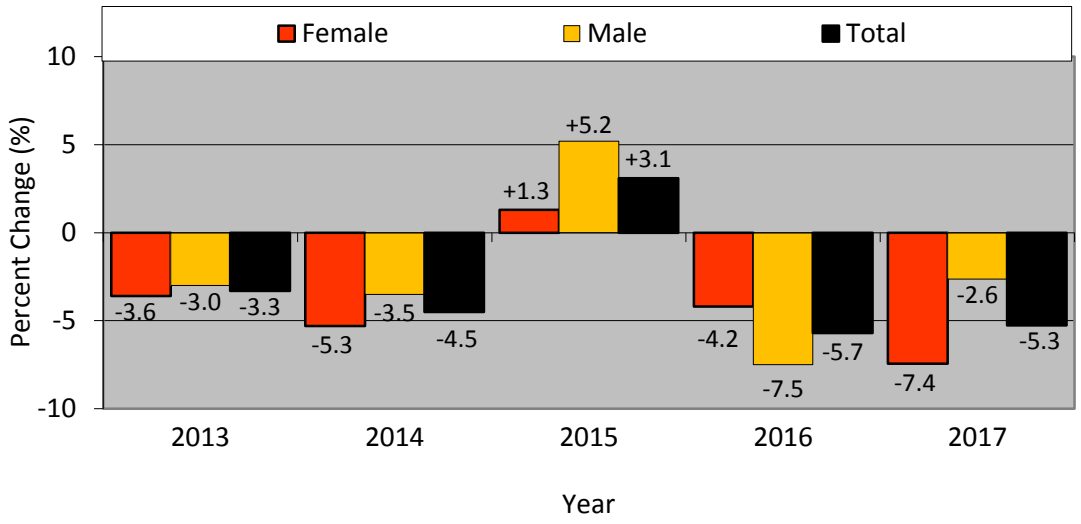
[1] Includes inpatient discharges and emergency encounters.

[2] Includes cases that may have been inadvertently coded as non-infectious gastroenteritis.

[3] Respiratory diseases (all) includes acute bronchitis, chronic sinusitis, asthma, pneumonia, etc.

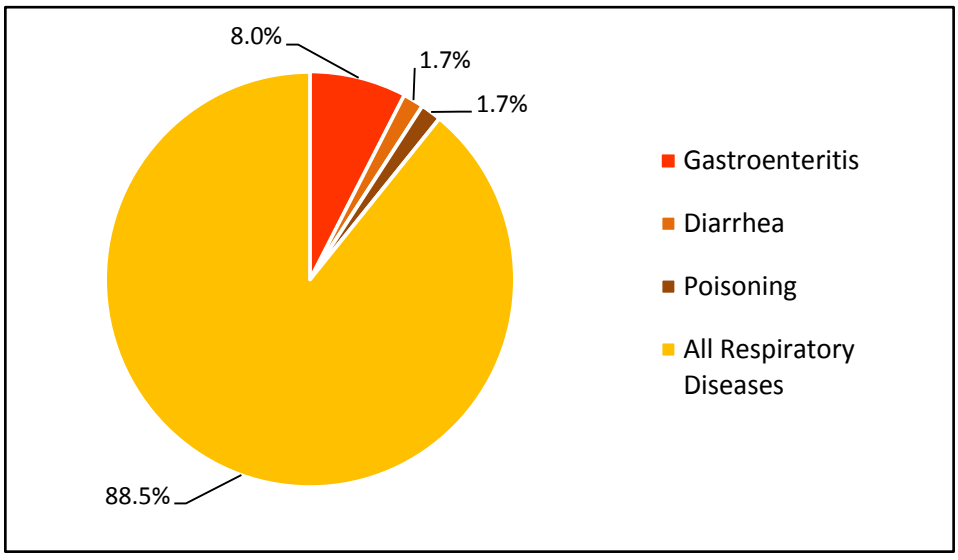
Note: The Poisoning category has been revised from 2013-2016 to reflect applicable International Classification of Diseases (ICD-9) codes.

Chart 3.1
PERCENTAGE CHANGE IN REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY SEX AND TOTAL, 2013-2017



Sources: Department of Health and Bermuda Hospitals Board

Chart 3.2
REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY CAUSE, 2017[1]



Sources: Department of Health and Bermuda Hospitals Board

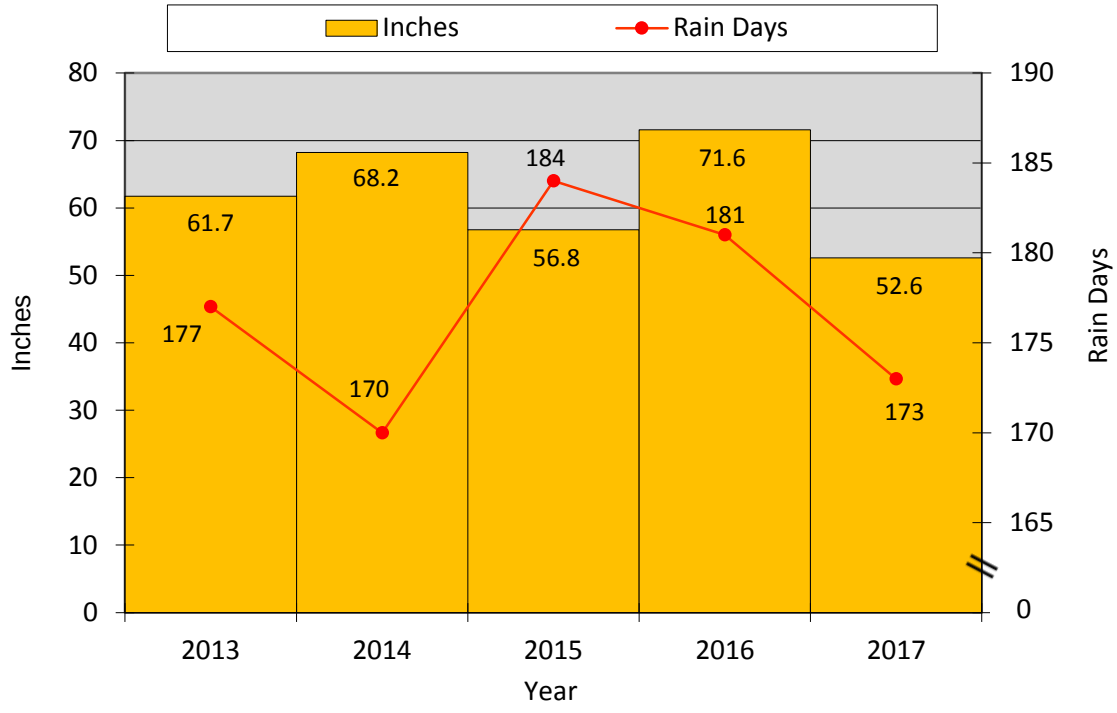
[1] Excludes Accidental Pesticide (0.02%)

Table 3.2
TOTAL NUMBER OF INCHES OF RAINFALL AND RAIN DAYS, 2013-2017

Year		Month												
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2013	Inches	2.1	6.5	5.5	3.6	2.0	4.6	3.1	10.4	9.8	6.2	3.4	4.7	61.7
	Rain Days	16	18	19	13	10	8	9	15	22	17	14	16	177
2014	Inches	6.2	8.1	4.8	1.9	3.0	2.6	4.0	14.1	4.1	7.4	8.9	3.1	68.2
	Rain Days	18	13	19	8	6	11	13	21	14	13	17	17	170
2015	Inches	4.0	9.2	2.9	4.0	1.2	3.0	8.9	5.6	5.0	6.1	2.9	4.1	56.8
	Rain Days	19	19	17	14	8	8	20	14	17	20	17	11	184
2016	Inches	6.9	5.5	7.7	2.9	6.6	5.0	4.1	3.3	11.8	10.7	3.5	3.6	71.6
	Rain Days	24	18	16	16	11	16	10	15	17	13	12	13	181
2017	Inches	9.7	3.8	2.8	0.7	0.8	4.8	5.6	5.6	4.0	6.4	3.6	4.8	52.6
	Rain Days	15	13	16	8	10	18	17	15	13	16	15	17	173

Source: The Bermuda Weather Service

Chart 3.3
TOTAL NUMBER OF INCHES OF RAINFALL AND RAIN DAYS, 2013-2017



Source: The Bermuda Weather Service

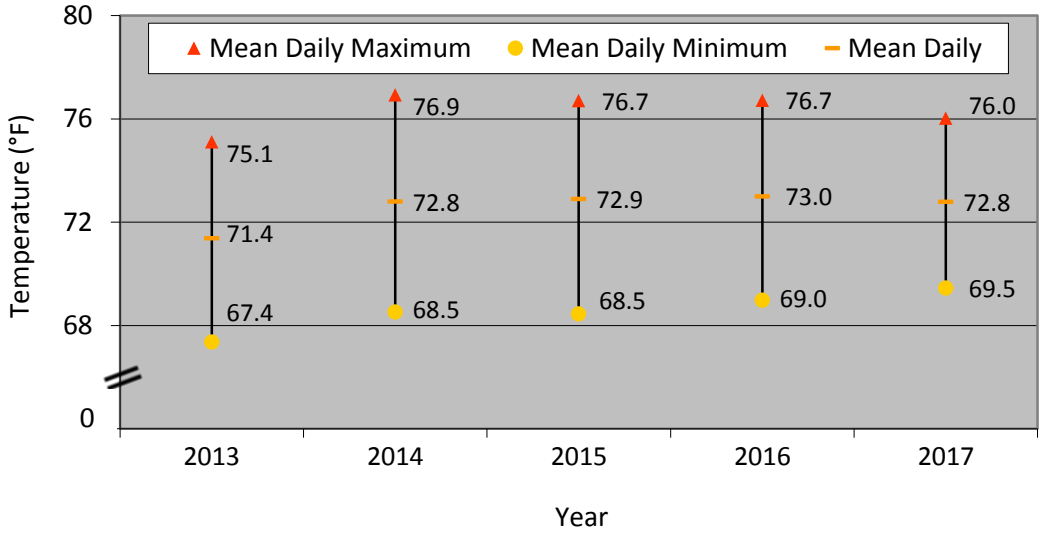
Table 3.3
MEAN DAILY MAXIMUM, MINIMUM AND DAILY AIR TEMPERATURE, 2013-2017

(°F)

Year		Month												Yearly Average
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
2013	Mean Daily Max.	68.0	67.2	66.3	69.9	73.0	80.4	85.6	84.8	82.3	79.6	73.0	71.3	75.1
	Mean Daily Min.	60.0	59.6	58.7	62.3	65.5	73.2	77.2	75.9	74.4	72.5	65.4	63.7	67.4
	Mean Daily	64.4	63.5	62.6	66.2	69.2	76.7	81.4	80.7	78.5	76.0	69.5	67.8	71.4
2014	Mean Daily Max.	70.5	71.7	70.0	72.2	74.8	80.0	83.8	84.0	85.5	81.4	75.8	73.4	76.9
	Mean Daily Min.	63.0	63.5	61.8	65.5	66.8	71.7	76.7	74.9	75.2	71.6	66.6	65.0	68.5
	Mean Daily	67.0	67.7	66.0	68.7	70.7	75.8	80.2	79.8	80.2	76.5	71.7	69.3	72.8
2015	Mean Daily Max.	70.6	67.7	68.9	71.7	75.4	82.1	85.8	85.3	84.4	79.9	75.3	73.4	76.7
	Mean Daily Min.	61.9	58.5	60.6	63.6	68.5	74.6	71.1	77.9	77.1	72.7	68.7	66.2	68.5
	Mean Daily	66.6	63.4	64.8	67.8	71.6	78.2	81.4	81.7	80.7	76.5	72.1	70.0	72.9
2016	Mean Daily Max.	70.4	69.4	71.2	71.6	76.9	80.6	85.4	86.5	84.8	79.9	72.7	71.2	76.7
	Mean Daily Min.	62.6	61.1	63.1	63.8	69.5	73.5	77.9	78.2	76.8	72.8	65.0	63.5	69.0
	Mean Daily	66.6	65.6	67.6	67.9	73.3	76.9	81.5	82.3	81.2	76.4	69.2	67.5	73.0
2017	Mean Daily Max.	69.4	68.9	67.0	71.9	68.7	82.2	85.6	86.4	84.2	79.6	76.1	72.4	76.0
	Mean Daily Min.	61.8	60.4	58.8	64.4	76.8	74.3	77.4	78.3	77.3	71.7	67.8	64.4	69.5
	Mean Daily	65.9	64.9	62.9	67.9	72.3	78.1	81.7	82.5	80.8	75.9	72.0	68.6	72.8

Source: The Bermuda Weather Service

Chart 3.4
MEAN DAILY MAXIMUM, MINIMUM AND DAILY AIR TEMPERATURE, 2013-2017



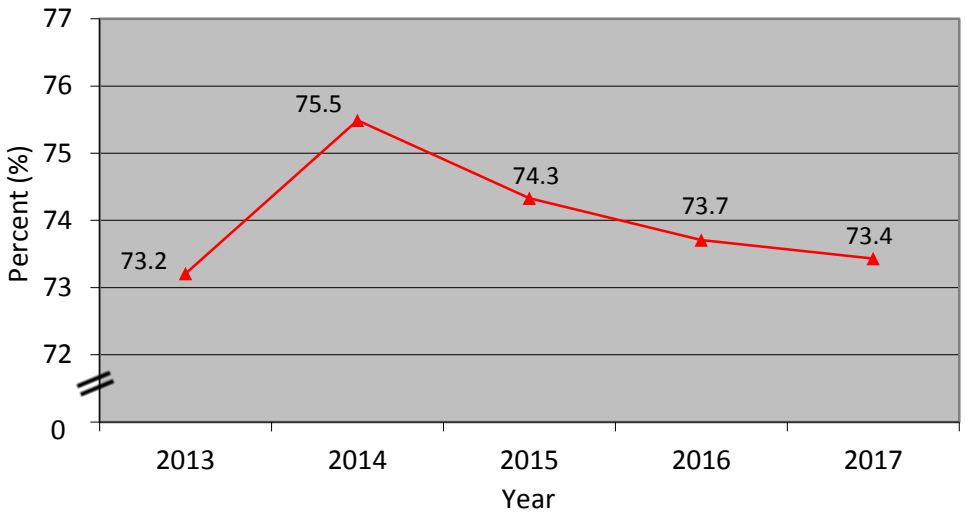
Source: The Bermuda Weather Service

Table 3.4
MEAN RELATIVE HUMIDITY, 2013-2017

Year	Month												(%) Yearly Average
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	
2013	71.3	69.7	69.5	76.9	72.0	76.9	71.7	74.5	76.8	76.5	67.8	74.9	73.2
2014	74.8	77.9	69.5	71.9	68.6	76.8	76.1	82.6	81.5	77.4	77.3	71.5	75.5
2015	70.2	70.8	69.6	74.2	73.5	79.2	75.7	76.6	76.0	76.9	71.3	77.9	74.3
2016	72.3	73.8	74.9	71.6	80.2	79.4	77.4	73.8	74.9	70.7	64.3	71.2	73.7
2017	74.3	69.9	66.4	71.0	74.2	78.2	76.1	74.3	73.4	74.0	77.2	72.1	73.4

Source: The Bermuda Weather Service

Chart 3.5
MEAN RELATIVE HUMIDITY, 2013-2017



Source: The Bermuda Weather Service

NATURAL AND ENVIRONMENTAL DISASTERS

Occurrences of natural and environmental disasters are very rare in Bermuda.

Hurricanes

• There were no hurricanes that affected Bermuda in 2017. The last hurricane to hit Bermuda was in October 2016.

Fires

• The total number of fires reported in Bermuda (2,033) remained the same from 2016-2017 (Table 4.2).

• In 2017, the majority of fires (51.6%) were classified in the "Structure" category (Table 4.2).

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.

Types of Disaster: Avalanches, floods, earthquakes, hurricanes, torrential rains, volcanic eruptions, droughts, landslides, mudslides, fires, blizzards, tsunamis, etc.

Source: CARICOM Environment Programme

Table 4.1
NATURAL DISASTERS, 2017

Item	
Type of disaster	—
Date started	—
Total casualties:	—
of which: dead	—
Total population affected	—
Damage ($ million)	—

Source: The Bermuda Business Development Agency

Note: Hurricane Jose passed Bermuda 18-19 September, 2017 but there was no damage sustained to the Island.

