

## Appendix 2 5th National Survey on the Natural Environment

### by the Ministry of the Environment

#### The survey on coastal environment --- Distribution of coral reef ---

The information on the coral reef distribution described in chapter 6 is based on the results of the 4th National Survey on the Natural Environment. Following the 4th Survey, the 5th National Survey was carried out on coastal environment including coral reefs from 1996 to 1998, however, the results of both surveys, such as gross area of coral distribution, can not be directly compared, because in the 5th Survey, only the area shallower than 10-m was surveyed, while 4th survey result include deeper area. The summary of methods of both surveys is:

#### 4th National Survey on the Natural Environment:

- Surrounding waters of Japanese archipelago was divided into two regions, which are coral reef region and non-coral reef region (The non-coral reef region was described as the northern area from Kodakara Island of Tokara Islands, while the coral reefs distribute in the southern area from the island),
- Ogasawara is exceptionally included in coral reef region.
- Only the coral communities with more than 0.1-ha in area and more than 5-% coral coverage were surveyed.
- The type of coral communities, coral coverage, distribution and area of corals were investigated by;
  - analysis of aerial photographs and manta tow survey in coral reef region,
  - literature citing and information gathering, manta tow and quadrat survey in non-coral reef region,

#### 5th National Survey on the Natural Environment:

- Surrounding waters of Japanese archipelago was divided into two regions, which are coral reef region and non-coral reef region,
- Ogasawara was included in non-coral reef region as it is part of Tokyo metropolis.
- Only the shallow areas less than 10-m in depth were selected for the survey,
- When coral community in the shallow area, which is less than 10-m in depth, extended its distribution into the deeper water, whole community was counted including the part of the community more than 10-m in depth,
- The results of the 2nd and 4th National Survey were analyzed in each prefecture,
- Additional data were collected by literature citing and information gathering, and analyzed in each prefecture,

#### Summary of result of the 5th National Survey on the Natural Environment

##### 1. Distribution of Hermatypic corals (in shallow area less than 10-m in depth)

##### Distribution of corals in the regions

Total area of hermatypic corals of Japan is shown in Table 1 and Table 2.

##### [Non-coral reef region]

The total area of coral communities was 1,814.2-ha in the non-coral reef region. The communities without specific dominant corals described as type "Others", showed 825-ha and it was the largest portion of total area (45.50-%). Coral communities with dominant tabular corals were 728.2-ha and the second largest group in the non-coral region (40.14-%) (table 1).

Table 1. Area of hermatypic corals (non-coral reef region)

|          | Branching | Tabular | Massive | Encrusting | Foliose | Others | Unknown | Total   |
|----------|-----------|---------|---------|------------|---------|--------|---------|---------|
| Area(ha) | 53.0      | 728.2   | 172.3   | 29.7       | 1.8     | 825.4  | 3.8     | 1,814.2 |
| %        | 2.92      | 40.14   | 9.50    | 1.64       | 0.10    | 45.50  | 0.21    | 100.0   |

\*Others include the community with mixed species.

\*The survey in Hyogo and Tokushima prefecture were not conducted.

##### [Coral reef region]

The total area of hermatypic corals was 33,531-ha in the coral reef region. Excluding the coral communities with uncertain dominant species, the group "Others" was the largest with 28,907-ha (8.62-% of the total area of coral), followed by the group of "tabular coral", which area was 1,222.8-ha (3.65-%)(table 2).

Table 2. Area of hermatypic corals (coral reef region)

|          | Branching | Tabular | Massive | Encrusting | Foliose | Others  | Unknown  | Total    |
|----------|-----------|---------|---------|------------|---------|---------|----------|----------|
| Area(ha) | 573.2     | 1,222.8 | 544.6   | 14.3       | 0.0     | 2,890.7 | 28,285.5 | 33,531.1 |
| %        | 1.71      | 3.65    | 1.62    | 0.04       | 0.00    | 8.62    | 84.36    | 100.0    |

\*Others include the community with mixed species.

\*The survey in Hyogo and Tokushima prefecture were not conducted.

### Distribution of corals at each prefecture

[Non-coral reef region]

Figure 1 shows the area of coral distribution in each prefecture of non-coral reef region. Tokyo metropolis was the richest in hermatypic corals (527.0-ha, 29.05-% of total area of corals in the region), which including Ogasawara Islands (520.4-ha and 28.68-%). Miyazaki prefecture had the second largest coal area (378.8-ha, 20.88-%), followed by Kagoshima prefecture (294.8-ha, 16.25-%).

