SUMMARY OF HUMPBACK WHALE CALFS: 2011

This document contains a summary of calfs encountered during the 2011 humpback whale season in Vava'u, Kingdom of Tonga. For additional information contact Tony Wu. (Version: 31 Oct '11)

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INTRODUCTION

This document is a summary of humpback whale calf encounters in and around the Vava'u island group in the Kingdom of Tonga during the months of August to October 2011.

During our stay this year (05 August to 01 October), we identified 45 humpback whale mother/ calf pairs over the course of 73 in-water encounters, with three additional IDs contributed by friends, for a total of 48 humpback whale mother/ calf pairs.

We initially recorded 33 sightings of calfs that we were unable to identify at the time of encounter. We were later able to assign IDs to two of those 33 in the process of preparing this summary, lowering the total unknown calf sightings to 31.

This is the highest number of mother/ calf pairs we have identified and tabulated since commencing this annual calf count project in 2008.

This season was notable in other respects as well:

- There were reliable reports of whales arriving in the Vava'u area by mid-June, with calf sightings reported before the end of June. This is several weeks earlier than the timing in a hypothetical average season, and contrasts with the relatively late arrival of the whales in 2010. The whales did not, however, seem to leave the area any earlier than normal.
- Overall whale behaviour/ disposition was "neutral", meaning significantly less standoffish than in 2010, but not as approachable as in "friendly" seasons like 2009.
- We documented three returning mothers. The mother of 201132 Toluua was also the mother of 200913 Luna, easily recognisable by her unique dorsal fin. Of note, her relaxed disposition was the same as it was two years ago, and both juveniles were friendly and inquisitive. The mother of 201107 Fitu was the same as the mother of 200920 Mama's Boy. And the mother of 201115 Tahanima was the same as the mother of 200814 Jet.
- We documented three mother/ calf pairs travelling between Vava'u and Toku Island, about 40km away. Travel among islands is not unusual, but it is the first time we have documented this taking place with photographs and GPS data.
- For the first time, we recorded data pertaining to escort relationships with mother/ calf pairs. Over half of all mother/ calf pair encounters involved at least one escort, which seems to be a relatively high ratio viz. other humpback whale breeding and calving grounds.
- We documented two long-term associations between an escort and mother/ calf pair: At least 14 days for 201114 Tahafa and at least 18 days for 201142 Faua. This is the first time we have observed/ noticed this. Such long-term associations seem to be unusual, or perhaps not well documented.
- Of interest, in both cases of long-term escort association, the mother/ calf pairs undertook the 40km journey between Vava'u and Toku while in the company of their respective long-term escorts.
- We also documented three occasions when escorts with mother/ calf pairs were singing, or vocalising in a song-like manner: 201114 Tahafa, 201121 Uataha and 201130 Tolunoa. We have come across this behaviour on multiple occasions in previous seasons as well.
- There were two juveniles with all-white pectoral fins, the first we've seen in the Vava'u area. They were 201127 Uafitu and 201142 Faua.
- We documented several juvenile whales with injuries that suggest coordinated attack by a pod of marine mammals, possibly false killer whales (*Pseudorca crassidens*).

Overall, there was an abundance of whales this season, a lot of interesting social interaction, and many opportunities to observe and record humpback whale behaviour. This document focuses upon the mother/ calf pairs and associated whales. For additional background information, please refer to the following blog posts:

Swimming with Humpback Whales in Tonga | 2011 Season Part 1

Swimming with Humpback Whales in Tonga | 2011 Season Part 2

Swimming with Humpback Whales in Tonga | 2011 Season Part 3

Swimming with Humpback Whales in Tonga | 2011 Season Part 4

Swimming with Humpback Whales in Tonga | 2011 Season Part 5

Swimming with Humpback Whales in Tonga | 2011 Season Part 6

Swimming with Humpback Whales in Tonga | 2011 Season Part 7

Swimming with Humpback Whales in Tonga | 2011 Season Part 8

All of this work has been and is being done on our own time, with our own resources. We are not receiving financial or other assistance, and we are not affiliated with any person or organisation involved with cetaceans.

If you have photographs of humpback whale mother/ calf pairs from the 2011 season in Vava'u that are not included in this file, or additional information about whales already included in this document, please contact Tony Wu.

Reference documents:
2008 Calf Summary, 2009 Calf Summary, 2010 Calf Summary

METHODOLOGY

1. Our basic methodology has remained unchanged since commencing this calf count project, with our core ID team comprising Tony Wu, Takaji Ochi, and Emiko Miyazaki.