Table 4.2
INCIDENCES OF FIRE BY TYPE, 2013-2017

Year	Total	Type					
		Minor Incidents[1]	Structure[2]	Island Fires	Vehicle	Boat Fires	Other[3]
2013	1,830	372	495	..	13	..	950
2014	1,804	512	629	..	28	..	635
2015	1,875	318	933	..	26	..	598
2016	2,033	298	1,069	..	18	..	648
2017	2,033	337	1,049	..	18	..	629

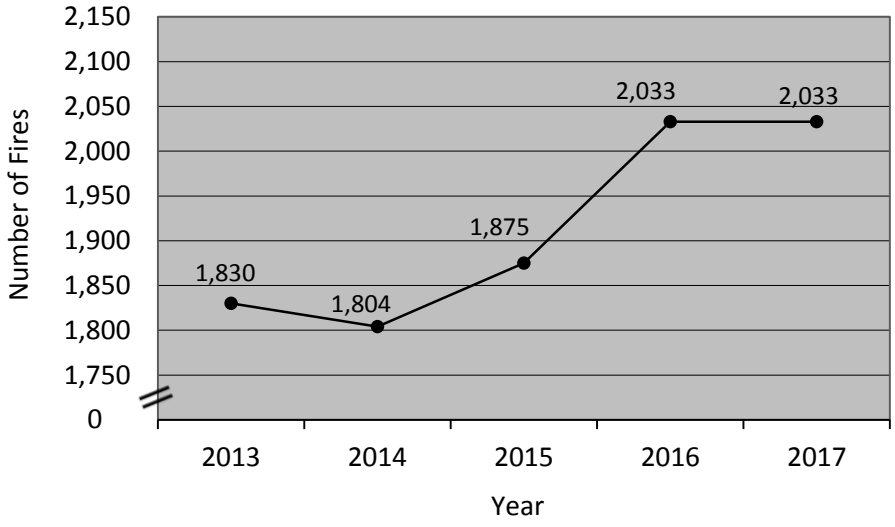
Source: Bermuda Fire and Rescue Service

[1] Includes brush, trash, gas cylinder leaks, oil spills, floodings, pole fires, etc.

[2] Includes false alarms.

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

Chart 4.1
TOTAL INCIDENCES OF FIRES, 2013-2017



Source: Bermuda Fire and Rescue Service

SECTION 5

ENERGY, MINERALS AND TRANSPORT

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

Fuel

• In 2017, the value of imported petroleum oils and oils from bituminous minerals, other than crude imported into Bermuda, was $75.3 million, a decrease of 5.4 percent from the total value imported in 2016 (Table 5.1).

• The quantity of imported fuels decreased to 176.1 million kg in 2017, a decrease of 3.4 percent over the previous year (Table 5.1).

Mineral Fuels

• In 2017, the value of imported mineral fuels, mineral oils and related products dropped to $78.8 million. This is a 4.1% decrease from the $82.2 million imported in 2016 (Table 5.2).

Electricity

• Total electricity consumption in 2017 fell marginally to approximately 585 million kWh from 586 million kWh in 2016. The commercial sector accounted for just under half (48.7%) of all electricity consumed in Bermuda (Table 5.3).

Transport

• In 2017, there were 49,019 registered road vehicles in Bermuda. Private cars accounted for nearly half (45.0%) of this total, while just over one-third (35.0%) were motorcycles and scooters (Table 5.6).

Table 5.1
VALUE OF IMPORTED FUEL[1] BY TYPE, 2015-2017

Type	2015 Value ($)	2015 Quantity (kg)	2016 Value ($)	2016 Quantity (kg)	2017 Value ($)	2017 Quantity (kg)
Total	89,501,659 r	168,886,295	79,649,287	182,289,097	75,336,261	176,115,844
Light oils & preparations (i.e. motor spirits)	14,718,077	15,158,486	16,787,737	22,213,786	14,716,895	16,816,186
Gas oils (diesel)	5,849,354	7,779,153	13,246,535	19,640,803	16,251,227	24,940,228
Gas oils (heavy atmospheric)	11,935,809	22,074,662	8,311,503	18,116,640	965	56
Kerosene & other medium oils (not including gas oils)	11,374,549	20,208,931	10,046,836	20,488,022	6,081,754	11,542,749
Fuel oils not elsewhere specified	42,503,568 r	102,464,241 r	28,269,783 r	100,768,690 r	35,144,801	122,073,991
Other lubricating oils & greases, etc.	3,104,778	1,198,566	2,970,482	1,058,303	3,105,100	733,612
Other waste oils	15,524	2,256	16,411	2,853	35,519	9,022

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, 2015-2017

Type	2015 Value ($)	2015 Quantity (kg)	2016 Value ($)	2016 Quantity (kg)	2017 Value ($)	2017 Quantity (kg)
Total	91,734,034	180,937,147	82,238,355	208,957,446	78,824,783	182,156,315
Coal, briquettes	20,996	7,707	22,211	10,572	21,579	5,632
Lignite	—	—	—	—	—	—
Peat	66,718	48,576	81,706	65,616	139,270	46,862
Coke and semi coke	85,425	50,116	75,576	48,906	48,082	30,049
Coal gas, water gas	—	—	—	—	—	—
Tar distilled	3,960	5,974	781	2,000	4,603	4,470
Oils and other products	97,511	3,209	16,949	3,494	2,758	615
Pitch and pitch coke	—	—	—	—	167	16
Petroleum oils	—	—	—	—	—	—
Petroleum oils other than crude	89,501,658	168,886,296	79,649,286	182,289,097	75,336,262	176,115,844
Petroleum gases & other gaseous hydrocarbons	1,491,365	3,723,766	1,859,422	25,550,267	2,464,040	4,368,200
Petroleum jelly	126,896	76,613	39,900	5,964	47,033	5,433
Petroleum coke	66,894	7,170	42,037	4,337	156,844	32,402
Other bitumen and asphalt	10,140	7,689,946	47,103	117,655	162,106	331,730
Bituminous mixtures	262,471	437,774	403,384	859,538	442,039	1,215,062
Electrical energy	—	—	—	—	—	—

Source: Department of Statistics

Table 5.3
ELECTRICITY CONSUMPTION BY TYPE OF CONSUMER, 2013-2017

Year	Total ('000 kWh)	Type		
		Residential ('000 kWh)	Commercial ('000 kWh)	Other[1] ('000 kWh)
2013	586,704	244,421	295,043	47,240
2014	577,365	235,523	291,350	50,492
2015	590,427	245,498	290,552	54,377
2016	585,774	245,105	286,588	54,081
2017	584,518	245,124	284,866	54,528

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

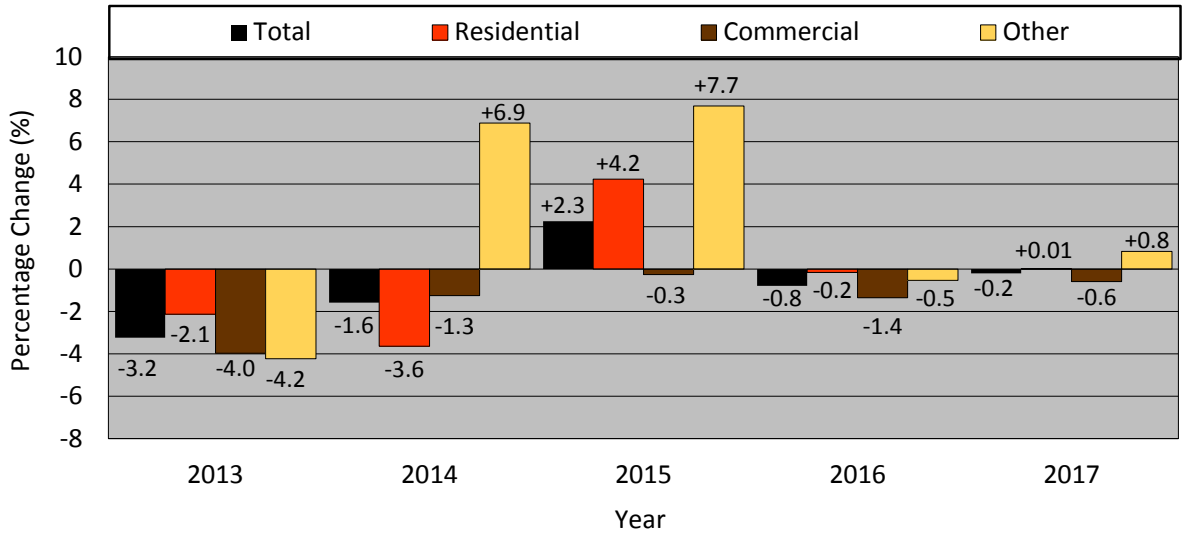
Table 5.4
GROWTH IN ELECTRICITY CONSUMPTION BY TYPE OF CONSUMER, 2013-2017

Year	Growth	Type		
	Electricity Consumption	Residential Percentage	Commercial Percentage	Other[1] Percentage
2013	-3.2	-2.1	-4.0	-4.2
2014	-1.6	-3.6	-1.3	+6.9
2015	+2.2	+4.2	**	+7.7
2016	**	**	-1.4	**
2017	**	**	**	**

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

Chart 5.1
GROWTH IN ELECTRICITY CONSUMPTION BY TYPE OF CONSUMER AND TOTAL CONSUMPTION, 2013-2017



Source: Ascendant Group Limited

Table 5.5
PERCENTAGE OF TOTAL ELECTRICITY CONSUMPTION BY TYPE OF CONSUMER, 2013-2017

		Type		
Year	Total	Residential Percentage	Commercial Percentage	Other[1] Percentage
2013	100.0	41.7	50.3	8.1
2014	100.0	40.8	50.5	8.8
2015	100.0	41.6	49.2	9.2
2016	100.0	41.8	48.9	9.2
2017	100.0	41.9	48.7	9.3

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

Table 5.6
REGISTERED ROAD VEHICLES[1], 2013-2017

Type	Year				
	2013	2014	2015	2016	2017
Total	46,947	46,625	47,092	47,482 r	49,019
Percentage change (%)	-1.1	**	+1.0	** r	+3.2
Private Cars	21,564	21,464	21,607	21,709 r	22,046
Buses, Minibuses & Limousines	187	190	208	225 r	250
Taxis	581	576	564	553 r	555
Trucks	3,655	3,620	3,583	3,624 r	3,742
Trailers	288	290	280	288 r	258
Farm Tractors	25	29	29	26 r	26
Ambulances & Fire Engines	44	46	45	46 r	47
Military Vehicles	32	31	33	36 r	42
Tractors & Tractor Trailers	376	338	319	262 r	254
Light Private Cars	81	80	76	73 r	71
Auxiliary Cycles[2]	4,458	4,196	4,074	3,933 r	3,925
Motor Cycles & Scooters	15,009	15,134	15,659	16,116 r	17,148
Construction Vehicles[3]	60	53	53	51 r	45
Government Private (GP) Vehicles[4]	252	254	244	241 r	272
Other [5]	335	324	318	299 r	338

Source: Transport Control Department

[1] Number of vehicles for which a valid license was in effect as of 31st December.

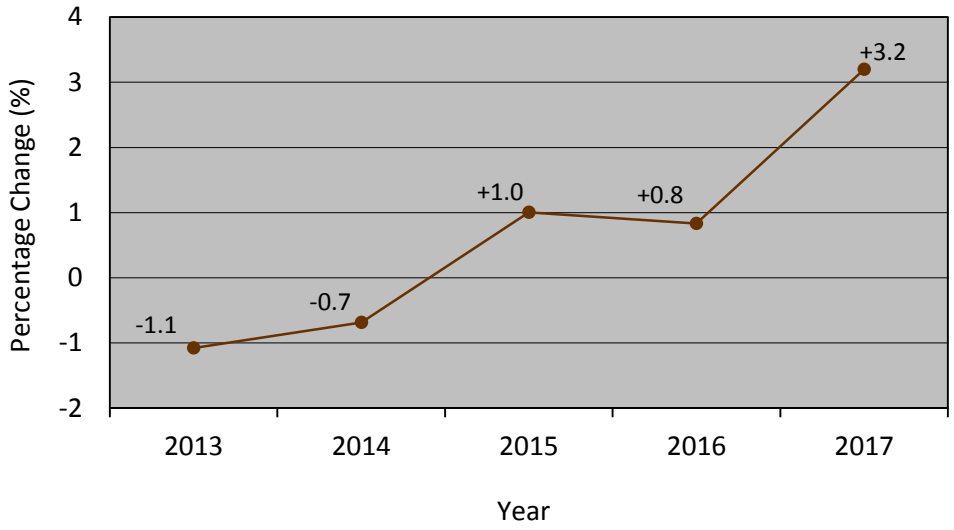
[2] Includes livery cycles.

[3] Includes cement mixers.

[4] Includes cars (classes A-H) and minibuses.

[5] Includes classic cars, community service vehicles, doctors' cars, garbage trucks, hearses, instructional vehicles, loaner vehicles, locomotives, police utility vehicles, public carriages and sporting associations.

Chart 5.2
PERCENTAGE CHANGE IN REGISTERED ROAD VEHICLES, 2013-2017



Source: Transport Control Department

SECTION 6

AGRICULTURE

The Agriculture Section includes tables and charts on the importation of fertilizers and pesticides to Bermuda.

Fertilizers and Pesticides

• In 2017, the value of fertilizers imported into Bermuda totaled nearly $612 thousand for 227,884 kg (Table 6.1).

• In 2017, other fertilizers accounted for over half (59.3%) of the total value of fertilizers imported to Bermuda (Table 6.1)

• In 2017, the value of pesticides imported into Bermuda totaled approximately $1.8 million for 380,933 kg (Table 6.2).

• In 2017, insecticides accounted for over one-third (35.6%) of the total value of imported pesticides. (Table 6.2).

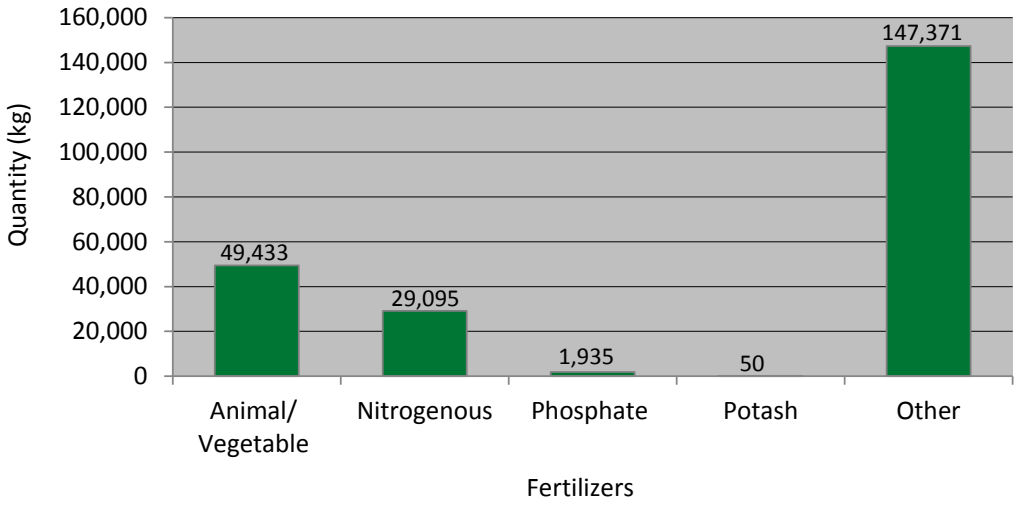
Table 6.1
IMPORTED FERTILIZERS BY TYPE, 2015-2017

Category	2015 Value ($)	2015 Quantity (kg)	2016 Value ($)	2016 Quantity (kg)	2017 Value ($)	2017 Quantity (kg)
Total	606,966	270,256	540,604	308,762	611,514	227,884
Percentage change (%)	-6.6	-14.5	-10.9	+14.3	+13.1	-26.2
Animal/Vegetable fertilizers	205,005	59,821	207,310	117,984	156,883	49,433
Nitrogenous fertilizers	75,123	23,256	85,965	30,506	84,981	29,095
Phosphate fertilizers	20,412	527	1,218	1,150	6,721	1,935
Potash fertilizers	9,250	1,375	2,497	34	158	50
Other fertilizers [1]	297,176	185,277	243,614	159,088	362,771	147,371

Source: Department of Statistics

[1] Other fertilizers include mixtures of two or three of the fertilizing elements nitrogen, phosphorus or potassium.

