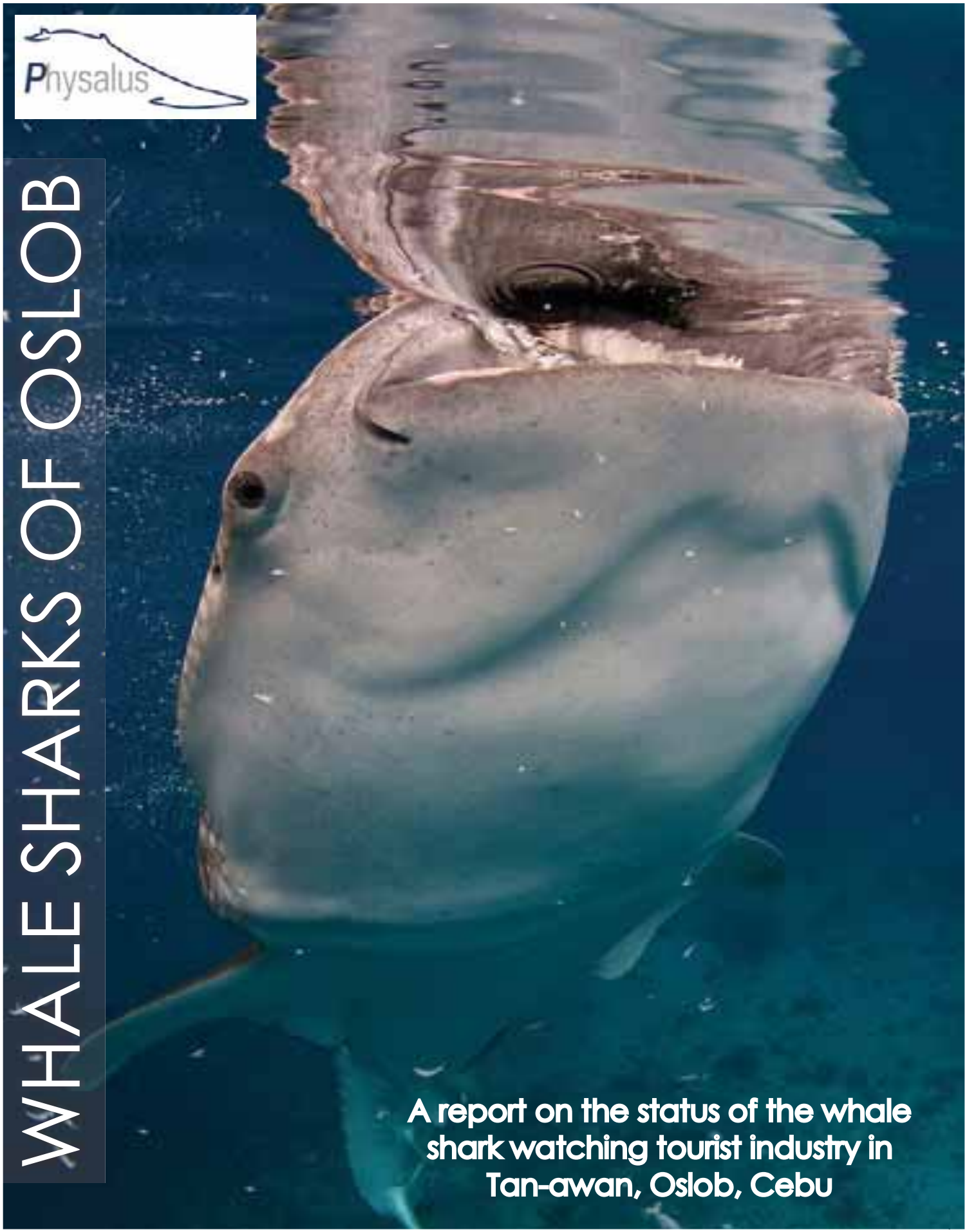
Physalus

WHALE SHARKS OF OSLOB



A report on the status of the whale shark watching tourist industry in Tan-awan, Oslob, Cebu

Preface

This report is the result of 5 months of intensive work and represents only the first steps towards a better understanding of the behavior and biology of these giant fish and the effect that human activities have on them.

Understanding the long term effects of our actions on an animal that will reach maturity in half the life span of a human and that can live much longer that any man is difficult and humbling, and this is one of the primary reasons why the “precautionary principle” should apply in a situation such as this.

Physalus does not agree with feeding any species of wildlife, in particular a long-living migratory species like the whale shark.

Unfortunately, our NGO is not in the position of making any decisions regarding the practice of provisioning, but nonetheless we feel the obligation to study and monitor this activity to learn more about the effect on the animals and provide, through rigorous data collection, strong tools to allow the Authorities to properly manage the practice and make informed decisions.

This report has been created for the Local Government Unit in Oslob, for DENR and BFAR region 7 and the Cebu Provincial Government, to provide recommendations on how to improve the practice.

It is not the intention of this report to be an attack on the provisioning, the tourism industry in Oslob or the local communities.
Evidences indicating that provisioning has a detrimental effect on the whale sharks have been already presented in several occasions to the Authorities in the past 6 months.

We strongly believe that proper information and education are the foundation of environmental conservation, and this is the reason why this report is open to the public.

We think the provisioning should stop and that tourism related activities should be converted into a well-managed eco-friendly activity, following the footprints and the astonishing examples of Southern Leyte (LGU of Limasawa and Pintuyan) and the model of Donsol, Sorsogon.

Physalus will keep studying the whale sharks in Oslob and work for their protection while providing its service to the Authorities and the communities.

Physalus understands the importance of tourism as a source of livelihood for the local community, but we would like to emphasize that in order to be a real long-term alternative and to increase the welfare of the community it has to be done in a sustainable way.

Our team is present in the waters of Oslob every day and will keep working with the community for the protection of its marine resources and to raise awareness and social responsibility, independently from the provisioning activities.

In the hope that the provisioning will cease, our team will be first in line to help the community to reorganize and adapt to the new situation, creating educational tools both for the tourists and the people of Oslob and management tools for the Authorities.

For any concern and information related to our research please feel free to contact us through our website. www.lamave.org

For all other concerns regarding the organization of the activities and the legality of the provisioning of an endangered species please contact the Local Government Unit of Oslob, the Department of Tourism or the Bureau of Fisheries and Aquatic Resources.

This report has been possible thanks to collaboration of the LGU in Oslob and in particular Mayor Ronald Guaren and all the personnel of the Oslob Municipal Tourism Office, PAWB RTD Al Orolfo, Department of Agriculture Secretary Processo J. Alcala for the gratuitous permit as well as a series of individual and NGOs that have sustained our activities and/or volunteered for this project in 2012, including Marine Wildlife Watch of the Philippines, Save Philippines Seas, The Tuki Chronicles, The University of San Carlos Cebu, Mr. Elson Aca, Dr. Jennifer Schmidt, Dr. Simon Pierce, Ms. Anna Lucey, Ms. Samantha Craven and Ocean Park Conservation Foundation Hong Kong to have partially founded the research project.
Special gratitude goes to the members of TOWSFA for their help in collecting some of the data, collaboration and moral support.
A full list of acknowledgements can be found at the end of this report.

Sincerely

Dr. Alessandro Ponzo
President of Physalus

Dedicated to Fermin and Elson

Drawing by Sally Snow

Not the glittering weapon fights the fight, but rather the hero's heart

We ourselves feel that what we are doing is just a drop in the ocean.
But the ocean would be less because of that missing drop.
Mother Teresa

This report has been written by

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Physalus

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A History of Oslob

Oslob is a small municipality in the southern tip of Cebu Island, Philippines. It encompasses 21 barangays (villages), including Tan-awan, whose whale shark feeding tourist industry is the subject of our study.

The waters surrounding Cebu, and the Bohol Sea have been an important habitat for whale sharks and this is corroborated by historical hunting data. Oslob is listed as one of the fishing villages that were reported to hunt whale sharks in the 1980's (Alava & Dolumbalo, 2002).

"Whale sharks were reportedly landed in six other sites (Argao, Caseres, Oslob, Santander, Samal Island and Surigao). The status of these fisheries was not confirmed."

Many fishermen recall seeing them since their childhood. However traditional hunting practices became more commercial as demand for shark fin and whale shark meat increased in the 1980s. At least 627 individuals were landed in only seven (7) years in the Bohol Sea (Alava & Dolumbalo, 2002). As a result, there was a decline in whale shark sightings.

The Philippines became one of the first countries in the world to initiate national whale shark protection. Fisheries Administrative Order No. 193 (1998, Box 1.) prohibits the take, catch, sale, purchase, transport of export of whale sharks (and manta rays) whether dead or alive. It also prohibits wounding or killing whale sharks. The penalties issued to offenders include fines up to five thousand pesos (PHP 5,000) and/or imprisonment of up to four (4) years.

Box 1.
Fisheries Administrative Ordinance 193 series of 1998

Sec 2. Prohibition – it shall be unlawful to take or catch whale shark and manta rays in Philippine waters or to sell, purchase, posses, transport or export the same whether dead or alive, in any state whether raw or processed.

In the last few years, the number of whale shark sightings reported have been increasing – a sign of the slow return of these giants to the previous home range, and of increased awareness of the population.

Figure 1. 'A' marks the location of Oslob on Cebu Island

How the feeding started

Shrimp (of the family Sergestidae) are traditionally caught at night and is used for human consumption and as bait in hook and line fishing. The sharks would approach hook and line, trying to feed off the bait, locally known as Uyap. As the sharks interrupted fishing practices, fishermen would try to drive them away with different methods including throwing rocks at them.

Fishermen from the village of Tan-awan, in Oslob, Cebu took a different approach towards the whale sharks, and led them away from the fishing activities by luring them with Uyap.

Figure 2. Fisherman feeding a whale shark in close proximity to tourists. Photo by Steve De Neef

Figure 3. Shawn Henrichs' photograph from late 2011 was used to promote tourism in the Do It Yourself "It's more fun in the Philippines" campaign.

People who witnessed the practice documented this and as word spread, people started visiting Oslob and paying the fishermen to take them out to see the sharks. By December 2011, social media sites were flooded with photos and videos of people getting up close to the sharks (Fig. 2).

The Daily Mail, a UK newspaper, also featured articles about the feeding with pictures (Fig. 3) and interviews from conservationist photographer Shaun Henrichs on 22nd December 2011, and 10th January 2012. This contributed to international awareness of the practice.

Oslob is only three hours away from Cebu City, and less than an hour from Dumaguete City. The relatively easy access in addition to the high chance of whale shark encounters resulted in a tourist boom for the small village.

At that time, no regulations were in place and many people described the conditions as chaotic. There was no demarcation line defining the interaction area and dive boats would moor or anchor in the middle of the feeding area causing visible damage to the reef. There were many reports of people getting hit by the paddleboats and the water was extremely crowded with tourists.

Legislation

On Jan. 6th 2012, after five months of non-regulated interaction and pressure from the media and whale shark scientists, the local government unit (LGU) passed an ordinance (hereafter referred to as 'the ordinance') regulating interactions with whale sharks (Regulation No. 296, Ordinance No. 091:s-'12 – Box 1).

Other government organizations, such as the Bureau of Fisheries and Aquatic Resources (BFAR), the Department of Environment and Natural Resources (DENR) and the provincial government were not consulted during the draft of the ordinance. One month after it was passed a Technical Working Group (TWG) was created by the Provincial Government of Cebu, with representatives from these departments, in addition to the Governor of Cebu, the Mayor of Oslob and representatives from the Department of Tourism, the fishermen's association and a representative of the diving industry. The goal of the TWG was to create a new set of regulations and improve the organization of the tourism in Tan-awan.

After the third meeting on 6th March 2012, the final version of the document was sent to the LGU of Oslob to be approved and made into legislation through an ordinance.

For unknown reasons the Local Government Unit (LGU) of Oslob decided not to endorse the

Box 2

Regulation No. 296, Ordinance No. 091:s-'12 Section 10. Policies, Regulations and Guidelines on Whale Shark Watching: The following are the policies, regulations and guidelines on whale sharks watching:

10.1. Only authorized tour guides from the accredited association, organization and/or cooperative shall be allowed to ferry a tourist/whale shark watcher for the purpose of whale shark watching;

10.2. Only manual boat shall be allowed to enter the designated demarcated area for whale shark watching. Motorboat is strictly prohibited;

10.3. No riding, touching using hands, feet, camera or pointer on whale sharks;

10.4. No staying within five (5) meters directly beside or behind the caudal fin or tail fin of the whale sharks;

10.5. No staying within two (2) meters in front of the whale shark's mouth when feeding;

10.6. Heavy splashing is prohibited;

10.7. A maximum of six (6) tourists/whale shark watchers per whale shark shall be allowed to view for about thirty (30) minutes;

10.8. To avoid crowding, a maximum of scuba divers is limited to four (4) divers per shark only;

10.9. No feeding on whale sharks shall be allowed except those who are authorized under this Ordinance.

Box 3

Section 1. Section 7 of the Municipal Ordinance 091:-s-12 entitled "An Ordinance Providing Measures On The Protection And Conservation Of Marine Wildlife Particularly On Whale Sharks In The Municipal Waters Of Oslob, Cebu, Prescribing Regulations, Guidelines and Imposing Fees, Fines, and Penalties For Violation Thereof" is hereby amended to read as follows.

Section 7 – SAFETY AND SECURITY OF DIVERS AND SNORKELERS. A) To ensure the safety and security of the tourist/whale shark watcher, the Barangay Official of Tan-awan, in coordination with the accredited association, organization, and or cooperative, must observed the following:

1. The barangay tanods must always be visible every time a tourist is coming and increase their visibility in all areas of concern.
2. They must see to it that the tourist/ whale shark watcher shall have undergone orientation at the Briefing Center on the rules and regulations prior to the actual whale shark interaction and/or whale shark watching.
3. All tourists shall be provided with life jacket during the whale shark watching.
4. Whale shark watching shall be limited to thirty (30) minutes unless allowed to extend by the authorities in accordance with this ordinance.
5. The number of tourists on-board the manual boat shall be limited depending on size and weight and/or the boat's capacity.
6. There shall be detailed lifeguards in areas for the whole duration of the whale shark watching and/or interaction.

recommendations proposed by the TWG. The ordinance was amended on Apr. 15th 2012 to increase the registration fees for interaction, and implement a briefing for guests on the rules and regulations before interaction (Resolution No. 326:s-'12, Box 2). The amendment also dictates that dive shops must apply for accreditation and be issued a license before running tours to Tan-awan.

After reports of feeding from nearby towns, and the declaration of interest by some resorts and the local government of Moalboal, a famous diving destination on the west coast of Cebu island to begin feeding whale sharks, the Mayor of Oslob and representatives from Physalus called for a meeting with the Governor Gwendolyn Garcia of Cebu Province to talk about preventing the spread of feeding practices. The meeting took place on the 16th September along with the Mayor of Moalboal (Inocentes Cabaron), Romel D. Krit (Coastal resource management consultant for Moalboal) and Congressman Pablo John Garcia who was present as a legal advisor.

The Mayor of Moalboal expressed his interest and will to start feeding to boost the tourism in Moalboal since the bait balls of sardines at Pescador Island, the star attraction for tourism in Moalboal, were not as apparent this year.

The Physalus team agreed to join the discussion, not to justify the feeding in Oslob, but to try to limit the impact on the sharks due to the spread of the activity. The following issues were highlighted: -

- Disruption of migration patterns to other feeding sites and breeding grounds

Fact Box 1:

Data from satellite transmitters attached on whale sharks by researchers of WWF Philippines and in collaboration with Hubbs-Sea World Research Institute have shown that several sharks migrated to countries like Indonesia where the whale sharks are still legally hunted, as well as countries like Taiwan and Malaysia where poaching is still common.

- Positive association between boats and food leading to increased risk of injury, by catch, and poaching and hunting if the sharks eventually migrate to countries where these activities still occurs (Fact Box 1).
- Even after six months after the enactment of the ordinance in Oslob, regular violations of regulations still occur.
- Creating a new whale shark interaction site would damage the livelihood in Oslob without reducing the impact on the animals.
- Additionally it would set the stage for any other communities to start the feeding practice thus reinforcing the view of the whale sharks as pets and an easily tameable animal that is to exploit, and not a species vulnerable to extinction that requires full protection.

The Governor declared she could not legally allow one town to continue feeding while banning the practice in another town, since it would be a case of favouritism and discrimination. Furthermore, the Governor encouraged the spread of feeding practices to boost tourism and economy in the province. Towns would be able to use Oslob's ordinance as a template and example to set up similar whale shark activities. Governor Garcia conceded that if national law banned the feeding of whale sharks, the Provincial Government would enforce it.

The environmental awareness and educational value of the whale shark watching interaction was prioritized over any precautionary move to protect the sharks from the consequences of feeding; unfortunately, there is currently little to no educational value to the whale shark experience in Oslob. The briefing contains no information about the animals (page 8), there are no educational materials provided by the local government and even the road signage contains the wrong

Figure 4. Local government road signs inaccurately depict the whale shark interaction. This sign points to the registration area in Tan-awan.

information indicating the interaction area as "whale watching".

Fee distribution & TOWSFA

Box 4.

Resolution No. 296, Ordinance No. 091:s –'12. Section13. Sharing Scheme. The income of this operation shall be shared and distributed as follows, to wit:

a) Sixty percent (60%) of the income shall go to the accredited association and or cooperative which will be divided among its members according to their agreed sharing scheme.
b) Thirty percent (30%) of income shall go to the municipality which shall accrue to the general fund.
c) Ten percent (10%) shall also accrue to the general fund of the barangay.
d) Income derived on video camera, snorkelling, diving and anchorage shall go to the municipality.

The income from the registration is divided between the fishermen's association, the Municipal Government and the Barangay (village) Government (See Box 4).

When the feeding started, there was less than 50 members were involved. These individuals

organized themselves into the Tan-awan Oslob Whale Shark Wardens and Fishermen's Association (TOWWFA).

In April of 2012, the association applied for official accreditation, and changed the name of the association to Tan-awan Oslob Whale Shark and Fishermen's Association (TOWSFA). The association now has 118 registered members. The official papers for the accreditation of the Association were only initiated on 8th August 2012, with the first official meeting held on 11th August, 2012.

The Association divided themselves into three groups. Green, Yellow and Blue. This facilitates organizing the tourist's experience. Each group is associated with a 'base' – a plot of land assigned to the group with a variety of services offered to their guests. Locally, these are referred to as resorts. The resorts are businesses run separately to TOWSFA, and the fishermen do not receive the profits from associated services.