2. We recorded GPS locations for all sightings of humpback whale calfs upon initial visual and/ or radio confirmation. We used Garmin GPS 60 and GPS 72H handheld units for marking GPS locations and converted to Google KML format using HoudahGPS. When GPS units were not available, we marked locations by hand on a map.

3. Where possible, we entered the water to photograph mother/ calf pairs and other associated whales if any.

4. We made notes of behaviour, easily recognisable physical traits, and any other noteworthy circumstances.

5. For the first time, we have recorded the number of escorts with each mother/ calf pair sighting, for the purpose of tracking escort activity from this season onward.

6. When we were able to take photographs of sufficient quality and quantity to establish an ID, we named and assigned a numerical ID to the relevant calf.

7. In those cases where we were unable to get sufficient photographs to establish ID, we did not name the calfs. We recorded the sightings as unknowns and cross-checked any photos of such juveniles with subsequent ID-ed whales to look for possible matches.

8. We have uploaded all the GPS and hand-marked location data to Google Maps, where the locations of all ID-ed calfs and unidentified calfs are available for viewing. GPS locations are also embedded as hyperlinks throughout this document when there is text that refers to date and location of sightings. Clicking the hyperlinks will take you to Google Maps to view the relevant location.

9. The photographs contained in this document represent a small portion of the images we collected. For most ID-ed calfs, we have many more images for verification purposes.

OBSERVATIONS

1) Figure 1 below illustrates our cumulative calf counts over the past four seasons (incorporating all ID-ed juvenile whales each season, including those contributed by third parties). While we recognise that there are inherent differences in each season (different periods of stay, varying number of boat days, weather variations, etc.), the slope of the line representing cumulative calf count has appeared relatively similar across previous seasons. With the addition of data for 2011 however, a divergence in the slopes of the curves for 2009 and 2011 from those for 2008 and 2010 is apparent. This makes intuitive sense against the backdrop of the number of calf encounters, overall whale mood and other conditions in each season.

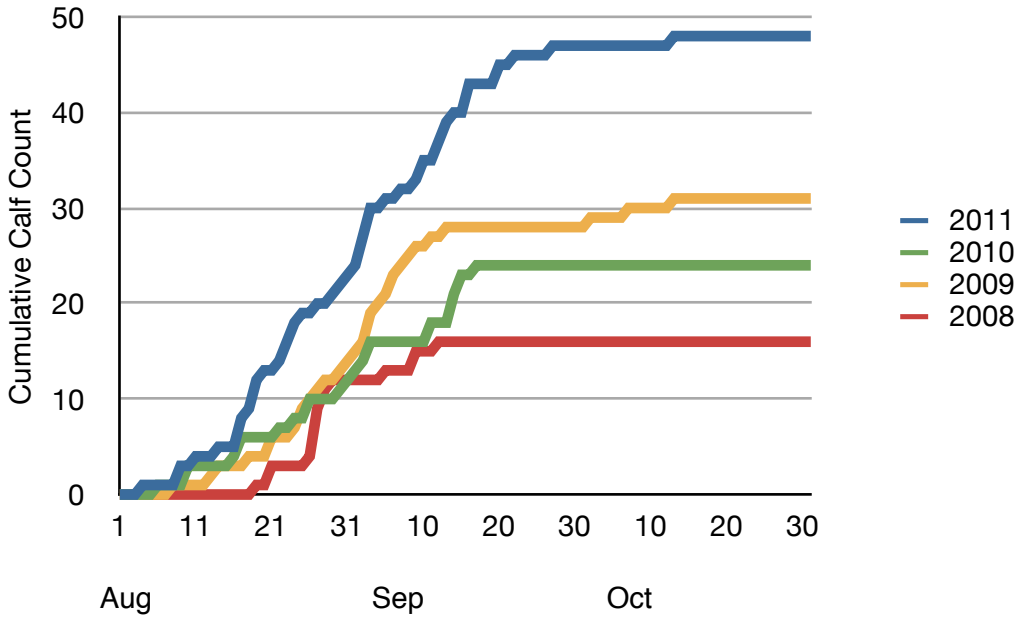

Figure 1: Cumulative ID-ed Calf Count*

** Includes all ID-ed mother/ calf pairs*

2) During our stay this season, we had 73 encounters with 45 mother/ calf pairs that we identified over 76 boat-days on the water (compared with 22 calf IDs over 81 boat days in 2010; 26 calf IDs over 59 boat days in 2009; 16 calf IDs over 67 boat days in 2008; 14 calf IDs over 53 boat days in 2007). This worked out to **0.59** Calf/ Boat-day, with a boat-day being defined as a single day of approximately six hours on the water on a boat looking for whales. These figures do not include calf IDs contributed by other people.