Chart 6.1
IMPORTED FERTILIZERS BY TYPE, 2017



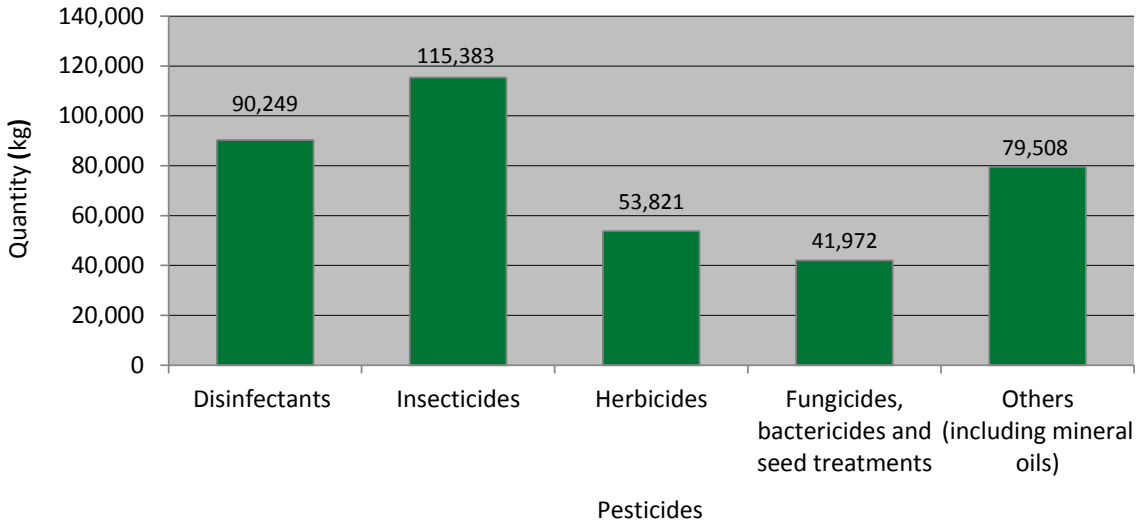
Source: Department of Statistics

Table 6.2
IMPORTED PESTICIDES BY TYPE, 2015-2017

Category	2015 Value ($)	2015 Quantity (kg)	2016 Value ($)	2016 Quantity (kg)	2017 Value ($)	2017 Quantity (kg)
Total	2,029,851	559,676	2,037,312	664,346	1,811,041	380,933
Percentage change (%)	+10.9	+11.3	**	+18.7	-11.1	-42.7
Disinfectants	490,923	226,962	510,664	307,633	546,259	90,249
Insecticides	866,730	143,154	1,041,277	166,948	645,594	115,383
Herbicides	339,472	87,701	221,916	40,164	306,163	53,821
Fungicides, bactericides and seed treatments	115,513	31,564	64,645	66,765	112,316	41,972
Others (including mineral oils)	217,213	70,295	198,810	82,836	200,709	79,508

Source: Department of Statistics

Chart 6.2
IMPORTED PESTICIDES BY TYPE, 2017



Source: Department of Statistics

SECTION 7

LAND USE

The data in the Land Use Section was collected in 2001 by the Department of Planning and has not been updated.

Land Use

• Residential properties occupied 45.10 percent of all land in Bermuda, covering roughly 5,984 acres of land (Table 7.1).

• Nearly 4,417 acres were dedicated to open space land use which comprises of golf courses, nature reserves, other recreation and rural areas. This represents about one-third (33.3%) of Bermuda's land (Table 7.1).

• Land used for commercial purposes (such as retail and office space) accounted for 1.70 percent of all occupied land space in Bermuda (Table 7.1).

Parishes

• A comparison of land use by parish showed that St. George's holds the largest share of land (2,162.7 acres) and Pembroke has the least (1,170.3 acres) (Table 7.2.2).

Municipalities

• Among the two municipalities, the City of Hamilton occupies the least amount of land in Bermuda (176.3 acres) and the Town of St. George has the most (341.0 acres) (Table 7.2.2).

Table 7.1
LAND USE, 2017

Main Use	Sub-Category	Total Area (Acres)	Percentage Distribution
Total		13,268.7	100.0
Residential	Total	5,983.9	44.9
	Housing	5,799.5	43.7
	Condos	162.3	1.2
	Institutional	22.2	**
Open space	Total	4,416.8	33.3
	Nature reserve	1,258.1	9.5
	Rural	1,162.8	8.8
	Other	946.2	7.1
	Golf courses	808.8	6.1
	Recreation	240.9	1.8
Utilities	Total	734.3	4.1
	Airport	548.4	4.1
	Waste	67.1	**
	Transport	44.0	**
	BELCO	38.0	**
	Docks	36.8	**
Institutional	Total	524.0	1.9
	Education	254.2	1.9
	Religious	87.5	**
	Government	64.0	**
	Police	59.1	**
	Hospital	30.3	**
	Prison	16.8	**
	Social	12.2	**
Tourism	Total	332.3	2.5
	Cottage colonies	204.7	1.5
	Hotels	127.6	1.0
Industrial	Total	321.6	1.5
	General	200.4	1.5
	Light industrial	64.4	**
	Quarry	56.8	**
Vacant	Total	119.9	**
	Vacant land	610.3	4.6
	Vacant buildings	119.9	**
Commercial	Total	99.5	**
	Retail	126.2	1.0
	Office	63.0	**
	Mixed-use	36.5	**

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 time mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

Table 7.2.1
LAND USE BY PARISH, CITY AND TOWN IN ACRES, 2017

Main Use / Sub-Category	Parish/Town/City										
	St. George's	Town of St. George	Hamilton	Smith's	Devonshire	Pembroke	The City of Hamilton	Paget	Warwick	South-ampton	Sandy's
Total	2,162.7	341.0	1,312.2	1,216.3	1,221.4	1,170.3	176.3	1,303.0	1,415.4	1,511.7	1,438.4
Residential	450.3	98.6	585.4	709.7	562.4	758.1	27.4	803.6	707.0	610.7	669.5
Housing	444.2	95.9	570.1	696.0	527.2	742.8	25.7	780.0	686.2	586.1	645.4
Condos	6.1	2.7	15.3	10.6	28.0	11.9	—	21.8	20.8	24.6	20.4
Institutional	—	—	—	3.1	7.2	3.5	1.7	1.8	—	—	3.7
Open space	715.6	138.8	611.3	432.7	499.3	132.3	7.9	296.8	584.8	614.4	383.0
Nature reserve	296.4	8.4	156.2	106.0	163.7	74.0	6.4	70.3	164.5	104.3	107.8
Other	218.9	30.2	167.9	75.3	57.0	25.4	1.5	59.3	65.3	121.7	124.0
Golf courses	139.5	79.7	127.7	—	76.6	—	—	10.8	171.0	198.1	5.4
Recreation	36.0	—	9.1	24.8	35.4	27.3	—	4.2	53.4	16.9	33.9
Rural	24.9	20.4	150.4	226.6	166.6	5.7	—	152.2	130.7	173.5	111.9
Utilities	606.2	9.4	10.8	6.7	23.5	23.5	26.4	—	—	4.7	20.2
Airport	548.4	—	—	—	—	—	—	—	—	—	—
Waste	37.0	2.4	10.8	—	14.1	—	—	—	—	—	2.7
Transport	10.2	3.2	—	—	5.0	3.2	16.1	—	—	3.3	2.5
Docks	6.5	3.7	—	—	—	—	10.3	—	—	—	15.1
BELCO	4.1	—	—	6.7	4.4	20.3	—	—	—	1.4	—
Institutional	48.1	33.9	13.0	15.8	72.6	96.2	29.9	66.4	54.6	30.7	60.6
Education	27.3	20.4	8.9	11.3	36.0	47.8	4.4	27.9	28.0	17.0	25.3
Police	15.5	0.5	—	—	9.3	1.3	1.1	—	9.0	6.8	15.4
Religious	2.3	10.0	4.1	4.5	5.0	15.7	6.6	10.3	10.3	6.9	11.9
Prison	1.5	—	—	—	—	2.8	5.3	4.6	2.6	—	—
Government	1.5	2.9	—	—	11.0	25.5	12.5	8.9	—	—	1.2
Hospital	—	—	—	—	11.3	—	—	14.7	—	—	3.2
Social	—	—	—	—	—	3.2	—	—	4.7	—	3.7

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 13,430.4 acres (low time mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

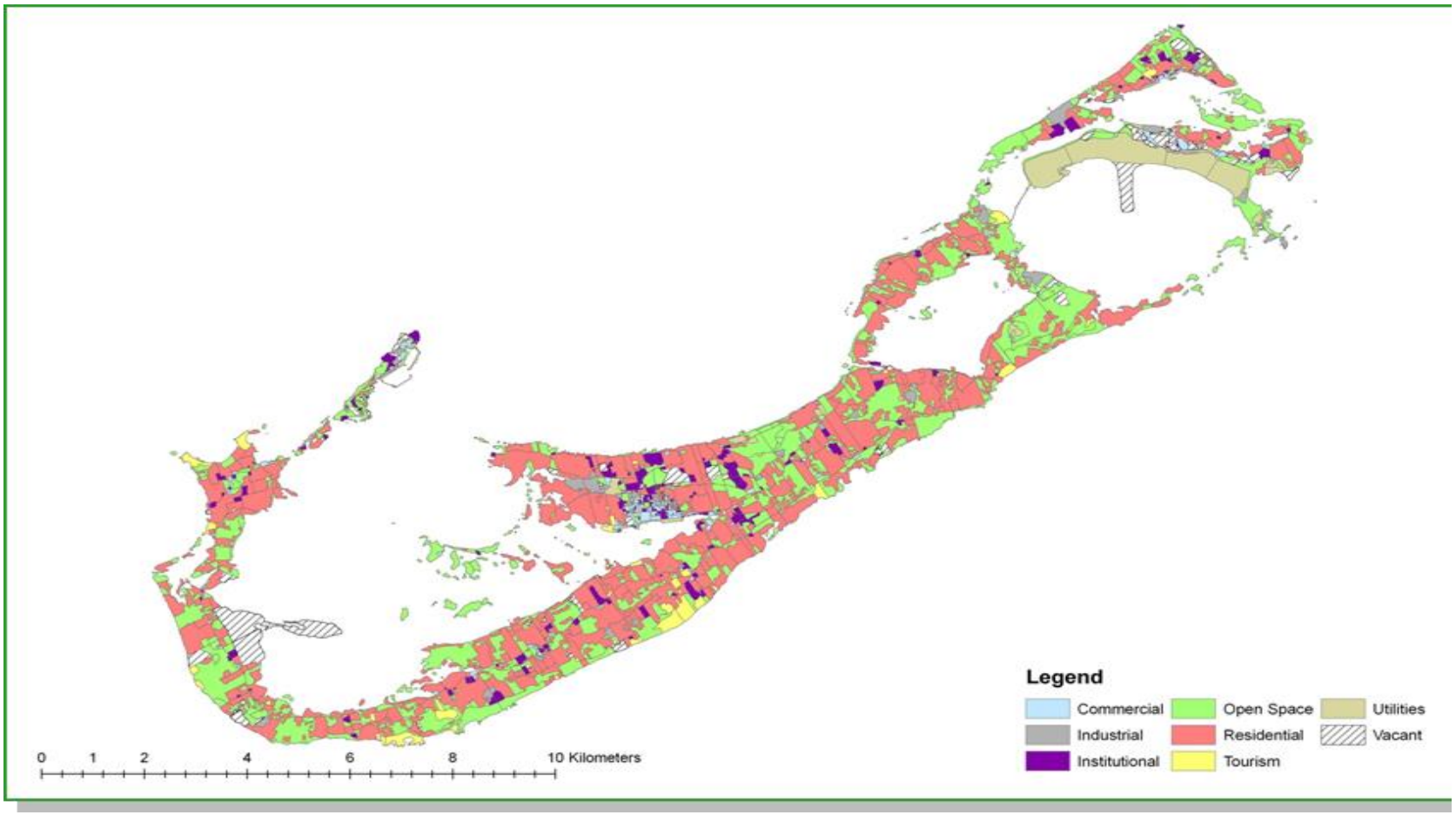
Table 7.2.2
LAND USE BY PARISH, CITY AND TOWN IN ACRES, 2017

Main Use / Sub-Category	Parish/Town/City										
	St. George's	Town of St. George	Hamilton	Smith's	Devonshire	Pembroke	The City of Hamilton	Paget	Warwick	South-ampton	Sandy's
Tourism	4.0	10.2	18.7	15.3	14.2	15.7	—	112.1	8.7	88.7	44.7
Cottage colonies	4.0	10.2	18.7	15.3	14.2	3.0	—	62.4	8.7	23.6	44.7
Hotels	—	—	—	—	—	12.7	—	49.8	—	65.2	—
Industrial	99.6	8.9	47.5	21.1	18.9	55.6	12.3	4.1	18.0	21.8	13.9
General	66.6	1.3	11.5	9.5	11.3	52.9	6.0	0.7	7.8	18.9	13.9
Light industrial	33.0	7.6	—	—	7.5	2.7	6.4	3.4	1.0	2.9	—
Quarry	—	—	36.0	11.6	—	—	—	—	9.2	—	—
Vacant	206.5	29.1	14.0	12.2	19.5	60.5	3.6	3.1	30.8	130.2	219.4
Vacant land	155.4	10.3	—	12.2	19.5	60.5	3.6	—	21.3	130.2	197.1
Vacant buildings	51.2	18.8	14.0	—	—	—	—	3.1	9.5	—	22.3
Commercial	32.5	10.6	11.01	2.9	10.8	27.2	66.8	16.4	9.1	10.2	27.0
Office	19.0	—	—	—	4.2	15.1	16.9	6.6	—	—	—
Retail	13.5	6.3	11.01	2.9	6.6	12.1	17.7	9.8	9.1	10.2	27.0
Mixed-use	—	4.3	—	—	—	—	32.2	—	—	—	—

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 13,430.4 acres (low time mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

Map 7.1
LAND USE SURVEY, 2017



Source: Department of Planning

SECTION 8

COASTAL AND MARINE RESOURCES

This Section includes information on various marine areas by name, location, 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

• Bermuda's total marine area covers 4,236.1 km^2, of which 7.0% or 294.7 km^2 is classified as protected area (Table 8.1 and Chart 8.1).

• There are 29 protected dive sites located in Bermuda covering an area of 13.7 km^2 (Table 8.2).

• A total of 12 marine parks have been established in Bermuda covering an area of 1.86 km^2 (Table 8.2).

• There are two fisheries seasonal protected areas that measure 153.4 km^2 (Table 8.2).

• Two coral reef preserves occupy a total of 131.1 km^2 (Table 8.2).

Fisheries

• Fish landings excluding bait and shellfish totalled 320.7 metric tonnes (mT) in 2017, a decrease of 2.3% from 2016. The tuna and pelagic group was the most popular catch at 151.5 mT

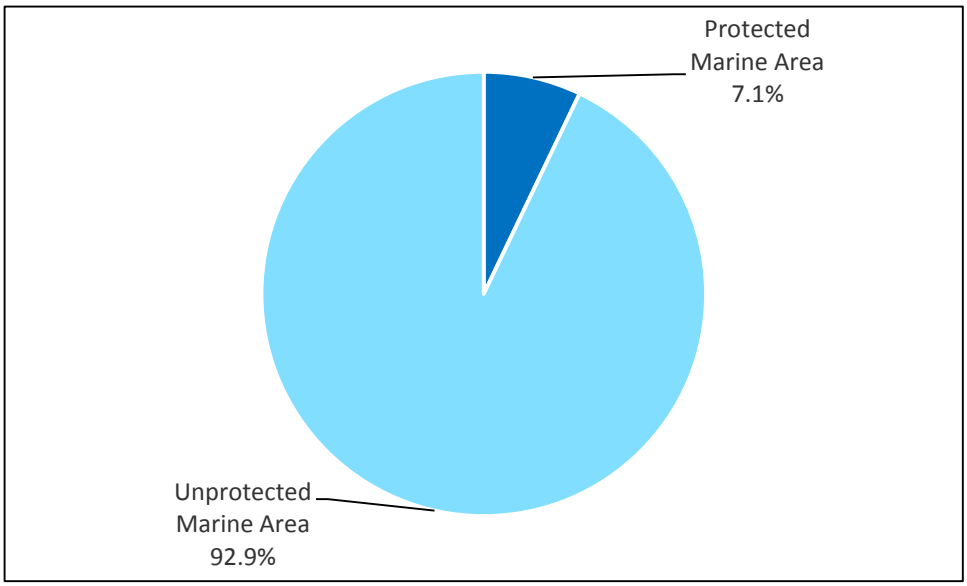
• In 2017, 325 registered fishermen spent a total of 74,019 hours at sea. There was a 17.3% increase in registered fishermen which accounted for 6,310 more hours spent at sea (Table 8.5).