The resort associated with the Green group is based at the home of one of the association members and provides a seating area and buffet style food.

The Blue group is divided between two businesses; "Aarons Beach Resort" which provides parking, shower and bathroom facilities, seating areas, a restaurant and the only walk-in dive shop in the barangay – Oslob Divers. Currently, accommodation facilities are being built. The other business is "George and Jimmy's Lechon Manok" – a restaurant with seating area.

The Yellow group is also divided between two businesses – "MBs Sunrise Beach resort" which has parking, accommodation, bathroom and shower facilities, seating areas and a restaurant, and "BCDs resort" which provides parking, seating areas, bathroom and shower facilities and has accommodation as well.

All bases provide tourists with lifejackets (provided by the LGU) that are included in the registration fee. Mask and snorkels can be rented from the resorts or registration area for PHP10 (US$0.24).

The group that brings the tourists to the registration area will be assigned to guide the visitors during the interaction and the relative percentage of the fee will be assigned and shared within that group at the end of each day. The resorts provide services that differ in aesthetics and variety, and have different marketing strategies, and thus there is a discrepancy in the number of tourists, and therefore amount of money, that each group and individual fishermen earns.

TOWSFA roles

The members of TOWSFA are divided into different roles. Boat Guides are members assigned, in rotation, to ferry tourists on paddleboats to the interaction area. There are usually two boat guides per guest boat.

Feeders are representatives from each group that feed the whale sharks from small, single person paddleboats (bancas, referred to as feeder boats; Fig. 5). There is no official training required to be a feeder, experienced feeders coach those who want to learn. The number of feeders operating is dependent on the number of guest boats in the interaction area.

Figure 5. Authorized feeder from the Green group feeding a whale shark from a feeding banca

The profits from each group are shared between members of that group, and feeders are paid an additional PHP 200 per day.

The Bantay Dagat

The Bantay Dagat, or sea wardens, are individuals hired by the LGU to monitor the interactions, and enforce the rules of the ordinance.

Eight of the Bantay Dagat have been trained to dive. There are usually four on duty in the water at a time. Two within the groups of snorkelers swimming on the surface and two diving, moving between the groups of boats. They are on duty four hours at a time, the first shift starts at 0600 and the second at 1000.

Figure 6. Bantay Dagat on duty in the interaction area.

Bantay Dagat are also stationed at the registration area and in each of the resorts to check that those heading out the interaction area have paid. However, tourists are not always told of their presence or role in the interaction and therefore sometimes resistance is encountered when enforcing regulations.

Enforcement by the Bantay Dagat varies between individuals. The Bantay Dagat are supposed to be on duty for the entire length of the interaction time but on several occasions of witnessing infractions, none of the Bantay Dagat could be found in the interaction area and it was impossible to reprehend the offenders. This is often at the beginning of the day, during 'shift change', and at the end when there are just a few tourists left in the water.

The majority of the time infractions are reported, warnings are issued, and it is infrequent for a guest to be removed from the water and the infraction investigated and penalised. Despite this, their presence in the water is a deterrent for infractions. Their efficiency and effectiveness would greatly increase if the tourists were educated about their presence and role, and enforcement was the norm.

The Interaction

Registration & Briefing

Registration time runs from 0600 – 1230 daily. Tourists can either register directly at the designated registration area (which at the time of writing is a tent with tables, chairs and a poster on interaction regulations), or go direct to one of the TOWSFA bases (page 7). If the tourist goes directly to the designated registration area they will be assigned to one of the groups, following a rotation scheme. If they come from a resort, they walk or are transferred by paddleboat to the registration area and their fees and care will be assigned to the TOWSFA group associated from the resort from which they originated.

All tourists must have their names registered in the logbooks, however the names recorded are often only nicknames and thus have no legal value. They are then directed to a seated briefing area to listen to a briefing given by a Municipality Tourism Officer (MTO), which is supplemented by a visual representation of the rules on a poster (Fig. 7).

Figure 7. The poster used during briefings in Tan-awan

The amount of information relayed to visitors varies depending on the person in charge and the crowding in the area. The briefing usually covers the following points: -

- Do not touch the whale shark
- Do not ride the whale shark
- Do not use flash photography
- Do not create splash when entering the water.
- Do not wear sunscreen if you are going to enter the water.
- Maintain a minimum distance of 5m from the head, 6m from the tail (this differs from the 2m from the head, and 5m from the tail stated in the ordinance)

Tourists are usually informed that infraction of the regulations will result in penalties, though this has not been observed in every briefing. The penalties listed in the ordinance include fines up to PHP 2,500 and imprisonment. There is no information given about the history of the industry, the biology and conservation of the whale shark or why it is important to respect the rules.

Tourists are then required to pay the relevant fees. These are listed in Tables 1 and 2.

Whale shark watching	Adult	Child
Oslobanon	₱30 | $0.71	₱15 | $0.35
Non-Oslobanon	₱300 | $7.08	₱300 | $7.08
Additional fees		
Snorkeling	₱20 | $0.47	
Diving	₱50 | $1.18	
Video Camera	₱100 | $2.36	
Anchorage fee	₱500 | $11.80	

Table 1. Outline of the initial fee system as listed in Ordinance (6th Jan to 15th April 2012) in PHP and US$.

	Adult	Child	Snorkel	Diving
Oslobanon	₱30 $0.71	₱15 $0.35	+ ₱20 $0.47	+₱50 $1.18
Filipino	₱300 $7.08	₱300 $7.08	+ ₱200 $4.79	+₱300 $7.08
Foreigner	₱500 $11.80	₱500 $11.80	+ ₱500 + $11.80	+₱1000 +$23.61

Table 2. The current fee system as outlined by the amended ordinance passed on 15th April 2012 (in PHP and US$).

	Accreditation fee	Daily Anchorage Fee
Dive shop	₱5000 | $118	-
Dive Instructor	₱3000 | $70.82	-
Dive Master	₱1500 | $35.41	-
Pump boat	-	₱250 | $5.90
Liveaboard	-	₱500 | $11.80

Table 3. Outline of fees for dive operators under the amended ordinance (PHP and US$)

Once tourists have received the briefing and fitted with life jackets, they board the guest boats, small paddleboats with outriggers (bancas – Fig. 8) and are taken by two or more boat guides to the interaction area. This is an area of roughly 500 x 100 m directly in front of the Tan-awan shoreline. This section is defined by buoys and ropes that mark the interaction area within which no motorised vessels are permitted. Dive boats often moor directly to these buoys.

There are several mooring lines (tied around coral) within the interaction area that are used by guest boats.

Figure 8. Guest boats are small wooden boats with outriggers, also known as bancas

Feeders usually provide Uyap for the shark from one side of their boat between the hull and outrigger (Fig. 5), and lead the shark around the interaction area. Tourists may watch from the boat, or enter the water and swim, snorkel or hold on to the outriggers of the banca. Each group has a different area within the demarked area where their assigned tourists carry out the interaction.

Diving

Divers are not required to go through the briefing process at the registration area. Any dive centre bringing guests must acquire a permit (see Table 3) for their facility and for each of their staff members leading the dives. These employees are responsible for briefing the divers and reporting any infractions. There is no method to monitor the briefing given by dive staff, and no dive guides have undergone formal whale shark interaction training. Furthermore, one of the penalties in case of the violation of the regulation included in the ordinance from divers is the revocation of the permit of the dive centre that caters to them. This is a clear conflict of interest and its inefficiency is underlined by the fact that no divers have ever been sanctioned and no dive centre have lost its permit despite the evidence provided to the Bantay Dagat of multiple infractions. Currently 33 dive centres are accredited for interaction.

As previously mentioned, there is one dive shop, Oslob Diver's, located in Aaron's Beach Resort that caters to bookings and walk-in divers. Some dive shops arrive by land and bring their own equipment, entering the water from any of the 'resorts'. Their fees are paid at the resort. Others arrive by motorized boats or liveaboards and fees are collected from a small-motorized boat belonging to the registration team.

The Feeding

When the feeding first started, fishermen would go out at night to collect Uyap (small pink sergestid shrimp. Fig 9.) locally, as they had traditionally done to obtain bait for fishing, and for use in dishes like 'bangoon'.

Uyap vs. Uyabang

After several months of extensive and unsustainable exploitation (Fig. 10) at the beginning 2012, the local Uyap population was depleted to the point where was unable to sustain the industry. Members of TOWSFA had to start buying and transporting a different species of shrimp – known locally as Uyabang. This species is larger in size and white in colour and has been reported to be bought from as far away as Consolacion (~110km), Moalboal (~45km), Car Car (~60km) (Cebu Island), and recently from Bacolod, which is located several hours away on a nearby island (Negros).

The price of the Uyabang has risen exponentially. At the beginning of 2012 the price for one kilogram of shrimp around one peso, whilst now, eight months later, the price can reach 60-90 pesos depending on demand and availability. This has significantly depleted profits from the industry, since during the interaction, fishermen have reported using between 20 and 250 kilos of Uyabang in one day, the amount being dependent on the number of guests but it has not be possible to verify the quantities.

Each group obtains it's own food, but the Uyabang is bought in bulk and kept on ice in Styrofoam boxes (Fig. 11). Some of the fishermen have noted and reported that on occasion, some sharks refused the provided food if older than five days.

Researchers estimate that due to the inefficient nature of feeding from a boat, the sharks consume only 30-50% of what is put into the water, depending on several variables the ability of the feeder. It is common to swim through a “cloud” of uneaten shrimp in the water.

There are several fish that eat the excess Uyabang including Caesionidae sp, Scombridae sp., Labridae sp., Pomacentridae sp. and Chaetodontidae sp.

Figure 9. At the beginning: Fishing for Uyap at night

Figure 10. At the beginning: preparing the Uyap for the next day

Figure 11. Uyabang is differs from Uyap - it is larger and white and needs to be crushed before fed to the sharks

Feeding Ecology

Few studies have been carried out on whale shark feeding. A study by Motta *et. al.* (2010) showed that whale sharks feed for an average of 7.5 hours per day. During that time, they ingest a variety of food including sergestid shrimp, calanoid copepods (zooplankton), chaetognaths (arrow worms), and fish larvae.

When feeding naturally, whale sharks of 4m and 6m total lengths feed on an average plankton biomass of 1.5 kg and 2.8 kg per hour (for 7-8 hours of daylight) respectively. This amounts to 11.25 kg and 21 kg per day.

In contrast, the whale sharks in Tan-awan are fed solely with sergestid shrimp for an average of 8 hours a day (assuming feeding starts at 06:00 though feeders report they sometimes start at 05:30, and taking the average end of interaction at 13:06).

During this time, minimal “natural feeding” behaviours, like surface feeding, passive feeding or vertical feeding on plankton are displayed by the feeding sharks. The majority of time is spent vertically feeding beside or behind a feeding boat, or swimming between moored groups with closed mouths and approaching and begging at boats (Fig. 12, 13).

Figure 12. Nearing the end of interaction time, only a few feeder boats actively feed the sharks. Many individuals "swarm" around the remaining feeding boats in attempt to get more food.

Figure 13. Approaching a boat when no Uyabang is being dispensed.

Figure 14. Volunteer research assistants performing photo ID and in-water surveys in Tan-awan. Photo by Steve DeNeef.

With the increased price of Uyabang feeders rarely feed if there are no guests present. During weekdays, the average number of guests boats after 10:00 is six (6).

Feeders have expressed their preference for provisioning to certain sharks. These are the sharks that consistently follow the Uyabang dropped in the water and are easily led around for tourists. The feeders also report that some shark's skin is rougher than others also affecting their preference for which sharks to feed.

The Research Team

Physalus is an Italian based Non-Government Organization (NGO) committed to the active promotion of the protection of nature, particularly the marine environment, through education of local communities and research of different ecosystems and their inhabitants.

As part of its international campaign Physalus started the Large Marine Vertebrates project Philippines (LAMAVE) in 2009.

LAMAVE aims to:

- *Assess the current status of the population of marine mammals, sea turtles and whale sharks in the Bohol Sea and ensure their protection and conservation.*

- *Raise environmental awareness throughout the local population*

- *Restore and develop, in collaboration with the local authorities, provincial stranding networks across the Visayas for the rescue and release of marine wildlife (CMARNET, BRUMM).*

Physalus does not support the feeding of any wildlife and recognized the urgent requirement to closely monitor these activities, and collect robust scientific data to be able to create the tools necessary for the authorities to manage this industry in a more sustainable manner.

After the initial report of the status of the activities from fellow scientist Elson Aca, the team visited the site in February and March 2012 to assess the situation and try to coordinate the effort with other local NGOs and authorities. On March 31st 2012, after two months of negotiation, Physalus, with permission from the LGU of Oslob and the provincial government set up a branch of their Large Marine Vertebrates Project (LAMAVE) in Tan-awan. The aim is to evaluate the effects of nature-based tourism and provisioning activity on the behavior of whale sharks and help the local community to develop viable alternatives.

The research team is composed of one or more Principal Investigators, and voluntary research assistants. The volunteers are selected students, early career researchers and conservationists, of a variety of nationalities, who are trained in whale shark biology and data collection methods in an effort to build local capacity and raise social responsibility.

This report is a summary of the results and observations between March 31st and July 31st 2012. These results have been presented to the LGU, and the regional office of BFAR.

Surveys

Researchers carry out four different studies on a daily basis. Surveys 1,2 and 3 are carried out in rotation during defined sessions through the morning (Session 1: 07:00 – 08:00, Session 2: 09:00 – 10:00 and Session 3: 11:00 – 12:00), while Survey 4 is a tourist questionnaire distributed with the aid of the fishermen. A minimum of two (2) researchers is in the water during any session. All members of LAMAVE wear a uniform of a white t-shirt with the project logo in the water, and have synchronized waterproof watches.

All surveys are conducted snorkelling, and researchers enter the interaction area from the shoreline. The team is based in MB's Sunrise View resort where proprietors have granted use of a seating area.

Figure 15. LAMAVE researchers about to enter the interaction area for surveys

Researchers in the water carry out the following surveys:

1. **Photo identification of individual sharks:** The spot patterns on a whale shark are unique to each one. By photographing each individual, we are able to compare patterns and match identities of the sharks. Photographs are taken with an underwater camera of the left and right area between the last gill slit and the first dorsal fin. The photo identification study allows us to characterize the population describing the gender and age composition, the age at sexual maturity and the presence of pregnant females and juveniles. We are also able to monitor the occurrence of scars and their relative healing time, parasitic load, size and growth rate of individuals, individual behaviour differences and possible social networks. Individuals are also uploaded onto the ECOCEAN whale shark library – a global online database (www.whaleshark.org). This database compares spot patterns of all individuals in the library to assess if individuals have been matched in other locations shedding light whale shark migratory patterns.

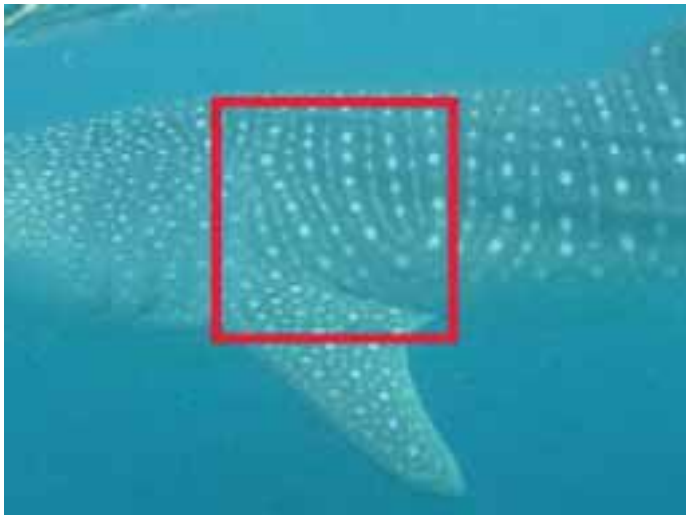

Figure 16. The left identification photo for S50. The online database, ECOCEAN whale shark library compares the spot pattern (in the area marked) between individual sharks.

2. In-water surveys: After entering the water, one researcher identifies one randomly selected shark and observes it for 20 minutes recording the compliance of people around the animal to the regulations in the ordinance, and once the survey is completed, or the animal swims out of sight, another survey is started. For the second observation period (also 20 minutes), a different shark is randomly selected both to reduce pressure on a single individual and to reduce any bias related to personal differences in behavioural response. The second survey records the sharks behaviour and reactions to other sharks and people in the water. The results are recorded on an underwater slate.

   Shark behaviour is divided into categories of the most common activities identified during preliminary surveys.

Figure 17. Anna Lucey, one of the Principal Investigators conducting a behaviour survey on an underwater slate.

Figure 18. LAMAVE's in-water data write up sheet.

These surveys are performed on land:

3. Land survey: One researcher based on land uses binoculars and a dedicated data sheet to monitor the boats and tourists movement within the interaction area. This gives an index of traffic loads and number of people in the water that coupled the data collected simultaneously in the water, will help us to describe and quantify the effect of these activities on the whale shark behaviour.

Figure 19. LAMAVE's land survey data sheet

4. Tourist survey: A questionnaire-based survey designed to assess briefing quality and areas of guest satisfaction and dissatisfaction through multiple choice and open answer questions. The questionnaires approved by the Municipality Tourism officer, are distributed daily to all resorts in the morning, and collected after operation. The surveys are given to tourists through the assistance of TOWSFA members.

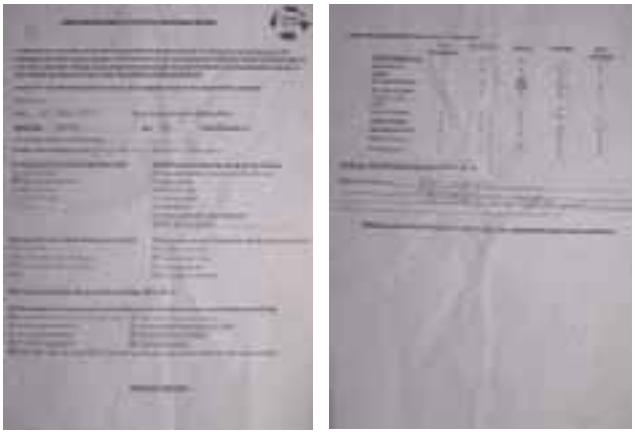

Figure 20. LAMAVEs tourist questionnaire survey

Additional studies are carried out opportunistically to supplement the daily data collection:

Laser photogrammetry: Green lasers (Sea Turtle Scuba Inc, USA) of less than 5mW (Class IIIa) have been chosen according to international regulations to ensure the safety of the operator and the sharks. Green lasers are more visible underwater than traditional red lasers, and laser intensity is balanced so as not to damage the eyes of the receiver (either humans or fish).

