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'outer-' or oceanic islands: Ogasawara (Bonin)  
and Daito Islands**

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# NOTES ON THE FISHERIES AROUND JAPAN'S SO-CALLED 'OUTER-' OR OCEANIC ISLANDS: OGASAWARA (BONIN) AND DAITO ISLANDS

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## ABSTRACT

Due to their unique oceanographic, ecological and socioeconomic conditions, the oceanic islands of Japan, i.e., the Ogasawara and Daito Islands, the fisheries on these islands have histories that are distinct from those on the main islands of Japan. Here I provide a brief commentary on the fisheries of Japan's remote, oceanic islands, including summaries of their historical (1950-2010) marine fisheries landings.

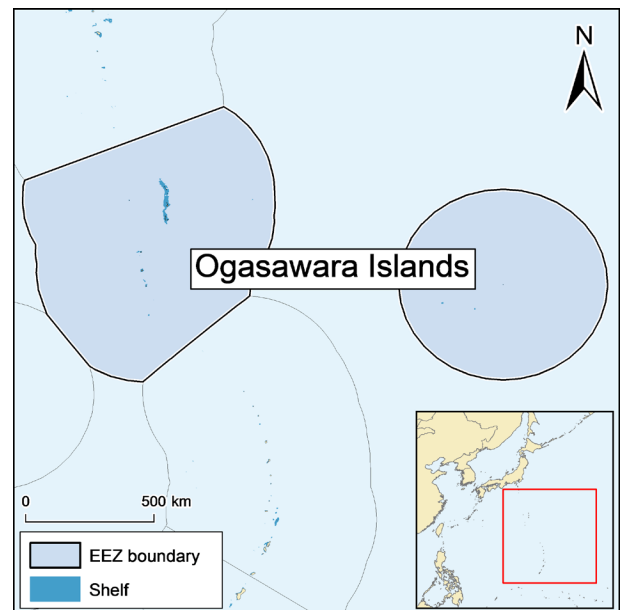
## INTRODUCTION

The 6,852 islands of Japan can be classified into two groups: four large 'home islands' and the surrounding islands that are sited on three continental shelves (western Japan on the Amur plate, northern Japan on the Okhotsk plate, and southern Japan—including the Ryukyu Islands—on the Okinawa Plate); and the oceanic volcanic islands of the Philippine Ocean Plate (Neall & Trewick 2008). As a result of the vast differences in the physical-oceanographic,<sup>1</sup> ecological, and socio-economic conditions, the fisheries catch reconstruction for Japan's Exclusive Economic Zones (EEZs, Swartz and Ishimura 2014) limited its scope of analysis to the EEZs surrounding the continental islands. The following commentary is, therefore, a supplement to Swartz and Ishimura (2014), aimed at describing the fisheries of Japan's two oceanic islands groups: Ogasawara and Daito.

### *Ogasawara Islands*

The Ogasawara Islands, also known 'Bonin Islands', are located about 1,000 km south of Tokyo, between 27°44'N and 24°14'N at 140°12'E (Figure 1). They comprise approximately 50 volcanic islands that are between 40-42 million years old, and lie between the Izu Islands in the north and the Marina Islands to the south, along the northeastern margin of the Philippine Ocean Plate. These islands are believed to have formed near the equator, and carried north to their current location by the expansion of the Philippine Plate. They continue to move northwestward at a rate of about 4 cm per year (Shimizu 2003a). Due to the richness of their diverse endemic terrestrial fauna, the Ogasawara Islands are commonly referred as the "Oriental Galapagos" (Shimizu 2003a) and were designated as a UNESCO World Heritage site in 2011 (Nakayama 2012). Together with uninhabited Okinotori-jima ('Parece Vela') and Minamitori-jima ('Marcus Island'), the EEZ area of the Ogasawara Islands is approximately 1.19 million km<sup>2</sup>; 30% of the Japan's total EEZ space.