Table 8.1
TOTAL AND PROTECTED MARINE AREA, 2017

Indicator	
Total land and marine area (km^2)	4,289.7
Total marine area (km^2)	4,236.1
Protected marine area (km^2)	294.7
Protected marine area as a % of total marine area	7.1
Protected marine area as a % of total land and marine area	6.9

Source: Department of Planning

Chart 8.1
PROTECTED MARINE AREA AS A PERCENTAGE OF TOTAL MARINE AREA, 2017



Source: Department of Planning

Table 8.2
MARINE PROTECTED AREAS BY CATEGORY AND AREA, 2017

Marine Protected Areas	Area (km^2)	Areas Protected Dive Sites	(km^2)
Coral Reef Preserves			
Subtotal	131.1	Subtotal	13.7
North Shore Coral Reef Preserve	126.3	North Rock	3.1
South Shore Coral Reef Preserve	4.8	SW Breaker	1.1
		Eastern Blue Cut	1.1
Fisheries Seasonal Protected Areas		Pelinaion	0.8
Subtotal	153.4	Hermes	0.8
South Western Area	114.7	Constellation	0.8
North Eastern Area	38.7	Cristobal Colon	0.3
		NE Breaker	0.3
Marine Parks		Taunton	0.3
Subtotal	1.9	Aristo	0.3
Castle Island Marine Park	0.7	Mills Breaker	0.3
South Shore Marine Park	0.4	Cathedral	0.3
Cooper's Island Marine Park	0.3	Kate	0.3
Walsingham Marine Park	0.2	Tarpon Hole	0.3
John's Smiths Bay Marine Park	0.1	Marie Celeste	0.3
Tobacco Bay Marine Park	0.1	North Carolina	0.3
Spittal Pond Marine Park	0.1	Airplane	0.3
Church Bay Marine Park	0.0	Blanche King	0.3
Astwood Bay Marine Park	0.0	Darlington	0.3
Shelly Bay Marine Park	0.0	L'Herminie	0.3
Daniel's Head Marine Park	0.0	Lartington	0.3
Somerset Long Bay Marine Park	0.0	Montana	0.3
		Snake Pit	0.3
		Hog Breaker	0.3
		Caraquet	0.3
		Madiana	0.3
		Commissioner's Point	0.1
		Xing Da	0.1
		Vixen	0.0

Marine Protected Areas	Area (km^2)
Merged marine protected areas (no	294.7
Territorial area (net)[2]	4,236.1

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 km^2) to avoid double counting.

[2] Territorial area (net) means total water area and does not include the land area of 54.35 km^2.

Table 8.3.1
MARINE PROTECTED AREAS AROUND BERMUDA, 2017

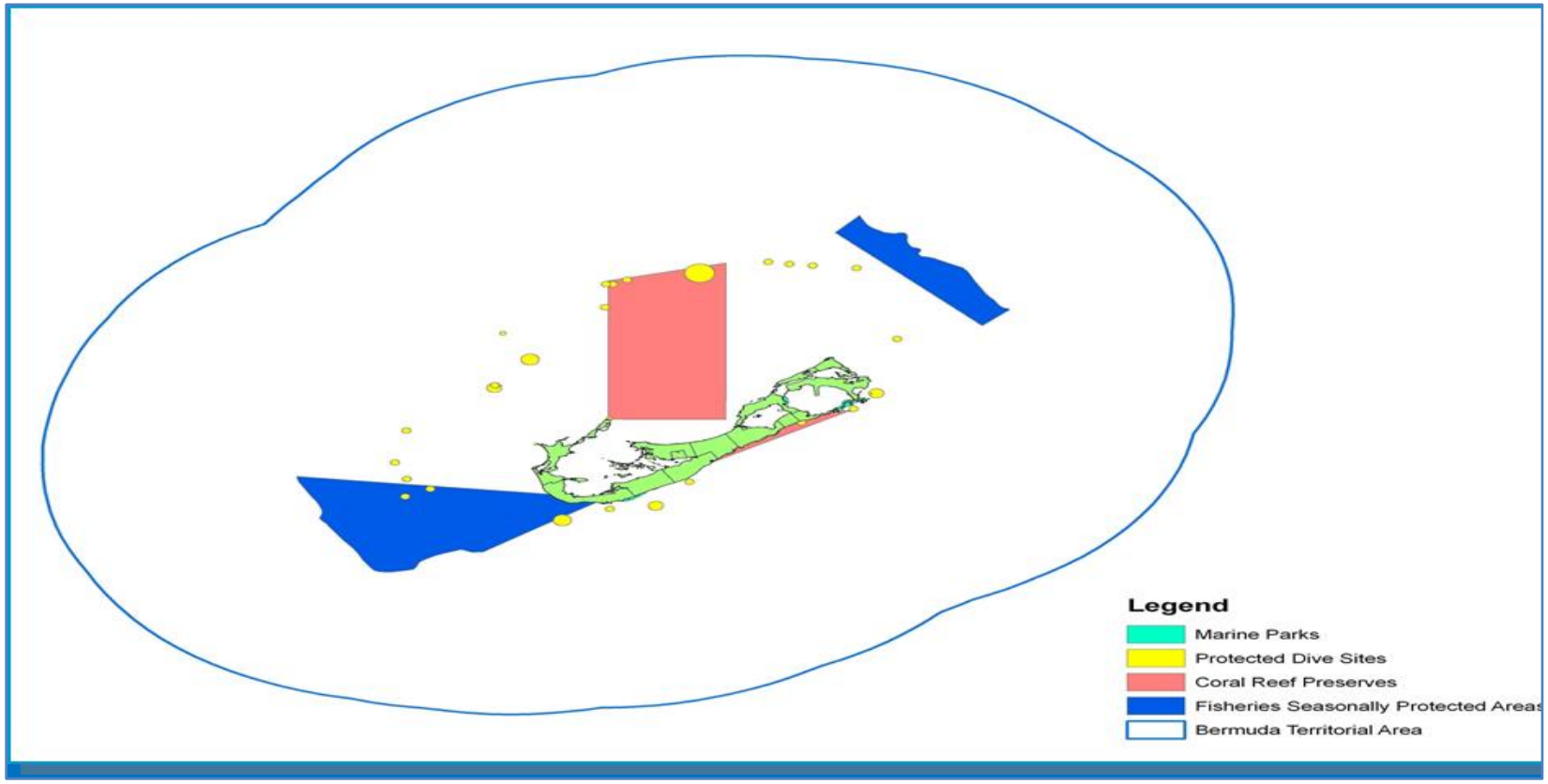
Marine Protected Area/ No-Take Reserve	Year Established	Anchoring Permitted?	Scuba Diving Permitted?	No-Take Reserve?
North Shore Coral Reef Preserve	1966	Yes	Yes	Line fishing is permitted throughout this Preserve, as is lobster diving and spear fishing provided they are within the limits of the prevailing 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 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.
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.

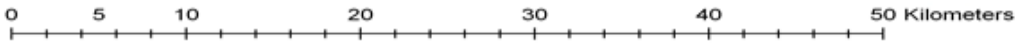
Table 8.3.2
MARINE PROTECTED AREAS AROUND BERMUDA, 2017

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	1989	No	Yes	Yes
Kate (Wreck)	1989	No	Yes	Yes
Hermes and Minnie Bressleur	1989	No	Yes	Yes
North Rock	1990	No	Yes	Yes
The North Eastern Area	1990 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
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

Source: Department of Environmental Protection

Map 8.1
MARINE PROTECTED AREAS, 2017





Source: Department of Planning

Table 8.4
QUANTITY OF FISH LANDINGS BY TYPE, 2013-2017

Species Group	Year (mT) 2013	2014	2015	2016	2017
Total including bait and shellfish	457.4	408.2	402.3	394.0	385.0
Percentage change (%)	-10.3	-10.8	-1.5	-2.1	-2.3
Total fish	383.8	333.6	333.1	331.9	320.7
Tuna and pelagic	141.0	122.5	136.4	142.8	151.5
Groupers	75.7	77.4	70.8	64.0	45.1
Jacks and related species	71.8	55.8	58.4	53.2	41.0
Snappers	46.2	39.5	39.7	47.9	53.5
Miscellaneous	44.2	33.9	24.0	18.8	25.2
Sharks	5.0	4.4	3.9	5.2	4.4
Bait	40.0	31.5	31.5	37.9	35.5
Shellfish[1]	33.7	43.1	37.7	33.1	28.8

Source: Department of Environmental and Natural Resources, Marine Management Section

[1] Shellfish includes spiny lobster.

Table 8.5
TOTAL CATCH BY HOURS AT SEA, AVERAGE CATCH OF FISHING AREA AND NUMBER OF REGISTERED FISHERMEN, 2013-2017

Indicators	Year				
	2013	2014	2015	2016	2017
Total catch[1] (mT)	457.4	408.2	402.3	394.0	385.0
Percentage change (%)	-10.3	-10.8	-1.5	-2.1	-2.3
Average catch of fishing area[2] (mT per km^2)	0.1	0.1	0.1	0.1	0.1
Total hours at sea	84,106	76,335	77,112	67,709	74,019
Percentage change (%)	-1.9	-9.2	+1.0	-12.2	+9.3
Total number of licences[3]	192	178	183	176	174
Percentage change (%)	-4.0	-7.3	+2.8	-3.8	-1.1
Total hours at sea per licence	438	474	421	385	425
Percentage change (%)	+2.1	8.2	-11.2	-8.6	+10.4
Total registered fishermen	315	293	300	277	325
Percentage change (%)	-11.5	-7.0	+2.4	-7.7	+17.3

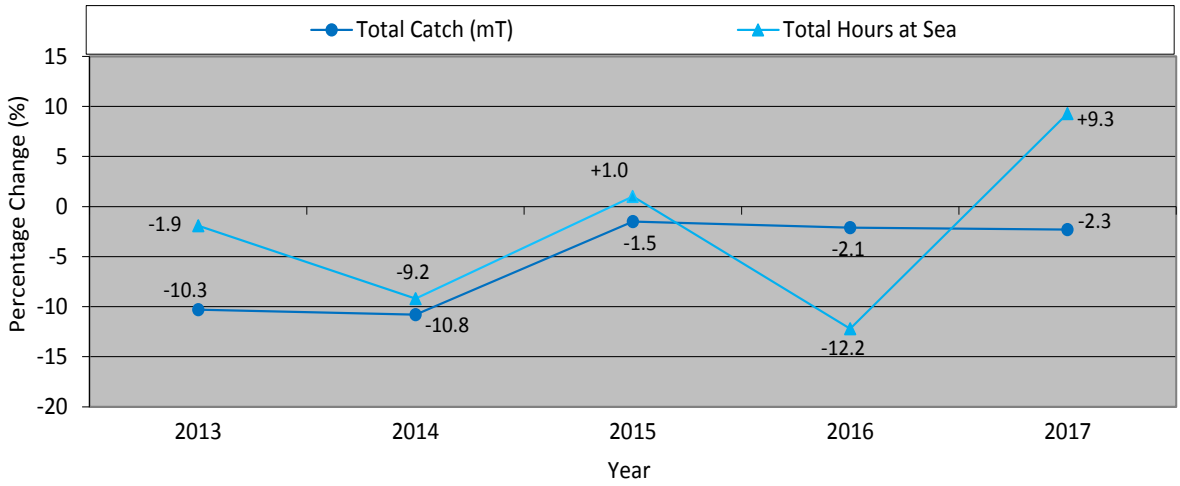
Source: Department of Environmental and Natural Resources, Marine Management Section

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

[2] Total fishing area is estimated as 4,236.1 km^2 (Department of Planning, see Table 8.1). Fishing area includes the fisheries seasonal protected areas (153.4 km^2) which are closed between May 1st and August 31st.
Computation: Average catch of fishing area = Total catch (mT) / Total estimated fishing area of 4,236.1 km^2.

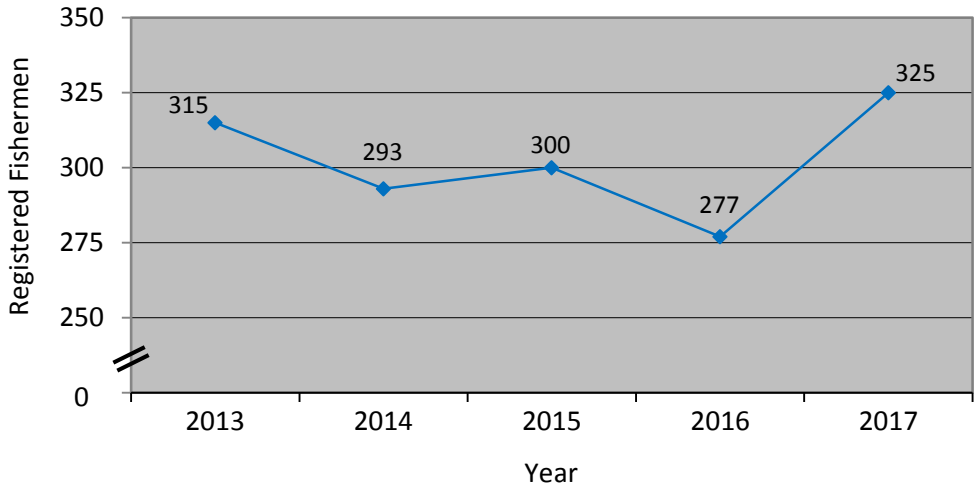
[3] Some licences have a smaller ancillary vessel attached.

Chart 8.2
GROWTH IN TOTAL CATCH AND TOTAL HOURS AT SEA, 2013-2017



Source: Department of Environmental Protection, Marine Resources Section

Chart 8.3
NUMBER OF REGISTERED FISHERMEN, 2013-2017



Source: Department of Environmental Protection, Marine Resources Section

Table 8.6
NUMBER OF HOUSEHOLDS AND POPULATION OF COASTAL AREAS FOR CENSUS YEARS 1980, 1991, 2000, 2010 AND 2016

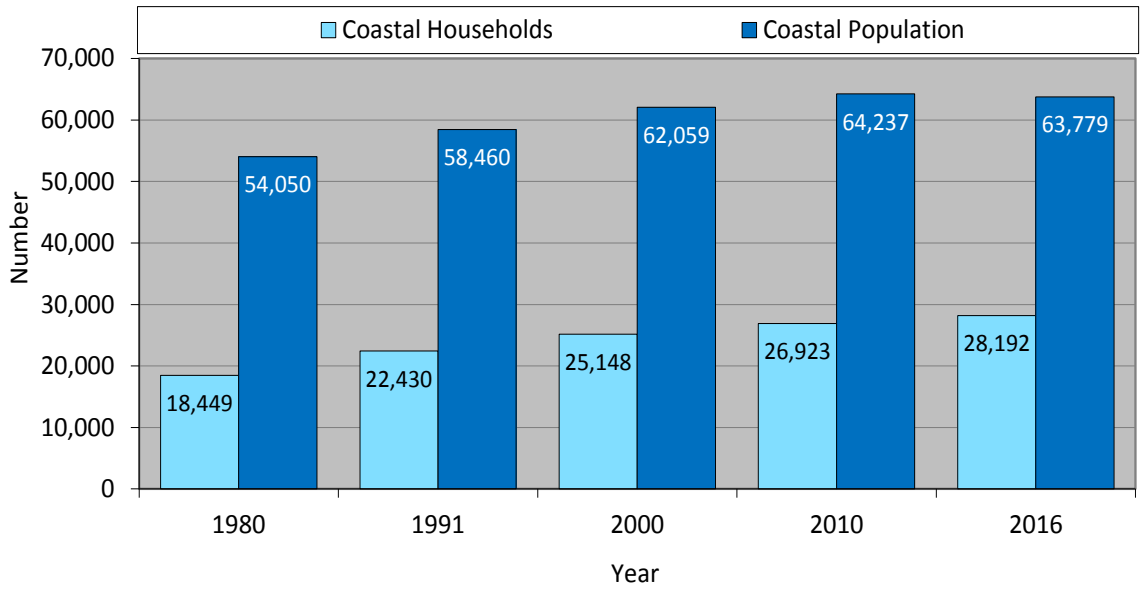
Indicators	Census Years				
	1980	1991	2000	2010	2016
Number of households in coastal areas	18,449	22,430	25,148	26,923	28,192
Ten-year growth rate (%)	..	+21.6	+12.1	+7.1	+4.7
Population in coastal areas [1]	54,050	58,460	62,059	64,237	63,779
Ten-year growth rate (%)	..	+8.2	+6.2	+3.5	**

Sources: 1980 to 2016 Population and Housing Censuses

[1] Does not include the non-sheltered and institutionalized populations.

Note: Bermuda measures 1 mile at its widest point. Based on the standard definition of coastal area, the entire island will be considered coastal.

Chart 8.4
NUMBER OF HOUSEHOLDS AND POPULATION OF COASTAL AREAS FOR CENSUS YEARS 1980, 1991, 2000, 2010 AND 2016



Sources: 1980 to 2016 Population and Housing Censuses

SECTION 9

BIODIVERSITY

The Biodiversity Section contains information on the protected land areas in Bermuda such as; protected coastal reserves, protected open space, historical cove areas and parks.

