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## **The resumption of traditional drive-hunts of dolphins in the Solomon Islands in early 2013**

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### SUMMARY

The Solomon Islands have a long history of exploiting dolphins through traditional drive-hunt, in particular at the island of Malaita. Only a few villages have specialized in dolphin hunt, but they probably caught up to several thousands of individuals in some years. It appears that the extent of the hunt in terms of catch rate has been highly variable through history, with a noticeable increase during the 60s'. However, over the last decade or so, only the village of Fanalei has pursued the hunt in a regular fashion, usually taking a few hundreds to over a thousand dolphins annually (primarily pantropical spotted and spinner dolphins). In 2010, the community stopped the hunt over the signature of a MoU with the non-governmental organization, Earth Island Institute. However, in early 2013, media reports emerged that villagers from Fanalei resumed dolphin hunting, killing as many as 900 dolphins in a couple of events. Here, we report on a visit to the Fanalei community conducted in March 2013 in order to better document the species and number of dolphins killed in the recent hunts. We conducted interviews with community hunters, elders and representatives and we searched for remains of the recent hunts. Evidences were found in the form of numerous teeth held by the villagers, cooked meat in the kitchens, and carcasses at the dumping area. We collected 45 samples (teeth, bones, meat or skin) to confirm species identity using molecular tools (analyses in progress). Accurate records for the 2013 hunts as well as for some of the previous years were provided to us by one of the hunter. They show that three species were caught so far this year. The largest catches were the pantropical spotted dolphins with over 1,500 individuals killed in seven hunting events (ranging 54 to 700+ per event). The other two species were the spinner dolphin (159 killed in three events) and, presumably, the common bottlenose dolphin (15 killed in one event). Such levels of removals raise concerns for depletion of local populations, in particular for the pantropical spotted dolphin. It is likely that the Fanalei community (and maybe other villages) will pursue the hunt in the future as they appear to be attached to this tradition but also because the demand for dolphin teeth is still high in the Solomon Islands, as evidence by inflation of price (currently SBD5 for one tooth, about US\$0.7 or €0.55). Although protective of their traditions, villagers are aware of conservation issues and seem willing to support future monitoring and scientific research.

Keyword: Whaling – small type, Pacific Ocean, conservation, monitoring.

### **HISTORY OF THE DRIVE-HUNT AND RECENT DEVELOPMENTS**

The Solomon Islands, in the South Pacific, are well known for their practice of dolphin hunting where fishermen use

traditional techniques to drive entire schools from the open ocean to coastal shallow waters (Dawbin 1966, Takekawa 1996a). The main objective of this hunt is to obtain teeth that are used as traditional currency, bride price and adornment. However, the meat from the carcasses is also consumed either within the hunting villages or after being sold locally. This practice was first reported long ago (Ivens 1902), but it remains unclear when and where the hunt was initiated or introduced in the country. Based on oral history, it most likely pre-dates the arrival of the first missionary in the mid-19th Century (Takekawa 1996b). However, it could potentially be much older.

Only a few villages in the Solomon Islands are specialized in dolphin hunting, and most of them are located on the island of Malaita (only Lau-speaking), although it seems that this practice also occurred at time on other islands such as Makira. The dynamic of the hunt through history is not clear (e.g., which village went hunting and when?) but previous reports seems to indicate that it varied substantially over the years. Oral history from Fanalei village, as reported by Takekawa (1996b), indicates that dolphin hunt might have stopped around the mid-19th Century, maybe in relation to Christianity, before being resurrected at Fanalei and introduced to new Lau villages in 1948. Boyd (no date, as cited in Reeves et al. 1999) also indicated that dolphin hunting stopped some time before World War II. Dolphin hunts used to be widely spaced out, with probably some years between the hunts. However, in 1964, the scale of hunting increased enormously, resulting in catches of several thousand animals per year (Dawbin 1966). At that time, some of the villages had stopped the hunt while others continued, including Lau-people from North and South of Malaita (Reeves et al. 1999 and references therein). According to Takekawa (1996b), Fanalei was the last village to still hunt in a regular basis in more recent years. In 2004, it was confirmed that the Bita 'ama community (thought to be one of the primary hunting community in the past) has not been hunting for reasons that are unclear (Kahn 2006). During his interview, Kahn (2006) was told by elders from this community that they should resume hunting soon, but apparently they did not, apart maybe for a couple of events as reported to us by Bita'ama elders during a visit in July 2011. Note that these last hunts might have been motivated by the recent development of the dolphin live-capture and export business in the country, that aroused interest for economical benefits through dolphin capture (Solomon Star News, 5 June 2009).