Two lasers set 60cm apart, with a camera mounted in the centre are used to measure shark total length, dorsal fin height, clasper size, and scar size (Fig. 21). Photographs are analysed with dedicated software by comparing the number of pixels between the two green dots projected by the lasers on the body of the animal and the number of pixels between the margins of the body parts to be measured (Fig 22.). This allows researchers to estimate the length of the shark and any other physical characteristics of interest.

Repeated measurement of the same animal over times allows calculation of the growing rate of these slow maturing giants. Measuring the claspers (male genital organs) and comparing it with the total body length will also help us identify the reproductive status these sharks, as well as describe other important characteristics such as size at sexual maturity and clasper development.

Figure 21. Dr. Ponzo using the laser system to measure a shark.

Figure 22. Analysis of laser photogrammetry on shark P-427

Tissue sampling: Small (3-4cm) samples of epidermis and dermis are collected from the back of the shark (an area where the skin can reach 14cm in thickness) (Taylor, 1994) using a spear pole with specially designed biopsy tips. The spear pole is manually operated allowing fine tuned control of the force of impact, and all the materials that come into contact with the shark are made of surgical grade stainless steel and are sterilized prior to each use (Fig. 23).

The biopsy process requires one researcher to photo identify the shark (so the same shark is not sampled twice), and visually identify the gender. This researcher then films the reaction of the shark and follows the animal for ten (10) minutes to monitor its behaviour, while a second researcher

will collect the biopsy sample. This method allows us to assess the short-term effects of the procedure. Long-term effects are evaluated by the presence or avoidance of the shark in the interaction area after the biopsy and the biopsy site healing time.

Studying the DNA from individual whale sharks can give us a wide range of information as to:

- Which population the shark belongs to and where it comes from (North/South/East/West Pacific Ocean, or Indian Ocean).
- The relatedness between individuals.
- Size of the global population (genetic diversity).
- How closely related Oslob whale sharks are to other sampled areas in the Philippines (Donsol and Southern Leyte).
- Whether whale sharks breed locally, or if they travel long distances and breed with whale sharks in other countries.

Additionally, stable isotope analysis will be performed on the biopsy sample, which will give us information on the feeding ecology and nutritional status of the sharks.

The reaction of the shark to the biopsy procedures varies from no reaction at all, to a slight flinch. Full analysis of this survey is on-going. Data shows that two (2) of the 13 sharks sampled experienced a light to strong reaction to the biopsy, and only one shark displayed a reaction at 5 min and all of the sharks showed no reaction at 10 minutes and long term.

12 sharks, including those who experienced a reaction to the biopsy, have been re-sighted in the interaction area. Seven (7) of these sharks are now seen on a daily basis.

A gratuitous permit, number 0061-12, has been granted by the Department of Agriculture on the 17th February 2012 according to Republic Act no. 9147 Section 15, and Republic Act No. 8850 for the project entitled “Genetic analysis of whale shark population biology” in collaboration with WWF Philippines and independent researcher Mr. Elson Aca and a Prior Informed Consent was signed by Mayor Ronald Guaren (Oslob) on 9th July 2012.

Figure 23. Dr. Ponzo taking a small sample of skin from the back of a whale shark. Samples are taken just below the dorsal fin where the skin is thickest.

Samples are preserved in 95% ethanol and will be sent to the Schmidt laboratory of the University of Illinois, Chicago, USA that will perform series of analyses. The results will be then compared with other samples collected as part of this study in other regions of the Philippines and as part of Professor Schmidt’s collaboration in other region of the world (Africa-Asia-Oceania-South America) and will contribute to the conservation of this species not only in the Oslob or in the Philippines but on a global scale.

Community work

Working with the community is a fundamental step for the protection of the whale shark. Awareness and education are the foundations of conservation and no research or legislation will be possible or effective without the implementation of the guidelines from the frontliners.

Physalus team first visit Oslob on the 16-17-18th of February 2012, and in collaboration with the Provincial veterinary Office of Cebu, the Municipal Agricultural Office and the Municipal Tourism Officer organized the first workshop on the biology

and stranding rescue of whale shark in Southern Cebu.

Members of TOWSFA and the Municipal Government participate to the workshop where Physalus president Dr. Alessandro Ponzo and fellow whale shark scientist Elson Aca presented on the biology, ecology and conservation of the whale shark and the status of research in the Philippines. A special session about rescue techniques for stranded whale shark closed the workshop.

A series of educational materials were given to the fishermen and the LGU, including a poster about whale shark ecology made by Elson Aca as part of his IEC campaign. Digital copies of the poster are available on Mr Aca's website: www.butandingnetwork.net.

Department of Tourism, training for the fishermen's association, which is held over five days, was split into two sessions. The first was held on 17th February 2012. The training for the other half of the association is yet to be scheduled.

The training covered topics like customer care, health and safety and some information about the rationale behind the ordinance. Speakers included personnel from the DOT region 7, the Mayor of Oslob, and the Municipal Tourism Officers. A slot of one hour was given to Physalus to talk about the whale shark biology and conservation.

In collaboration with the Barangay of Tan-awan, educational movies and documentaries about the marine environment and whale shark biology have been presented during the months of April – July to the community. On several occasions the results of the research and a series of recommendations have been presented with the aid of a digital projector and sound system in the elementary school in Tan-awan and open discussion have been encouraged (Fig. 24).

This activity received positive responses but participation of the local community is variable with most of the participants being young people.

More presentations will be organized in the following month to try and raise awareness and engage the local community in a positive discussion.

Staff have also been consulted at TOWSFA meetings to give recommendations for improvements to the interaction regulations.

Before any new survey is carried out, researchers go to each group and the registration area to explain and demonstrate the surveys in order to give the community a chance to discuss or ask questions on the research (Fig. 25).

Figure 24. Kat Bolina, a volunteer research assistant, helping to translate the results of Physalus studies as presented to TOWSFA by Samantha Craven on 27th August 2012

Figure 25. Dr. Ponzo explaining the process of biopsy sampling and showing the spear-pole to TOWSFA members.

Results

The following summary is the results of the preliminary analysis of the data collected between March 31st and July 31st 2012. Data collection is still undergoing and the results will be presented with a 4 months cadence.

The data was recorded through rigid scientific methods by professional scientists assisted by volunteer researchers that have undergone training in methods of data collection.

Interaction Length

Resolution No. 296, Ordinance No. 091:s-'12. Section 7:

d) *Whale shark watching shall be limited to thirty (30) minutes unless allowed to extend by the authorities in accordance with this ordinance.*

The duration of the interaction is set at thirty minutes by Section 7d of the ordinance; however, many of the boat guides do not have watches, and may rely on guessing or guests telling them when the allocated thirty-minute viewing time has passed.

Total guest boats surveyed	1727
Interaction Time Length	**% of guest boats**
00:03 – 00:30	27.79%
00:31 – 00:40	34.05%
00:41 – 00:50	25.07%
00:51 – 01:00	9.15%
1:00 +	3.95%
Average interaction time	37 mins
Max. Interaction time	113 mins

Table 4. Guest boat survey results (31st March - 31st July 2012)

Researchers monitored the length of stay in the interaction area of a total of 1727 boats (Table 4) by randomly selecting and following guest bancas carrying tourists, noting the time of entry and exit from the interaction area on a dedicated form (Fig. 19). Each boat was identified by hull colouration and decoration or an alphanumeric code painted on the bow. The majority of boats stayed longer than the 30-minute time limit (72.21%), with 68 boats (3.95%) staying longer than one hour in the interaction area. The average length of stay was 37 minutes – seven minutes over the time indicated in the ordinance. The longest interaction length observed was 1-hour 53 mins.

Tourist Distribution

As part of the land based survey, researchers monitored the number of boats, guests and staff in the interaction area throughout the length of the operation. We monitored 264 hours of interaction during different times throughout the day, counting the number of boats, guests, people in the water and feeders (Fig. 26,27).

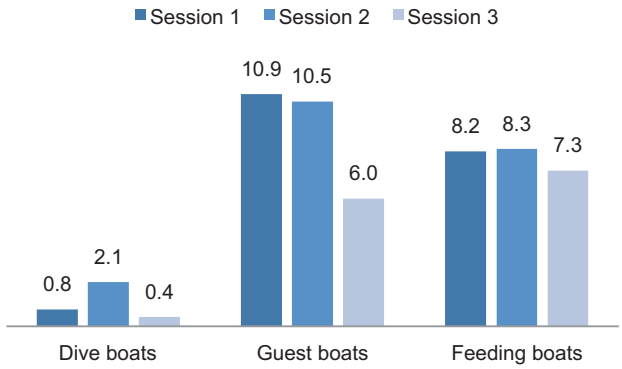

Figure 26. Bar chart showing the average number of dive, guest and feeder boats in three sessions throughout operation time.

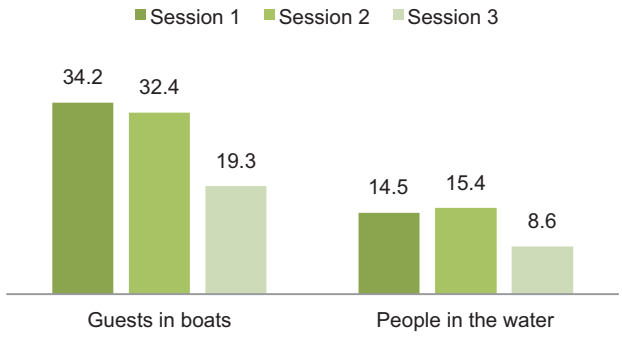

Figure 27. Bar chart showing the average number of guests on boats and people in the water per hour.

The average number of guests in a boat was four (4). The maximum observed was 14, and the minimum was one (1).

	Before Fee increase	After Fee increase
Weekdays	299	246
Weekends	636	683

Table 5. The average number of registered tourists on weekdays and weekends before and after the fee increase implemented on 15th April 2012

The number of tourists and divers varies greatly; with a seasonal peak during the Philippines summer months (April, May), and a weekly peak at weekends and public holidays (see Fig. 28). The average number of tourists recorded during weekends and weekdays before and after the price increase are listed in Table 5. On average the increase in price made no significant difference to the number of tourists visiting daily. The maximum number of tourists recorded in one day was 1,624 on Saturday, 7th April, which coincided with the end of Holy Week.

Whilst there are a maximum number of tourists allowed around a single shark, the rule has been ignored by TOWSFA from the beginning as is impractical to follow and there has been no effort by the local government to enforce it.

There is no cut off point of the interaction for safety when the weather is rough. Researchers have observed interaction running in Beaufort 4-5 and high swell conditions and have witnessed capsized guest boats on several occasions.

Tourist questionnaire

Tourist questionnaires were distributed to the bases of the three groups to be handed out by fishermen between June and July 2012. A total of 548 surveys were completed (Table 6).

Activity	% tourists who participated in questionnaire
Stayed on boat	20.8%
Held onto boat	15.2%
Snorkelled freely	48.5%
Scuba diving	9.7%
Unknown	5.8%

Table 6. The activity participation distribution of tourists that completed the questionnaire.

278 of the surveys were completed by women, 251 by men and in 19 surveys the gender was not provided. The average age of people surveyed is 32 years.

The majority of persons sampled were Filipino (68.25%) with 29.38% of International origin. In some surveys (2.37%) the nationality was not provided. The number of surveys returned from the Blue group totalled 86, and Green and Yellow returned 114, and 175 respectively.

The majority of persons that completed the questionnaire (66.42%) had not seen a whale shark before the Tan-awan interaction.
Only 43.8% of tourists received a briefing that covered all the following points:

- Swimmers must remain 5m from the shark
- No touching of the shark
- No sunscreen allowed
- 30 minute viewing limit
- Visitors that break the rules will be removed from the water
- Enter the water slowly and carefully (no splash)
- Do not dispose of garbage in the water
- Camera flash not permitted
- Lifevests mandatory

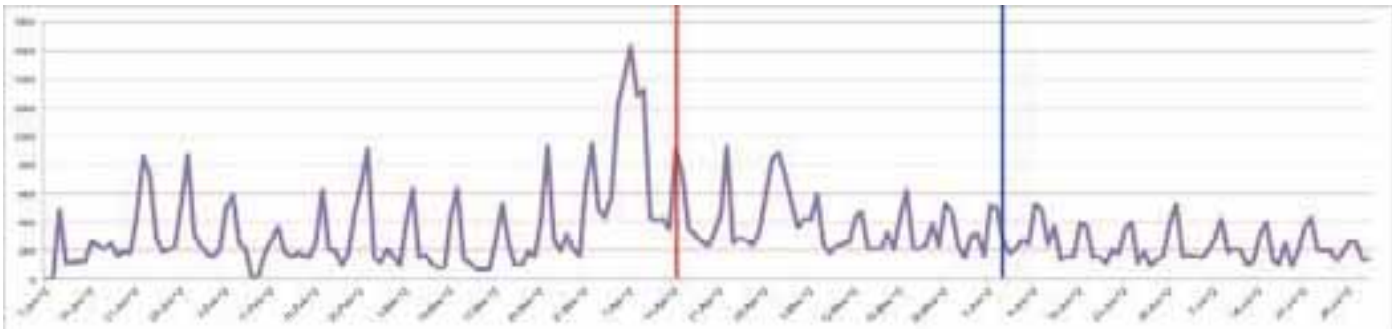

Figure 28. Total number of tourists registered for whale shark interaction daily from 7-Jan-12 - 31-Jul-12. The red line indicates 15-Apr-12 - when the fee increase was implemented (Table 2). The blue line indicates the end of local summer holidays on 4-Jun-12

Overall feedback was extremely positive, and 81.2% of those surveyed said they would recommend the experience.

Compliance to proximity regulations

Regulation No. 296, Ordinance No. 091:s-'12 Section 10.: -

10.2. No staying within five (5) metres directly beside or behind the caudal fin or tail fin of the sharks.

10.3. No staying within two (2) metres in from of the whale shark's mouth while feeding.

Compliance to interaction regulations was monitored for 3,849 minutes (Table 8). Surveys lasted for 20 minutes or until the shark moved out of sight. The following categories were assessed.

1. Number of times a **snorkeler actively** moved to less than 2m from a shark.
2. Number of times a **diver actively** moved to less than 2m from a shark.
3. Number of times a feeding boat brought a shark less than 2m from a snorkeler (**passive**)
4. Number of times a **shark actively** moved to less than 2m from a person.

Tourists are briefed to stay 5m from the head and 6m from the tail, following a poster in the briefing area, rather than the distances stated in the ordinance.

Feeding boats lead sharks along the rows of guest boats, to allow guests that remain on the vessels to see the animals in close proximity. At the same time many guests hold onto the outriggers of their boats, resulting in the feeders brining the shark less than 5m away from the guests (Fig. 37). Tourists have been seen getting trapped between the body of a shark and the hull of a boat as a consequence of the animal's movement in close proximity the feeding boat.

Infraction	Av. per 20 mins	Max. per 20 mins
1. Snorkeler <2m active	6.36	50
2. Diver <2m active	1.82	35
3. Snorkeler <2m passive	5.26	37
4. Shark <2m	2.5	56

Table 8. The number of infractions observed during a 20 minute survey (Fig.32,33,34,35)

Figure 29. Whale shark approaching a group of snorkelers

Feeders have also been observed throwing Uyap at people to lead the shark closer to them. This includes groups of guests, researchers, and other Tan-awan staff.

As a result, the sharks have learnt to associate people with food and now actively approach persons in the water, even in the absence of food (Fig. 30, 31). When the sharks approach, they make no effort to avoid contact with the swimmers, usually coming very close (less than 50cm) before swimming to another person or boat, but often also making physical contact with the person in the water. This is not an aggressive behaviour, as it may appear, but it is a clear index that the **flight initiation distance** (the minimum distance that wild animals like to keep between themselves and a threat of danger) is reduced to nearly zero (0). This is a strong indication of the shark being **habituated** (the decline and eventual elimination of a conditioned response following repeated exposure to conditioned stimulus) to human presence. For the sharks sighted daily there is often no reaction to the contact, a stark contrast from the reactions of sharks that are new to the interaction area and of what is reported in the scientific literature.

Figure 30. Researchers are often approached head on. The shark either makes contact, or turns last minute in close proximity.

Figure 31. Often tourists get close to whale sharks to pose for pictures

Figure 32. Diver posing for photograph <2m from caudal fin

Figure 33. Diver getting in close for a photograph.

Figure 34. Shark swimming through a group of boat holder

Figure 35. Snorkeler not avoiding caudal fin, contact

Figure 36. Sharks fed next to each other, many guests in close proximity

Figure 37. Feeders place their feet in front of the shark to prevent them from pushing the small bancas.

Compliance to No Touch policy

Regulation No. 296, Ordinance No. 091:s-'12 Section 10.

10.3 No riding, touching using hands, feet, camera or pointer on whale sharks.

Over the course of the study period we recorded 1823 'active touches' of the whale sharks. That equates to 29 touches per hour. The habituation of the shark to human contact occurs regardless of the identity of the person, or their intention.

In 89% of the events the contact is initiated by one of the feeders that touches the mouth of the shark, or places his foot in between the shark and the hull of the boat. This is usually to prevent the shark from bumping the banca, and pushing into it whilst it is getting fed (Fig. 38). The feeders have also been observed to occasionally stroke the sharks and push them away in an attempt to discourage the shark and communicate to the animal the non-intention to feed (Fig. 39).

Figure 38. Feeders push the sharks away from the boat by hand

Figure 39. Diver actively touches the caudal fin

Figure 40. A tourist touches the right pectoral fin of a whake shark with her foot.

Figure 41. A tourist touches a sharks caudal fin with his feet.

This often happens when the number of tourists in the interaction area decline, in an effort to conserve the Uyap for the next group of guests, or the next day.

Four (4) percent (69 instances) of recorded touches are by guests, either by those that remain on the boat, snorkelers or divers (Fig. 40, 41, 42) The remaining 7% is a combination of the two before the categories were distinguished in our survey protocol.

Whale shark interaction codes of conduct around the world round include a strict no touch policy. Studies have shown touch to have a negative impact on the sharks that will show avoidance, ending the interaction earlier and leaving the area (Quiros, 2007); Pierce *et al.* 2012). The stress related to disturbance can be high enough to displace the shark from the area. This can have a detrimental effect on the population by eliminating important feeding areas or migration corridors from the range of these animals, and will at the same time endanger the livelihood of the people involved in the wildlife interaction business.