Protected Area: Land and Water

• Bermuda's protected area, inclusive of land and water, totals 319.7 km^2. This represents 7.45 percent of the total area (6.87% water and 0.58% land) (Table 9.1).

• As a proportion of the total land area (53.56 km^2), protected land area represents 46.5 percent or 24.9 km^2. Protected water area represents 7.0 percent of 294.7 km^2 of the total water area (Table 9.1).

NOTE TO READER

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

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

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, natural and associated cultural resources and managed through legal or other effective means.

Category Ia: Strict Nature Reserve

Category Ib: Wilderness Area

Category II: National Park

Category III: National Monument

Category IV: Habitat/Species Management Area

Category V: Protected Landscape/Seascape

Category VI: Managed Resource Protected Area

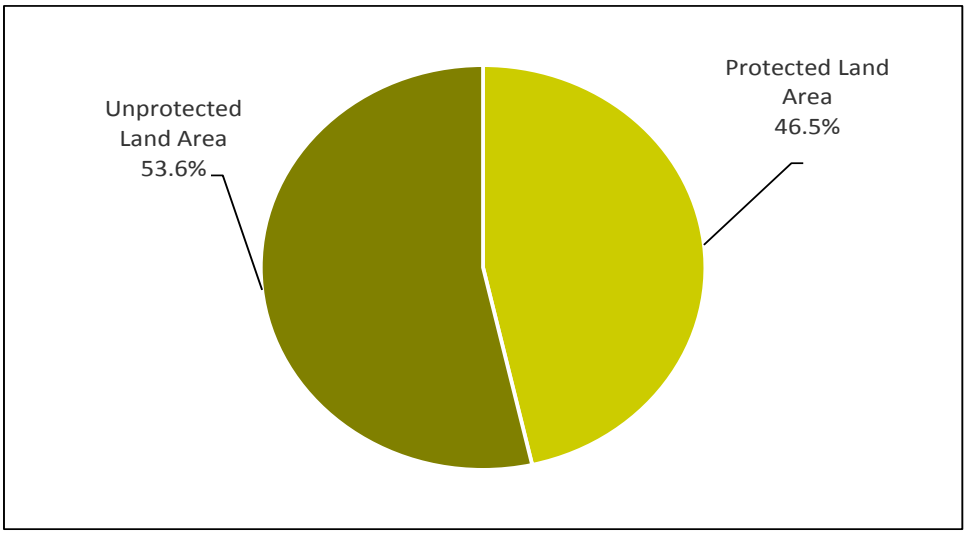
Total Area: Total area (of country) including area under inland water bodies, but excluding off-shore territorial waters (= total land area + water).

Source: CARICOM Environment Programme

Table 9.1 PROTECTED AREAS, 2017	
Category	
Total area (km^2)	4,289.7
Total land area (low tide mark) (km^2)	53.6
Total water area (km^2)	4,236.1
Protected land area (km^2)	24.9
Protected land area as a % of total land area	46.5
Protected land area as a % of total area	0.6
Protected water area (km^2)	294.7
Protected water area as a % of total water area	7.1
Protected water area as a % of total area	6.9
Total protected area (land and water) (km^2)	319.6
Total protected area as a % of total area	7.5

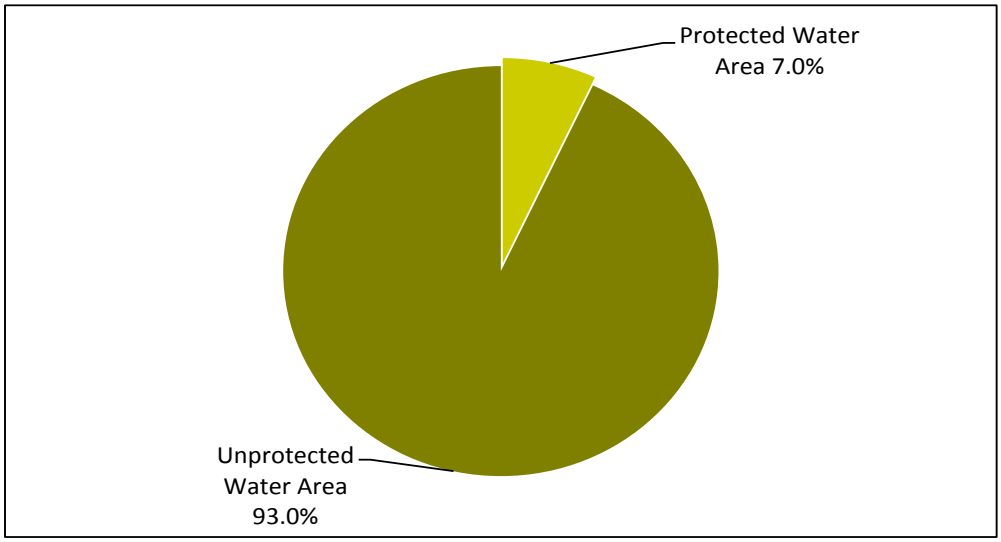
Source: Department of Planning

Chart 9.1
PROTECTED LAND AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2017



Source: Department of Planning

Chart 9.2
PROTECTED WATER AREA AS A PERCENTAGE OF TOTAL WATER AREA, 2017



Source: Department of Planning

Table 9.2 PROTECTED AREAS BY CATEGORY AND AREA, 2017		
Protected Area Category	Acres	km^2
Conservation base zones		
Open space reserve	1,298.1	5.3
Recreation	963.9	3.9
Park	884.6	3.6
Coastal reserve	823.3	3.3
Nature reserve	770.1	3.1
Sub-total	4,740.0	19.2
Conservation areas		
Woodland reserve	983.9	4.0
Agricultural reserve	731.6	3.0
Sub-total	1,715.5	6.9
Cave protection area	1,107.2	4.5
Historic protection area	201.1	0.8
Conservation base zone and conservation areas (no overlap)[1]	6,156.8	24.9
Overlapping area	1,670.1	6.8
Total terrestrial area (low tide mark)	13,430.4	53.6
Water resources protection area[2]	4,000.6	16.2

Source: Bermuda Plan 2008, Department of Planning

[1] Total protected area does not equal to the sum of the sub-totals as it excludes any overlapping areas (6.8 km^2) 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 24.9 km^2 of protected area but is contained in the total terrestrial area of 53.6 km^2.

Note: 1 km^2 = 247.1 acres

Map 9.1
TERRESTRIAL PROTECTION AREAS INCLUDING MARINE PARKS, 2017

Source: Department of Planning

SECTION 10

FORESTRY

The Forestry Section of the Environmental Statistics Compendium includes a table and chart with information on the forest area in Bermuda.

Forestry

• In 2017 Bermuda's total forest area was 4.2 km^2. This represents 7.8% of Bermuda's total land area and is inclusive of woodland reserves (Table 10.1).

NOTE TO READER

Forest: land under forestry or no land use, spanning more than 0.005 km^2 (0.5 hectares); with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. Please include mangroves and forests on wetlands according to the above height and canopy coverage.

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

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, 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).

Source: CARICOM Environment Program

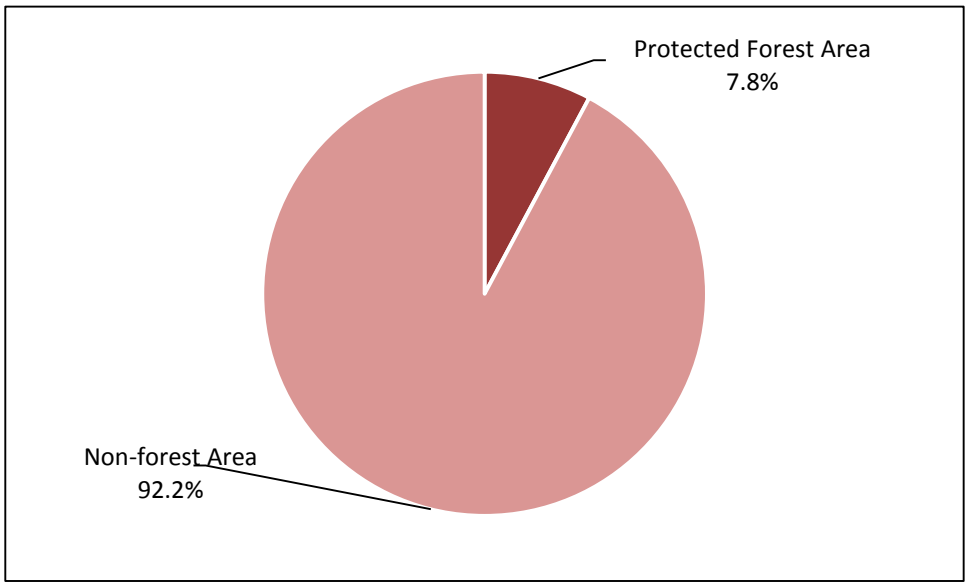
Table 10.1
PROTECTED FOREST AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2017

Protected Area Category	Area km^2
Total forest area	4.2 [1]
Total land area	53.6
Protected forest area as a % of total forest area	100.0
Protected forest area as a % of total land area	7.8

Source: Department of Planning

[1] This includes woodland reserves.

Chart 10.1
PROTECTED FOREST AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2017



Source: Department of Planning

SECTION 11

AIR

The air quality in Bermuda is a valued part of its natural resources.

Air Emissions

• In 2017, the highest concentrated pollutant of air emissions from Tynes Bay waste to energy incinerator was NO_2 (242.9 mg/Nm^3) (Table 11.1).

Air Concentrations

• Bermuda contains five ambient air monitoring sites that are located across the island (Table 11.2).

• The maximum daily concentrations for the ambient air monitoring sites recorded pollutant concentration levels below Bermuda's limit, except for the pollutants PM_{10} and TSP (Table 11.3).

Table 11.1
ANNUAL AIR EMISSIONS FROM TYNES BAY WASTE TO ENERGY INCINERATOR, 2013-2017

Pollutant	Year				
	2013	2014	2015 [1]	2016	2017
VOCs (mg/Nm3)	2.3	—	—	—	2.0
NO2 (mg/Nm3)	253.2	258.1	259.3	274.4	242.9
SO2 (mg/Nm3)	38.5	29.0	52.6	36.5	43.8
Lead (mg/Nm3)	—	—	—	—	—
Particulate Matter (mg/Nm3)	1.9	2.5	11.9	3.9	8.1

Source: Department of Environmental Protection

[1] One field of the 3-field Electrostatic Precipitator exhaust abatement system was down during testing.

Note: The data is captured through isokinetic sampling over a two day period each year and is reported normalised to 11% oxygen.

Table 11.2
AVERAGE CONCENTRATIONS FOR AMBIENT AIR MONITORING SITES, 2015-2017

	Pollutants	Units	Bermuda Limit (Clean Air Regulations 1993)	2015					2016					2017				
				Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS
Hourly	NO_2	$\mu g/m^3$	**400**	26.6	14.9	17.5	6.0	-	15.8	15.0	15.0	8.4	-	21.6	11.7	14.0	6.0	-
	SO_2	$\mu g/m^3$	**450**	7.1	10.8	13.2	17.2	-	9.4	4.5	12.2	9.3	-	2.1	5.5	9.6	9.5	-
	PM_{10}	$\mu g/m^3$	**-**	-	29.2	-	-	-	-	28.0	-	-	-	-	25.5	-	-	-
	$PM_{2.5}$	$\mu g/m^3$	**-**	7.8	-	-	-	-	7.6	-	-	-	-	6.0	8.4	-	-	-
	TSP	$\mu g/m^3$	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Hour	NO_2	$\mu g/m^3$	**200**	26.6	14.9	18.1	6.1	-	15.8	15.0	15.0	8.3	-	21.6	11.7	14.0	6.0	-
	SO_2	$\mu g/m^3$	**150**	6.8	10.5	13.2	17.2	-	9.4	4.5	12.1	9.3	-	2.1	5.5	9.7	9.6	-
	PM_{10}	$\mu g/m^3$	**50**	22.3	28.8	15.0	23.5	18.4	16.8	31.7	16.7	16.0	26.8	19.2	32.7	16.1	13.8	
	$PM_{2.5}$	$\mu g/m^3$	**-**	7.7	-	-	-	-	7.5	-	-	-	-	6.0	8.0	-	-	-
	TSP	$\mu g/m^3$	**100**	21.2	32.2	29.4	24.2	-	26.8	32.3	43.1	58.9	-	19.4	34.5	31.1	31.0	-
1-year	NO_2	$\mu g/m^3$	**60**	28.3	20.2	18.1	6.1	-	15.6	-	15.0	8.4	-	21.4	-	14.0	6.0	-
	SO_2	$\mu g/m^3$	**30**	6.8	11.1	13.2	17.2	-	9.7	-	12.2	9.3	-	2.1	-	9.6	9.5	-
	PM_{10}	$\mu g/m^3$	**30**	18.5	24.3	15.0	23.5	16.0	15.4	29.8	16.8	16.2	24.3	20.9	34.8	16.0	13.8	
	$PM_{2.5}$	$\mu g/m^3$	**-**	7.0	-	-	-	-	7.5	-	-	-	-	5.9	-	-	-	-
	TSP	$\mu g/m^3$	**60**	19.1	31.0	29.4	24.2	-	24.2	31.4	43.1	58.9	-	21.1	36.4	31.1	31.0	-

Source: Department of Environmental Protection

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

Table 11.3
MAXIMUM CONCENTRATIONS FOR AMBIENT AIR MONITORING SITES, 2015-2017

	Pollutants		Bermuda Limit (Clean Air Regulations 1993)	2015					2016					2017				
				Prospect	East Broadway	Cemetry Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetry Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS
Hourly	NO_2	µg/m^3	**400**	319.3	73.2	354.3	137.0	-	99.5	100.4	266.3	144.9	-	62.8	87.6	280.5	122.3	-
	SO_2	µg/m^3	**450**	91.3	108.7	385.3	320.7	-	109.3	65.8	244.1	253.0	-	120.2	39.3	174.8	286.9	-
	PM_{10}	µg/m^3	**-**	-	-	-	-	-	-	122.0	76.8	99.7	-	-	178.0	-	-	-
	$PM_{2.5}$	µg/m^3	**-**	316.6	-	-	-	-	49.1	-	-	-	-	35.2	43.0	-	-	-
	TSP	µg/m^3	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Hour	NO_2	µg/m^3	**200**	160.2	42.8	149.5	61.0	-	38.4	46.1	136.4	138.3	-	36.5	48.7	133.2	57.2	-
	SO_2	µg/m^3	**150**	27.1	60.5	136.0	103.0	-	52.9	10.5	91.8	128.3	-	31.4	34.1	73.0	129.2	-
	PM_{10}	µg/m^3	**50**	113.8	77.0	55.0	91.6	53.1	37.7	98.2	62.4	73.3	60.9	46.9	71.3	74.6	55.6	49.0
	$PM_{2.5}$	µg/m^3	**-**	26.8	-	-	-	-	27.6	-	-	-	-	15.0	12.0	-	-	-
	TSP	µg/m^3	**100**	43.7	56.1	96.1	59.3	-	64.0	54.4	130.6	153.1	-	57.1	82.0	75.2	110.4	-
Total number of exceedances of the limits set in the Clean Air Regulations 1993 over each year				1	10	2	17 *	1	0	3	9	20	2	0	5 †	4	3	0

Source: Department of Environmental Protection

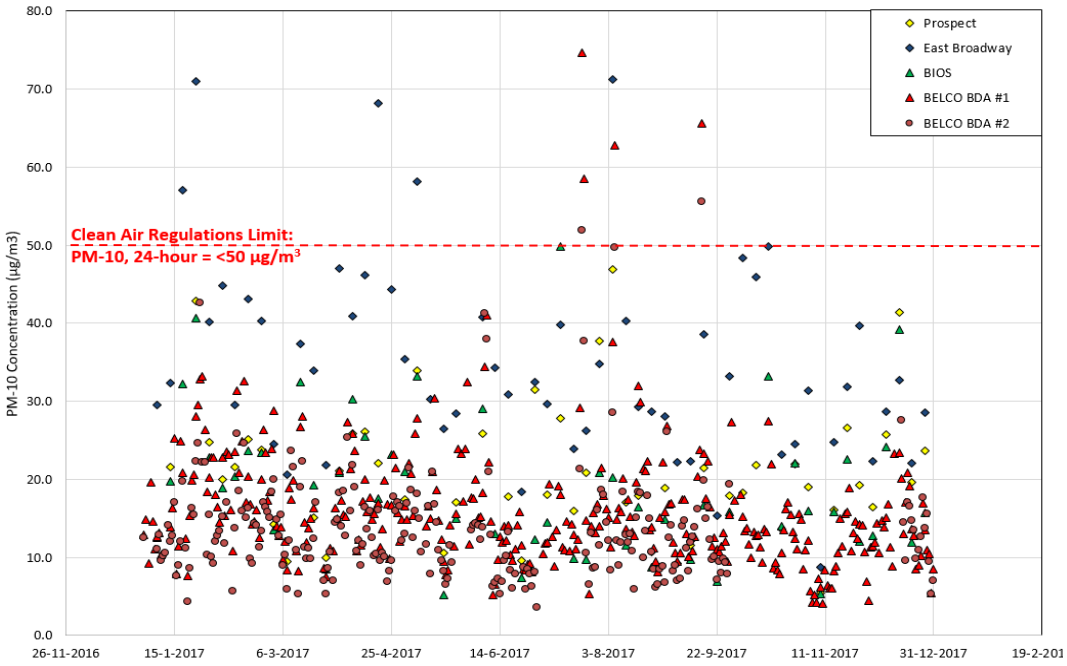
- Not determined as part of the current protocols.