During a visit to the Fanalei village in 2009, it was confirmed to us that this community was the last one to go hunting every year (Oremus, Unpublished.). However, in 2010, things took a new turn under the influence of the non-governmental organisation (NGO) Earth Islands Institute (EII). Indeed, this NGO offered financial support to develop alternatives activities in exchange for stopping the hunt (Solomon Star News, 10 Apr. 2010). A Memorandum of Understanding (MoU) was signed with Fanalei representatives but also with the former hunting communities of Bita'ama and Walande. These were also offered some financial support although they had already stopped hunting for numerous years. However, in December 2012, local newspaper reported that 134 dolphins (announced as bottlenose dolphins) were just killed by the community of Ata'a, on the north east of Malaita, using traditional methods. This community had no agreement with EII but is formally known to be a village of traditional dolphin drive-hunter (Takekawa 1996a). Soon after, the Fanalei people decided to go back hunting presumably because of financial dispute with EII. On 22<sup>nd</sup> January 2013, local newspaper, the Solomon Star News, confirmed that the Fanalei community resumed hunting with a massive catch of 700 more dolphins. According to subsequent newspaper reports, this was soon followed by another hunt of 300 dolphins (Solomon Star News, 25 Jan. 2013).

These hunts raised welfare concerns but also questions onto the exact numbers taken and the species targeted. Therefore, in order to better document these recent events, we organized a visit to the Fanalei

community. A team travelled there by boat on the 22nd March 2013 with the main objectives of getting accurate numbers of dolphins hunted during this season and identifying the species that were caught. To do so, interviews were conducted with representatives, hunters and elders of the village at the community house. We looked for artifacts of the recent hunts, in particular for teeth, meat and carcasses remains, in order to collect genetic samples for species identification. The interview also provided with an opportunity to discuss the community future plans for hunting and conservation issues.

## RESULTS

### Species identity

Several species of dolphins are hunted in the Solomon Islands (Takekawa 1996a), usually small cetaceans. However, it seems that most of the catches, at least recently, are from two species; the spinner dolphin and the pantropical spotted dolphins (Takekawa 1996a, Reeves et al. 1999). From our interviews at Fanalei, we were told that three species were hunted so far in the season: “unubulu”, “raa” and “robo manole”. The first two are clearly identified as the pantropical spotted dolphin and the spinner dolphin, respectively. In Takekawa (1996b), “robo manole” is suggested to be the common dolphin (*Delphinus delphis*) although there was some uncertainty, as illustrated by Takekawa’s question mark following the Latin name for this species. After questioning the hunters on the group and morphological characteristics of the “robo manole”, it seems to us that the species is more likely to be the common bottlenose dolphin (*Tursiops truncatus*). We note that at the time of Takekawa’s work, the status of *Tursiops* in the Solomon Islands was still poorly known, which might have created some confusion. Indeed, recent molecular work based on biopsy samples collected at sea has confirmed the presence of two *Tursiops* species in the water the Solomon Islands: *Tursiops truncatus*, found in deep offshore waters, and *Tursiops aduncus*, found in shallow coastal waters (Oremus et al. 2013). Therefore, it is likely that Takekawa misidentified the species locally called “Olo folosi walo” as being the *Tursiops truncatus*, when it was in fact *Tursiops aduncus*.

In order to confirm the identity of species, we collected various kinds of samples from recently hunted dolphins. Four different types of samples were collected:

- Meat from recently hunted dolphin, found in the village’s kitchens.
- Skin from a few carcasses found at the dumping area.
- Bones from the dumping area.
- Teeth from recent hunts, provided by villagers.

These will be used to confirm species identity of the recent hunt but also to build on a dataset on the current genetic diversity within the targeted population (analyses in progress). The number of samples and presumed species are summarized in Table 1.

