



CCSBT-CC/1209/08

## SOUTHERN BLUEFIN TUNA TRADE DATA: EXPLORATORY ANALYSES

### Introduction

In October 2011, the 6th Meeting of the Compliance Committee (CC6) recommended that market analyses be conducted, and that a subscription to a trade database be taken out to allow these analyses to be undertaken. Further, CC6 recommended that the ESC be tasked with developing a methodology for using these trade figures to analyse market trends.

As recommended, the Secretariat took out a subscription to the Global Trade Atlas® (GTA) database in January 2012, and subsequently prepared a paper on exploratory analyses of these trade data. This paper was submitted as paper ESC/1208/10 (Rev.2) to the 17<sup>th</sup> Meeting of the Extended Scientific Committee (ESC). It is equally relevant to CC7, and is therefore re-submitted here as paper CCSBT-CC/1209/BGD 03<sup>1</sup>.

### ESC Meeting Outcomes

The ESC made no recommendations on paper ESC/1208/10 (Rev.2). However, the following key observations were made:

1. The ESC agreed that the Secretariat's analysis was of value in identifying broad market trends and particularly expansion of new markets and trade by NCNMs.
2. The ESC regarded the lack of information for SBT fillets in the subscription to the GTA database as being a substantial issue, given the potential scale of SBT fillet trade.
3. The ESC noted the limitations in the trade data presented. In addition, the ESC noted the substantial issue of potential accidental or intentional miscoding and that there is uncertainty in the robustness of the price and origin data. The ESC was not aware of the validation processes for these data and noted the Compliance Committee was probably better placed to evaluate this. The GTA data presented also do not distinguish trade of SBT product that is on-sold, *i.e.* that is imported to one country and then exported on to another country.
4. Given the data limitations, the ESC did not recommend more detailed analyses at this stage, but reiterated the value of continuing the Secretariat's approach.

### Summary of Exploratory Analyses

Some of the conclusions noted within the original ESC paper were as follows:

- A total of 26 Non-Cooperating Non-members (NCNMs) were recorded as importers<sup>2</sup>. One additional importing NCNM was identified from Catch Documentation Scheme (CDS)

---

<sup>1</sup> Note that CDS import quantities presented in this paper do not include imports from Re-export/ Export after Landing of Domestic Product (REEF) forms

<sup>2</sup> Importers are considered to be those states/entities listed as either importers or export destinations (and so by implication importers)

records, giving a grand total of 27 importing NCNMs. Many of these importers received SBT in small quantities,

- A total of 11 NCNMs were recorded as exporters<sup>3</sup> from combined GTA and CDS database extracts, and
- A general inspection of the CDS and GTA data suggested that the main markets outside the current CDS coverage areas include Hong Kong, Singapore, the USA and more recently China.

However, data extracted from the GTA trade database should be considered with caution due to its inherent limitations. For example, CCSBT's subscription includes only a subset of all the GTA data available. In addition, some low unit price values and unlikely trades of fresh SBT, potentially indicate that some miscoded commodity codes could be present within the trade database, *i.e.* that some non-SBT product may have been erroneously recorded under SBT commodity codes in the trade data.

### **World Wildlife Fund (WWF) Market Survey in China**

An additional item relevant to this paper was notified to Members in the Secretariat's Circular #2012/023. In this Circular, the Secretariat advised Members and Cooperating Non-Members (CNMs) of the outcomes of a market survey carried out in the People's Republic of China by the World Wildlife Fund (WWF). That survey is provided at Attachment A.

One hundred samples of sashimi-grade tuna products were collected in 75 different restaurants and 4 different supermarkets in Beijing and Shanghai during July and August 2011. Of the samples collected that were verified to be tuna (88 out of 100), a surprisingly large percentage, were confirmed by genetic analysis to be southern bluefin tuna (29.5%). All of the southern bluefin tuna identified came from the restaurant samples. These results appear to indicate that substantial quantities of SBT reached both Beijing and Shanghai.

China confirmed that the China Customs Authority recorded 9.864 tonnes of SBT imports during 2011. This figure matches the quantity of 9.864 tonnes of frozen SBT imports to China extracted from the trade database. However, the trade database also recorded 0.46 tonnes of fresh/chilled SBT imports to China during 2011. Note that the quantity of imported product confirmed by China (9.864 tonnes) is substantially greater than is indicated by CDS quantities of fresh plus frozen export records to China (0.45 tonnes during 2011) provided to CCSBT by Members and CNMs. However, the CDS does not store any information on any NCNM exports to China which may have occurred.