Note: Amounts in red show that the limit according to the 1993 Clean Air Regulation was exceeded.

* 10 of the 17 exceedances occurred before calibration highlighted a problem with the instruments.

† A second PM_{10} sensor at East Broadway that uses a US EPA Federal Equivalent Method records data every hour and identified a total of 10 exceedances of 24-hour PM_{10} over 2017.

Figure 11.1
24-HOUR AVERAGE PM_{10} CONCENTRATION, 2017



Source: Department of Environmental Protection

SECTION 12

WASTE

The Waste Section comprises of information regarding the generation and disposal of solid waste in Bermuda.

• In 2017, the amount of waste generated totalled 95,700 mT. This represents an increase of 6.6% over the 89,800 mT of waste generated in 2016 (Table 12.1).

• In 2017, 6,600 mT of waste was recycled, 118,000 mT was composted, 66,600 mT was incinerated to generate electricity and 10,000 mT was land-filled (Table 12.2).

• There were 80 container loads of materials recycled in 2017. Eight container loads of special waste items were processed and exported for the United States recycling market (Chart 12.1).

• Bermuda exported 530,000 pounds of hazardous waste in 2017 (Table 12.3).

NOTE TO READER

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

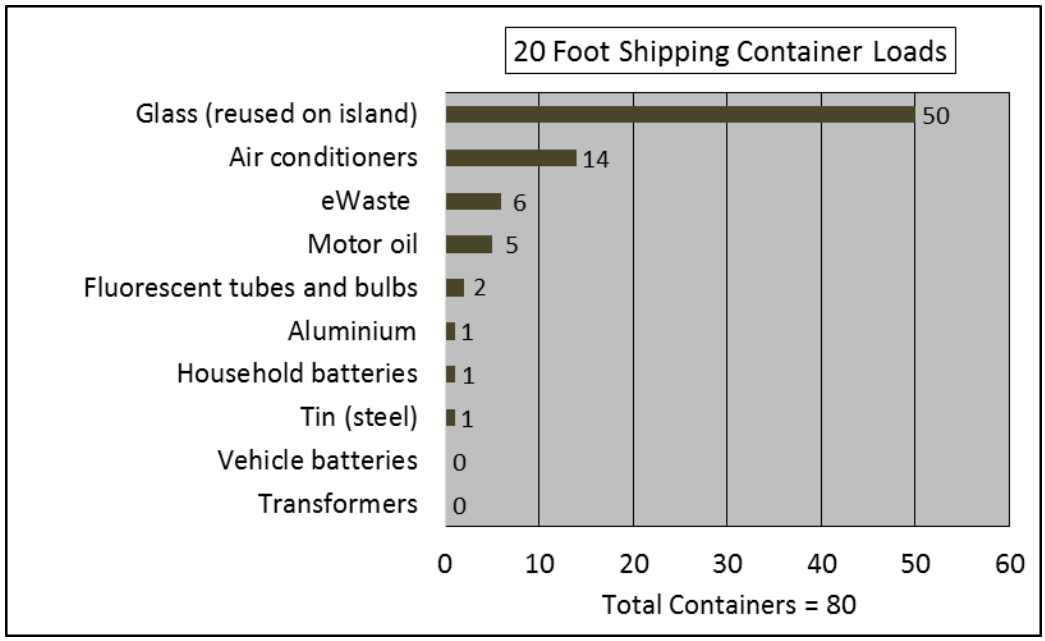
Table 12.1
GENERATION OF WASTE BY SOURCE, 2013-2017

(1,000 mT)

Indicator	2013	2014	2015	2016	2017
Total amount of waste	84.6	85.2	83.6	89.8	95.7
Waste from households	28.2	28.4	27.9	29.9	31.9
Waste from other origins	56.4	56.8	55.7	59.9	63.8

Source: Department of Works and Engineering, Waste and Enforcement Section

Chart 12.1
ESTIMATED EXPORT OF RECYCLABLE WASTE, 2017



Source: Department of Works and Engineering, Waste and Enforcement Section

Note: Motor oil, fluorescent tubes and bulbs, household batteries and transformers are special waste items and processed for the USA recycling market.

Table 12.2
MANAGEMENT OF WASTE, 2013-2017

	(1,000 mT)				
Indicator	2013	2014	2015	2016	2017
Total amount of waste	84.6	85.2	83.6	89.8	95.7
Amounts going to:					
Recycling	1.9	1.0	1.6 e	1.6 e	1.0
Composting	15.0 e	18.0 e	18.0 e	18.0 e	18.0 e
Incineration	58.0	55.6	54.0	60.2	66.6
Landfilling	10.0 e	10.0 e	10.0 e	10.0 e	10.0 e

Source: Department of Works and Engineering, Waste and Enforcement Section

Table 12.3
MANAGEMENT OF SPECIAL WASTE, 2013-2017

Indicator	(1,000 lbs) 2013	2014	2015 e	2016 e	2017 e
Total	543.0	615.0	668.9	600.0	530.0
Stock of hazardous waste at the end of the year	115.0	88.0	20.6	20.6	15.6
Stock of hazardous waste at the beginning of the year	92.0	115.0	88.0	20.6	20.6
Hazardous waste generated during the year	566.0	588.0	601.5	600.0	525.0
Hazardous waste exported during the year:					
Recycling	356.0	376.0	401.0	400.0	310.0
Incineration	8.0	5.0	6.6	10.0	5.0
Landfilling	179.0	234.0	261.5	190.0	215.0

Source: Department of Works and Engineering, Waste and Enforcement Section

Table 12.4
MANAGEMENT OF WASTE BY TYPE, 2010, 2012, 2014 AND 2016[1]

Indicator	Year 2010	2012 e	2014 e	2016 e	2017
Total (%)	100.0	100.0	100.0	100.0	100.0
Paper, paperboard	29.0	29.0	29.0	29.0	27.0
Textiles	17.0	17.0	17.0	17.0	4.0
Plastics	13.0	13.0	13.0	13.0	19.0
Glass	9.0	9.0	9.0	9.0	13.0
Metals	6.0	6.0	6.0	6.0	5.0
Other inorganic material	9.0	9.0	9.0	9.0	8.0
Organic material	17.0	17.0	17.0	17.0	24.0

Source: Department of Works and Engineering, Waste and Enforcement Section

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

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 2017, the total volume of precipitation in Bermuda was 71.6 mio m^3 (Table 13.1).

NOTE TO READER

Actual Evapotranspiration: total actual volume of evaporation from the ground, wetlands, 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.

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

Regular Freshwater Resources 95.00% of the Time: a 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 95.00% 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.

Renewable Freshwater Resources: equal internal flow plus any inflow of surface and groundwaters.

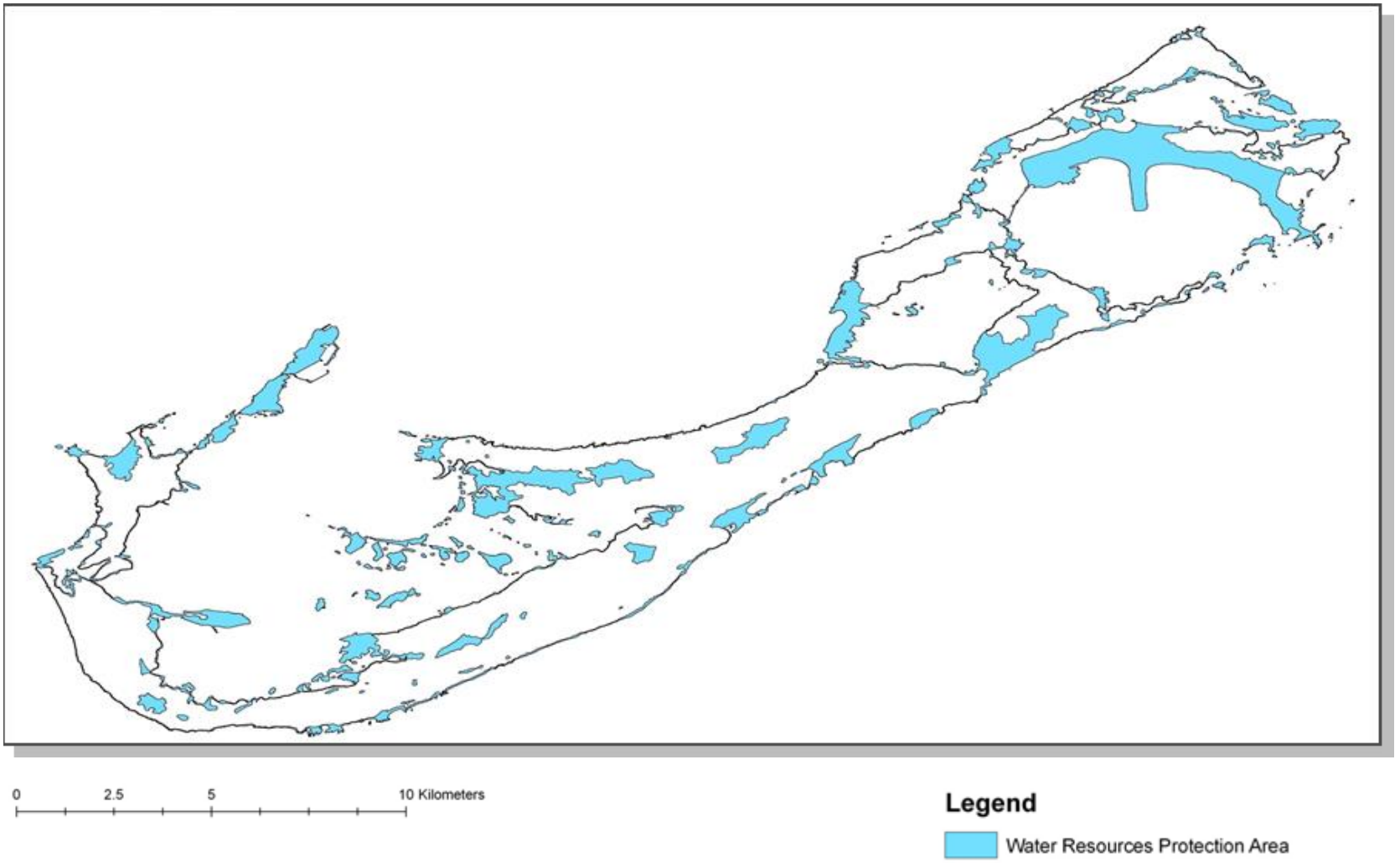
Sources: United Nations Statistics Division (UNSD) and United Nations Environment Programme (UNEP)

Table 13.1
RENEWABLE FRESHWATER RESOURCES, 2013-2017

	mio m^3/y				
Category	2013	2014	2015	2016	2017
Precipitation	85.2	94.2	78.4	98.8	71.6
Actual evapotranspiration	..	..	..	..	..
Internal flow	..	..	..	..	..
Renewable freshwater resources	..	..	..	..	..
Regular freshwater resources 95.00% of the	..	..	..	..	..

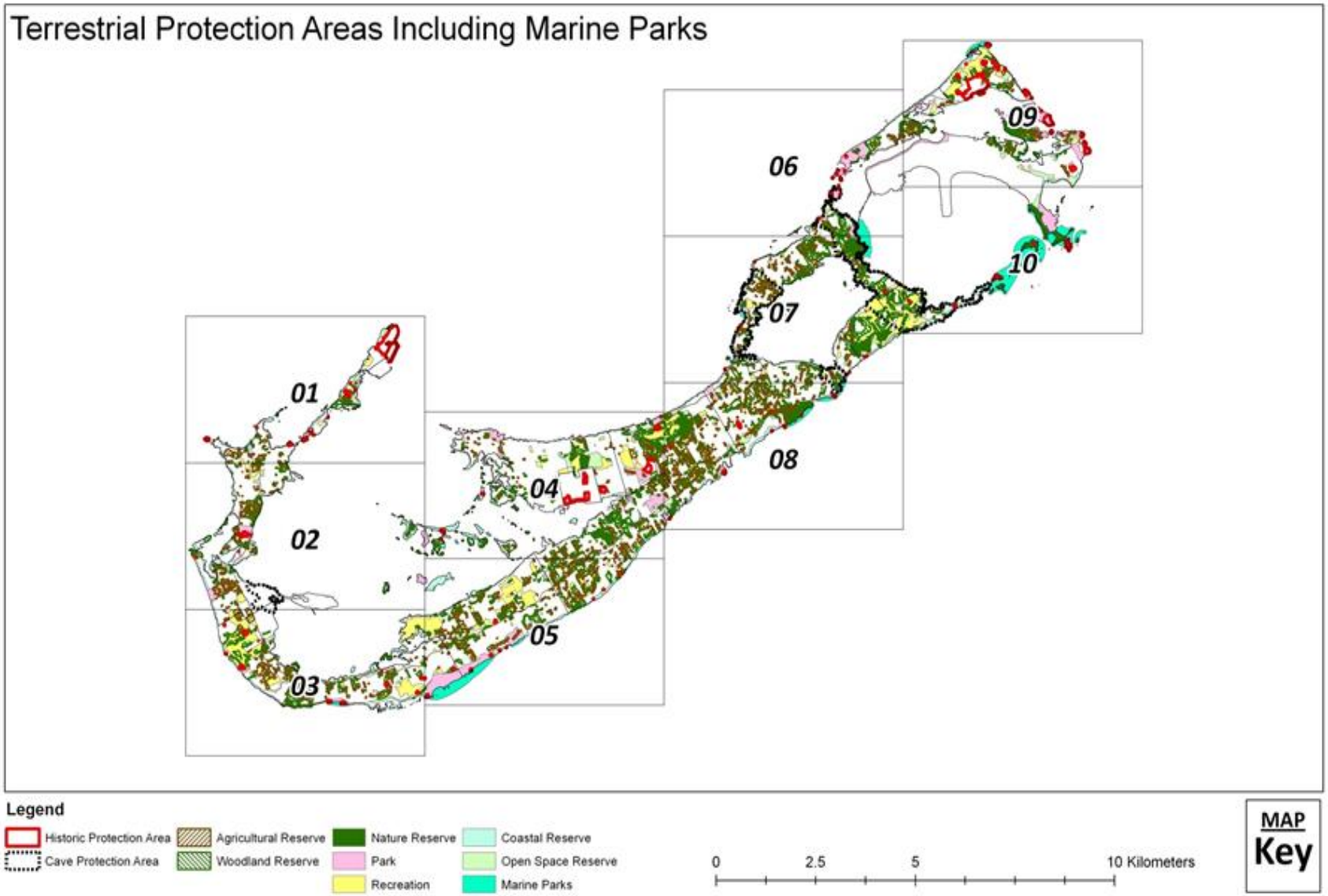
Source: Department of Environmental Protection