**Table 1:** List of the samples from recently hunted dolphins collected at Fanalei, Malaita, March 2013

Assumed species	Sample type	Number
<i>Stenella attenuata</i>	Skin	7
	Meat	10
	Tooth	5
<i>Stenella longirostris</i>	Meat	1
	Tooth	6
<i>Tursiops truncatus</i>	Tooth	1
Unknown species	Bones	15

Although results from genetic analyses should be awaited, we note that the shape and size of the teeth provided by the villagers seems to confirm the identity of the three species that were indicated (Figure 1).

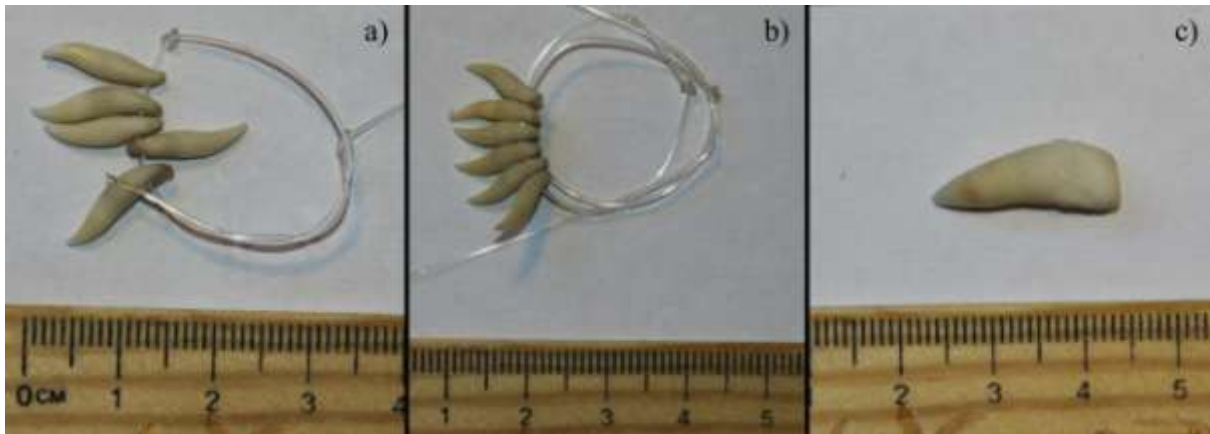


Figure 1: Teeth from the three species of dolphins hunted by the Fanalei in 2013: a) “unubulu”, spotted dolphin; b) “raa”, spinner dolphin; c) young “robo manole”, common bottlenose dolphin.

### 2013 catch records

Catch records for the 2013 hunting season were provided to us by one of the dolphin hunters from Fanalei who kept clear notes of the dates, species and number of dolphins caught for each hunt. These catches (n = 11 hunting events) are summarized in Table 2. It shows that the largest catch was the “unubulu”, or pantropical spotted dolphin, with over 1,500 individuals taken. The second largest catch was the “raa” or spinner dolphin, but in much smaller numbers with a total of 159 dolphins killed. Finally, a group of 15 “robo manole”, or presumed common bottlenose dolphins were caught. Average number of dolphins taken per event was 154+. It appears that there is a substantial difference between catches of pantropical spotted dolphins (mean of 218+ individuals per event) and spinner dolphins (53 individuals per event).

Table 2: Summary of dolphin catches by the Fanalei community from the beginning to the 2013 season until the 23<sup>rd</sup> March 2013, as reported by one of the dolphin hunters from Fanalei (Pers. comm. Albert Balei).

	Date	Latin name	Traditional name	Number caught
1	21/01/2013	<i>Stenella attenuata</i>	Unubulu	700+
2	24/01/2013	<i>Stenella attenuata</i>	Unubulu	60+
3	05/02/2013	<i>Stenella attenuata</i>	Unubulu	126+
4	06/02/2013	<i>Stenella attenuata</i>	Unubulu	300
5	09/02/2013	<i>Tursiops truncatus?</i>	Robo manole	15
6	11/11/2013	<i>Stenella longirostris</i>	Raa	56
7	20/02/2013	<i>Stenella longirostris</i>	Raa	33
		<i>Stenella attenuata</i>	Unubulu	70
9	06/03/2013	<i>Stenella longirostris</i>	Raa	70
10	20/03/2013	<i>Stenella attenuata</i>	Unubulu	54
11	23/02/2013	<i>Stenella attenuata</i>	Unubulu	214
			Total Unubulu	1,524+
			Total Raa	159
			TOTAL	1698+

The last hunt reported here happened the day after our visit. Since a usual hunting season would generally last one more month after the date of our visit, additional hunts might have happen after this that we are not aware off.