Minutes surveyed: 3849	
Total Active Touches	1823
% Guest touch	4%
% Feeder touch	89%
% Unknown touch	7%

Table 9. Breakdown of active touches of sharks recorded and those responsible

Compliance to diving regulations

Box 4
Resolution No. 326:s'12, Enacting Ordinance No. 093:s-'12. Section 7C.

No diver shall be allowed to dive within the whale sharks watching designated area without being issued at least an OPEN WATER DIVER LICENSE and without an accompanying accredited duly licenced dive master and or instructor.

Currently, there is no system in place to monitor the level of certification of any divers (Box 4). Furthermore, on several occasions, unaccompanied guest divers have been observed within the interaction area as well as those partaking in discovery scuba courses (Discover Scuba Diver – DSD – Fig. 43), which is a level lower than Open Water Diver.

Without complete training, divers have no experience with buoyancy control, nor learn of the responsibilities they have to the marine environment or their own safety.

Lack of buoyancy control causes divers to make contact with the sea floor to steady themselves as their attention is focused on another subject. This can cause physical damage to coral reefs. Additionally, since the whale sharks are mostly seen at the surface of the water, many divers come to the surface to get a better view. Surfacing from depth whilst breathing compressed air

requires a slow ascent, to reduce the risk of diving related illnesses, like decompression sickness.

Many divers wear dive computers to monitor depth and ascent speed. These computers set off an alarm when dangerous ascent speed is achieved. The sound of these alarms is frequently heard by researchers in the interaction area.

Figure 42. Dive masters/instructors holding onto the tanks of young Discover Scuba Diver students in Tan-awan.

Box 5
Regulation No. 296, Ordinance No. 091:s-'12 Section 10

10.8. To avoid crowding, a maximum of scuba divers is limited to four (4) divers per shark only;

Despite the ordinance limiting the number of divers per shark, a maximum of fifteen (15) divers have been observed around one shark at one time.

The Sharks

As of the 31st July 2012, Physalus researchers have identified 62 individual sharks through photo-identification of their left and right spot patterns. Four (4) sharks were photographed from the left side only, and three (3) from the right side only. Since only the sharks with at least the left side spot pattern are included in our catalogue the total number of identified individuals is 66. 49 sharks have been added or identified from previous sightings on the Ecocean Whale Shark library (www.whaleshark.org). The remaining sharks are in the process of being uploaded.

The majority of individuals identified (76%) are males, whilst females represent only 10%. The remaining 14% is composed of sharks where it was not possible to identify the sex. This is due to the brief appearance of the shark in the interaction area or bad visibility underwater due to adverse weather conditions or turbidity.

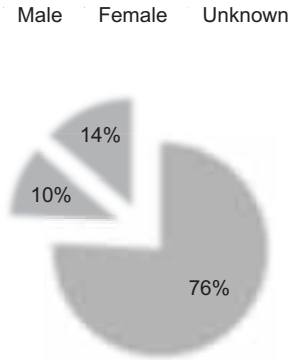

Figure 43. Gender distribution of whale sharks in Tan-awan.

The size of 49 individuals have been measured by laser photogrammetry, or estimated in relation to the known length of other sharks or comparing the animal to the lengths of boats and people

Sexual maturity in male whale sharks is defined by having claspers that are fully calcified with the outer clasper length noticeably longer than the pelvic fins (Winter, 2000). Sexual maturity as defined by length is still highly debated in the scientific literature. It is estimated that males reach maturity at a total of 9 meters but there is data from some geographical regions there indicates male maturity at 8.1m (Norman and Stevens 2007).

In Tan-awan, the size of individuals ranges from <3m to ~7m (Fig. 44). Whilst large, calcified claspers have been observed, none have been significantly longer than the pelvic fins (Fig. 45).

This indicates that the individuals sighted are all juveniles, yet to reach sexual maturity. This is in accordance with most other populations described in feeding aggregations in Australasia and Africa, and is significantly different from what has been reported in Donsol, where according to WWF Philippines, 50% males and 50% females represent the population of sharks visiting

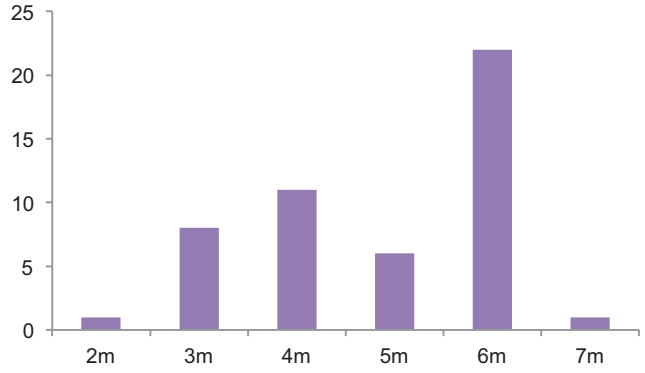

Figure 44. Estimated size range of 49 individuals observed in Tan-awan Interaction area. These figures will be validated by laser photogrammetry.

Figure 45. A pair of immature claspers, not yet calcified or longer than the pelvic fins.

Sorsogon's waters. This suggests that the sharks in the Bohol Sea may belong to a different population to the one in Donsol.

Further photo-identification work, paired with satellite tagging and genetic analysis will help us determine the answer.

31 individuals (46.97%) have been observed feeding from the feeder boats. Table 10 lists the date the most frequent (regular) sharks first added to the ECOCEAN database, and the number of days they have been photographed in the interaction area.

Name	ID	1st Recorded on Ecocean	Recorded days Present since 31-Mar-12 (119)
Bender	P-396	27-Dec-11	112
Bubbles	P-432	2-Apr-12	105
Raymond	P-395	17-Apr-12	101
Fermin	P-382	14-Oct-12	97
Ripper	P-387	14-Dec-11	94
Roxy	P-385	13-Dec-11	86
Tulips	P-384	13-Dec-11	55
Eeyore	P-445	27-Dec-11	45
Squiggles	P-427	26-Apr-12	36
'88'	P-440	27-May-12	35
Ace	P-457	03-Jun-12	33
Diver Eater	P-433	03-May-12	28
Lucky 7	P-403	01-Feb-12	27
Bullseye	P-430	03-May-12	22

Table 10. The most common sharks seen in Tan-awan, the date they were first sighted on Ecocean and the no. days present recorded by Physalus since 31st March 2012.

Shark P-396, also known as Bender, has been here the most number of days since the beginning of the study at (112 out of 119 days), whilst Fermin, Shark P-382, has had the longest site fidelity to the site. Fermin was added to the ECOCEAN database on 14th October 2011 and fishermen report him to have had a near daily presence in the interaction area.

Sixteen (16) individuals were only identified on one day.

Shark behaviour

The behaviour of the whale sharks is monitored by recording its activities and tourist proximity every five minutes.

The sharks spend the majority of time (68.89%; Table 11) in the interaction area feeding on Uyabang delivered from feeder boats. The feeding behaviour is split into two categories, vertical (Fig. 47) and horizontal (Fig. 48) feeding.

The next most common category observed is free swimming – when a shark swims without following a boat. This behaviour is most commonly observed in sharks new to the interaction area that are not being fed, and regular sharks swimming

between the groups of feeder boats. The latter is more frequently observed near the end of interaction, when the feeders are using less food and the sharks approach different feeding boats and adopt the vertical feeding position.

Behaviour	% time recorded	
Vertical Feeding	35.52%	68.89%
Horizontal Feeding	33.37%	
Free Swimming	16.79%	
Out of sight	8.93%	
Avoidance behaviour	0.33%	

Table 11. The results of the behaviour study

Figure 46. Sharks feeding from feeder boats in Tan-awan in the vertical feeding position. Photo by Steve DeNeef.

Figure 47. A whale shark horizontally feeding after a feeder boat. Photo by Steve DeNeef.

Figure 48. Before regulations were in place, a guest gives Uyap to a shark feeding vertically.

Figure 49. Hand feeding a shark in vertical posture

Figure 50. Two sharks vertically feeding from the same feeder boat.

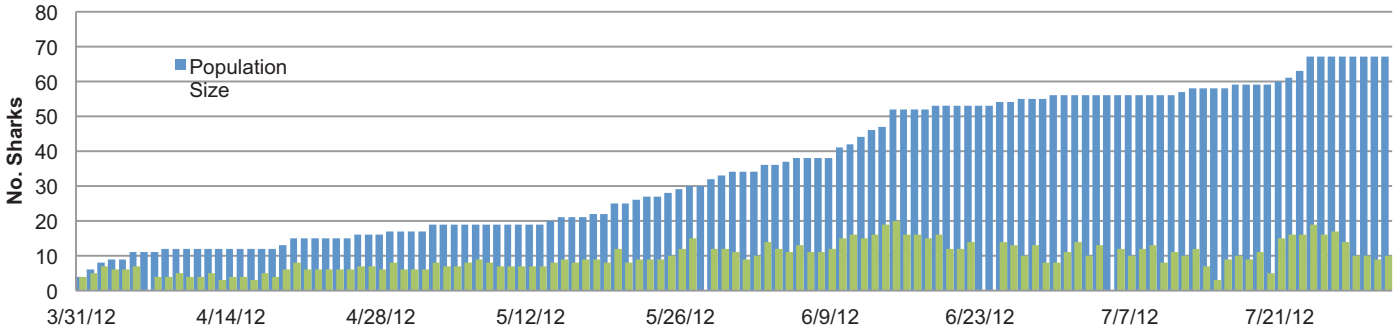

Figure 51. Bar chart showing the number of individual sharks sighted daily (green) and total individuals identified (blue) over time

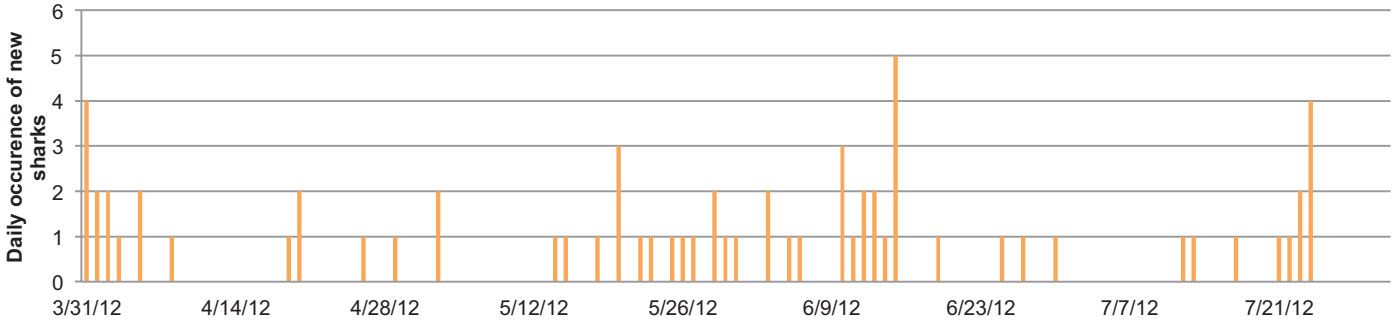

Figure 52. Bar chart showing the number of individuals sighted daily over time.

Scarring

Whale sharks all over the world bear many scars indicative of the threats they run into in the ocean. The most common documented scars are related to predatory attacks from other sharks, propeller impacts and net entanglement (Meekan *et al.* 2006). The data for these common scars is still undergoing analysis.

The whale sharks in Oslob bear scars that fall into some of these categories but in addition they have marks that are unique as the result of the provisioning activity.

Constant friction from rubbing against the side of feeder boats (Fig. 53.) is the cause of these injuries. These lesions, that appear mostly white and have a spongy consistency, are the result of the reaction of the skin around the mouth to repeated abrasion. None of the new sharks that arrive in Tan awan has any sign of these scars and it takes less than a week of feeding from boats to develop them. The same is

Figure 53. Whale shark mouth rubbing against the hull of a feeder boat whilst being fed.

true for the white scars on the leading edge of the first dorsal fin, where the abrasion is due to the contact with the hull and outrigger of the paddleboats.

Up to the 31st July 2012, the white marks around the mouth have been observed on 18 out of 31 sharks, representing 58% of the sharks that are fed for

Figure 54. Shark P-430, nicknamed Bulls Eye, feeding naturally on 15th June 2012. This was only the 5th day he had been recorded in the interaction area since 18th May 2012

Figure 55. Bulls Eye showing the beginnings of lesion formation on 9th July 2012, after he started feeding.

Figure 56. Bulls Eye on 12th August 2012. He now has lesions on both sides of the mouth.

Figure 57. On the 24th August 2012, Bulls Eye's lesions were red and inflamed indicating severe irritation.

prolonged times next to the boats. The lesions start as small white growth of skin and grow in diameter and volume with time (Fig. 54, 55, 56, 57). The older scars show ramification and tissue hyperplasia. The number of individuals bearing mouth scars has increased further through August 2012.

Box 6.
Resolution No. 296, Ordinance No. 091:s-'12
Section 10.2

Only manual boat shall be allowed to enter the designated demarcated area for whale shark watching. Motor boat is strictly prohibited.

Propeller Scars

As mentioned above, whale sharks all over the world are susceptible to propeller scars. Their disruptive colouration (disruptive patterns use strongly contrasting markings such as spots or stripes to break up an animal's outlines) makes them hard to see from the surface, and increased boat traffic over the years has seen more propeller contacts when the sharks are surface feeding. Propeller scars are distinctive, as wounds are always parallel, and if deep enough, show a slight S-shape (Fig. 58, 59).

Whale sharks in Tan-awan have been seen with propeller scars of varying degrees of severity from the first sighting. These scars are on the back of the head or body of the shark indicating a propeller boat passed over them whilst they were near the surface.

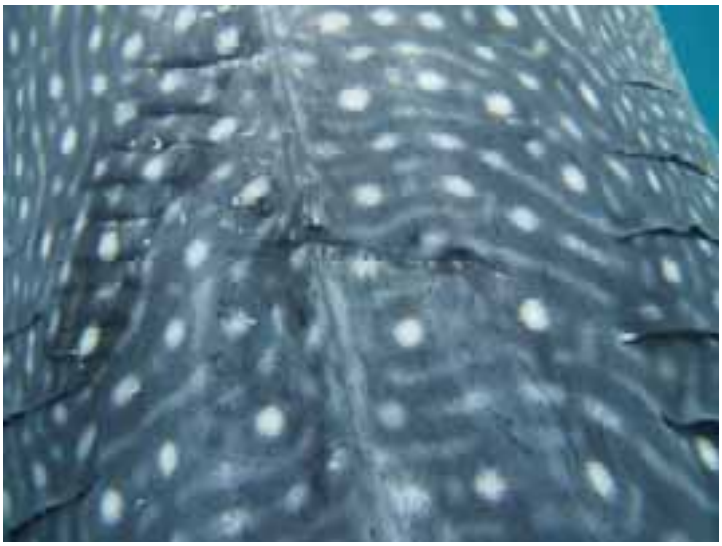

Figure 58. Shark P-442 was first sighted in May 2012 with two sets of propellor cuts. The line of cuts on the left of the head is from a small propellor, and the large wound across the back of the head is the center strike of a larger propellor.

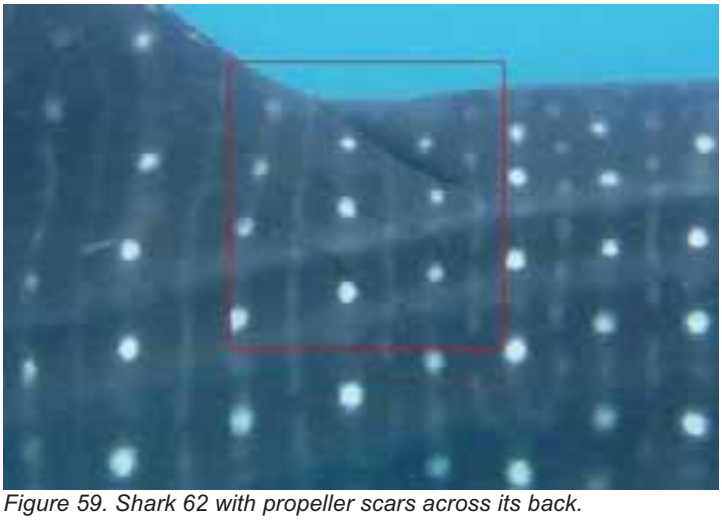

Figure 59. Shark 62 with propeller scars across its back.

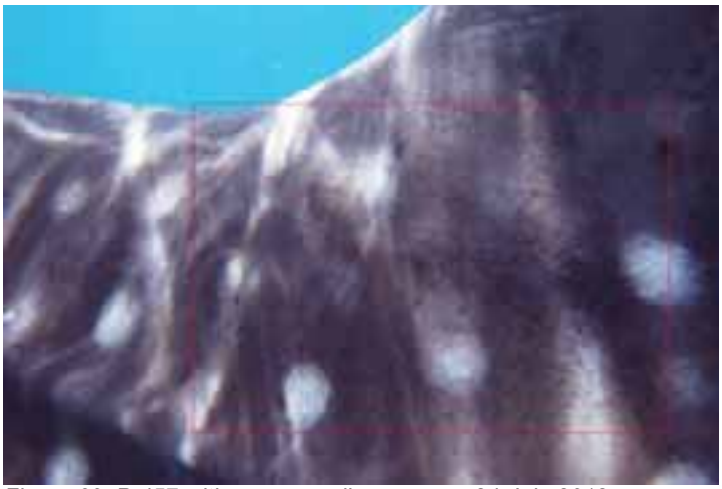

Figure 60. P-457 with new propellor scars on 24-July-2012

We have seen an increase in the number of propeller marks on the frequently sighted in the last three months (Fig. 60). If the sharks become accustomed to spending more time in shallow waters, this is will increase the chance of boat contact.

Whilst no motorboats are permitted in the interaction area of Tan-awan (Box 6), dive boats, which are often large, motorized boats, and speedboats with propellers, moor at the demarcation buoys of the interaction area. Their propellers are used to manoeuvre to the mooring buoy. Section 10.2 of the ordinance may protect the whale sharks within the interaction area but there is nothing protecting the sharks when they leave, neither from the behaviour of approaching boats due to an association with food. There are also several fishing boats, of exactly the same shape and size of the feeder and tourist boats, which are motorized and used less than 100m offshore and around Sumilon Island. A whale shark would not be able to differentiate these boats to feeder boats.

Fermin

Figure 61. Fermin on 20-Jul-12

Fermin, shark P-383, is the shark with the longest recorded site fidelity (from October 2011 http://www.whaleshark.org/encounters/encounter.jsp?number=191020116527) and has one of the highest recorded days of presence in Tan-awan, at 97 days (Table 8.)