Map 13.1
WATER RESOURCES PROTECTION AREAS, 2017

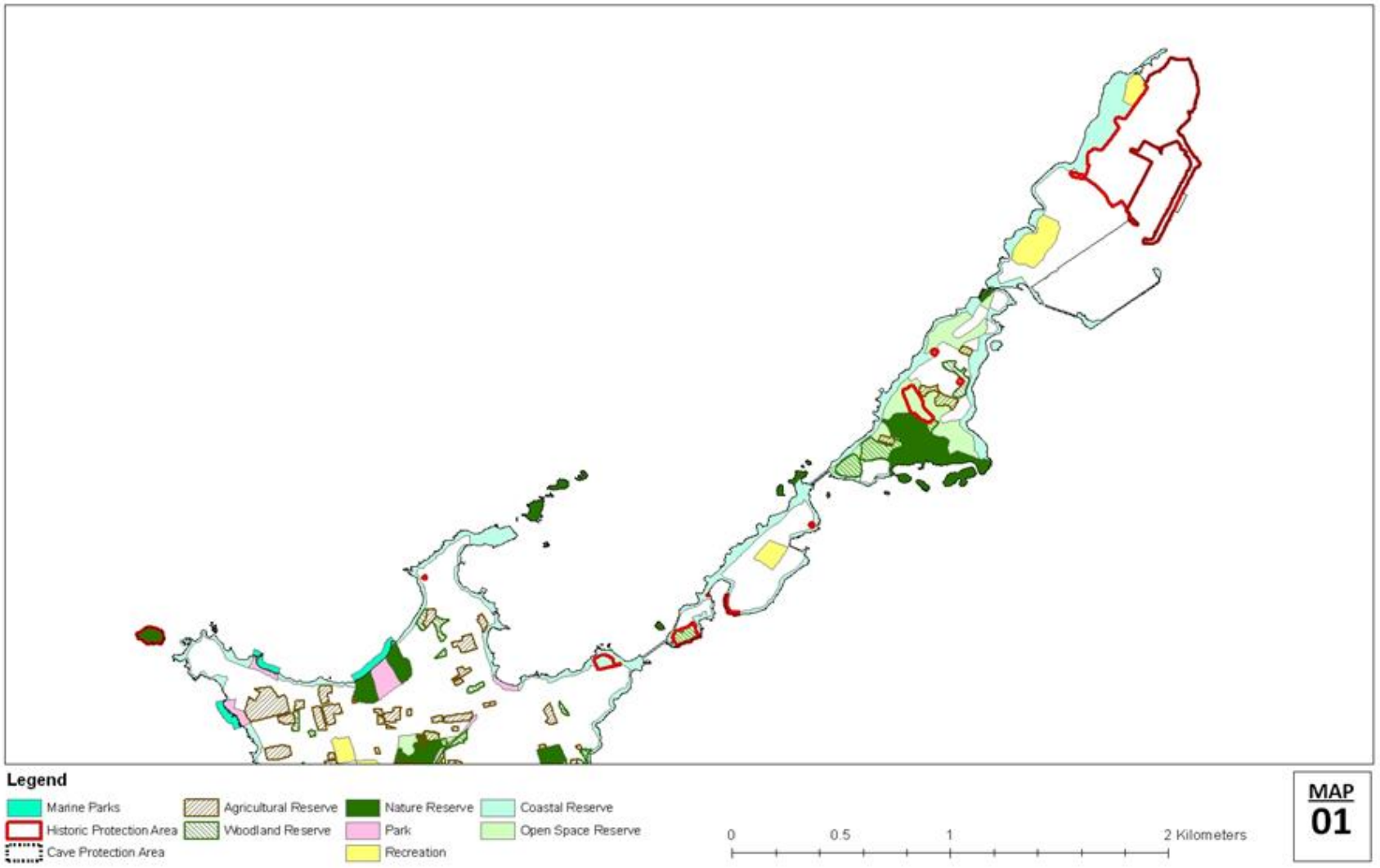


Source: Department of Planning

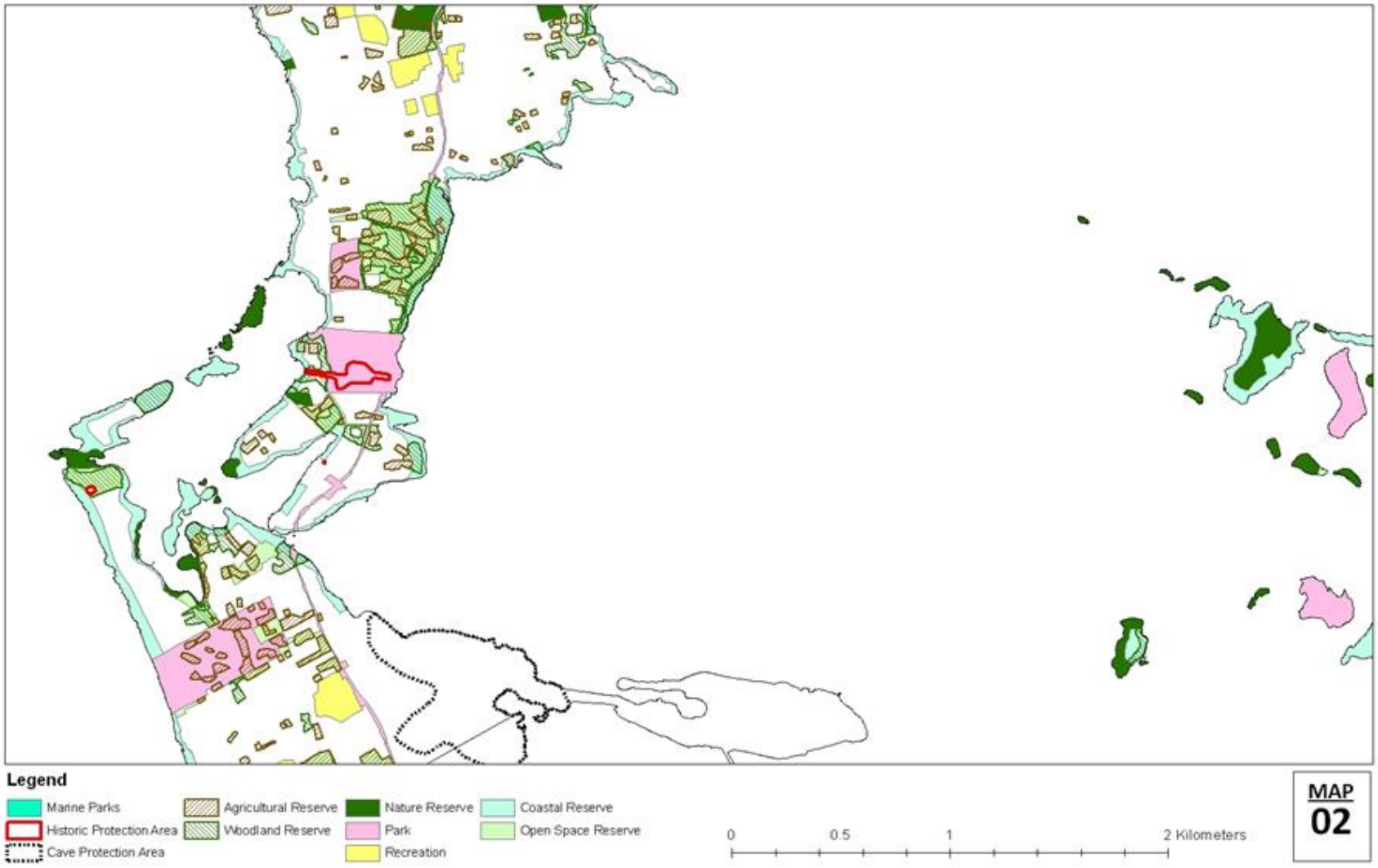
ANNEX



Source: Department of Planning



Source: Department of Planning



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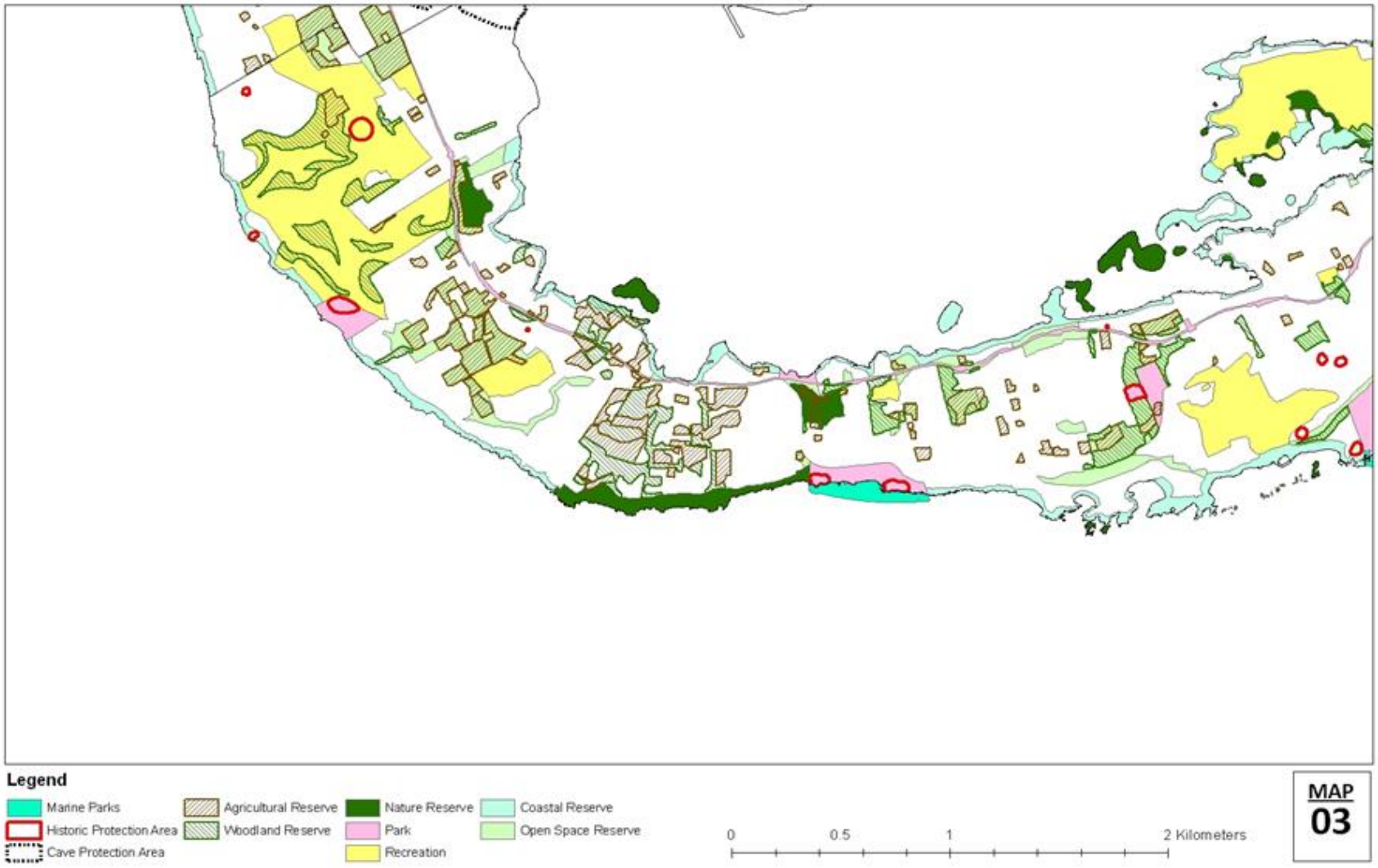
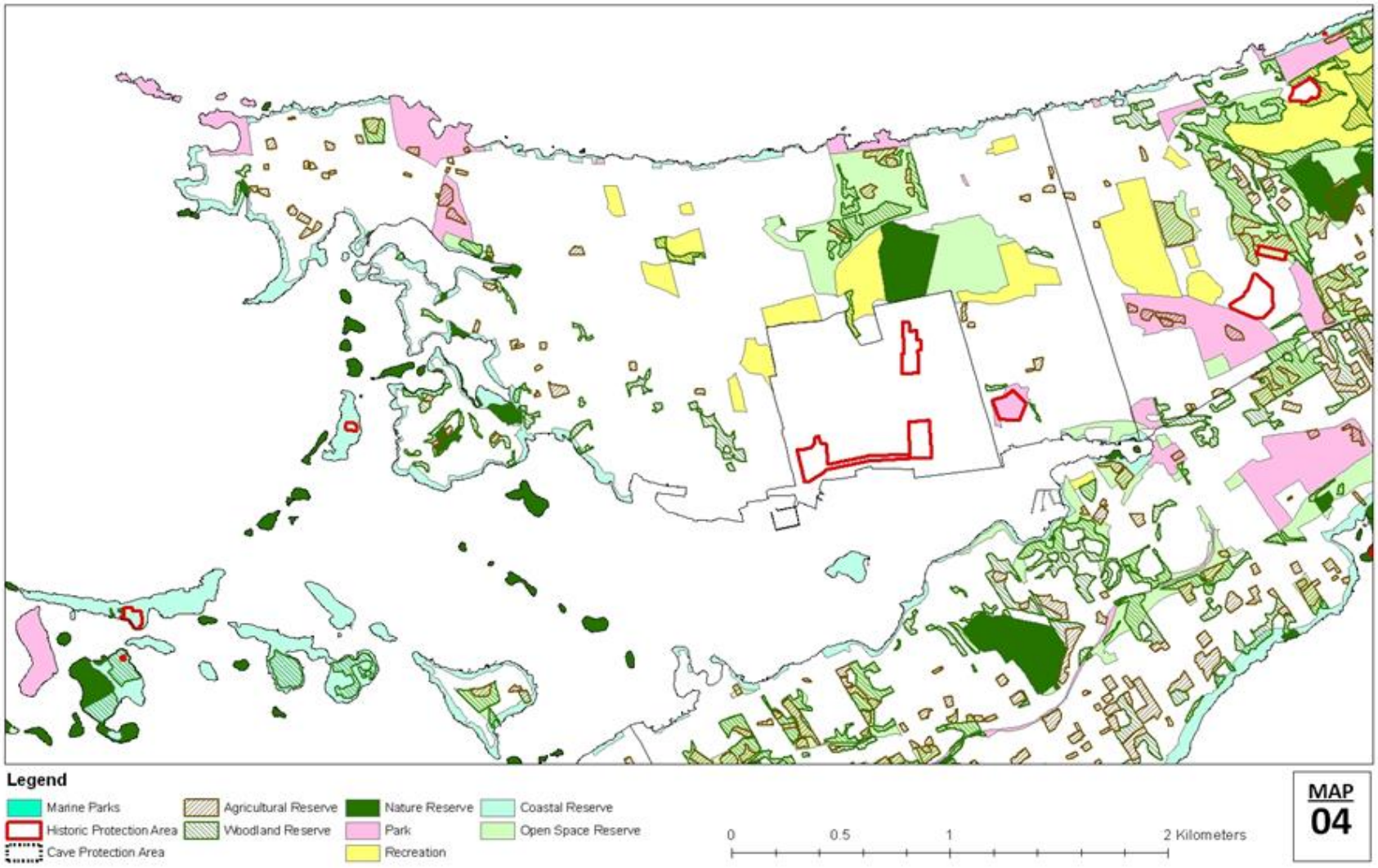
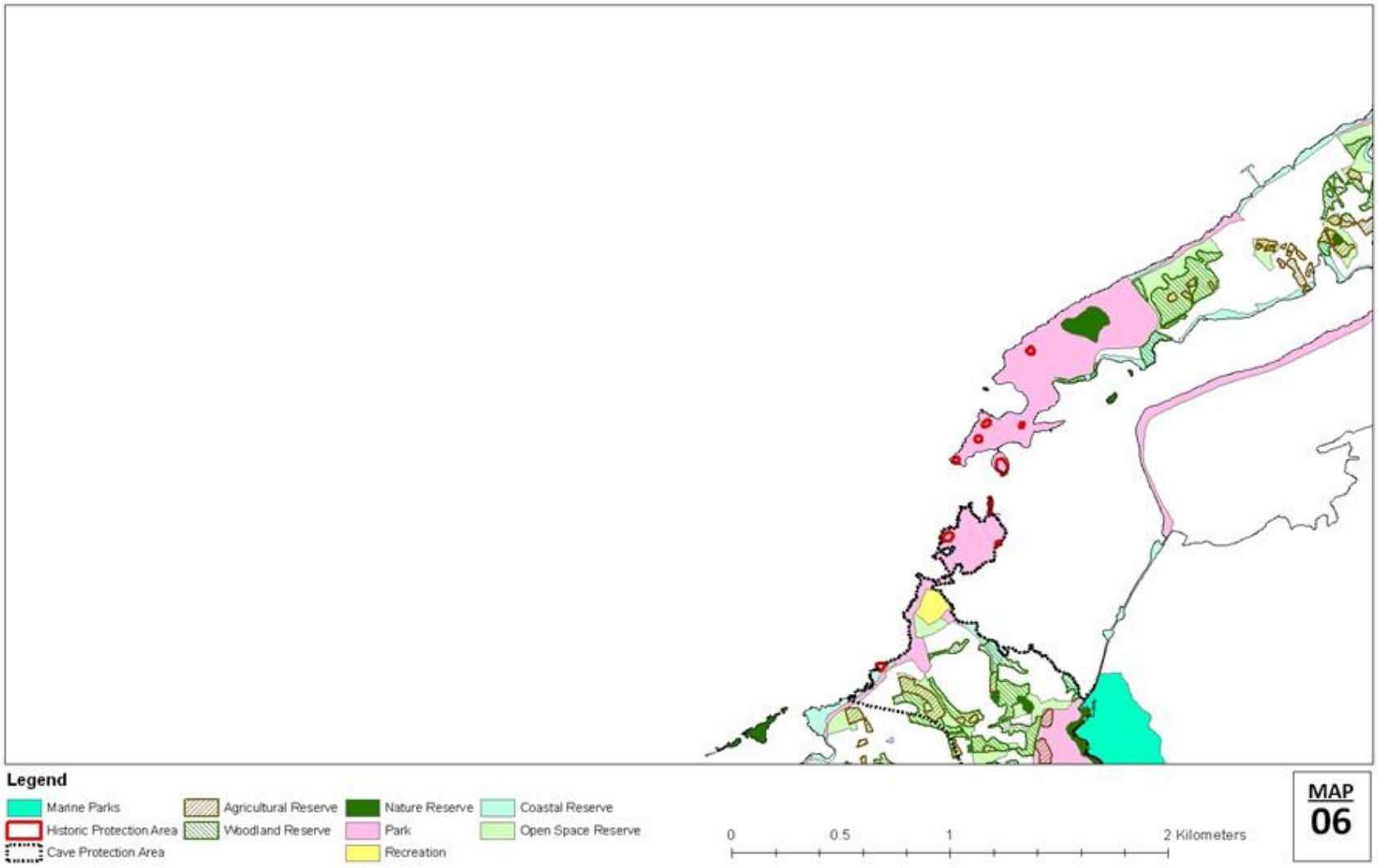