### Past catch records

In addition to the 2013 records, we were also provided with accurate records of catches for the years 2000 to early 2003 season in Fanalei (Figure 2, Table 3). Only pantropical spotted dolphins and spinner dolphins were caught during this period, confirming the predominance of these species in traditional drive-hunt. The number of successful hunts per year was: 10 in 2000, 5 in 2001 and 11 and 2002 (data were incomplete for 2003). The difference between the number of pantropical spotted dolphins and spinner dolphins caught was not as marked as in 2013 (728 vs. 628, respectively, between 2000 and early 2003). On the other hand, the tendency for larger groups of pantropical spotted dolphins being caught was confirmed: mean of 94 individuals for pantropical spotted dolphin against 42 individuals for spinner dolphin.

2002						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
13	14	15	16	17	18	19
x	x	x	x	x	x	x
20	21	22	23	24	25	26
x	x	x	x	x	x	x
27	28	29	30	31	Feb 1	2
x	Δ	•	•	•	Δ	Δ
3	4	5	6	7	8	9
	200 Pant	Δ	•	•	•	•
10	11	12	13	14	15	16
	Δ	Δ	x	Δ	Δ	Δ
17	18	19	20	21	22	23
x	Δ	Δ	Δ	Δ	•	24

Figure 2: Example of catch records from Albert Balei notebook for the period 2000 to early 2003. (x) indicates that no boat went out; (•) indicates that boat went at sea but found no dolphins; (Δ) indicates that dolphins were sighted but there was no catch; local species name and total number of dolphins are indicated when caught.

Unfortunately, nobody was able to give us records for the 2003 to 2009 period, i.e. before the hunt temporally stopped in 2010. Kahn (2006) reported some overall annual catches for Fanalei for the period 1999-2004 (not 2001), which he collected after a visit to the community. For the year 2000, Kahn reported a larger catch than the data given to us (800 vs. 577) while for 2002, we got fairly similar numbers (700 vs. 648). The reason for the discrepancy for the 2000 numbers is unknown. While our total catch could be an underestimate for that year, the records provided to us seem to be

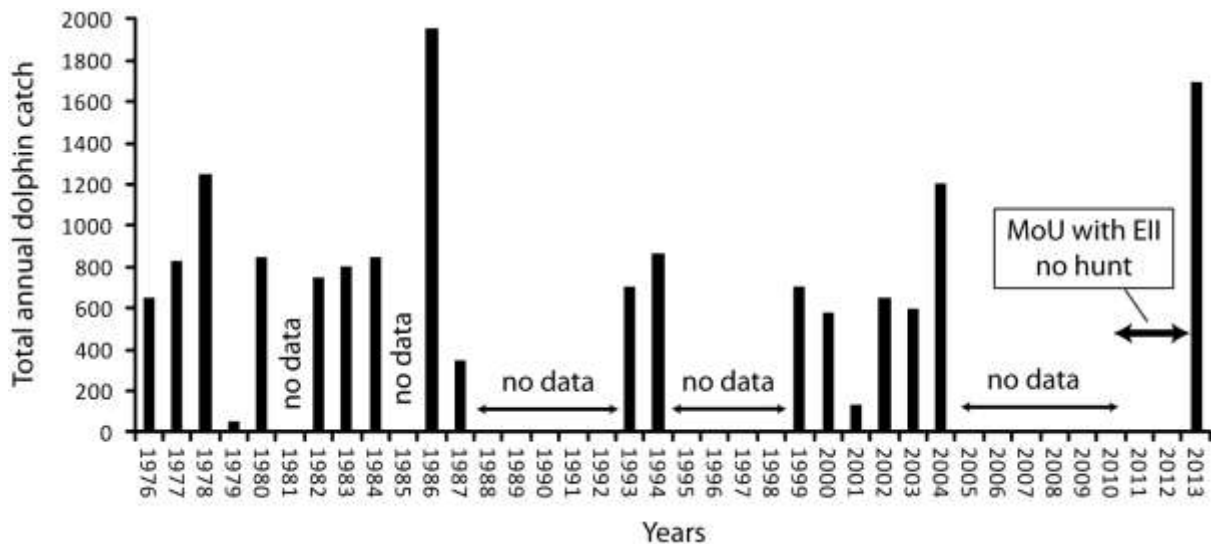
very accurate, including days not going at sea and days going out with no catch (Figure 2). Therefore, we believe that the new total catches presented here are likely to be more accurate.