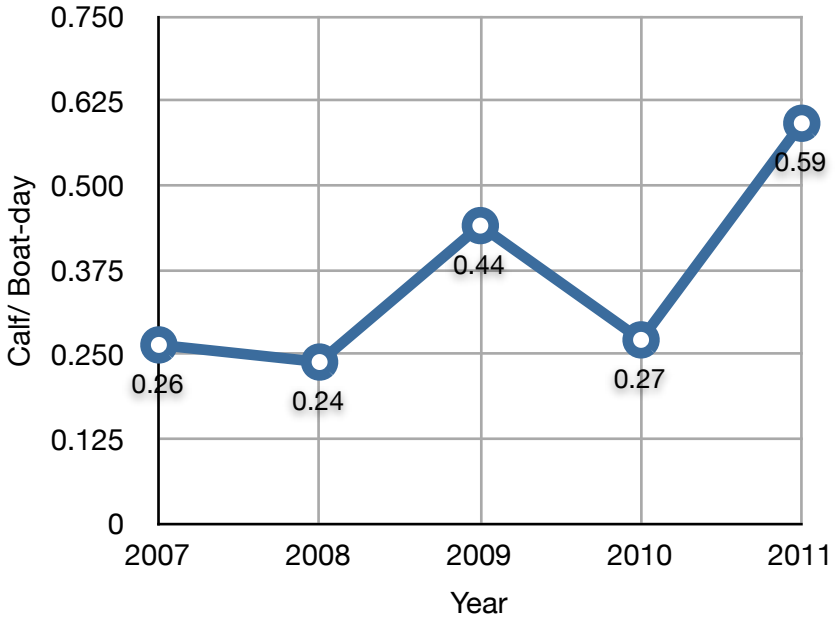

Figure 2: ID-ed Calf/ Boat-day*

** Boat-day = single day of approximately six hours on the water on a boat looking for whales*

3) As is apparent from Figure 2, this season was exceptional, with the Calf/ Boat-day ratio significantly exceeding the levels recorded in each of the previous seasons. In our 2010 summary, we posited that a Calf/ Boat-day ratio of 0.25 might represent the norm, with 2009 being an outlier. With this season's ratio of 0.59 however, the question of whether there is a normal level or not becomes more intriguing.

4) It is certainly possible that our experience in 2011 is exceptional, and that we will not see a similarly high number and density of humpback whale mother/ calf pairs in the Vava'u area in the future. However, given the 0.44 ratio recorded in 2009, and our personal recollections of similarly high numbers and frequency of mother/ calf pair encounters in 2004 and 2005, it seems possible that there is no "norm", and that the Calf/ Boat-day figure may vary unpredictably within a relatively broad band.

5) What this underscores is that extrapolating from limited observation in any single season to draw conclusions about the dynamics of the southern hemisphere humpback whale population is inadvisable. Only long-term observation and consistent recording of data may eventually reveal underlying patterns and trends.

6) In addition to the calf IDs we established, we received three more mother/ calf pair IDs from friends (201115 Tahanima from Shawn; 201143 Fatolu from Douglas, 201148 Favalu from Allan/ Ma'ata), bringing the total ID-ed calf count to 48.

7) In 2009, we commenced recording sightings of unknown mother/ calf pairs (those whales which we are unable to ID at the time), by marking GPS location, taking notes about behaviour, and taking photos when possible, for the purpose of trying to establish IDs at a later point. This year, we recorded 33 unknown mother/ calf pairs. We were later able to establish IDs for two of those 33 (Unknown calf #10 = 201146 Faono; Unknown calf #27 = 201147 Fafitu), meaning that we ended up with 31 unidentified calfs (compared with 16 in 2010; 24 in 2009).

8) Figure 3 depicts the total Calf Sighting Ratio for 2009 to 2011, where we have defined Calf Sighting Ratio as = (Total ID-ed calf count + Total unidentified calf count)/ Total boat-days. This ratio was **1.01**, which compares with **0.49** for 2010 and **0.85** for 2009. This ratio provides a reasonable indication of the overall level of humpback whale mother/ calf pair activity in the Vava'u area.