### **Prepared by the Secretariat**

---

<sup>3</sup> Exporters are considered to be those states/entities listed as either exporters or import sources (and so by implication exporters)

**WWF study:****Market survey in the People's Republic of China in 2011-2012 (sashimi-grade tuna)****July 2012****Introduction**

In order to check the reliability of information on species composition of sashimi-grade tuna products in global markets, we carried out a systematic monitoring of tuna products from the Japanese, Chinese and some European markets during two years. The sampling was carried out in Tokyo, Hong Kong, Beijing, Shanghai, Rome and Barcelona, and the samples of sashimi grade tuna were later analyzed based on DNA sequencing methodologies. In the case of China the purpose of the work was also to assess from the field the magnitude of Atlantic bluefin tuna (ABFT) consumption and trade, as information reported to ICCAT points to little more than anecdotal relevance.

A total 100 samples were taken from supermarkets and restaurants in the Chinese cities of Beijing and Shanghai during July and August 2011 (Table 1, from sample CNB011 to CNS421). Furthermore, in order to check how significant the Chinese capacity to import Bluefin tuna is, 17 additional samples were obtained from a field assessment in January and February 2012 in Dalian and Yantai. These cities were identified as the hubs for importing and redistributing bluefin tuna in China therefore, in addition to markets, supermarkets and restaurants, samples were taken from the three main bluefin tuna importing and processing companies in Dalian and Yantai (Table 1, from sample 1 to 17, and Figure 1), which in order of assessed importance for Atlantic bluefin tuna imports are:

1. Yantai Shandong Zhonglu Oceanic Foods Co., Ltd. (YSZOF)
2. Dalian Global Foods Corporation Ltd. (DGF) subsidiary company of Dalian Zhangzidao Fishery Group Co., Ltd.
3. Dalian Ocean Fishery Group of Corporations. (DOFGC)

These companies import, process, freeze and redistribute several species of sashimi-grade tunas, including Atlantic bluefin tuna. Our consultant visited the cold storage rooms at Dalian Global Foods Ltd. and was informed by local sources of the presence there of frozen bluefin tuna from a Turkish farm, as well as of the packing of 250g-pieces of frozen tuna intended for the European market.

**Results**

The samples, once taken, were sent to the ichthyological genetics laboratory of Girona's University (Spain) to be analyzed. After several runs of PCR and sequencing, all 117 samples were successfully identified. Several procedures were used to identify the species. First, 105 samples were identified as species of the genus *Thunnus* using the methodology described in Viñas and Tudela (2009); the remaining 12 samples were not recognized as any *Thunnus* species. Using the BLAST approach, these 12 samples were compared to the sequences from GenBank and gave a positive identification of 10 sequences with escolar *Lepidocybium*

*flavobrunneum*, one sequence with Atlantic salmon *Salmo salar*, and one sample with Atlantic blue marlin *Makaira nigricans*. See Table 1 for the summary results of the species identification and Document 4 (Annex 2) for details.

The identification obtained from the 100 samples taken in Shanghai and Beijing (i.e. samples CNB011 to CNS421) is the following: 29 were identified as yellowfin tuna (*Thunnus albacares*), 26 as Southern bluefin tuna (*T. maccoyii*), 15 as bigeye tuna (*T. obesus*), 12 as Atlantic bluefin tuna (*T. thynnus*), 6 as Pacific bluefin tuna (*T. orientalis*), and 12 were not from the genus *Thunnus*. This means that from the genus *Thunnus* 33 % were yellowfin (*T. albacares*), 29.5 % Southern bluefin (*T. maccoyii*), 17 % bigeye (*T. obesus*), 13.6 % Atlantic bluefin (*T. thynnus*), and 6.8 % Pacific bluefin (*T. orientalis*).

Regarding the additional 17 tuna samples taken for the field assessment in Dalian and Yantai (i.e. samples 1 to 17), the identification outcome is as follows: 8 *T. thynnus*, 4 *T. albacares*, 2 *T. obesus*, 2 *T. alalunga* and 1 *T. maccoyii*. Atlantic bluefin tuna was found in the three cold storage facilities (= main importing companies) sampled.

### **Conclusion**

Our research suggests consumption and related imports of Atlantic bluefin tuna in China are significant, and our findings don't seem consistent with the very low figures reported to ICCAT (imports of only 19 t in 2010, COC-303/2011; it's worth noting Chinese catches in 2011 were not consumed in China but were reportedly exported to Japan).