**Table 3:** Catch records by the Fanalei community between 2000 and early 2003 (Pers. comm. Albert Balei).

Year		Date	Species	Numbers caught
<i>Year 2000</i>	1	23/01/00	<i>S. longirostris</i>	42
	2	15/02/00	<i>S. longirostris</i>	15
	3	25/02/00	<i>S. attenuata</i>	40
	4	02/03/00	<i>S. longirostris</i>	55
	5	08/03/00	<i>S. attenuata</i>	45
	6	27/03/00	<i>S. longirostris</i>	44
	7	05/04/00	<i>S. attenuata</i>	36
	8	06/04/00	<i>S. attenuata</i>	274
	9	Sept 2000	<i>S. longirostris</i> *	15
	10	02/12/00	<i>S. longirostris</i>	11
<i>Year 2001</i>	1	31/01/01	<i>S. longirostris</i>	19
	2	20/02/01	<i>S. longirostris</i>	27
	3	17/03/01	<i>S. longirostris</i>	54
	4	22/03/01	<i>S. attenuata</i>	15
	5	24/03/01	<i>S. longirostris</i>	16
<i>Year 2002</i>	1	09/01/02	<i>S. longirostris</i>	9
	2	04/02/02	<i>S. longirostris</i>	96
	3	23/02/02	<i>S. longirostris</i>	64
	4	06/03/02	<i>S. attenuata</i>	18
	5	08/03/02	<i>S. longirostris</i>	128
	6	18/03/02	<i>S. attenuata</i>	50
	7	25/03/02	<i>S. longirostris</i>	13
	8	30/03/02	<i>S. longirostris</i>	33
	9	08/04/02	<i>S. attenuata</i>	72
	10	09/04/02	<i>S. attenuata</i>	40
	11	17/04/02	<i>S. attenuata</i>	125
<i>Year 2003</i>	1	14/04/03	<i>S. attenuata</i>	400

\*voluntarily entered in the lagoon.

Takekawa (1996b) give some information on annual total catch at Fanalei for the period 1976 -1994 (based on his own observations as well as on Meltzoff (1983) and personal notes from community member J. Filei). He reported an average of 840 dolphins taken per year during this period (max close to 2000 in 1986; min less than 50 in 1979). The average number of individual caught per hunt was 115.5 (no details on the species) and the average number of successful hunts per year was 7.3. These numbers are roughly consistent with the new figures provided here. For instance, during the period 1999 to 2013, the mean annual catch was 793 dolphins, all species confound. We summarized all available total annual catches for Fanalei in Figure 2.



**Figure 2:** Summary of the total annual dolphin catch available for the Fanalei community between 1976 and 2013. Years 1976 to 1994 from Takekawa (1996b) and reference therein; years 1999, 2003 and 2004 from Kahn (2006); years 2000, 2001, 2002 and 2013 from present study.