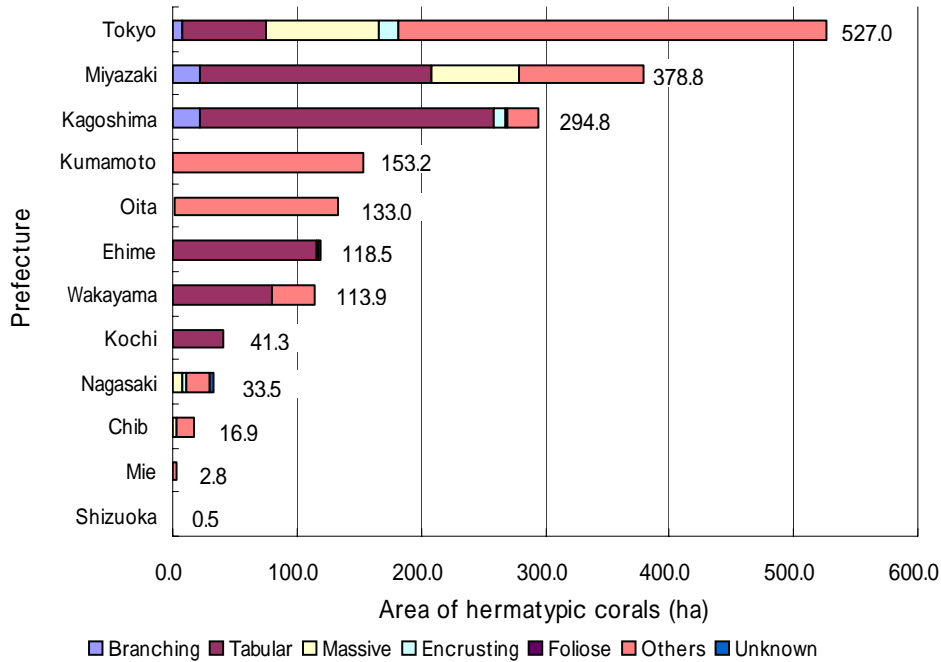


Fig. 1. Area of corals in each prefecture of non-coral region.

In Tokyo, several types of corals were mixed, while the tabular corals were dominant in Miyazaki and Kagoshima.

In this survey, Ogasawara islands were surveyed with the same method of the survey in non-coral region because of the low visibility of water and less developed reef systems, however, these islands actually belong to the coral reef region on geological location and their climate.

[Coral reef region]

Figure 2 show the area of corals in each prefecture of coral reef region. Okinawa prefecture was the richest in hermatypic corals (28,235.0-ha, 84.21-% of total area of corals), followed by Kagoshima prefecture (5,296.1-ha, 15.79-%).

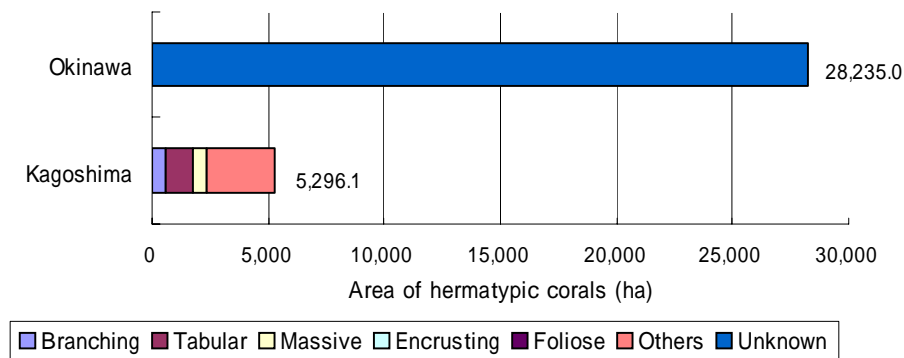


Fig. 2. Area of corals in each prefecture of coral reef region.

### Distribution of corals at regional waters

#### [Non-coral reef region]

In non-coral reef regions the area was divided into 14 regional waters. Figure 3 show the area of hermatypic corals in the regional waters of non-coral reef region.

Surrounding waters of Ogasawara Islands had the largest coral area in the non-coral reef region (520.4-ha and 28.68-% of total coral area). The Hyuga open seawater had the second largest coral area (472.4-ha 26.04-%). The corals of these two waters occupied about a half of the total coral area in the region.