He was seen almost daily until the 11th July 2012. He was sighted again on the 16th July 2012 feeding as usual from the boats in the interaction area. He was not recorded again until the 20th July 2012, when he was observed to have 11 propeller wounds from the front of the mouth across and over the left eye (Fig. 61).

The position of the wounds differs from the type of propeller encounters described in the previous section. The frontal location of the wounds indicates that he actively approached a boat.

Feeders, boat guides and tourists splash the water, creating bubbles to attract the sharks. In addition, a large volume of divers creates walls of bubbles near feeding boats. Researchers and fishermen have both observed sharks following trails of bubbles. With the consistent presence of dive boats in the area, the sharks are likely to have become accustomed to the sounds of the propellers and not shy away from them as observed in other whale shark tourism destinations.

Fermin may have approached a boat to beg for food while the boat was still moving and made contact with the propeller. He may have also approached a stationary boat, who, intimidated by the size and direct nature of the shark turned on it's motor to get away.

The positive association the sharks have made between boats and food is one of the most dangerous aspects of the feeding practice. Researchers have observed sharks approaching guest boats, and even empty paddleboats and dive boats, bumping them, as they would do with a feeder boat when searching for provisioned food. This indicates that whale sharks do not differential between types of boats. Observations of sharks approaching boats have increasingly been reported from other nearby municipalities as testimony that the behaviour learnt in Oslob are displayed outside the interaction area.

Fermin was sighted on-and-off in the interaction area over the following 19 days. He attempted to feed from boats, but contact with the wounds caused him

Figure 62. Fermin (P-382) on 29th July 2012. The wounds have healed quickly, but the eye is discoloured and non-reactive

to leave the boats and for three days he was seen free-swimming around the interaction area not feeding naturally, nor from boats.

The propeller cuts impacted the left eye, and when swelling around the eye decreased, the eye was rolled back for a week. On the 29th July, the eye had returned to its natural functional position, and it exhibited a pale discolouration.

Whilst sharks are able to heal very quickly, their eyes are likely to be as sensitive as any other animal. The discolouration and the lack of reaction to stimuli is indicative that the eye is permanently damaged (Fig. 62).

In an effort for transparency about the industry in Tan-awan, Physalus published a statement about this incident on the Large Marine Vertebrates Project website (www.lamave.org).

Figure 63. Fermin vertically feeding with propeller cuts clearly visible. Photo by Steve De Neef

The story soon spread and received much media attention. The community of Tan-awan showed great concern for the recovery of Fermin. Many questioned whether it was someone who had cut the shark with a knife. As mentioned above, propeller cuts are very distinctive in shape and placement. Fermin's wounds are parallel in nature and the deepest cuts, either side of the eye, exhibit a clear S-shape, representative of propeller contact.

Fermin obtained his wounds outside of the interaction area in Tan-awan, but exactly where is unknown. There have been reports of whale shark sightings in other areas in Oslob's municipal waters and in neighbouring towns as well as further afield, in Moalboal.

The lack of ability by the whale sharks to differentiate between paddleboats in the interaction area, and motorized boats outside is one of the most profound negative side effects of the feeding practice.

Shark presence around the Bohol Sea

Forty-nine (49) of the sharks recorded through photo-identification studies have been uploaded onto the ECOCEAN database.

This has yielded the first two matches of whale sharks between different regions in the Philippines.

Shark P-429, dubbed Ronald, was first seen in the Tan-awan interaction area, for just one day, on 20th April 2012. He was then spotted on a LAMAVE research expedition to San Ricardo, Southern Leyte, 200km away, one month later. Ronald was sighted again in Tan-awan on 18th August 2012.

Shark P-374 was first recorded in the ECOCEAN database on 17th January 2011, sighted in Panglao, Bohol by a diver. 18 months later, on 15th June 2012, he was sighted in the interaction area, only 50km away. P-374 was recorded a second time in Tan-awan on 22nd June 2012.

Both these findings underline the importance of the Bohol Sea for the Philippine Whale Shark population.

The Ecosystem

The seafloor of interaction area is covered by coral reef. This reef supported the fishing communities of Tan-awan and adjacent barangays (villages) before the feeding practices started. Even now, a year into the interaction, there are still fishermen that frequent the area after operation hours.

Figure 64. A group of divers kneeling on the coral reef in Tan-awan.

Large amounts of coral damage was caused by the anchoring of diving and tourist boats before the interaction area was marked by mooring buoys and motor boats in the interaction area prohibited. Poor diving standards are damaging the reef further. Researchers have observed divers walking or sitting on the coral on several occasions, which has pulverised the coral into rubble in some areas. (Fig. 64, 65).

Several species of fish have been observed feeding on Uyabang not consumed by the shark including fusiliers, moon wrasse, Scrombidae sp, butterflyfish, rainbow runners, and damselfish (Fig. 66). Another negative effect of the feeding is the unintended provisioning of reef fish that have important functions to perform to maintain a healthy reef ecosystem. If reef fish are feeding on the Uyabang, they are not performing those functions, which for some species includes feeding on the algae and grazing on sea grass beds maintaining the health of the ecosystems and increasing the level of oxygen present in the water.

This can have serious implications for the use Tan-awan's local reef as a source of protein. Damaged and algae-covered reefs support less biomass and diversity of fish.

In addition, researchers have observed solid waste floating in the interaction area, including the plastic bags used for containing Uyap, generic plastic bags, diapers, sachets and plastic bottles. This type of waste can cause serious harm if ingested by the marine wildlife in the interaction area.

The unregulated growth of related industries in Tan-awan, such as eating, washing and accommodation facilities is likely to contribute waste chemicals through run-off into the marine environment. The chemicals in household and bathroom cleaning products, as well as sewage run-off can have serious detrimental effects to marine wildlife, and there is a need for water quality tests throughout the area where whale shark interaction takes place.

Figure 65. A diver walking on the coral reef in the whale shark interaction area.

Figure 66. Fish aggregations feeding on left over Uyabang around the whale sharks.

Conclusion

A series of recommendations were submitted to the local government unit of Oslob in May and June 2012. Another series of recommendations will be prepared in collaboration with the authorities.

Physalus will continue to study the behaviour of the sharks in Tan-awan. At the time of writing, the future of the provisioning activities is in question. Regardless of the outcome, Physalus will continue to work with the community to develop a viable alternative and transform the industry into a genuine eco-tourism destination that ensures authentic protection for whale sharks, increases awareness and education whilst still providing livelihood for the local community.

Acknowledgements

Physalus would like to thank the following parties for their support throughout the research period.

- The Local Government Unit of Oslob
- Barangay of Tan-awan
- Members of TOWSFA
- MB's Sunrise Beach Resort

Physalus would like to acknowledge the work of several individuals that have made this report possible and that dedicated their life to the protection of the environment.
The list does not follow any meritocratic order.

Anna Lucey, Elson Q. Aca, Kristina Pahang, Josh Silberg, Dominic Clarke, Katie Hughes, Cameron Hookey, Veleria Senigallia, Caitlin Birdsall, Ewa Krzyszczyk, Samantha Craven, Alessandro Ponzo, Portia Pajares, Marianne D. B. Malaga, Sally Snow, Michael Estopin, Aurelien Durrieu, Roy. O. Mejorada, Elise Garcia, Stephen Barsana, Kat Bolina, Gonzalo Araujo, Daniel Geary, Peter Grimm, Zerlina Leung, Heidi Chan, Donald Au, Chan Vincy, Karina Escudero, Martha Lovina, A.A. Yaptinchay, Steve De Neef, Quintin Jose Garcia Gomez III.

We would also like to thanks Dr. Alessandro Ponzo, All security System Sicilia S.R.L. and OPCFHK for co-funding the project.

Appendix 1

Oslob Ordinance Regulation No. 296, Ordinance No. 091: Series 2012

Appendix 2

Oslob Resolution No. 326: Series 2012

Appendix 3

First report presented by Physalus to the Authorities on May 2012, including summary and recommendations.

Republic of the Philippines
Province of Cebu
Municipality of Oslob

OFFICE OF THE SANGGUNIANG BAYAN

EXCERPT FROM THE MINUTES OF THE SANGGUNIANG BAYAN OF OSLOB, CEBU IN THEIR SPECIAL SESSION HELD AT THE MUNICIPAL SESSION HALL, ON JANUARY 6, 2012.

Hon. Jose C. Tumulak, Jr.	Vice-Mayor/Presiding Officer	Present
Hon. Leonardo S. Rendon	SB Member	Present
Hon. Kenneth C. Tan	SB "	Present
Hon. Clementino A. Filosofo	SB "	Present
Hon. Mansueto A. Jugador	SB "	Present
Hon. Teodoro D. Mirasol	SB "	Present
Hon. Jesus C. Lim	SB "	Present
Hon. Carlos S. Luzano	SB "	Present
Hon. Guillermo R. Zamora	SB "	Present
Hon. Nenita T. Filosofo	SB " (ABC President)	O.B.
Hon. Jonald Michael A. Guaren	SB " (SKF President)	Absent

RESOLUTION NO. 296:s-'12

ENACTING ORDINANCE NO. 091:s-'12

WHEREAS, it is the policy of the Municipality of Oslob to protect and conserve its marine wildlife particularly all the endangered species existing on its municipal waters;

WHEREAS, it is also the policy of the Municipality of Oslob to promote its tourism potentials including but not limited to the promotion of its marine wildlife, underwater diving, whale sharks watching and other marine tourism potentials;

WHEREAS, there is need to harmonize its policies so as not to destruct and destroy its marine wildlife in the process of promoting the marine tourism potentials of the Municipality;

NOW THEREFORE:

RESOLVE, as it is hereby resolved to enact Ordinance No. 091:s-'12, to wit:

ORDINANCE NO. 091:s-'12

AN ORDINANCE PROVIDING MEASURES ON THE PROTECTION AND CONSERVATION OF MARINE WILDLIFE PARTICULARLY ON WHALE SHARKS IN THE MUNICIPAL WATERS OF OSLOB, CEBU, PRESCRIBING REGULATIONS, GUIDELINES AND IMPOSING FEES, FINES AND PENALTIES FOR VIOLATION THEREOF

BE IT ORDAINED by the Sangguniang Bayan of Oslob, Cebu, that:

Section 1. Title: This ordinance shall be known as "AN ORDINANCE PROVIDING MEASURES ON THE PROTECTION AND CONSERVATION OF MARINE WILDLIFE PARTICULARLY ON WHALE SHARKS IN THE MUNICIPAL WATERS OF OSLOB, CEBU, PRESCRIBING REGULATIONS, GUIDELINES AND IMPOSING FEES, FINES, AND PENALTIES FOR VIOLATION THEREOF"

Section 2. Definition of Terms: The following terms and phrases shall mean as used in this Ordinance as follows:

1. Accredited association, organization and or cooperative – a legitimate association, organization and or cooperative duly accredited by the Sangguniang Bayan which has been tasked to protect and conserve the marine wildlife particularly on whale sharks in the municipal waters of Oslob and the one who is authorized to ferry, tour and guide tourists/whale shark watchers to the designated demarcated whale shark watching area;

2. Designated whale sharks watching area – a designated whale sharks watching area demarcated with buoys within the municipal waters of Oslob, Cebu;

3. Municipal Waters – include not only streams, lakes, inland bodies of tidal waters within the Municipality of Oslob which are not included within the protected areas as defined under R.A. 7586 (NIPAS LAW), Public Forest, Timberlands, Forest Reserves, or Fisheries Reserves but also Marine Waters included between two (2) lines perpendicular to the general coastline from points where the boundary lines of the municipality touches the sea at low tide and a third line parallel with the general coastline including offshore inland and fifteen (15) kilometers from such coastline where two (2) municipalities are situated on opposite shores that there are less than thirty (30) kilometers of marine waters between them, the third line shall be equally distant from opposite shores of the respective municipalities (R.A. 8550, SEC. 458);

4. Tourist/Whale Shark Watcher – refers to any individual whose purpose is to see and watch the whale sharks in the municipal waters of Oslob, Cebu;

5. Whale sharks – gentle giant fish species which sizes very from 15 – 35 or more feet in length;

Section 3. Purpose and Objectives of this Ordinance:

1. To prescribe rules and guidelines for the protection of whale sharks;

2. To establish partnership for effective implementation of this ordinance;

3. To introduce standard procedure on whale shark watching and/or viewing; and

4. To ensure convenience and safety of the tourists/whale shark watchers.

Section 4. Accreditation of Association, Organization and/or Cooperative: The Sangguniang Bayan of Oslob is in charge in accepting application for accreditation of any association, organization, or cooperative which is composed preferably of fisher folks which will be tasked for the care, protection and conservation of the marine wildlife particularly of the whale sharks in the municipal waters of Oslob The membership of the association, organization and cooperative shall be open to all interested fisher folks as reflected under the association's by-laws. Likewise, it is necessary to include into the policy, the "ejection" of members. The accredited association, organization and or cooperative must satisfy the tourist/whale watchers needs and demands in the course of whale sharks watching. In the event that this accredited association, organization and or cooperative can not meet or fulfill the tourists/whale watcher satisfaction based on reports from the monitoring team, the Local Government Unit (LGU) shall have the right to cancel the accreditation and grant the privilege to other interested association, organization, and or cooperative which satisfactorily comply the needs of the tourist/whale shark watcher. The accredited association, organization, and or cooperative is expected to formulate policies, plans and programs to strengthen its organization and for the common good of the entire membership.

Section 5. Monitoring Team: There shall be a monitoring team which is composed of the following characters: (a.) the municipal agriculture officer, (b.) the MFARMC chairperson, (c.) SB Chairperson on Fisheries, (d.) SB Chairperson on Peoples' Organization, (e.) tourism officer, (f.) one (1) representative from beach owners association, if there is any, (g.) one (1) representative from the barangay council, preferably, the Brgy. Captain or his duly authorized representative, (h.) the municipal treasurer, (i.) one (1) representative from the accredited association, organization and/or cooperative and (j.) SB Chairperson on Environment. The team is primarily tasked to formulate plans, programs, and strategies for proper and effective implementation of this ordinance.

Section 6. Care, Protection and Conservation of Marine Wildlife: The accredited association, organization and or cooperative is hereby tasked for the care, protection and conservation of marine wildlife in the Municipal waters particularly on whale sharks. Anybody caught destroying or cause to destroy and/or hurting or cause to hurt the whale sharks and its habitat, by any means, shall be subjected to the penalty provided under Section 14 of this ordinance.

Section 7. Tourists/Whale Shark Watchers' Safety and Security: To ensure the safety and security of the tourist/whale shark watcher, the Barangay Official of Tan-awan, in coordination with the accredited association, organization, and or cooperative, must observed the following:

a. The barangay tanods must always be visible every time a tourist is coming and increase their visibility in all areas of concerns.

b. They must see to it that he tourists/whale shark watcher shall , have undergone orientation at the Briefing Center on the rules and regulations prior to the actual whale shark interaction and/or whale shark watching.

c. All tourists shall be provided with life jacket during the whale shark watching.

d. Whale shark watching shall be limited to thirty (30) minutes, unless allowed to extend by the authorities in accordance with this ordinance.

e. The number of tourists on-board the manual boat during watching shall be limited depending on its size and weight and/or the boat's capacity.

f. There shall be detailed life guard/s in areas for the whole duration of the whale shark watching and/or interaction.

Section 8. Steps and Procedures on Whale Shark Watching: The following are the steps and procedures for whale shark watching:

First. – Tourists/Whale Shark Watchers shall proceed to the Briefing Center provided by the Municipality for orientation on the rules, policies and other precautionary measures on whale shark watching. However, the orientation on the tourists/whale shark watchers already on board at sea, shall be conducted thereon

Second. – Pay the required fees to the cashier or designated collector.

Third. – Proceed to the designated tour guide who will ferry the tourists/ whale shark watchers using their manual boat for closer viewing of the whale sharks for thirty (30) minutes;

Fourth. – After the prescribed time, the tourists/whale shark watchers shall be brought back to the briefing center for exit;

Section 9. Studies,Research/ Training Purposes: Students and researchers shall abide with all the policies on the safety, protection and conservation of the whale sharks provided under this Ordinance. Before the conduct of the study or research, the student or researcher must secure a permit from the Local Government Unit stating the terms and references of the study and research. The Local Government Unit, through the Sangguniang Bayan shall have the authority to give permission to anybody, be it local or foreign, to conduct a study or research relative to whale sharks.

Second 10. Policies, Regulations and Guidelines on Whale Shark Watching: The following are the policies, regulations and guidelines on whale sharks watching:

1. Only authorized tour guide from the accredited association, organization and/or cooperative shall be allowed to ferry a tourist/whale shark watcher for the purpose of whale shark watching;
2. Only manual boat shall be allowed to enter the designated demarcated area for whale shark watching. Motor boat is strictly prohibited;
3. No riding, touching using hands, feet, camera or pointer on whale sharks;
4. No staying within five (5) meters directly beside or behind the caudal fin or tail fin of the whale sharks;
5. No staying within two (2) meters in front of the whale shark's mouth when feeding;
6. Heavy splashing is prohibited;
7. A maximum of six (6) tourists/whale shark watchers per whale shark shall be allowed to view for about thirty (30) minutes;
8. To avoid crowding, a maximum of scuba divers is limited to four (4) divers per shark only.
9. No feeding on whale sharks shall be allowed except those who are authorized under this Ordinance.

Section 11. Prohibited Acts: The following are the prohibited acts under this Ordinance.

1. Except those who are authorized under this Ordinance, it is prohibited for any individual or entity to tame or feed any whale shark within the municipal waters of Oslob, Cebu;
2. Only those members from the accredited association, organization and or cooperative shall be allowed to ferry, tour and guide any tourist/whale shark watcher in the designated whale watching area;
3. No ferry, vessels, banca or any form of boat with engine shall be allowed to enter or cross the designated whale shark watching area;
4. No acts, doings, or any form of activities that would harm, threaten, or endanger the life of the whale sharks shall be allowed within the municipal waters of Oslob, Cebu.

Section 12. Fees and Charges. There shall be fees and charges to be collected from any individual who would wish to watch the whale sharks within the whale watching area, to wit:

a. Oslobanon:

   1. P30.00/ adult
   2. P15.00/ child below 12 years of age

b. Non-Oslobanons:

   1. P300.00 per person regardless of age

c. Video Camera – additional P100.00
d. Snorkeling – additional P20.00
e. Diving – additional P50.00
f. Anchorage fee – P500.00

Section 13. Sharing Scheme. The income of this operation shall be shared and distributed as follows, to wit:

a. Sixty percent (60%) of the income shall go to the accredited association, organization and or cooperative which will be divided among its members according to their agreed sharing scheme.

b. Thirty percent (30%) of the income shall go to the municipality which shall accrue to the general fund.

c. Ten percent (10%) shall also accrue to the general fund of the barangay.

d. Income derived on video camera, snorkeling, diving and anchorage shall go to the Municipality.