Across the total period (1976 to 2013), a minimum of 15,444 dolphins were killed by the villagers (mean annual catch was 813 dolphins,  $SD = 464$ ). However, this is clearly an underestimate of the number of dolphins hunted in the Solomon Islands as we lack data for 16 hunting years across this period (excluding the 3 years of MoU) and only consider the community of Fanalei. If one considers that a usual annual catch would be between 600 and 1,000 dolphins (i.e.  $\pm 200$  around the average catch), it appears that success rate is fairly stable across years. The community got lower success rate ( $< 600$  dolphins) for three years (1979, 1987 and 2001) while they got high success rate ( $> 1000$  dolphins) for four years (1978, 1986, 2004 and 2013). There is no clear tendency in success rate across years, which could indicate a minimal impact of the hunt on dolphin populations. However, such conclusion would be premature as data are lacking for numerous years. Furthermore the absence of information on the proportion of species caught for most years could obscure tendencies at the species levels. We note that the two successful years for which data were available during the next season (i.e. 1978 and 1986) were followed by a low catch rate the following year (1979 and 1987, respectively). However, this tendency could be explained by a lesser need for dolphin teeth in the community following a successful year, rather than local depletion of the dolphin populations.

### **Interview with Fanalei community**

Although the financial dispute over the MoU with EII has probably played an important role in the Fanalei community decision to resume hunting, the village representative told us that they did so simply because the MoU came to an end and there was no further agreement to maintain the ban. He also explained that stopping hunting had brought much tension in the village and that resuming it brought back peace among community members. Therefore, they intend to continue the hunt from now on.

It is important to note that dolphin teeth are used by many villages in Malaita and not only by the hunting communities. Teeth are also sent to other islands such as Guadalcanal and Florida Islands. Therefore, there is a high demand for them and stopping the hunt had consequences that went over the village of Fanalei. Since dolphin tooth prices are apparently set at Fanalei (as the main drive-hunting

community), it is likely that the economical value of hunting has played an important role in the decision not to pursue the collaboration with EII.

From our interviews and previous report, it appears that the price for dolphin tooth has greatly increased through recent history. In 1964, each tooth used to cost 0.5c (Dawbin 1966) while in 1994, it was set at 0.5 SBD Solomon Islands Dollars or SBD (Takekawa 1996b). Kahn (2006) reported that in 2004 the price has increased to 1SBD (about how much in US\$0.14 or €0.11). It was still the same price for “unubulu” and “raa” teeth during our first visit to Fanalei in 2009. However, as for our second visit in 2013, the price for “unubulu” or “raa” teeth has increased to 5SBD each (about US\$0.7 or €0.55). Price for teeth from any “robo” species (larger teeth) would be higher.

From discussion about the hunt of 134 dolphins by Ata’a villagers in December 2012, we were told that the species caught was the pantropical spotted dolphin and not bottlenose dolphins, as reported in the local newspaper. It was apparently the only hunt from this community this season. It was also the first hunt there in a very long time and therefore, it is unclear why they resumed the practice. According to the Fanalei community members, there were two possible explanations: 1) the demand for dolphin teeth has increased since the hunting was halted providing a good financial opportunity for any new catch. 2) Ata’a was not included in the EII agreement and resuming hunting was a way to attract attention for future consideration.

The people from Fanalei do not understand why they attract so much attention regarding the recent dolphin hunt, which they have been practicing for a very long time. However, they are aware of conservation issues and were willing to discuss that. They first expressed concerned about dolphin by-catch by purseiners in the Solomon Islands that they see as a threat for their resource. It would therefore be useful to inform them more precisely on this issue, which we were not able to do. They were not very receptive to the idea of using a quota as they are concerned that they would be too restrictive. On the other hand, they see the value of collecting scientific data that would help in gaining better knowledge on the status of local dolphin populations. They understand that this is a necessary step for a good management of the populations in order to insure that they can continue the tradition of dolphin drive-hunting over the next generations. As such, they are willing to collaborate with any future scientific program that would work to this goal. In the future, they will try to improve communication with the Government of Solomon Islands Ministry of Fisheries and Ministry of Environment in order to provide records of catches through a monitoring program. They would also consider having observers in the village during the hunting season to could collect further data from the hunts.

## **RECOMMENDATIONS**

1. The Solomon Islands Ministry of Fisheries and Ministry of Environment should provide a system to collect information on all future hunts and, if possible, provide some verification through independent observers or photographs.
2. The Ministry of Fisheries and Ministry of Environment should require collection of samples from each hunt and genetic monitoring should be implemented to confirm species identification and track changes in diversity and population identity over time.
3. Surveys of local waters should be initiated to provide estimates of abundance for species of small cetaceans around Malaita



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