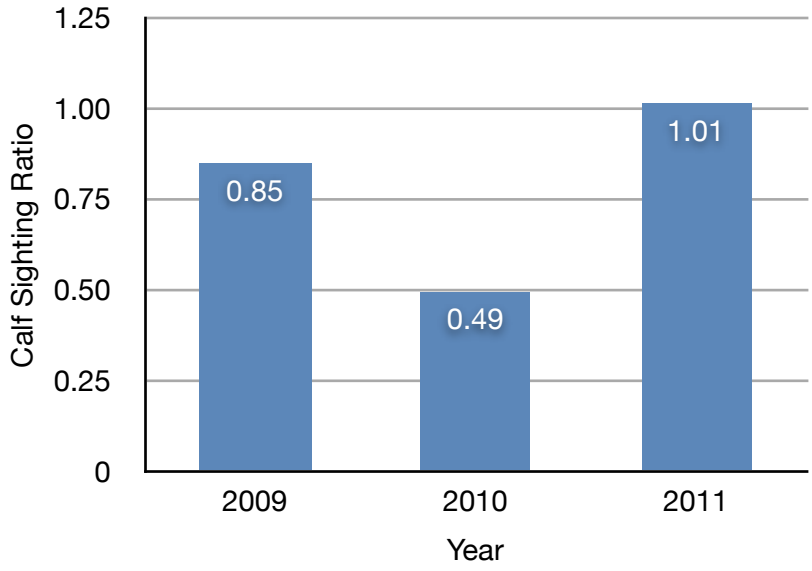

Figure 3: Calf Sighting Ratio*

** Calf Sighting Ratio = (Total ID-ed calf count + Total unidentified calf count)/ Total boat-days*

9) We again found mother/ calf pairs throughout the entire topography of the Vava'u Island group without apparent clustering or preference for a specific area. As with 2010, however, there were not many sightings in North Bay, once again consistent with our experience from most previous seasons. 2009 was the exception, when we recorded a significant number of encounters in North Bay. We recorded more encounters in the Toku area than in previous seasons. This may, however, have been due to the fact that calm conditions prevailed for a number of days in the latter part of the season, allowing several visits to Toku. See map of ID-ed mother/ calf pairs and map of encounters with unidentified whales.

10) The pattern of sightings once again supports our notion that, for the most part, humpback whale mother/ calf pairs use Vava'u as a transit area, visiting for a short duration before moving on, returning to the area at a later date in some instances. Within this context however, we have documented a number of repeat sightings over extended periods of time:

- 201103 Tolu (4 encounters/ 30 days);
- 201114 Tahafa (9 encounters/ 33 days, Vava'u to Toku to Vava'u);
- 201120 Uanoa (3 encounters/ 27 days);
- 201123 Uatolu (2 encounters/ 29 days, Toku to Vava'u);
- 201130 Tolunoa (2 encounters/ 33 days); and
- 201142 Faua (2 encounters/ 18 days, Toku to Vava'u).

This adds to our long-term repeat sightings in previous seasons:

- 201005 Ikumi (11 encounters/ 31 days);
- 201008 Lele (3 encounters/ 11 days);
- 200904 Stitches (4 encounters/ 23 days); and
- 200912 Luna (3 encounters/ 13 days).

11) Of note is that in three of the long-term sightings for 2011, the relevant mother/ calf pairs were sighted in both Vava'u and Toku. This is the first time we have documented travel by mother/ calf pairs between the two locations, which are about 40km apart.

12) As was the case in 2009 and 2010, the ratio of female to male juveniles favoured females. This year, we counted 13 females and 10 males. In 2010, it was 7 female to 4 male. In 2009, it was 14 female to 9 male. Given that this relationship has remained in favour of females for three consecutive seasons, it's tempting to speculate that females may represent a greater proportion of overall calf births than males. Since it is not possible to establish the sex of every juvenile encountered, we cannot be certain of this however, and need to consider other possible explanations as well. It could be the case, for instance, that mother/ calf pairs with female babies tend to be more favourably disposed to interacting with people.