Section 14. Penal Clause: Any individual or entity found guilty of violating any of the provisions of this Ordinance shall be punished to a fine of Two Thousand Pesos (P2,000.00) but not exceeding Two Thousand Five Hundred Pesos (P2,500.00) or imprisonment of not less than four (4) months but not exceeding six (6) months or both in the discretion of the court.

The penalties cited above are without prejudice to the filing of criminal action on violation provided for in R.A. 8550 and other pertinent laws, orders and decrees.

If the violators are member/s of the accredited association, organization and or cooperative, the violation would be a sufficient ground for the termination of the accreditation of the association, organization and or cooperative.

Section 15. Separability Clause: If, for any reason or reasons, any part of

provisions of this Ordinance shall be held to be unconstitutional or invalid, other parts or provisions hereof which are not affected thereby shall continue to be in full force and effect.

Section 16. Effectivity: This Ordinance shall take effect immediately after its complete publication in a newspaper of general circulation.

RESOLVED FINALLY, to forward this resolution/ordinance to the Municipal Treasurer, Oslob, Cebu, accredited association, organization and or cooperative and Barangay Council of Tan-awan, Oslob for information and guidance and to the Sanggunaing Panlalawigan for information and perusal.

ADOPTED unanimously on motion of Hon. Leonardo S. Rendon, duly seconded in mass.

CARRIED.

-oOo-

I hereby certify to the correctness of the above-quoted resolution/ordinance.

MARIAN C. LAGAHID
SB Secretary

JOSE C. TUMULAK, JR.
Vice-Mayor
Presiding Officer

APPROVED: Jan. 6, 2012

ATTY. RONALD L. GUAREN
Municipal Mayor

...BONGALAN
...OPICAL PARADISE RESORT
Marciso
Diving
...CAVANO JR
DIVING CENTER
...ERRAN

Republic of the Philippines
Province of Cebu
Municipality of Oslob

OFFICE OF THE SANGGUNIANG BAYAN

EXCERPT FROM THE MINUTES OF THE SANGGUNIANG BAYAN OF OSLOB, CEBU IN THEIR SPECIAL SESSION HELD AT THE MUNICIPAL SESSION HALL, ON APRIL 11, 2012.

Hon. Jose C. Tumulak, Jr.	Vice-Mayor/Presiding Officer	Present
Hon. Leonardo S. Rendon	SB Member	Present
Hon. Kenneth C. Tan	SB "	Present
Hon. Clementino A. Filosofo	SB "	Present
Hon. Mansueto A. Jugador	SB "	Present
Hon. Teodoro D. Mirasol	SB "	Present
Hon. Jesus C. Lim	SB "	Present
Hon. Carlos S. Luzano	SB "	Present
Hon. Guillermo R. Zamora	SB "	Present
Hon. Nenita T. Filosofo	SB " (ABC President)	Present
Hon. Jonald Michael A. Guaren	SB " (SKF President)	Absent

RESOLUTION NO. 326:s-'12

ENACTING ORDINANCE NO. 093:s-'12

WHEREAS, it has been observed that diving and snorkeling in the whale sharks watching designated area in Barangay Tan-awan, Oslob, Cebu, has been difficult to control in view of too much snorkelers and divers and thus, it has exposed the Whale Sharks from harm by human intervention;

WHEREAS, it is deemed proper and appropriate to amend the ordinance in order to provide additional rules and guidelines that would preserve and protect the continued existence of the whale sharks in the municipal waters of Oslob, Cebu;

NOW THEREFORE:

RESOLVE, as it is hereby resolved, to enact Ordinance No. 093:s-'12, to wit:

ORDINANCE NO. 093:s-'12

AN ORDINANCE AMENDING SECTION 11 and 12 of ORDINANCE NO. 091:s-'12 OTHERWISE KNOWN AS AN ORDINANCE PROVIDING MEASURES ON THE PROTECTION AND CONSERVATION OF MARINE WILDLIFE PARTICULARLY ON WHALE SHARKS IN THE MUNICIPAL WATERS OF OSLOB, CEBU, PRESCRIBING REGULATIONS, GUIDELINES AND IMPOSING FEES, FINES AND PENALTIES FOR VIOLATION THEROF

BE IT ORDAINED by the Sangguniang Bayan of oslob, Cebu, that:

Section 1. Section 7 of Municipal Ordinance 091:-s-12 entitled "**AN ORDINANCE PROVIDING MEASURES ON THE PROTECTION AND CONSERVATION OF**

MARINE WILDLIFE PARTICULARLY ON WHALE SHARKS IN THE MUNICIPAL WATERS OF OSLOB, CEBU, PRESCRIBING REGULATIONS, GUIDELINES AND IMPOSING FEES, FINES AND PENALTIES FOR VIOLATION THEROF is hereby amended to read as follows.

Section 7. SAFETY AND SECURITY OF DIVERS AND SNOREKELERS. A) To ensure the safety and security of the tourist/whale shark watcher, the Barangay Official of Tan-awan, in coordination with the accredited association, organization, and or cooperative, must observed the following:

1. The barangay tanods must always be visible every time a tourist is coming and increase their visibility in all areas of concern.

2. They must see to it that the tourist/whale shark watcher shall have undergone orientation at the Briefing Center on the rules and regulations prior to the actual whale shark interaction and/or whale shark watching.

3. All tourists shall be provided with life jacket during the whale shark watching.

4. Whale shark watching shall be limited to thirty (30) minutes, unless allowed to extend by the authorities in accordance with this ordinance.

5. The number of tourists on-board the manual boat during watching shall be limited depending on its size and weight and or the boat's capacity.

6. There shall be detailed life guard/s in areas for the whole duration of the whale shark watching and/or interaction.

B.) The owners of the diving shops/centers must apply for accreditation and have their dive masters and instructors duly licensed by the Municipality before they can dive within the municipal waters of the Municipality. A certificate of accreditation for diving shops/centers and license for dive masters and instructors shall be issued only upon payment of the following fees:

a. Diving shops/Centers - - - - -	P5,000.00
b. Diving Instructors	P3,000.00
c. Diving Masters	1,500.00

C) No diver shall be allowed to dive within the whale sharks watching designated area without being issued at least an OPEN WATER DIVER LICENSE and without an accompanying accredited duly licensed dive master and or instructor.

Section. 2, Section 12 of the same Ordinance is hereby amended to read as follows:

Section 12. Fees and Charges. There shall be fees and charges to be collected from any individual who would wish to watch the whale sharks within the whale watching area, to wit:

A. Oslobanon:
   1. P30.00/ adult

2. P15.00/ child below 12 years of age
3. Snorkeling – Additional P20.00
4. Diving - Additional P50.00

B. Local (Non-Oslobanon):
1. P300.00 per person regardless of age
2. Snorkeling – additional P200.00
3. Diving –additional P300.00

C. Foreigner:
1. P500 per person regardless of age
2. Snorkeling – additional P500.00
3. Diving – additional P1,000.00

D. Anchorage fee:
1. Pump boat – P250.00
2. Livaboard – P500.00

RESOLVED FINALLY, to forward this resolution/ordinance to the Municipal Treasurer, Oslob, Cebu, accredited associations, organization and or cooperative and the Barangay Council of Tan-awan, Oslob for information and guidance and to the Sangguniang Panlalawigan for information and perusal.

ADOPTED unanimously on motion of Hon. Leonardo S. Rendon, duly seconded in mass.

CARRIED.

-oOo-

I hereby certify to the correctness of the above-quoted resolution/ordinance.

MARIAN C. LAGAHID
SB Secretary

JOSE C. TUMULAK, JR.
Vice-Mayor
Presiding Officer

APPROVED: April 12, 2012

ATTY. RONALD L. GUAREN
Municipal Mayor

Research Report

April-May

2012

This report contain the data collected in Brgy Tan Awan, Oslob, between the 1st of April and the 16th of May 2012.

[Submitted by Physalus NGO]

Report prepared and produced by

Ms. Anna Lucey, BSc

Ms. Samantha Craven, BSc, MSc

Dr. Alessandro Ponzo, DVM

Copy Received by the DENR- PAWB Region 7 on the ___/___/_____

Dr. Alessandro Ponzo
President of Physalus

Dr. Al Orolfo
Regional Technical Director

Report Summary

Study period: March 31st to May 16th 2012
(46 days)

Whale Shark Data

21 individuals have been identified and catalogued using photo ID. Two are female, two are unknown and seventeen are males. All are thought to be juvenile, estimated to be between 4-6m long. Six whale sharks visit the interaction area on an almost daily basis, additionally since shark 19 was first sighted on the 3rd of May it has been seen almost everyday so is likely to also become a regular.
The average number of whale sharks sighted each day is 6. On an average day there is approximately 9 guests per shark, however on a busy day this can be as many as 28 guests per shark.
Many individuals have developed 'scar tissue' around the mouth area and dorsal fin due to continual contact with the boats.
Whale shark presence does not seem to be affected by weather conditions, however no extreme weather conditions have been witnessed during the study period.

Guest Distribution

During the study period 24,102 visitors entered the interaction area. 86% were Filipino, 5% International and 9% divers. The number of guests on a weekend day is approximately double that visiting on a weekday.
After the price increase, implemented 4/15/12, the number of guests halved from an average of 802 per day to 407 per day. This is beneficial for the protection of the whale sharks as their environment is disturbed less and they are placed under less stress. Also prior the price increase the average number of whale sharks sighted each day was 5, after the price change this increased to 7 sharks per day.
The average number of guest boats in the interaction area, at one time, is 11, however this can be as high as 33.
The average number of guests boats decreases throughout the morning, where as the average number of dive boats present is highest mid morning.

Guest Opinions

The Guest participation survey has only been active for 2 weeks, so data has not been fully analysed. However, preliminary analysis shows that the majority of guests are satisfied or highly satisfied with the experience. Key areas that were regularly highlighted as areas of dissatisfaction included:

- Educational value,
- Number of people in the water
- Shark safety.

Interaction Organisation

80% of the time the guest boats are moored in two groups within the interaction area, with the feeding boats bringing the whale sharks to the guest boats and leading them up and down the row of boats. This is arguably the best placement of the guest boats, not only for the sharks protection but also from a rule enforcement and guest safety point of view.

KEY ISSUE: the feeding boats constantly bring the shark very close to the guest boats, even with guests in the water, holding onto the guest boat. This makes it impossible for guests to maintain the minimum distance from the shark set by the Ordinance Section 10:4 and 10:5. Multiple times this would result in accidental touching or kicking of the whale sharks.

KEY ISSUE: In particular, it is essential that the guest boats remain moored in rougher sea conditions. When there is swell the guest and feeding boats are harder to control. It is also harder for guests to control their movements. On a number of occasions researchers have witnessed guests almost being hit by guest and feeder boats manoeuvring within the interaction area and have almost been hit themselves.

KEY ISSUE Feeding boats often chase the whale sharks if they leave the boat. This practice can be dangerous and unnecessary. Behavioural studies show that the majority of the time the whale sharks will circle away from the guest boats, whilst still remaining in the interaction area, then return to the guest boats and locate a feeding boat voluntarily. This is especially true of the 6/7 regular sharks that are present all morning and appear to only leave when the feeding finishes. When chasing the sharks feeding boats often move at high speeds and the risk of collision with guests in the water rises significantly. Boat contact between the sharks and the boats is also increased during this activity, resulting in increased scarring on the whale shark. It is advised that the chasing of whale sharks should be discouraged for the safety of those in the water.

Ordinance Compliance

Interaction Time Limit
During land surveys over 750 guest boats were sampled and their duration in the interaction area timed. The average number of guests per boat was 5, with an average of 2 members of staff.

KEY ISSUE: 54% of guest boats are at least 5 minutes over the 30 minutes interaction time limit described in the Ordinance Section 7:4. Some boats have been recorded as being in the water over an hour and a half.

Guest Proximity Limit
Through data collected by the in-water compliance survey it was found that, on average 21 snorkelers and 7 divers intentionally go less than 2m from the whale sharks every hour.

KEY ISSUE: Enforcement of the proximity rule set in the Ordinance needs to be consistent.

Touching the Whale Shark
During the study period over 300 active touches were recorded. The majority of active touches recorded were by the feeders during feeding.

KEY ISSUE: Active touches by guests are rare but do occur. If the Bantay-Dagat were in the area at the time of the violation the guest has been reported by the researcher, however enforcement does vary. On one occasion a diver was witnessed touching a shark, the Bantay-Dagat was informed and the diver was followed back to shore and given a warning. On another occasion a snorkeler was seen grabbing a sharks tail, the incident was reported to the Bantay-Dagat, no action was taken, the guest did not even receive a warning whilst he was still in the interaction area

Fishing within the Interaction Area
Researchers have regularly witnessed feeding boats fishing within the interaction area. The feeders use a single hook and line with uyap as bait, one attached to the hook with others thrown in to attract the fish.

KEY ISSUE: This is a direct violation of Section 11:5 of the Ordinance. This is not only a health risk for the sharks, who are attracted by the uyap used as fish bait and often approach boats who are fishing, but also for the guests and divers swimming in the water as the lines used are very thin and hard to see when swimming. On one occasion one of the whale sharks was seen with a hook in his tail with the line attached.

Guests Feeding Whale Sharks
On a number of occasions feeding boats have allowed guests to sit on the boat and feed the sharks, or sometimes even touch them.

KET ISSUE: Guests feeding the whale sharks is in direct violation of Section 10:9 and 11:1 of the Ordinance. It is advised that the practice of allowing guest on to feeding boats should be banned as it may lead to an escalation of visitors expectations.

Trash Disposal
Trash disposal is unregulated in the area. Boat crew have been witnessed throwing plastic bottles, plastic bags and cigarette butts into the water.

KEY ISSUE: Many types of trash will float on the surface and could be swallowed by a whale shark during feeding, this was actually witness by one guest. Additionally, plastic bottles and bags can take 400 years to degrade, some types of plastic never fully degrade and will lead to long term environmental damage. This is in violation of Sections 6 and 11:4 of the Ordinance.

Activities not specifically covered by the ordinance but need attention

Shore snorkelers
On a number of occasions researchers have witnessed people swimming to the interaction area from the shore

Feeding from guest boats
Researchers have noted regular feeding of whale sharks from guest boats. This practice occurs regardless of whether guests are in the water or not.

Feeding whale shark proximity
Feeders have a tendency to feed whale sharks very close to each other (3-5m apart). This could cause the sharks unnecessary stress as it is unknown how they react to other sharks in such close proximity. Additionally, this can be dangerous for guests in the water. On numerous occasions researchers have witnessed shark on shark contact, whilst feeding too close together, resulting in one or both whale sharks abruptly leaving the feeding boat and swimming off. On one occasion two sharks were fed so close together they made contact, causing the one feeding from the guest boat to abruptly leave the boat and swim quickly through the guest boat outriggers, where two guests were holding on. Both guests were hit by the shark and pinned to the guest boat.

Bad diving practices
Diving standards at the site can be low. It is essential that not only the whale sharks and the guests are protected but also the marine environment as a whole. Divers have been witnessed standing/sitting on corals, holding on to corals, ascending too quickly, uncontrolled buoyancy and diving without a buddy. Activities that result in coral and general habitat damage are a violation of Section 6 of the Ordinance.

Unauthorised vessels within the interaction area
On a few occasions kayaks have been seen to enter the interaction area. On one of these occasions the man in the kayak did not moor, entered the water and pulled the kayak around with him as he swam.

Throwing food close to guests or guest boats
Feeders have often been seen throwing food close to guests in the water or towards guest boats to give guests a closer look at the whale shark. This practice could lead to increased habituation to humans and the whale sharks may begin to associate people in the water with food. This can result in the whale sharks following guests and coming extremely close to guests. This has potential health risks for both the whale shark and the guests. Also for many guests this would be extremely intimidating and scary, possibly causing panic.

Suggested Improvements

More education on site
The guest questionnaires have demonstrated a number of people feel dissatisfied with the educational value of the experience and would like more information to be provided, both about the animal itself and the history of the area. Education of the public is key to helping conservation of this species.

SUGGESTED ACTIONS: LaMaVe suggests that it be compulsory for each resort to display educational materials and that the briefing be expanded to include at least some basic whale shark facts and the history of whale sharks in the area. Information for educational materials can be provided by LaMaVe, however funding from the LGU would be required for printing these materials if possible.

Additional training/ information provided for boatmen
Providing the boatmen with additional facts about the whale sharks would allow them to talk to the guests and answer questions whilst out in the water. It is important that the boatmen release how

special this situation is and how it is their responsibility to protect these animals, not just for the sake of the animals and the ecosystem as a whole, but also for the sustainability of this business and income.

SUGGESTED ACTIONS: LaMaVe can provide IEC workshops for the boatmen to attend. For example, the boatmen can be divided into groups of 20 (around 5 groups), each group attending one workshop for 1-2 hrs in an afternoon.

Set a maximum number of guests boats in the interaction area at one time

Large numbers of people in the water increases the chances of numerous health and safety risks occurring, both for the whale sharks and the guests. Also, a number of guests that completed a guest questionnaire stated that they were dissatisfied with the number of people in the water

SUGGESTED ACTIONS: It is suggested that the number of boats in the water be limited to 8 boats at one time. This would follow the guideline set in Section 10:7 of the Ordinance specifying there should be 6 guests per shark.

Penalties for bad diving practices

Bad diving practices can endanger peoples lives and result in the destruction of the habitat and ecosystem.

SUGGESTED ACTIONS: LaMaVe suggests that dive shops whose divers demonstrate bad diving practices should be warned and penalised if they are repeat offenders. Those who continually allow their divers to cause destruction of the habitat (contrary to Section 6 of the Ordinance) should be banned from diving in the interaction area. Such destruction is also in conflict with the Convention of Migratory Species, of which the Philippines is a member.

Enforcement of Ordinance

Enforcement of the rules set out in the ordinance does vary in the water. It is obvious that many boatmen and Bantay-Dagat do their best to maintain standards and enforce the rules. However, it is impossible for the Bantay-Dagat to be everywhere and see everything.

SUGGESTED ACTIONS: To help with enforcement LaMaVe suggests that the boatmen on feeding boats and on guest boats be encouraged to maintain the rules set out in the ordinance. Those staff members that continually allow guests to break the rules or encourage breaking of the rules should be penalised. Additionally the Bantay-Dagat should be present in the interaction area throughout the entire morning and only leave once the last guest boat has left the area. It is also advisable that at least one member of the Bantay-Dagat be present in each group of guests boats.