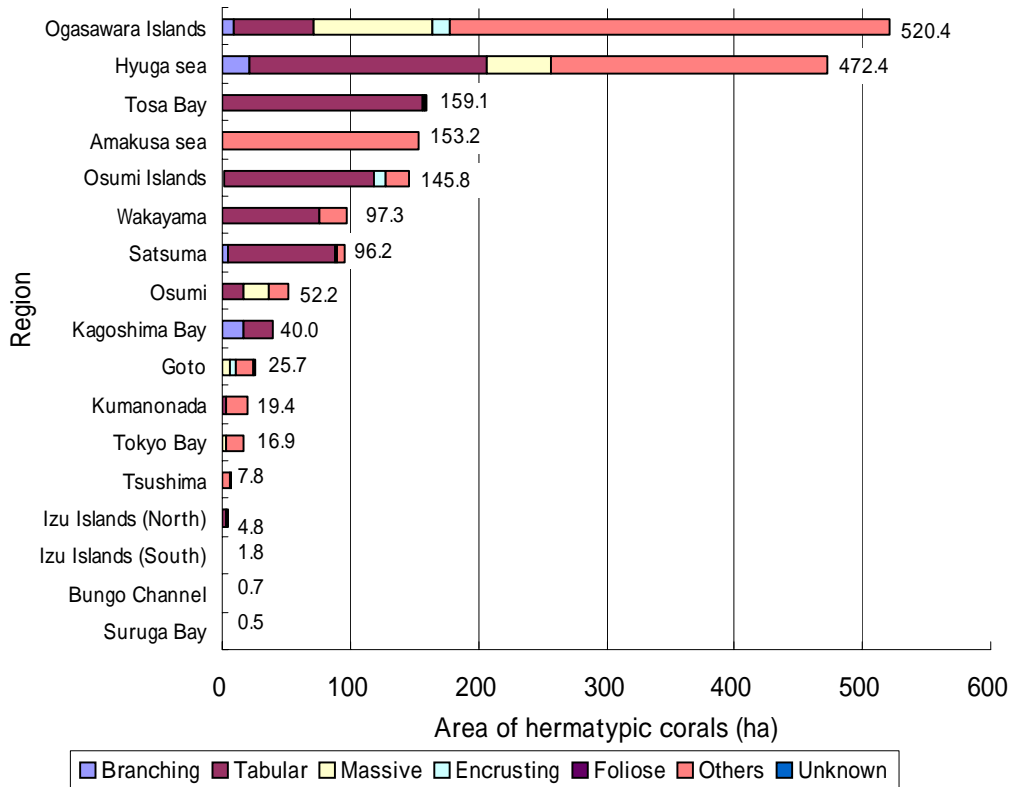


Fig. 3. Area of corals in regional waters of non-coral reef region.

The abundant type of corals of these waters was "Others", which included the coral communities with no dominant corals.

#### [Coral reef region]

In coral reef region the area was divided into 4 regional waters. Figure 4 show the area of corals in the regional waters of the coral reef region. Yaeyama islands water had the largest coral area among the regional waters. It was 19,231.5-ha and 57.35-% of total area of corals in the region. The most of the coral communities of this region had no specific dominant species.

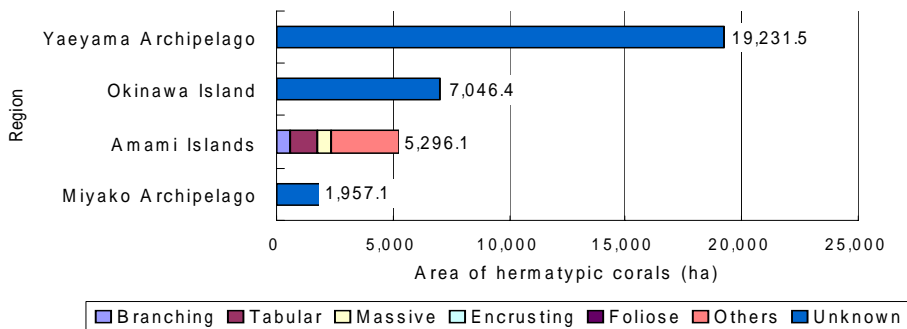


Fig 4. Area of corals in the regional waters of coral reef region.