Our findings regarding Southern bluefin tuna (second most abundant species after yellowfin in our sashimi sampling) suggest an even greater mismatch as trade data available from CCSBT and from Chinese customs points to an almost anecdotal trade of this species into China.

**Table 1.** Summary of China's sampling and genetic analysis. Samples CNB011 to CNS421 are from Beijing and Shanghai. Samples 1 to 17 are from the field assessment in Dalian and Yantai. More details are available upon request. Origin of samples 9 to 17 as reported by the companies' staff.

| Sample | SAMPLING               |                     |           |         | GENETIC ANALYSIS               |                                   |
|--------|------------------------|---------------------|-----------|---------|--------------------------------|-----------------------------------|
|        | Label Product's Name   | Place               | Date      | City    | Species common name            | Scientific name                   |
| CNB011 | Tuna                   | Japanese Restaurant | 7/2/2011  | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB021 | Tuna                   | Supermarket         | 7/2/2011  | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB031 | Red tuna               | Japanese Restaurant | 7/2/2011  | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB032 | White tuna             | Japanese Restaurant | 7/6/2011  | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB041 | Red tuna               | Japanese Restaurant | 7/10/2011 | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB042 | White tuna             | Japanese Restaurant | 7/10/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB051 | Tuna                   | Japanese Restaurant | 7/12/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB061 | Tuna                   | Japanese Restaurant | 7/12/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB062 | Tuna middle part       | Japanese Restaurant | 7/12/2011 | Beijing | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNB071 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB081 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB091 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNB101 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB111 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNB121 | Tuna                   | Japanese Restaurant | 8/3/2011  | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB131 | Tuna                   | Japanese Restaurant | 8/4/2011  | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB141 | Tuna                   | Japanese Restaurant | 8/4/2011  | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB151 | Bigeye tuna            | Japanese Restaurant | 8/4/2011  | Beijing | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNB152 | White tuna (whitefish) | Japanese Restaurant | 8/4/2011  | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB153 | Black-fin tuna         | Japanese Restaurant | 8/4/2011  | Beijing | Atlantic Blue marlin           | <i>Makaira nigricans</i>          |
| CNB161 | Tuna                   | Japanese Restaurant | 8/4/2011  | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |

| Sample | SAMPLING                 |                     |          |         | GENETIC ANALYSIS               |                                   |
|--------|--------------------------|---------------------|----------|---------|--------------------------------|-----------------------------------|
|        | Label Product's Name     | Place               | Date     | City    | Species common name            | Scientific name                   |
| CNB171 | Tuna                     | Japanese Restaurant | 8/4/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB172 | Tuna                     | Japanese Restaurant | 8/4/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB181 | Tuna                     | Japanese Restaurant | 8/4/2011 | Beijing | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNB191 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB201 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNB211 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB221 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB231 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB232 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB241 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNB251 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB261 | Tuna back part           | Japanese Restaurant | 8/6/2011 | Beijing | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNB271 | Tuna                     | Japanese Restaurant | 8/6/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB281 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB291 | White tuna               | Japanese Restaurant | 8/7/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB292 | Red tuna back part       | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB301 | Tuna                     | Japanese Restaurant | 8/6/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB311 | Wild bigeye tuna         | Japanese Restaurant | 8/7/2011 | Beijing | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNB312 | Bluefin tuna middle part | Japanese Restaurant | 8/7/2011 | Beijing | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNB321 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB331 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB332 | White tuna               | Japanese Restaurant | 8/7/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB341 | White tuna               | Japanese Restaurant | 8/7/2011 | Beijing | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB342 | Tuna                     | Japanese Restaurant | 8/7/2011 | Beijing | Yellowfin tuna                 | <i>Thunnus albacares</i>          |