Trash disposal

Trash disposal on land and in the water is an issue and is indirectly covered by Section 6 and 11:4 of the Ordinance. Multiple plastic bags, some used to carry uyap, have been collected by researcher whilst in the interaction area.

SUGGESTED ACTIONS: LaMaVe suggests that trash cans need to be mandatory within resorts and feeding and guest boats must not discard any trash, including cigarette butts, into the sea. Those caught littering, on land or at sea, should be penalised, for example fined. Educational materials can be provided to educate staff and visitors of the huge negative impact littering has on the environment. To reduce the risk of the plastic bags, used to carry the uyap, purposefully or accidentally entering the water it is advised that tupperware boxes be used to store the uyap whilst on the feeding boats.

More in-depth, consistent briefings

It is essential that guests receive a through briefing before entering the water for their own safety, for the protection of the whale sharks and for following the rules set in the ordinance. Briefing are also an excellent way to educate the public.

SUGGESTED ACTIONS: LaMaVe suggests that the following points be included in every briefing:

- Basic whale shark ecological/biological facts
- History of the whale sharks in Oslob
- These are wild animals and can act unpredictably

- Viewing time is 30 minutes
- No guests are allowed on the feeding boats or to feed the whale sharks
- Enter the water calmly and quietly. No heavy splashing.
- Life jackets are mandatory on the boat.
- If the current is strong, hold onto the boat.
- Do not chase the whale shark
- Remain a minimum of 2m from the head and 5m from the tail.
- Do not touch the whale sharks
- Do not hold onto the feeding boats
- No flash photography
- Do not litter
- If these rules are broken the violator can be fined up to PHP 2,500.

Additionally, an explanation as to why these rules are in place and possible consequences of breaking the rules, both with regard to the whale shark and the guest's personal safety, is important as it helps with the guests understanding and encourages compliance.
It is recommended that all divers receive the same briefing as snorklers in addition to their usual dive briefing.
This information could be provided in the form of a short video along with text and pictorial signage. LaMaVe is happy to help create these materials and assist in training those giving the briefings.

Potential Long Term Issues

To gain a full understanding of the impact of the feeding interactions and tourism on the whale sharks long term research is essential. The following points are potential long term issues that could arise from prolonged feeding by humans in this manner:

- Disruption of migration patterns
- Habituation to humans and boats
- Development of abnormal social behaviours
- Increased spread of diseases and parasites

Conclusion

It is essential that both staff and guests understand the rarity and uniqueness of this experience and most importantly, appreciate and learn from it. In normal, more natural circumstances, a person is considered extremely lucky to see a whale shark in the wild, some have waited years for the honour of that experience. Here, in Oslob, visitors are able to see six or more for extended periods of time. These are wild animals, they are not pets and they need to be treated with the respect they deserve.

By entering the water, people are entering the whale shark's environment and must respect that habitat. Visitors should leave Oslob feeling honoured to have seen a whale shark, and proud that those running the interaction experience are doing a good job.

With the support of the authorities, guidelines have been set by the Ordinance with the purpose of ensuring the safety and protection of the whale sharks and their environment, whilst also ensuring visitors are safe and satisfied. Considering this is a relatively new 'eco-tourism business', that has developed in a small town not accustomed to such high numbers of tourists, the system that is set in place has a good structure supporting sustainable development of eco-tourism. However, as with many forms of developing eco-tourism, enforcement of those rules is not consistently up to standard and needs further attention. Adherence to the rules set in the Ordinance varies greatly and needs further support if the whale sharks welfare, and sustainable development, are not to be compromised.

Continuing education is key to achieving the levels of adherence required. Visitors need to be educated on their impact on the lives of the whale sharks and on the environment, both in the water and on land.

Staff need to understand the key role they play in the protection of these creatures and the environment and their responsibility to the whale sharks, the guests, the environment and habitat and the sustainable opportunities for the local community.

With the continuing co-operation of all parties the current research of the whale sharks and the feeding interaction will lead to a better understanding of the whale sharks, their biology and ecology and ultimately the long term impacts of the feeding practices in Tan awan. Such understanding will support global conservation efforts and approaches to sustainable eco-tourism.

LaMaVe is keen to be involved with the local government in implementing the necessary education for both staff and visitors.

Statement from LaMaVe

Research undertaken by LaMaVe aims to provide a tool for authorities to aid proper management of the whale shark tourism and minimize the impact on the whale sharks and their environment. LaMaVe has no direct or indirect involvement of the tourism business and we strongly discourage the feeding practices currently taking place. All data collected are property of Physalus NGO and the LGU of Oslob and cannot be used in part, or as a whole, without prior consent from the owning parties. Further information can be obtained from:

Alessandro Ponzo, Director of Physalus – alessandro.ponzo@gmail.com

09277701420

or Lamave.project@gmail.com

Acknowledgements
LaMaVe would like to say thank you to all the researchers who volunteered their time to participate in the studies; Valeria Senigaglia, Dominique Clarke, Caitlin Birdsall, Tcha Pahang, Josh Silberg, Portia Pajares, Marielle Malaga, Stehanie Arenas, Sally Snow, Samantha Craven and Dr Alessandro Ponzo. With a special thank you to the Governor of the province of Cebu, the Mayor of Oslob, the Local Government Unit and the Oslob Tourism Officer for their support and interest in the research. We hope that research will continue and more questions about these unique creatures can be answered.

Whale Shark Interaction: Best Practice and Recommendations

Since April 1st more than 40 individuals have been identified and catalogued using photo ID.
During the first 46 days of the study period 24,102 visitors entered the interaction area. 86% were Filipino, 5% International and 9% divers. The number of guests on a weekend day is approximately double that visiting on a weekday.
The average number of whale sharks sighted each day is 6. On an average day there is approximately 9 guests per shark at one time, however on a busy day this can be as many as 28 guests per shark at one time.
Many individuals have developed 'scar tissue' around the mouth area and dorsal fin due to continual contact with the boats.
Whale shark presence does not seem to be affected by weather conditions, however no extreme weather conditions have been witnessed during the study period.

KEY ISSUES:

Guests:

- Poor information delivered during the briefing regarding whale shark biology and no information about fines and consequences of non-compliance with the ordinance.
- Bad diving practices resulting in coral and environmental damage.

Association Members:

- Unmoored guest boat in calm days creates a chaotic environment that can result in harm to guests and sharks.
- No compliance with the interaction time limit.
- Boatmen in the water taking pictures for tourist do not comply with minimum distance guideline setting a negative example and precedence.
- Guest boat carrying food and feeding the shark.
- Feeders bring the shark too close to the tourist boat, not giving chances to the snorkelers to maintain the proper distance.
- Feeders boat allowing tourist on board and allowing tourist to feed the sharks.
- Feeding boat chasing sharks when they try to leave the interaction area often resulting in collisions and subsequent scaring and contusions of the whale shark.
- Fishing in the interaction area.
- Feeding boats feeding different individual sharks too close to each other.
- Throwing food close to guests or guest boats.

Enforcement:

- No standardized level of enforcement for tourists and boat guide staff.
- Solid waste management: lack of garbage container, education materials and enforcement for pollution.
- Lack of regulation and enforcement regarding snorkelers coming from the shoreline and kayaks.
- Motorized boat that collect diving fees cuts through the interaction area.

Suggested Improvements

Physalus feel that most of the issues can be easily addressed through education of tourists and fishermen and strictly enforcement for rules.
A series of suggestions for improving best practices and to reduce the disturbance on the whale sharks.

Education for Tan awan:

- Initial workshops to educate the TOWFA members on best practice for whale shark interaction including key issues highlighted by this report.
- Monthly meet-ups with fishermen's association to present results of the research to keep them informed and involved with La.Ma.Ve. research.
- Weekly lessons with primary to school to educate and increase awareness of marine conservation.

- Bi-monthly “Documentary movie nights” in Tan awan to raise environmental awareness.

Education for tourists:

- Building a briefing and education centre as soon as possible.
- Audio-visual system for briefing centre to display briefing video made by La.Ma.Ve.
- Education posters displayed in every resort detailed basic whale shark biology and history of Tan awan whale sharks.

Solid Waste Management:

- Distribution of trash cans and ashtrays (with lids) along the beach at all resorts with marine pollution awareness posters.
- Distribution of small trash cans (with lids or high sides) on feeding and guest boats.
- Use of Tupperware (reusable plastic containers) for Uyap to prevent plastic bags blowing into the sea.

Enforcement:

- Guidelines for standardized enforcement for Bantay Dagat including when to issue warnings and when to remove guests from water and issue fines.
- Set an age limit of 10 years old.
- Set penalties for bad dive practices that cause destruction to the marine environment (Coral Reef and Sea Grass).

Conclusion

It is essential that both staff and guests understand the rarity and uniqueness of this experience and most importantly, appreciate and learn from it. By entering the water, people are entering the whale shark's environment and must respect that habitat. Visitors should leave Oslob feeling honoured to have seen a whale shark, and proud that those running the interaction experience are doing a good job.

The Physalus Research Team will prepare a series of detailed reports and materials to address specific issues such as:

- Number of boats and distribution of tourists during the day.
- Briefing material and video.
- Education material for the briefing center and resorts.
    - Photo-Id of the most common individuals
    - History of the whale shark interaction in Tan-Awan
    - Biology of whale shark in the Visayas.
    - Whale shark research in the Philippines and in Oslob.

For any additional information or materials please feel free to get in contact with the research team at any time.

Dr. Alessandro Ponzo 09277701420
Ms. Samantha Craven 09276246479

Initial Report on the Status of the Whale Shark Population in Tan awan, Oslob and an Assessment of the Interaction Experience Regulations

Study period: March 31st to May 16th 2012
(46 days)

1.0 Introduction

Physalus is a non-profit organization, founded in Italy, operating primarily for the protection of the environment through marine conservation initiatives. In 2010 Physalus started the Large Marine Vertebrates Project (LaMaVe) in the Philippines, conducting scientific research and raising awareness on environmental issues in collaboration with government agencies, non-governmental organisations, universities and the private sector (www.lamave.org).
Whale sharks are classified as VULNERABLE by the International Union for the Conservation of Nature (IUCN, www.iucn.org), which is currently the largest professional global conservation network. It is a neutral forum for governments, NGOs, scientists, business and local communities to find pragmatic solutions to conservation and development challenges. The IUCN Red List is the most comprehensive information source on the status of wild species and assesses the extinction risk of species. The whale shark is currently classified as vulnerable, with a declining population, which means it is at increasing risk of becoming extinct.
Whale sharks, *Rhincodon typus,* are protected by a number of national and international laws and conventions including CITES Appendix II. CITES is the Convention on International Trade in Endangered Species of Wild Fauna and Flora. It is an international agreement between governments with the aim to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Species are classified as either Appendix I, II or III. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.
Whale sharks are also protected under the Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) this convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It is an intergovernmental treaty concerned with the conservation of wildlife and habitats on a global scale. There are currently 116 members, of which the Philippines is one. The convention not only protects the animal itself but also its environment and habitat.
After consulting with the Governor of the province of Cebu, the Mayor of Oslob and the Local Government Unit, permission was granted to conduct behavioural studies on the whale sharks that visit the waters of Tan awan.
This is an exciting and valuable opportunity to learn more about whale sharks as limited scientific study has been carried out so far. The whale shark is an elusive creature and is rarely seen this regularly or in such large numbers.
The organisation of the interaction experience and compliance to the Municipality of Oslob Resolution No. 296:s-'12; Ordinance No. 091:s-'12 'An ordinance providing measures on the protection and conservation of marine wildlife particularly on whale sharks in the municipal waters of Oslob, Cebu, prescribing regulations, guidelines and imposing fees, fines and penalties for violation thereof' and Resolution No. 326 'An ordinance amending section 7,11 and 12 of ordinance 091:s-'12 (here after collectively referred to as the Ordinance) was also analysed.

2.0 Survey Methods

Surveys were completed daily between approximately 7-8am (session 1), 9-10am (session 2) and 11-12am (session 3). Each survey session lasted 1 hour and included 4 different types of survey.

2.1 Survey 1: Photo ID

The spot pattern of a whale shark is unique and can be used to identify individuals. The area of the body behind the gills to the end of the pectoral fin is used as identification, like a human fingerprint (see Figure 1). There is an international online database (www.whaleshark.org) that compares ID shots

taken around the world, checking for matches sighted in other countries. This is extremely important for establishing potential migration patterns and adding data to the scientific community world wide. New individuals seen in Tan awan have been uploaded to the database for comparison.

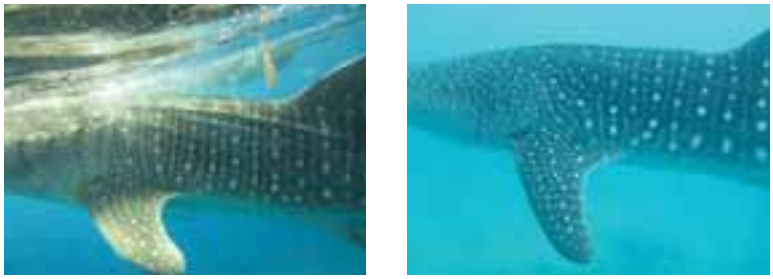

Figure 1: Left side spot pattern of two different whale sharks.

One researcher would enter the water at the beginning of the session with an underwater camera. For each shark sighted a record of the left and right ID shot was taken, along with any scars, parasites or distinct markings (see Figure 2).

Figure 2: Examples of identifying scars

At the end of the day all photos were grouped into different whale sharks. From this, a record of which sharks were in the water was made and changes in scars, parasites and markings were tracked.

2.2 <u>Survey 2: Whale Shark Behavioural Survey</u>

At the beginning of each session one researcher would enter the water with an underwater slate. The researcher would follow one shark for a total of 20minutes recording all behaviours and reactions to surroundings.

From this, basic behaviours could be logged. This data can also be used to track changes in behaviour and differences in behaviour of individual whale sharks.

2.3 <u>Survey 3: In-water Compliance Survey</u>

After the behavioural survey is complete the in-water researcher would follow another shark for a total of 20minutes recording the number of times certain infringements of the ordinance occurred.

At the end of the day the total number of occurrences were recorded.

2.4 <u>Survey 4: Land Survey</u>

During each survey session one researcher would remain on land to record the number of:

- dive boats,
- guest boats,
- guests in boats,
- people in the water, feeding boats
- whale sharks visible from land.

The weather conditions and guest boat configuration were also recorded. Also, for a random selection of guest boats entering the interaction area during the survey period the entry and exit times were recorded.

2.5 Survey 5: Tourist Satisfaction Questionnaire

This is a recent addition to the research. Each day questionnaires are left at each resort for guests to fill out (see Appendix 1). At the end of each day questionnaires are collected and reviewed.

Additional information collected included the number of guests visiting that day, using the registration log books, the time the last guest boat left the interaction area.

3.0 Whale Shark Data and Observations

Between March 31st and May 16th 2012 twenty-one individuals were identified and catalogued using photo identification. Six of these individuals visited the interaction area on an almost daily basis (see Table 1).

Shark	Sex	Visit Frequency (out of 46 days)	First sighted
1	Male	45	3/31/12
2	Male	45	3/31/12
3	Female	30	3/31/12
4	Male	38	3/31/12
6	Male	44	4/1/12
8	Male	41	4/2/12

Table 1: Visit frequency of the six most common whale sharks visiting Tan awan interaction area.

The remaining sharks are less frequent (see Table 2).

Shark	Sex	Visit Frequency (out of 46 days)	First sighted
5	Unknown	1	3/31/12
7	Male	2	4/2/12
9	Male	1	4/3/12
10	Male	1	4/5/12
11	Female	3	4/5/12
12	Unknown	1	4/8/12
13	Male	1	4/19/12
14	Male	1	4/20/12
15	Male	1	4/20/12
16	Male	5	4/26/12
17	Male	1	4/29/12
18	Male	4	5/3/12
19	Male	12	5/3/12
20	Male	4	5/13/12
21	Male	1	5/15/12

Table 2: Visit frequency of the remaining fifteen whale sharks visiting Tan awan interaction area.

Only 2 of the 21 sharks identified are female, 2 are unknown and the remaining 17 are male.

Of the regular whale sharks sizes range from an estimated 4-6m. Other individuals may exceed this size range as not all individuals have been measured.

Overall, an average of 6 sharks visit the interaction area on a daily basis, the minimum number sighted was 3 (4/16/12, 4/13/12), the maximum was 9 (5/15/12, 5/7/12). The average number of sharks sighted daily, prior to the price increase was 5. After the price increase was implemented the average number of sharks increased to 7 sharks per day.

Using data collected from the land survey regarding average number of boats in the water at one time and the average number of people per guest boat, the average number of people per whale shark was calculated (see Table 3) The average number of people per shark at any one time, on a normal day, was found to be 9 people. However, this varies considerably, for example the maximum number of guest boats recorded at any one time was 33. This would make the average number of people per shark 28.

	Average number of sharks	Average guests per boat	Number of boats	Number of people per shark
Average Day	6	5	11	9
Busy Day	6	5	33	28

Table 3: The number of people per shark on and average day and a busy day.

In general the whale sharks spend the majority of their time within the interaction area feeding from the feeding boats. Behaviours between new individuals and regular individuals do vary. The regular individuals will spend the majority of their time feeding and will approach feeding boats voluntarily. Whereas new individuals spend the majority of their time free swimming below the surface, possibly investigating boats and guests by approaching them then turning away at the last moment. It appears to take a few days of return visits for new individuals to become familiar with the feeding system. During the study period the regular individuals appear to have become more tolerant of people in the water, whereas new individuals will leave the area more readily.

Due to the way the whale sharks feed from the boats some individuals are developing 'scar tissue' around their mouths. It is likely that this scaring is caused by repeated impact with the boat during feeding. The level of scaring varies between individuals, but there has been a definite increase in the size of many individuals scars since research began (see Figure 3).

Figure 3: Development of scars on one individual (from left to right) 4/2/12 no scars around mouth area, 5/15/12 large white scars on both sides of the mouth, 5/20/12 inflamed red scars.

'Should pay more attention to the safety of the whale sharks. Concerning their noses were almost always touching the banka.' Quote from comments section of one guest survey.

Similar scars have been seen on the front edge of some individuals dorsal fins, which appears to be caused by regular contact with the bottom of feeding and guest boats, for example when the whale shark swims under a boat or if a boat passes over the whale shark (see Figure 4). The extent of the scaring varies between individuals. A considerable increase in scars has been noted on some individuals.