Human settlement of this archipelago dates back to 1830 with the arrival of small group of westerners and Polynesians, followed by larger groups of Japanese immigrants in the late 19th century. The Ogasawara Islands were formally annexed by Japan in 1876, and their two largest islands (Chichi-jima and Haha-jima) now have permanent settlements, with population of about 2,100 and 500, respectively (Nakayama 2012). In the early days of the Japanese settlement, agriculture, more specifically sugarcane farming, was the basis of the economy on the islands. By 1944, the population on the two islands had reached 7,700. At the end of WWII, the Ogasawara Islands were ceded to the US administration, and their inhabitants, who had evacuated the islands in 1944, were not allowed to return. Thus the islands remained uninhabited for over 20 years until they were returned to Japan in 1968. The islands, most of which were designated as national park in 1972, were re-settled, with villages constructed on Chichi-jima and Haha-jima. Presently, the Government of Tokyo administers the islands, with a weekly 26-hour passenger ship connecting Chichi-jima.



**Figure 1.** Map of the Ogasawara Islands

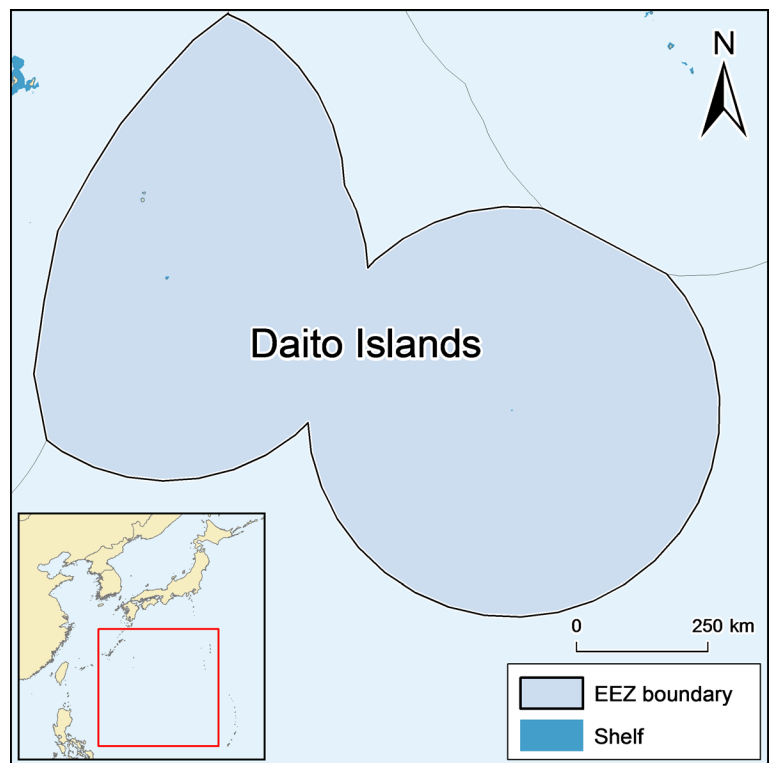
<sup>1</sup>The oceanic islands have steep shorelines, often with 50-100 m sea cliffs, while the ocean surrounding the continental islands is shallow, with a maximum depth of 150 m.

Although reef-building corals are abundant, the coral reefs are not as well developed as in the Ryukyu Islands, located at the same latitude, 1,000 km to the west. According to Randall *et al.* (1997), a total of 801 species of reef and shore fishes (occurring at depth of less than 200 m) from 97 families are recorded around the Ogasawara Islands, which are slightly less diverse than the Mariana Islands. However, Randall *et al.* (1997) believe that this difference is due to the lack of inshore surveys in the Ogasawara Islands and that the fish fauna in these islands, composed of species of southern Japan as well as tropical species of the Pacific, is likely to be more diverse than current data suggest. Of the species found in the Ogasawara Islands, 30% are tropical species not found farther north, and 10% are northern species of the mainland not found farther south. Randall *et al.* (1997), however, note that the northern species that do occur in the Ogasawara Islands are better established and abundant. The authors hypothesize that the ichthyofauna in the Ogasawara Islands may be strongly influenced by the prevailing oceanic currents, most notably the Kuroshio Current and the Subtropical Countercurrents, and the environmental volatility caused by the two current systems, which has results in the unusual mixing of fish species that may become established or disappear with relative frequency.