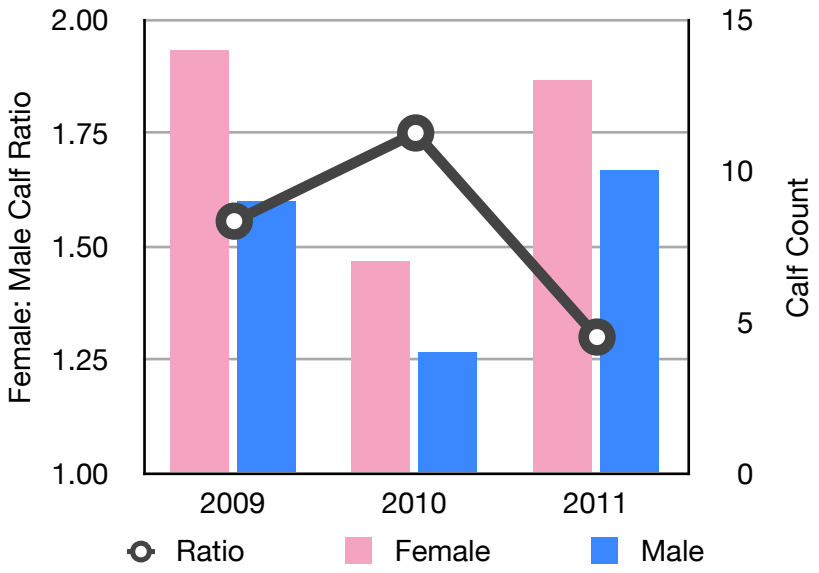

Figure 4: Ratio of Female to Male Juveniles

13) We documented long-term escort relationships with two of the mother/ calf pairs sighted over an extended period of time. In the case of 201114 Tahafa, the same escort stayed with the mother/ calf pair from at least 01 September to 14 September (14 days). In the case of 201142 Faua, the same escort remained with mother and calf from at least 20 September to 07 October (18 days). To the best of our knowledge, such long-term escort + mother/ calf relationships have not been documented previously in this area.

14) Spurred in part by observation of these long-term escort + mother/ calf relationships, we commenced recording escort sightings this season. In several instances, we were able to observe the effects of escorts on mother/ calf behaviour. In some cases, the adult females appeared to dislike the attention of the males; in other cases, the presence of an escort seemed to have a calming effect. We have made notes of such behaviour in the individual ID pages that follow.

15) Out of 48 ID-ed mother/ calf pairs, 30 were accompanied by escorts in at least one encounter with the relevant mother/ calf pair, a ratio of 0.63. Out of 76 total encounters with those 48 ID-ed mother/ calf pairs, 40 encounters involved at least one escort, a ratio of 0.53. In the case of unidentified mother/ calf pairs, the ratio was 0.35. We only calculated one ratio for unidentified mother/ calf pairs because we had only one encounter with each pair. In any event, the proportion of mother/ calf pairs accompanied by escorts was high. Subjectively, this is consistent with our experience in previous seasons.