| Sample | SAMPLING               |                     |           |          | GENETIC ANALYSIS               |                                   |
|--------|------------------------|---------------------|-----------|----------|--------------------------------|-----------------------------------|
|        | Label Product's Name   | Place               | Date      | City     | Species common name            | Scientific name                   |
| CNB351 | Tuna                   | Japanese Restaurant | 8/7/2011  | Beijing  | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB361 | Tuna                   | Japanese Restaurant | 8/16/2011 | Beijing  | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNB362 | Tuna                   | Japanese Restaurant | 8/16/2011 | Beijing  | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNB371 | Tuna                   | Japanese Restaurant | 8/1/2011  | Beijing  | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNB372 | Tuna                   | Japanese Restaurant | 8/1/2011  | Beijing  | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNS011 | Tuna sashimi           | Japanese Restaurant | 7/14/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS021 | South tuna             | Japanese Restaurant | 7/14/2011 | Shanghai | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNS022 | Fatty tuna middle part | Japanese Restaurant | 7/14/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS023 | Bigeye tuna            | Japanese Restaurant | 7/14/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS031 | Tuna sushi             | Japanese Restaurant | 7/15/2011 | Shanghai | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNS041 | Sashimi mixed          | Japanese Restaurant | 7/15/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS042 | Sashimi mixed          | Japanese Restaurant | 7/15/2011 | Shanghai | Escolar                        | <i>Lepidocybium flavobrunneum</i> |
| CNS051 | Sashimi mixed          | Japanese Restaurant | 7/15/2011 | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNS052 | White tuna sashimi     | Japanese Restaurant | 7/16/2011 | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNS061 | Tuna sashimi           | Japanese Restaurant | 7/16/2011 | Shanghai | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNS062 | Tuna sashimi           | Japanese Restaurant | 7/16/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS071 | Tuna                   | Japanese Restaurant | 7/16/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |
| CNS081 | Tuna                   | Japanese Restaurant | 7/17/2011 | Shanghai | Northern Bluefin tuna Pacific  | <i>Thunnus orientalis</i>         |
| CNS091 | Tuna sashimi           | Japanese Restaurant | 7/17/2011 | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNS101 | Tuna                   | Japanese Restaurant | 7/17/2011 | Shanghai | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>            |
| CNS111 | Tuna sashimi           | Supermarket         | 7/17/2011 | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>             |
| CNS121 | Tuna                   | Supermarket         | 7/17/2011 | Shanghai | Yellowfin tuna                 | <i>Thunnus albacares</i>          |
| CNS131 | Tuna sashimi           | Japanese Restaurant | 7/17/2011 | Shanghai | Northern Bluefin tuna Pacific  | <i>Thunnus orientalis</i>         |
| CNS141 | Tuna sashimi           | Japanese Restaurant | 7/17/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>           |

| Sample | SAMPLING               |                      |           |          | GENETIC ANALYSIS                                |                           |
|--------|------------------------|----------------------|-----------|----------|---|---------------------------|
|        | Label Product's Name   | Place                | Date      | City     | Species common name                             | Scientific name           |
| CNS151 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Northern Bluefin tuna Pacific                   | <i>Thunnus orientalis</i> |
| CNS161 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Northern Bluefin tuna Pacific                   | <i>Thunnus orientalis</i> |
| CNS171 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS181 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS191 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS201 | Tuna                   | Japanese Supermarket | 7/17/2011 | Shanghai | Yellowfin tuna                                  | <i>Thunnus albacares</i>  |
| CNS211 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Bigeye tuna                                     | <i>Thunnus obesus</i>     |
| CNS221 | Tuna sashimi           | Japanese Restaurant  | 7/17/2011 | Shanghai | Yellowfin tuna                                  | <i>Thunnus albacares</i>  |
| CNS231 | Tuna sashimi           | Japanese Restaurant  | 7/20/2011 | Shanghai | Northern Bluefin tuna Atlantic                  | <i>Thunnus thynnus</i>    |
| CNS241 | Bluefin tuna sushi     | Japanese Restaurant  | 8/7/2011  | Shanghai | Northern Bluefin tuna Atlantic                  | <i>Thunnus thynnus</i>    |
| CNS251 | Red tuna               | Japanese Restaurant  | 8/7/2011  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS252 | White tuna             | Japanese Restaurant  | 8/7/2011  | Shanghai | Northern Bluefin tuna Atlantic similar Albacore | <i>Thunnus thynnus</i>    |
| CNS261 | Tuna sashimi           | Japanese Restaurant  | 8/7/2011  | Shanghai | Yellowfin tuna                                  | <i>Thunnus albacares</i>  |
| CNS271 | Bluefin tuna           | Japanese Restaurant  | 8/7/2011  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS281 | Tuna sashimi           | Japanese Restaurant  | 8/8/2011  | Shanghai | Northern Bluefin tuna Atlantic                  | <i>Thunnus thynnus</i>    |
| CNS291 | Black fin tuna sashimi | Japanese Restaurant  | 8/7/2011  | Shanghai | Northern Bluefin tuna Pacific                   | <i>Thunnus orientalis</i> |
| CNS301 | Tuna sashimi           | Japanese Restaurant  | 8/7/2011  | Shanghai | Northern Bluefin tuna Atlantic                  | <i>Thunnus thynnus</i>    |
| CNS311 | Tuna sashimi           | Japanese Restaurant  | 2011-8-8  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS321 | Tuna sashimi           | Japanese Restaurant  | 8/11/2011 | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS331 | Bigeye tuna            | Japanese Restaurant  | 8/4/2011  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS341 | Tuna sashimi           | Japanese Restaurant  | 8/8/2011  | Shanghai | Yellowfin tuna                                  | <i>Thunnus albacares</i>  |
| CNS351 | Bluefin tuna           | Japanese Restaurant  | 8/7/2011  | Shanghai | Northern Bluefin tuna Pacific                   | <i>Thunnus orientalis</i> |
| CNS361 | Tuna sashimi           | Japanese Restaurant  | 8/8/2011  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |
| CNS371 | Tuna sashimi           | Japanese Restaurant  | 8/5/2011  | Shanghai | Southern Bluefin tuna                           | <i>Thunnus maccoyii</i>   |