### *Daito Islands:*

Located 360 km east of Okinawa (25°50'N, 131°14'E), the Daito Islands (Figure 2) are comprised of three islands: Kita Daito-jima, Minami Daito-jima and Oki Daito-jima, of which Minami Daito-jima is the largest (30.6 km<sup>2</sup>). Formed by unique vertical tectonic history of subsidence (which formed atolls), followed by uplift (which formed fringing reef around the emerged atolls), Kita Daito-jima and Minami Daito-jima are two of only a few uplifted atolls in the world (Ota and Omura 1992). Like the Ogasawara Islands, these islands were formed relatively recently (approximately 50 million years ago) around the equator before drifting northward.

Motivated by the prospect of sugarcane farming and phosphorus mining, the colonization of Minami Daito-jima and Kita Daito-jima began in the early 20th century. The population rapidly grew to 4,400 by 1921, though it has been on a decline since. Prior to WWII, the islands operated as a privately owned plantation, with no government administration. The islands were de-privatized in 1964 while under US occupation and returned to Japan in 1972. Currently, these two islands have a total population of about 2,000. With aging demographic, the decline in the population is expected to continue (Sekina and Horio 2012). Oki Daito-jima, the smallest and most remote of the three islands, remains uninhabited.



**Figure 1.** Map of the Daito Islands

Unlike the Ogasawara Islands, there is a considerable lack of scientific studies of the Daito Islands' ecology, both for terrestrial and marine ecosystems.<sup>2</sup> No studies of the ichthyofauna were found for the Daito Islands.

## FISHERIES OF OGASAWARA AND DAITO ISLANDS

### *Ogasawara Islands:*

According to the Tokyo Yearbook of Agricultural, Forestry and Fisheries Statistics (MAFF 2004-2011), total annual marine fisheries landings from the Ogasawara Islands are about 500 t annually (Figure 2; see Table 1 for species breakdown). Half of these landings were composed primarily of large pelagics species, including swordfish (*Xiphias gladius*), bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*). Spanish mackerels (*Scomberomorus niphonius*), amberjacks (*Seriola* spp.), while bigfin reef squid (*Sepioteuthis lessoniana*) and spiny lobsters (*Panulirus* spp.) make up the remainder of the catch. The islands' fishing fleet in 2010 was composed of 49 trolling vessels, of which all but two have GRT 10 t, and could thus be considered artisanal (i.e., small-scale commercial). The total employment in the fisheries sector was 70.

<sup>2</sup> Shimizu (2003b) being an exception (for terrestrial ecology).

A detailed study of the spiny lobster fisheries of the Ogasawara Islands by Nishikiori and Sekiguchi (2001) noted that of the six species of spiny lobsters found in the area, *Panilurus longipēs femoristriga* is the most abundant

**Table 1.** Total marine fisheries landings in the Ogasawara Islands by species, 2004-2010 (from MAFF 2004-2011).

Year	Bigeye	Yellowfin	Other tunas	Swordfish	Other marlins	Amberjack	Spanish mackerel	Other fish	Lobster	Squid	Other invertebrates
2010	33	26	2	202	1	17	11	168	4	12	1
2009	28	19	-	229	1	10	19	152	4	-	14
2008	45	21	1	331	1	10	16	141	5	11	14
2007	40	25	2	343	1	10	14	149	5	7	13
2006	22	32	16	310	1	8	23	137	5	5	10
2005	41	31	31	307	5	8	25	140	3	17	15
2004	24	46	1	161	1	13	23	162	3	5	15
Average*	33	29	8	269	2	11	19	150	4	8	12

\*average of 2010-2004 used for 1973-2003 catch.