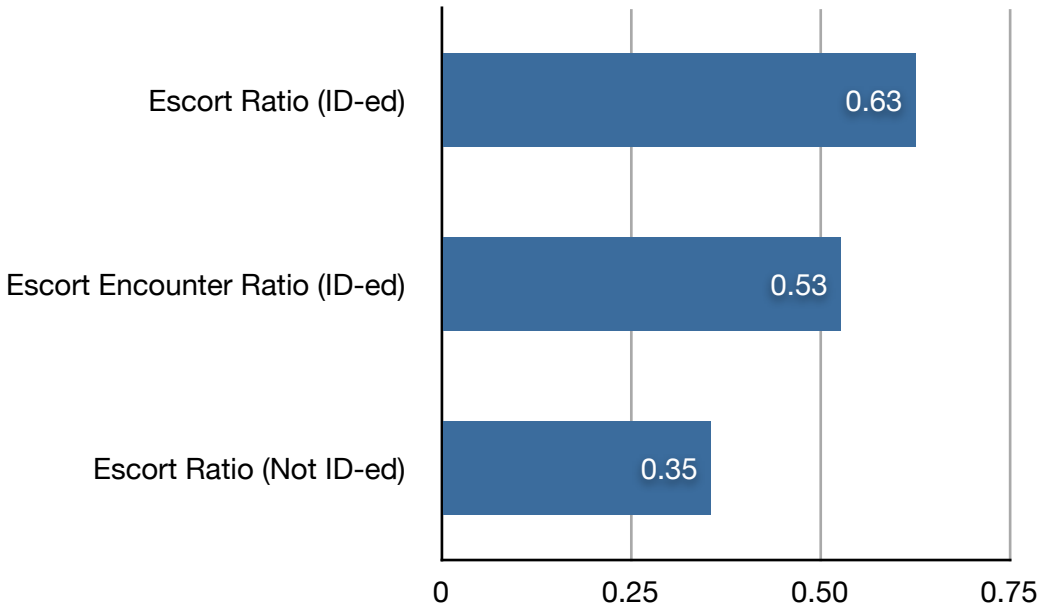

Figure 5: Frequency of Escorts with Mother/ Calf Pairs*

- **Escort Ratio (ID-ed)** = *ID-ed mother/ calf pairs that were accompanied by at least one escort in at least one of our encounters as a ratio of the total number of ID-ed mother/ calf pairs*
- **Escort Encounter Ratio (ID-ed)** = *Total number of encounters with ID-ed mother/ calf pairs that involved at least one escort as a ratio of the total number of encounters with all ID-ed mother/ calf pairs*
- **Escort Ratio (Not ID-ed)** = *Unidentified mother/ calf pairs that were accompanied by at least one escort in at least one of our encounters as a ratio of the total number of Unidentified mother/ calf pairs*

16) We documented three repeat mothers this season, making a total of five females that we've documented returning to the Vava'u area with second babies since 2008.

a) The mother of 201132 Toluua was the same as the mother of 200913 Luna. Her unique dorsal fin made it easy to recognise her, and her overall friendly disposition in both 2009 and 2011 made it relatively easy to photograph her and the calf. Of note, both Toluua and Luna were inquisitive and pro-active in their approach to people in the water.

b) The mother of 201107 Fitu was the same as the mother of 200920 Mama's Boy.

c) The mother of 201115 Tahanima was the same as the mother of 200814 Jet.

	2008	2009	2010	2011
Female 1	200801 Scratches	200904 Stitches ♀		
Female 2	200816 Chibi-chan	200929 Floppy ♀		
Female 3		200920 Mama's Boy		201107 Fitu
Female 4	200814 Jet			201115 Tahanima
Female 5		200913 Luna ♀		201132 Toluua ♀

Figure 6: Females Documented Returning with Second Babies

17) We documented several juvenile whales with injuries that suggest coordinated attack by a pod of marine mammals, possibly false killer whales (*Pseudorca crassidens*). Refer to summary pages for 201107 Fitu, 201114 Tahafa, 201120 Uanoa, and 201144 Fafa to see the wounds. See also this blog post for a discussion of this topic.

18) We documented two juveniles with all-white pectoral fins: 201127 Uafitu and 201142 Faua. This is interesting because these are the first such calfs we have seen in the Vava'u area. In previous seasons, we had wondered where the adults with all-white pectoral fins come from, as we had not seen any juveniles with this trait.

Table 1: Humpback Whale Calf Identifications
Vava'u, Kingdom of Tonga (Aug-Oct 2011)
(Click here to see map of sightings)

#	NAME		DATES/ LOCATIONS (# ESCORTS)
1	Taha	♀	09 Aug (0)
2	Ua		09 Aug (0)
3	Tolu	♂	11 Aug (0), 13 Aug (0), 18 Aug (1), 09 Sep (0)
4	Fa		14 Aug (0)
5	Nima		17 Aug (2)
6	Ono		17 Aug (0)
7	Fitu		17 Aug (1)
8	Valu		18 Aug (1)
9	Hiva	♀	19 Aug (0), 31 Aug (0)
10	Hongofulu		19 Aug (0)
11	Tahataha	♀	19 Aug (0)
12	Tahaua	♀	20 Aug (0), 23 Aug (0), 24 Aug (0)
13	Tahatolu	♂	22 Aug (1), 23 Aug (1)
14	Tahafa	♂	23 Aug (0), 01 Sep (1), 02 Sep (1), 03 Sep (1), 07 Sep (1), 09 Sep (1), 14 Sep (1), 16 Sep (0), 24 Sep (0), Vava'u and Toku
15	Tahanima	♂	23 Aug (0)
16	Tahaono		24 Aug (1)
17	Tahafitu		ID-ed 26 Aug (1), initial sighting 25 Aug (1)
18	Tahavalu		27 Aug (1)
19	Tahahiva		29 Aug (1)
20	Uanoa	♂	ID-ed 29 Aug (0), initial sighting 24 Aug (0), 24 Sep (1)
21	Uataha	♂	ID-ed 01 Sep (1), initial sighting 30 Aug (0
22	Uaua		31 Aug (1)
23	Uatolu		02 Sep (1), 20 Sep (0), Vava'u and Toku
24	Uafa	♀	02 Sep (1)
25	Uanima		02 Sep (0)