| Sample | SAMPLING             |                             |           |          | GENETIC ANALYSIS               |                          |
|--------|----------------------|-----------------------------|-----------|----------|--------------------------------|--------------------------|
|        | Label Product's Name | Place                       | Date      | City     | Species common name            | Scientific name          |
| CNS381 | Tuna sashimi         | Japanese Restaurant         | 8/8/2011  | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>  |
| CNS391 | Tuna                 | Japanese Restaurant         | 8/10/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>  |
| CNS392 | Long fin tuna        | Japanese Restaurant         | 8/10/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>  |
| CNS401 | Red tuna             | Japanese Restaurant         | 8/12/2011 | Shanghai | Atlantic Salmon                | <i>Salmo salar</i>       |
| CNS402 | White tuna           | Japanese Restaurant         | 8/12/2011 | Shanghai | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>  |
| CNS411 | Tuna sashimi         | Japanese Restaurant         | 8/1/2011  | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>    |
| CNS421 | Tuna                 | Japanese Restaurant         | 7/17/2011 | Shanghai | Bigeye tuna                    | <i>Thunnus obesus</i>    |
| 1      |                      | Supermarket                 | 1/19/2012 |          | Yellowfin tuna                 | <i>Thunnus albacares</i> |
| 2      |                      | Supermarket                 | 1/19/2012 |          | Yellowfin tuna                 | <i>Thunnus albacares</i> |
| 3      |                      | Uminosato Restaurant        | 1/19/2012 | Dalian   | Yellowfin tuna                 | <i>Thunnus albacares</i> |
| 4      |                      | Uminosato Restaurant        | 1/19/2012 | Dalian   | Yellowfin tuna                 | <i>Thunnus albacares</i> |
| 5      |                      | Wasabi Restaurant           | 1/25/2012 |          | Bigeye tuna                    | <i>Thunnus obesus</i>    |
| 6      |                      | Wasabi Restaurant           | 1/25/2012 |          | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 7      |                      | Wasabi Restaurant           | 1/25/2012 |          | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 8      |                      | Haiqiao Restaurant          | 1/29/2012 | Dalian   | Bigeye tuna                    | <i>Thunnus obesus</i>    |
| 9      |                      | DGF (Spain farm origin)     | 1/30/2012 | Dalian   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 10     |                      | DGF (Spain farm origin)     | 1/30/2012 | Dalian   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 11     |                      | DGF (Spain farm origin)     | 1/30/2012 | Dalian   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 12     |                      | DGF (Spain farm origin)     | 1/30/2012 | Dalian   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 13     |                      | YSZOF (Spain farm origin)   | 2/1/2012  | Yantai   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 14     |                      | DOFGC (Spain farm origin)   | 2/1/2012  | Dalian   | Northern Bluefin tuna Atlantic | <i>Thunnus thynnus</i>   |
| 15     |                      | YSZOF (Turkey farm origin)  | 2/4/2012  | Yantai   | Southern Bluefin tuna          | <i>Thunnus maccoyii</i>  |
| 16     |                      | YSZOF (Morocco trap origin) | 2/4/2012  | Yantai   | Albacore                       | <i>Thunnus alalunga</i>  |
| 17     |                      | YSZOF (Japan farm origin)   | 2/4/2012  | Yantai   | Albacore                       | <i>Thunnus alalunga</i>  |

Dalian Global Food Corporation Ltd.



Sample 10



Sample 12



Yantai Shandong Zhonglu Oceanic Foods Co., Ltd.  
Sample 13



Dalian Ocean Fishery Group of Corporations  
Sample 14