(accounting for 95% of the total lobster catch), and this species is targeted using traps on near-shore reefs. The authors found that in the post-resettlement period (i.e., 1968 onwards), the lobster catches in the Ogasawara Islands varied between 3 and 17 t·year<sup>-1</sup>. The lobster catches, as well as the catches of large pelagic species are destined primarily for the markets in Tokyo.<sup>3</sup>

### Daito Islands:

Because of their unique geology, neither Minami Daito-jima nor Kita Daito-jima possessed a fishing port or suitable landing site (i.e., beaches or inlets) until 2011 when the construction for a commercial fishing port was completed on Minami Daito-jima (Sekina and Horio 2012). Unable to land on shore due to the surrounding reefs, the loading and unloading of ships is conducted through the use of cranes located along the outer ridge of the islands. Despite abundant fish stocks in their inshore waters, these geographical challenges—as well as a lack of access to markets on Japan's main islands—meant commercial fisheries never became a key component of economic activities on these islands. The most recent account of fishing capacity by Sekina and Horio (2012) described fisheries on Minami Daito-jima as comprising 11 commercial fishers, with 30 additional fishing vessels for part-time use; all vessels are small trollers (GRT 5 t).

The total marine fisheries landings from the Daito Islands, based on the Yearbook of Okinawa Agriculture, Forestry and Fisheries Statistics (OGB 1971-2012) are presented in Figure 2 (see also 2). The landings, which total around 100 t per year, consisted mainly of yellowfin tuna, Spanish mackerel, and diamond squid (*Thysanoteuthis rhombus*). Due to the remoteness of these islands, these catches, are consumed exclusively by the local communities.<sup>4</sup>

Due to the remoteness and small population size of the local communities, the fisheries resources around the islands of Ogasawara and Daito have remained relatively unexploited (Sekine & Horio 2012). Given the uniqueness of the local marine ecosystems and opportunities, the government of Japan should pursue a model of sustainability that balances the modest economic and food security needs of the local communities and the need for conservation. The World Heritage listing of the Ogasawara Islands is a major step forward. It is maybe time to extend the protection offered to their terrestrial ecosystem also to the marine ecosystems.

### REFERENCES

- MAFF 2004-2011. Heisei 16-22 Statistical Yearbook of Agriculture, Forestry and Fisheries of Tokyo. Kanto Agricultural Policy Department, Ministry of Agriculture, Forestry and Fisheries.
- Nakayama T. 2012. World Heritage Treaty and its application in Japan: case of Ogasawara [in Japanese]. Hokkaido Journal of New Global Law and Policy 18:79-107.
- Neall VE, Trewick SA. 2008. The age and origin of the Pacific islands: a geological overview. Philosophical Transactions of the Royal Society B 363:3293-3308.
- Nishikiori K. and Sekiguchi H. 2001. Spiny lobster fishery in Ogasawara (Bonin) Islands, Japan. Bulletin of Japanese Society of Fisheries and Oceanography 65(3):94-102.
- OGB. 1971-2011. No 1. (Showa 46) – No. 40 (Heisei 22) Statistical Yearbook of Agriculture, Forestry and Fisheries of Okinawa. Agriculture, Forestry and Fisheries Department, Okinawa General Bureau, Cabinet Office.
- Ota Y. and Omura A. 1992. Contrasting styles and rates of tectonic uplift of coral reef terraces in the Ryukyu and Daito Islands, Southwestern Japan. Quaternary International 15/16:17-29.
- Randall JE, Ida H, Kato K, Pyle RL, Earle JL. 1997. Annotated checklist of the inshore fishes of the Ogasawara Islands. National Science Museum Monograph 11(1):74-94.
- Sekine T. and Horio T. 2012. What's going on at the Southern Daito Islands locating far south from the main islands of Japan? Is this the last paradise for public works? [in Japanese]. Kansei Gakuin University Departmental Bulletin Paper 39:61-92.

<sup>3</sup> For the purpose of *Sea Around Us*, marine fisheries catches in the Ogasawara Islands can be assumed to consist of 80% artisanal, and 20% subsistence catches.

<sup>4</sup> For the purpose of the *Sea Around Us* catch database, assumed marine fisheries catches in the Daito Islands can be assumed to consist of 60% artisanal, and 40% subsistence catches.

- Shimizu Y. 2003a. The nature of Ogasawara and its conservation [in Japanese]. *Global Environmental Research* 7: 3-14
- Shimizu Y. 2003b. The nature of Minami-Daitojima: from the viewpoint of another oceanic island [in Japanese]. *Regional Views* 16:9-32.
- Swartz W, Ishimura G. 2014. Baseline assessment of total fisheries-related biomass removal from Japan's Exclusive Economic Zones: 1950-2010. *Fisheries Science* DOI 10.1007/s12562-014-0754-6.