Table 1: Humpback Whale Calf Identifications
Vava'u, Kingdom of Tonga (Aug-Oct 2011)
(Click here to see map of sightings)

#	NAME		DATES/ LOCATIONS (# ESCORTS)
26	Uaono		03 Sep (1)
27	Uafitu		03 Sep (1), all-white pectoral fins
28	Uavalu		03 Sep (1)
29	Uahiva	♀	05 Sep (0)
30	Tolunoa	♀	ID-ed 05 Sep (2), initial sighting 04 Aug (0)
31	Tolutaha	♀	07 Sep (3), 13 Sep (1), 14 Sep (0), 15 Sep (0)
32	Toluua	♀	09 Sep (1), same mother as 200913 Luna ♀
33	Tolutolu		10 Sep (3)
34	Tolufa	♂	10 Sep (0), 15 Sep (0), 16 Sep (0)
35	Tolunima	♀	12 Sep (0)
36	Toluono	♂	12 Sep (0)
37	Tolufitu		13 Sep (0)
38	Toluvalu		14 Sep (0)
39	Toluhiva		16 Sep (1)
40	Fanoa	♂	16 Sep (1)
41	Fataha		20 Sep (1)
42	Faua	♂	20 Sep (1), 07 Oct (1), Vava'u and Toku, all-white pectoral fins
43	Fatolu	♀	13 Sep (0)
44	Fafa	♀	22 Sep (0)
45	Fanima	♀	27 Sep (1)
46	Faono		01 Sep (1), 06 Sep (0), initially recorded at Unknown calf #10
47	Fafitu		16 Sep (3), initially recorded as Unknown calf #27
48	Favalu		13 Oct (1)

Table 2: Timeline of Sightings — Identified Humpback Whale Mother/ Calf Pairs
Vava'u, Kingdom of Tonga (Aug-Oct 2011). Blue = full moon. Green = new moon.

AUG	CALF (ESCORTS)	SEP	CALF (ESCORTS)	OCT	CALF (ESCORTS)
1		1	Tahafa (1), Uataha (1), Faono (1)	1	
2		2	Tahafa (1), Uatolu (1), Uafa (1), Uanima (0)	2	
3		3	Tahafa (1), Uanoa (1), Uaono (1), Uafitu (1), Uavalu (1)	3	
4	Tolunoa (0)	4		4	
5		5	Uahiva (0), Tolunoa (2)	5	
6		6	Faono (0)	6	
7		7	Tahafa (1), Tolutaha (3)	7	Faua (1)
8		8		8	
9	Taha (0), Ua (0)	9	Tolu (0), Tahafa (1), Toluua (1)	9	
10		10	Tolutolu (3), Tolufa (0)	10	
11	Tolu (0)	11		11	
12		12	Tolunima (0), Toluono (0)	12	
13	Tolu (0)	13	Tolutaha (1), Tolufitu (0), Fatolu (0)	13	Favalu (1)
14	Fa (0)	14	Tahafa (1), Tolutaha (0), Toluvalu (0)	14	
15		15	Tolutaha (0), Tolufa (0)	15	
16		16	Tahafa (0), Tolufa (0), Toluhiva (1), Fanoa (1), Fafitu (3)	16	
17	Nima (2), Ono (0), Fitu (1)	17		17	
18	Tolu (1), Valu (1)	18		18	
19	Hiva (0), Hongofulu (0), Tahataha (0)	19		19	
20	Tahaua (0)	20	Uatolu (0), Fataha (1), Faua (1)	20	
21		21		21	
22	Tahatolu (1)	22	Fafa (0)	22	
23	Tahaua (0), Tahatolu (1), Tahafa (0), Tahanima (0)	23		23	
24	Tahaua (0), Tahaono (1), Uanoa (0)	24	Tahafa (0), Uanoa (1)	24	
25	Tahafitu (1)	25		25	
26	Tahafitu (1)	26		26	
27	Tahavalu (1)	27	Fanima (1)	27	
28		28		28	
29	Tahahiva (1), Uanoa (0)	29		29	
30	Uataha (0)	30		30	
31	Hiva (0), Uaua (1)			31	

Table 3: Unidentified Humpback Whale Calf Sightings
Vava'u, Kingdom of Tonga (Aug-Oct 2011)
(Click here to see map of sightings)