Source: Department of Planning

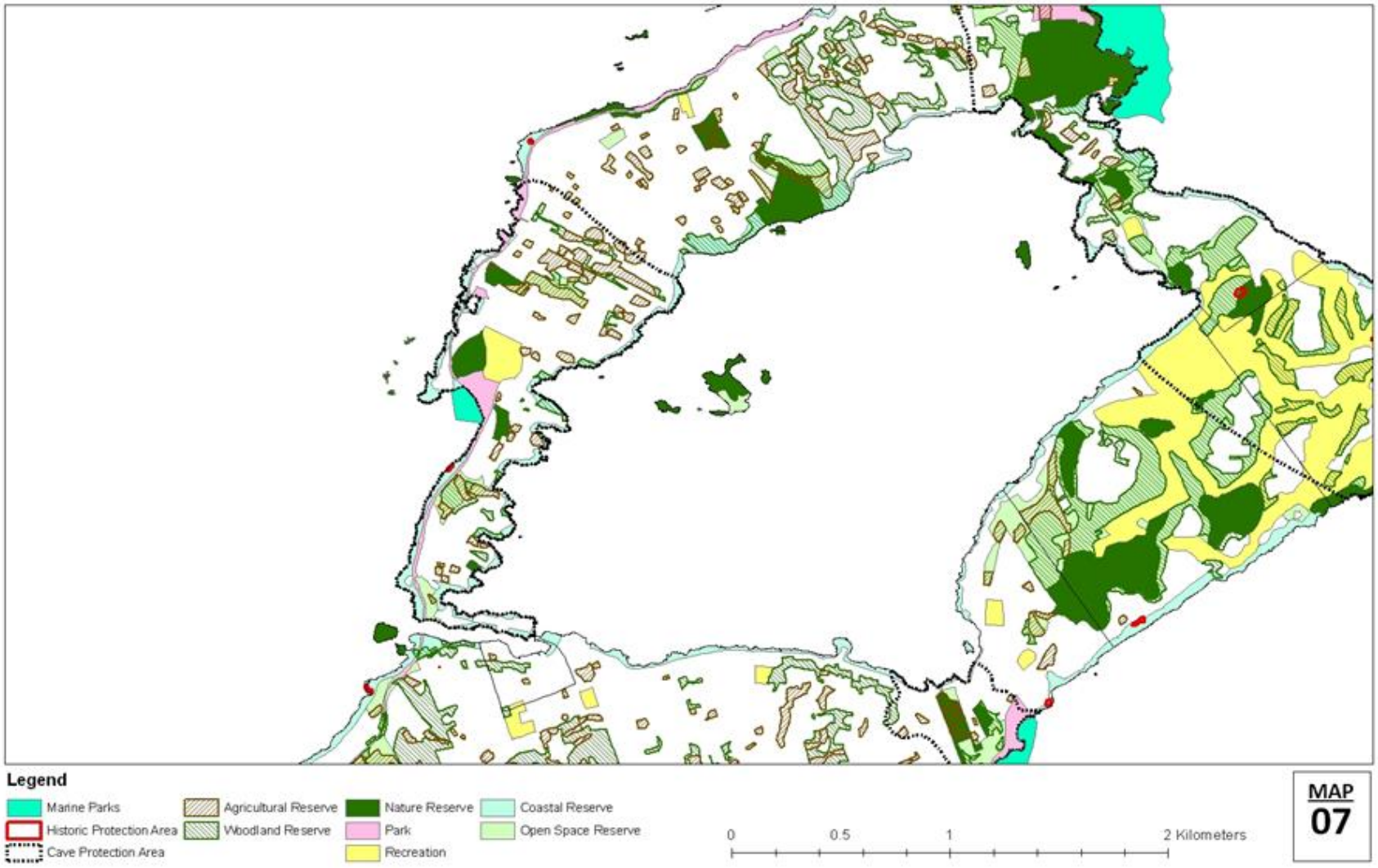


Source: Department of Planning

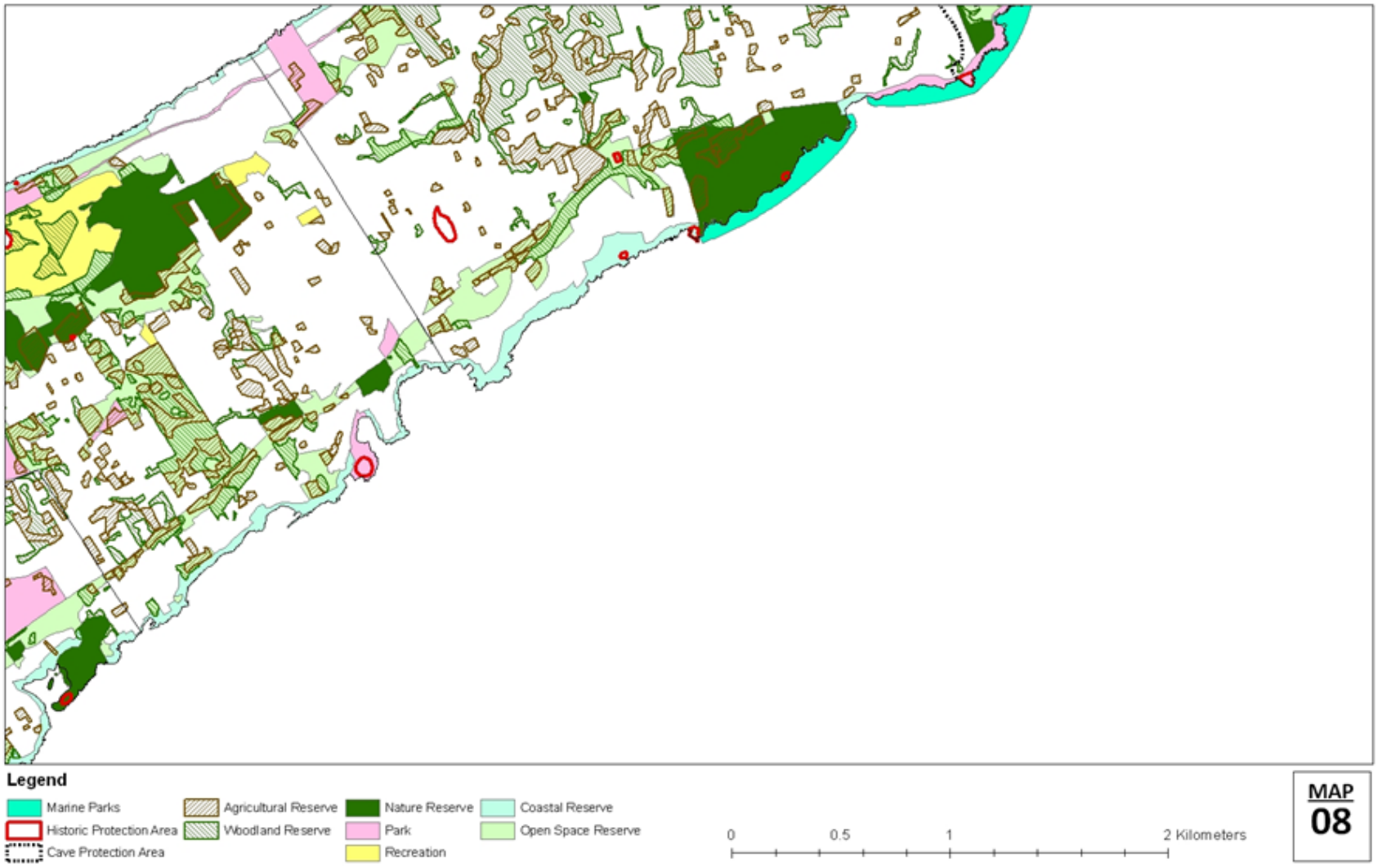
Source: Department of Planning



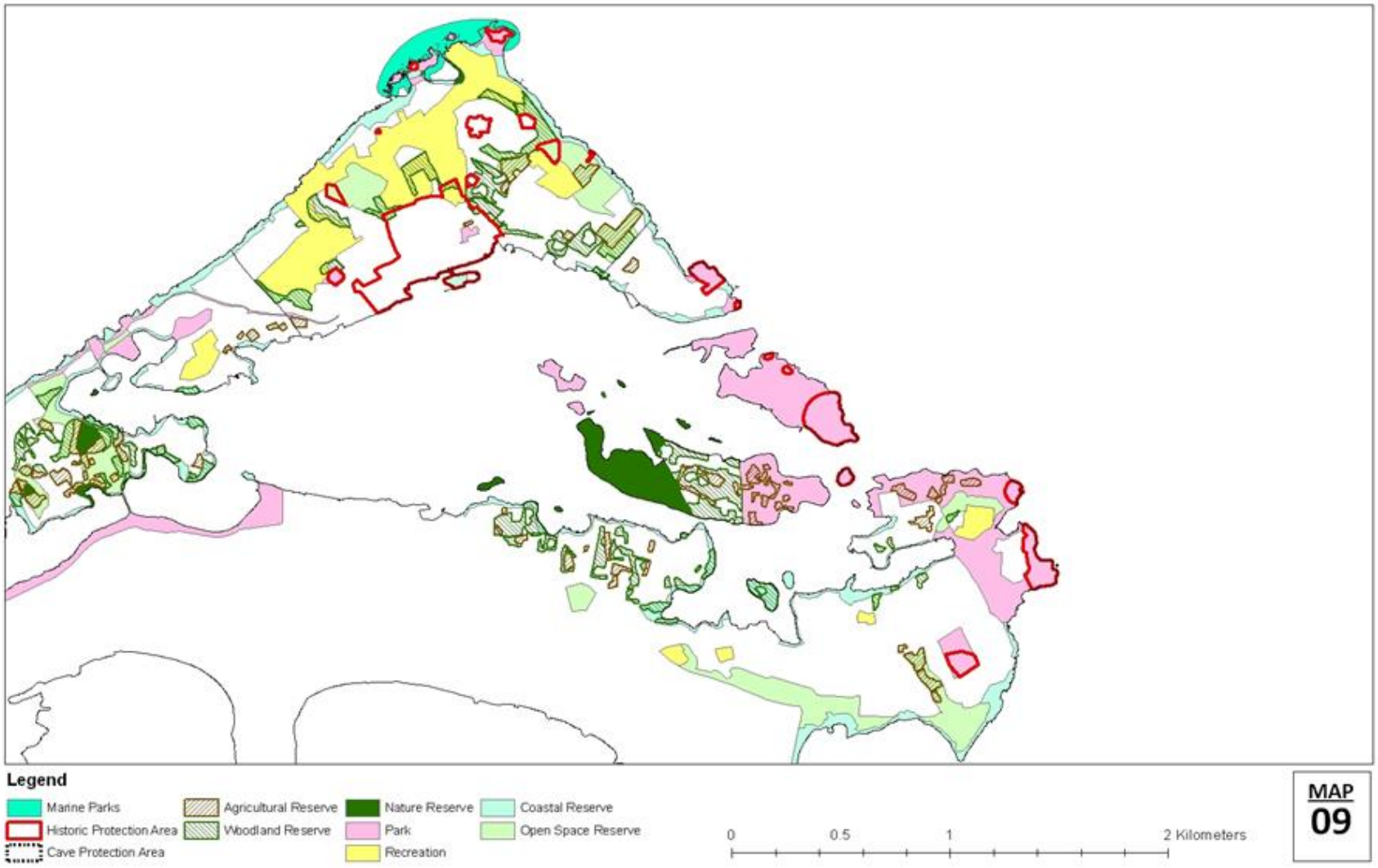
Source: Department of Planning



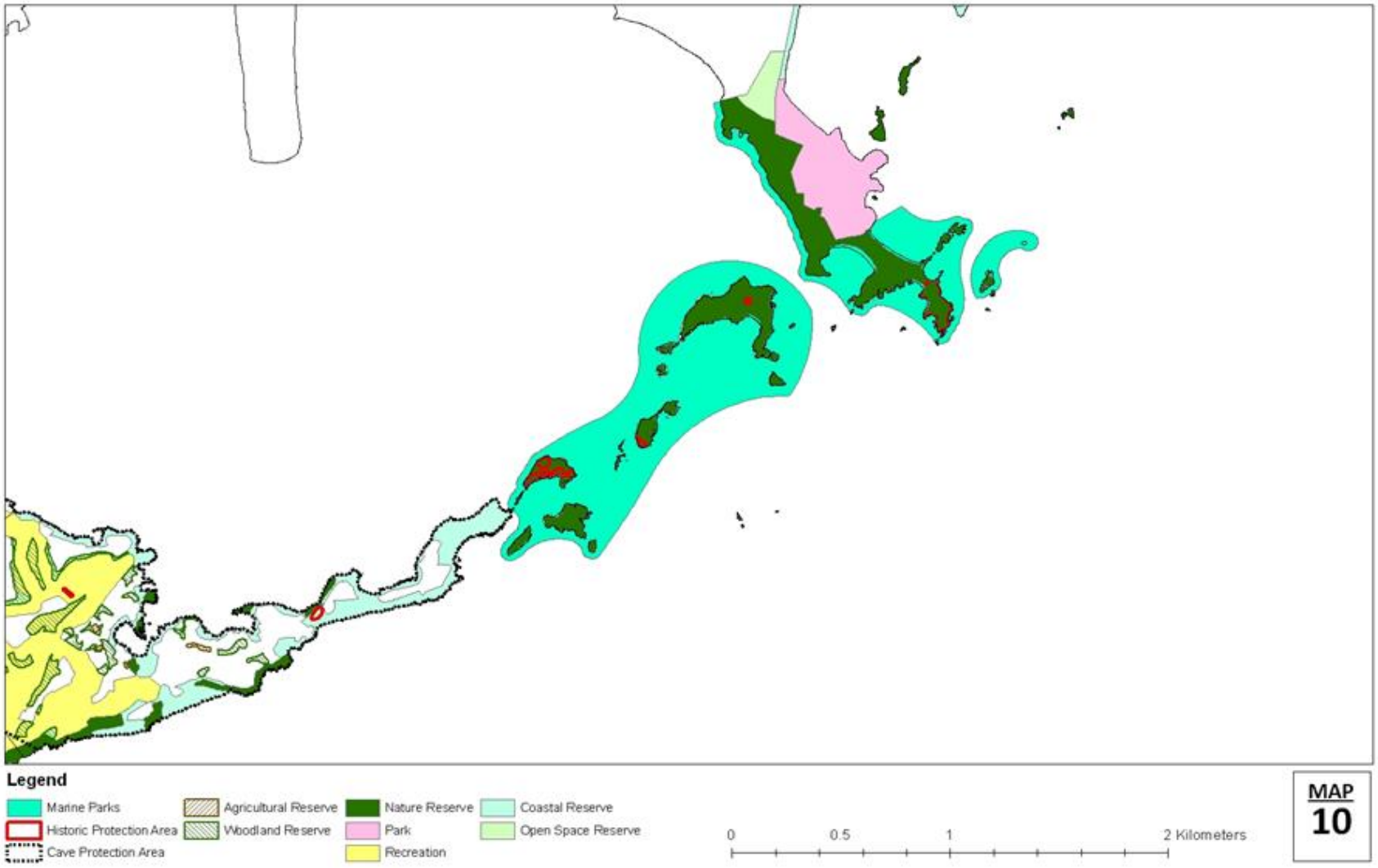
Source: Department of Planning



Source: Department of Planning



Source: Department of Planning



Source: Department of Planning

GOVERNMENT OF BERMUDA

Department of Statistics