**Appendix Table A1.** Reported landings of the Daito Islands (based on OGB 1963-2011)

Year	Location		Taxa									
	Minami Daito	Kita Daito	Albacore	Bigeye	Yellowfin	Misc tunas	Tuna (juvenile)	Marlin	Shark	Spanish mackerel	Misc fish	Diamond squid
1950-1961	81	3	-	5	20	2	18	-	-	28	8	3
1962	61	1	-	4	15	1	13	-	-	20	6	2
1963	93	6	-	6	24	2	21	-	-	33	10	3
1964	89	1	-	6	22	2	19	-	-	30	9	3
1965	77	3	-	5	19	1	17	-	-	26	8	3
1966	95	6	-	6	24	2	21	-	-	33	10	3
1967	79	8	-	5	21	2	18	-	-	29	9	3
1968	9	10	-	1	5	-	4	-	-	6	2	1
1969	74	16	-	6	22	2	19	-	-	30	9	3
1970	85	8	-	6	22	2	20	-	-	31	9	3
1971	18	7	-	2	6	-	5	-	-	8	3	1
1972	79	19	-	-	-	55	-	-	-	43	-	-
1973	53	10	-	3	-	-	20	-	-	39	1	-
1974	35	29	-	-	7	2	22	-	3	27	2	-
1975	72	30	-	22	2	7	26	-	3	41	-	-
1976	59	21	-	-	-	-	37	-	-	44	-	-
1977	69	33	-	-	-	-	59	-	-	43	-	-
1978	63	27	-	-	-	-	46	-	-	40	4	-
1979	71	27	2	3	2	-	43	-	-	38	11	-
1980	86	33	-	-	21	-	60	-	-	28	10	-
1981	72	28	-	-	35	-	17	-	-	36	12	-
1982	96	38	-	-	-	-	94	-	-	34	6	-
1983	68	24	-	-	-	-	55	-	-	26	9	-
1984	64	32	-	-	-	-	65	-	-	23	8	-
1985	48	23	-	-	-	-	39	-	-	23	9	-
1986	66	21	-	-	-	-	43	-	-	33	11	-
1987	65	30	-	-	-	-	48	-	-	35	11	-
1988	75	20	-	-	54	-	-	-	-	33	10	-
1989	52	24	-	5	18	1	16	-	-	25	8	3
1990	48	33	-	5	20	1	17	-	-	27	8	3
1991	80	41	-	-	58	-	-	-	-	47	15	-
1992	80	35	-	45	19	-	-	-	-	36	14	-
1993	71	45	-	39	15	-	-	-	-	46	16	-
1994	60	40	-	22	18	-	-	-	-	45	15	-
1995	66	43	-	30	12	-	17	-	-	34	15	-
1996	63	42	-	44	7	-	23	-	-	21	11	-
1997	76	45	-	3	57	-	24	-	-	19	15	1
1998	59	46	-	-	57	-	-	1	-	35	9	-
1999	28	10	-	-	23	-	-	-	-	3	9	-
2000	42	26	-	-	27	-	-	-	-	26	11	1
2001	58	34	-	-	48	-	-	-	-	32	9	1
2002	57	31	-	-	44	-	-	-	-	28	14	1
2003	74	29	-	-	25	2	22	-	-	34	10	4
2004	91	27	-	-	62	-	-	2	-	35	12	5
2005	46	33	-	-	41	-	-	1	-	24	8	5
2006	71	31	-	-	46	-	-	1	-	27	9	20
2007	81	29	-	7	27	2	23	-	-	36	11	4
2008	92	27	-	-	71	-	-	1	-	27	8	14
2009	96	25	-	5	62	-	-	1	-	36	10	7
2010	99	26	-	6	67	-	-	-	-	35	9	8

\*Fisheries statistics absent for 2003 and 2007. Average of the previous and next year used.

\*\*Catch composition not available for 1962-1971, 1989 and 1990. Average composition of the reported years used.

\*\*\*Fisheries statistics unavailable for years prior to 1962. Average of 1962-1964 used.