#	DATES/ LOCATIONS (# ESCORTS)	#	DATES/ LOCATIONS (# ESCORTS)
1	13 Aug (0)	26	16 Sep (1)
2	14 Aug (0)	27	16 Sep (3) Assigned ID 201147 Fafitu
3	23 Aug (1)	28	17 Sep (2)
4	23 Aug (0)	29	17 Sep (0)
5	25 Aug (0)	30	17 Sep (0)
6	27 Aug (0)	31	19 Sep (2)
7	30 Aug (1)	32	21 Sep (1)
8	31 Aug (0)	33	27 Sep (0)
9	01 Sep (0)		
10	01 Sep (1), 06 Sep (0) Assigned ID 201146 Fanoa		
11	01 Sep (0)		
12	01 Sep (0)		
13	01 Sep (0)		
14	02 Sep (3)		
15	03 Sep (1)		
16	03 Sep (0)		
17	06 Sep (0)		
18	06 Sep (0)		
19	09 Sep (1)		
20	12 Sep (0)		
21	13 Sep (1)		
22	14 Sep (0)		
23	14 Sep (0)		
24	14 Sep (3)		
25	14 Sep (5)		

Table 4: Timeline of All Humpback Whale Mother/ Calf Pair Sightings
Vava'u, Kingdom of Tonga (Aug-Oct 2011). Blue = full moon. Green = new moon.

AUG	CALF (ESCORTS)	SEP	CALF (ESCORTS)	OCT	CALF (ESCORTS)
1		1	Tahafa (1), Uataha (1), Faono/ Calf 10 (1), Calf 9 (0), Calf 11 (0), Calf 12 (0), Calf 13 (0)	1	
2		2	Tahafa (1), Uatolu (1), Uafa (1), Uanima (0), Calf 14 (3)	2	
3		3	Tahafa (1), Uanoa (1), Uafitu (1), Uavalu (1), Calf 15 (1), Calf 16 (0), Calf 17 (0)	3	
4	Tolunoa (0)	4		4	
5		5	Uahiva (0), Tolunoa (2)	5	
6		6	Faono/ Calf 10 (0), Calf 18 (0)	6	
7		7	Tahafa (1), Tolutaha (3)	7	Faua (1)
8		8		8	
9	Taha (0), Ua (0)	9	Tolu (0), Tahafa (1), Toluua (1), Calf 19 (0)	9	
10		10	Tolutolu (3), Tolufa (0)	10	
11	Tolu (0)	11		11	
12		12	Tolunima (0), Toluono (0), Calf 20 (0)	12	
13	Tolu (0), Calf 1 (0)	13	Tolutaha (1), Tolufitu (0), Fatolu (0), Calf 21 (1)	13	Favalu (1)
14	Fa (0), Calf 2 (0)	14	Tahafa (1), Tolutaha (0), Toluvalu (0), Calf 22 (0), Calf 23 (0), Calf 24 (3), Calf 25 (5)	14	
15		15	Tolutaha (0), Tolufa (0)	15	
16		16	Tahafa (0), Tolufa (0), Toluhiva (1), Fanoa (1), Fafitu/ Calf 27 (3), Calf 26 (1)	16	
17	Nima (2), Ono (0), Fitu (1)	17	Calf 28 (2), Calf 29 (0), Calf 30 (0)	17	
18	Tolu (1), Valu (1)	18		18	
19	Hiva (0), Hongofulu (0), Tahataha (0)	19	Calf 31 (2)	19	
20	Tahaua (0)	20	Uatolu (0), Fataha (1), Faua (1)	20	
21		21	Calf 32 (1)	21	
22	Tahatolu (1)	22	Fafa (0)	22	
23	Tahaua (0), Tahatolu (1), Tahafa (0), Tahanima (0), Calf 3 (1), Calf 4 (0)	23		23	
24	Tahaua (0), Tahaono (1), Uanoa (0)	24	Tahafa (0), Uanoa (1)	24	
25	Tahafitu (1), Calf 5 (1)	25		25	
26	Tahafitu (1)	26		26	
27	Tahavalu (1), Calf 6 (0)	27	Fanima (1), Calf 33 (0)	27	
28		28		28	
29	Tahahiva (1), Uanoa (0)	29		29	
30	Uataha (0), Calf 7 (1)	30		30	
31	Hiva (0), Uaua (1), Calf 8 (0)			31	