Figure 4: White scars along leading edge of dorsal fin

4.0 Guest Distribution

During the study period, which co-insides with Filipino summer vaction season, a total of 24,102 visitors came to interact with the whale sharks. 20,688 were Filipino (86%), 1226 International (5%) and 2,188 divers (9%) (see Figures 5 and 6).

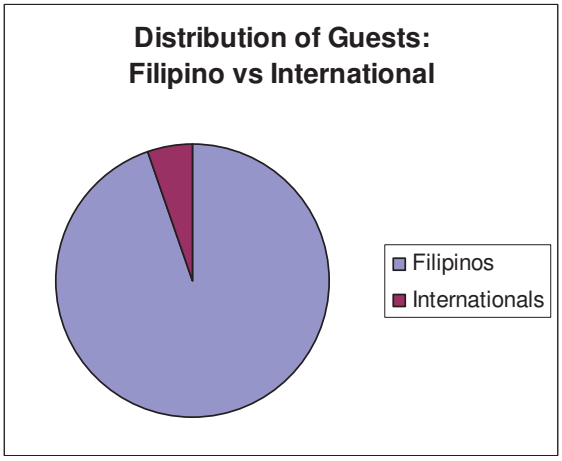

Figure 5: The distribution of guests, Filipino vs International, visiting Tan awan interaction area between 3/31/12 and 5/16/12.

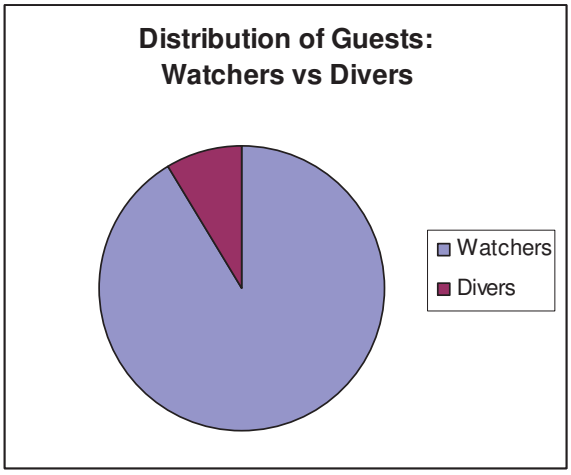

Figure 6: The distribution of guests, Watchers vs Divers, visiting Tan awan interaction area between 3/31/12 and 5/16/12.

Weekends are busier than weekdays with an average of 785 visitors per day on a weekend, compared with 401 per weekday. The average number of Filipinos that visit on a weekend (723) is over double the average number visiting on a weekday (326), where as the number of international visitors is consistent throughout the week (average of 25 per weekend day compared to 26 per weekday) (see Figure 7)

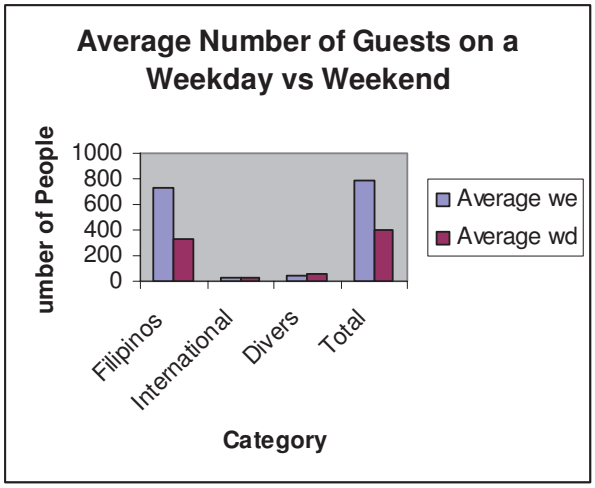

Figure 7: The average number of guest visiting on a weekday compared to a weekend day.

After the price increase was implemented on 4/15/12 the number of guests visiting the area halved from an average of 802 per day to the current average of 407 per day. This is beneficial for the protection of the whale sharks as their environment is disturbed less and they are placed under less stress. Also prior the price increase the average number of whale sharks sighted each day was 5, after the price change this increased to 7 sharks per day.

The distribution of guests between resorts varies from day to day. On average the yellow group receive more guests than the blue or green groups (see Figure 8).

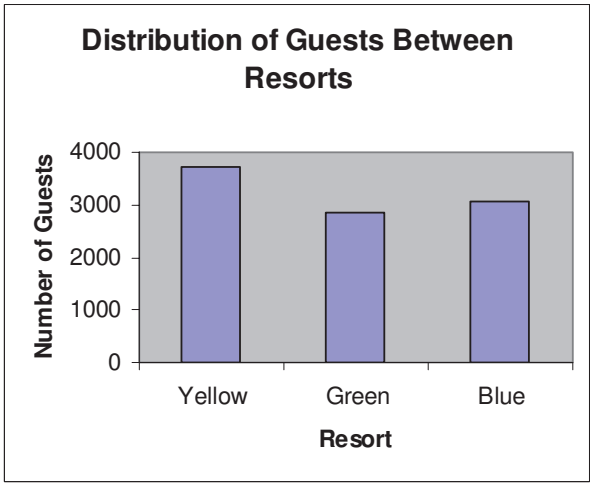

Figure 8: The distribution of guests between the coloured resorts, between 4/19/12 and 5/16/12

Data from the land survey was used to calculate the average number of dive boats and guest boats in the interaction area at any one time (see Table 4)

	Number of Dive Boats in Interaction area	Number of Guest Boats in the Interaction area
Average	1	11
Maximum	7	33
Minimum	0	0

Table 4: Number of dive boats and guest boats in the interaction area at a time.

The average number of both dive boats and guest boats are higher on weekends than on weekdays (see Figure 9)

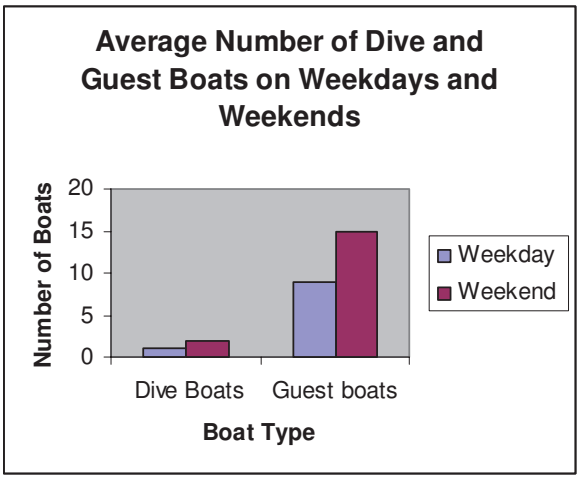

Figure 9: The average number of dive boats and guest boats within the interaction area at one time, comparing an average weekday with an average weekend day.

The data was also analysed by session. The average number of guest boats gradually declines during the morning (see Figure 10), whereas the average number of dive boats peaks mid morning in session 2 (see Figure 11)

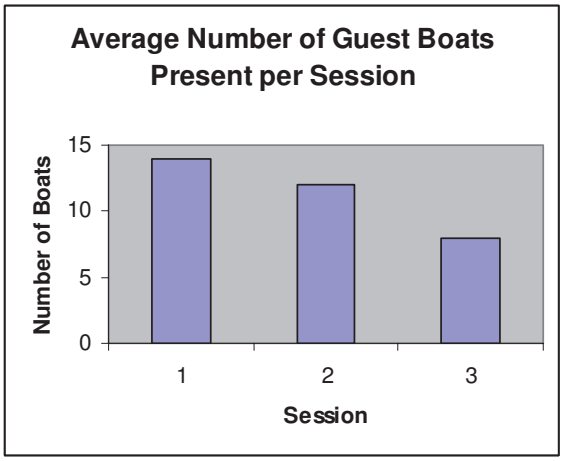

Figure 10: Average number of guest boats present at one time each session.

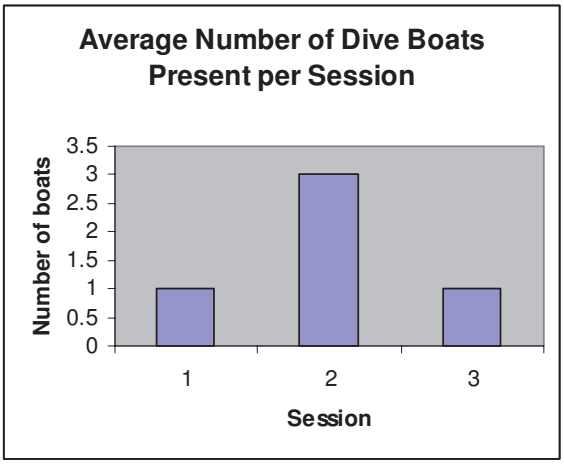

Figure 11: Average number of dive boats present at one time each session.

5.0 Guest Opinions

The Guest participation survey has only been active for 2 weeks, so data has not been fully analysed. However, preliminary analysis shows that the majority of guests are satisfied or highly satisfied with the experience. Key areas that were regularly highlighted as areas of dissatisfaction included:

- Educational value
- Number of people in the water
- Shark safety

Comments left by guests were very rarely negative, below is a selection of comments made.

'Very helpful to senior citizen, I shall return' *'Priceless experience'*

'The shark always gets hit by the bottom of the boats. Any way to keep them safer?'

'Take care of the sharks' *'It's not nature anymore, it's a zoo'*

'For now it is too much a tourist attraction, so it feels unnatural. Too much boats'

'Excellent, unbelievable' *'Nice. Very nice'*

'Enjoyable. Quite well organised for small town. More education about sharks would be good'

'More educational information or commentary about the sharks and Oslobs history with the sharks'

'The staffs are very friendly, approachable and serves for the best experience of the guests'

'To all the people in Oslob, please take care our environment especially the Tuki who promote tourism and income to the place and for the upcoming future. A great experience seeing the Tuki.'

'Very nice experience, nice people' 'Add some info in briefing about sharks life and habits'

'This experience has opened my mind on how wonderful nature's gifts are. Hopefully more efforts would be applied to preserving this experience'

'Very friendly and professional staff. Thank you for this amazing experience'

'GREAT!' *'The boat hit the whale shark'*

'Brilliant! Best underwater experience ever! Be careful not to make the whale sharks too dependant'

'Continue to take care of the butanding as other people enjoy it'

'Extra precautionary measures must be observed all the time to protect the life of the whale shark since they are considered as endangered species.'

'This experience is the most satisfied of my life in the sea. I want to come here again with my family'

'Should pay more attention to the safety of the whale sharks. Concerning their noses were almost always touching the banca.'

6.0 Interaction organisation

80% of the time the guest boats are moored in two groups within the interaction area, with the feeding boats bringing the whale sharks to the guest boats and leading them up and down the row of boats. This is arguably the best placement of the guest boats, not only for the sharks protection but also for rule enforcement and guest safety.

The feeding boats often lead the sharks in wide circles at the end of each row, giving the shark a break from the guests in the water. This method should be encouraged to ensure the sharks are not unduly stressed. A key issue is that the feeding boats constantly bring the shark very close to the guest boats, even with guests in the water, holding onto the guest boat (see Figures 12 and 13). This makes it impossible for guests to maintain the minimum distance from the shark set by the Ordinance Section 10:4 and 10:5.

Figure 12: Feeding boat feeding whale shark in between guest boat outriggers, 5/15/12

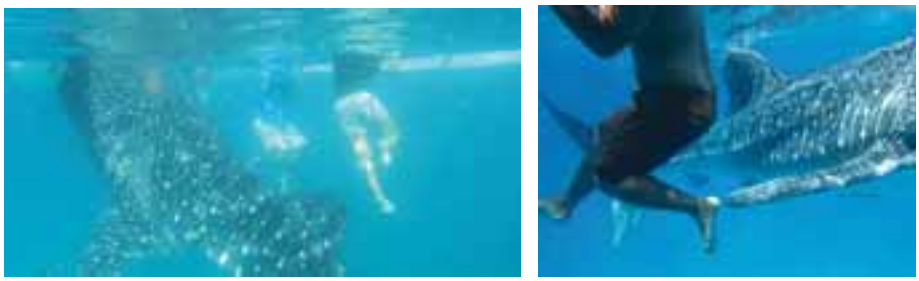

Figure 13: Examples of feeding boats leading whale sharks within 2m of boat holding guests, (from left to right) 4/24/12, 3/31/12.

During compliance surveys conducted, it was found that the number of times a feeding boat bought a shark less than 2m from a guest holding onto a guest boat averaged 17 per hour. Multiple times this would result in accidental touching or kicking of the whale shark. Incidents like this are not only stressful for the shark, possibly resulting in the shark leaving the area, but also dangerous for the guests in the water. Should the shark leave the feeding boat abruptly it could swim into a guest or hit them with its tail, possibly resulting in injury to the guest. A number of researchers have commented that

feeding boats often bring the shark less than 2m from guests purposefully, as a form of entertainment. Such practices should be discouraged or banned as they jeopardise the safety of the shark and the guests. Also feeding boats have often been seen throwing food at guests to send the shark close to them (for example 5/5/12, 5/6/12, 5/7/12, 5/14/12, 5/15/12).
Having guest boats moored in 2 groups makes it easier for the Bantay-Dagat to patrol the area and monitor the guests. If the guest boats are unmoored and spread out it is impossible for the Bantay-Dagat to see everything that is going on.

In particular, it is essential that the guest boats remain moored in rougher sea conditions. When there is swell the guest and feeding boats are harder to control. It is also harder for guests to control their movements. On a number of occasions researchers have witnessed guests almost being hit by guest and feeder boats manoeuvring within the interaction area and have almost been hit themselves.

Feeding boats often chase the whale sharks if they leave the boat. This practice can be dangerous and unnecessary. Behavioural studies show that the majority of the time the whale sharks will circle away from the guest boats, whilst still remaining in the interaction area, then return to the guest boats and locate a feeding boat voluntarily. This is especially true of the 6/7 regular sharks that are present all morning and appear to only leave when the feeding finishes. When chasing the sharks feeding boats often move at high speeds and can collide with guests in the water, who will be concentrating on the sharks not the boats. Boat contact between the sharks and the boats is also increased during this activity, resulting in increased scaring on the whale shark. It is advised that the chasing of whale sharks should be discouraged for the safety of those in the water.

On the rare occasion the guest boats are unmoored, only 8% of the time, guest boats will follow the sharks or approach the feeding boats to get closer to the shark. Having boats moving within the guest area to this extent increases risk of injury to the snorkelling guests and the sharks.

7.0 Ordinance Compliance

7.1 <u>Interaction time limit:</u> During land surveys over 750 guest boats were sampled and their duration in the interaction area timed. The average number of guests per boat was 5, with an average of 2 members of staff. The maximum number of guests in a guest boat was 14 (4/1/12). Of the boats sampled 54% were at least 5 minutes over the 30minutes interaction time limit described in the Ordinance Section 7:4. 28% of total boats were in the interaction area between 40-50 minutes. 11% of total boats were in the interaction area between 50-60 minutes. Whilst 5% of total boats were in the interaction area over 1 hour. Some boats were in the water over 1 and a half hours (for example 4/20/12, 4/29/12) (see Table 5).

Interaction Duration	Percentage of sampled boats
Under 35 mins	46
35-40 mins	10
40-50 mins	28
50-60 mins	11
Over 1 hour	5

Table 5: The percentage of guest boats in each interaction duration category.

7.2 <u>Guest proximity limit</u>: Through data collected by the in-water compliance survey it was found that, on average 21 snorkelers intentionally go less than 2m from the whale sharks every hour (see Figure 14).

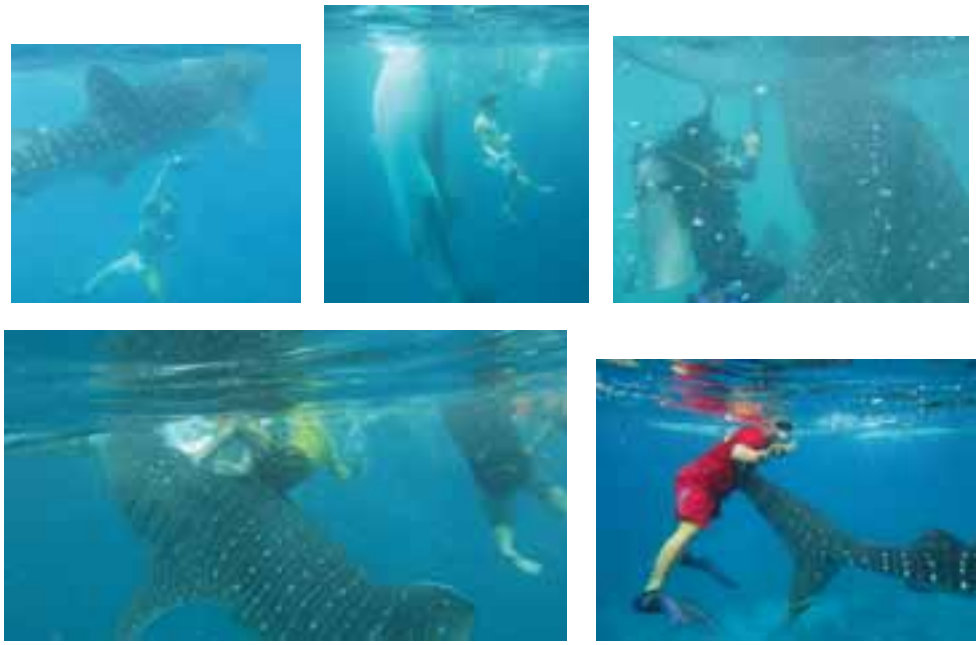

Figure 14: Examples of guests less than 2m from the shark, dates taken (from left to right) 5/16/12, 4/14/12, 4/20/12, 5/11/12, 5/11/12.

The maximum number of guests going within 2m of the shark during a 20minute survey was 44 times (5/6/12). Levels of enforcement vary, some boatmen discourage guests from getting too close and remind them of the proximity rule, whilst others encourage guests to get close and have been seen taking pictures for guests. Additionally some Bantay-Dagat consistently move guests back and aim to enforce the ordinance rule, whilst other do not.
On average 7 divers go within 2m of the shark every hour, many move very close to the tail, which is extremely dangerous (see Table 6).

	Average number of people less than 2m from whale shark per hour
Snorkelers	21
Divers	7

Table 6: The average number of snorkelers and divers less than 2m from a whale shark per hour.

7.3 <u>Touching the whale shark</u>: During the study period over 300 active touches were recorded. The majority of active touches recorded were by the feeders during feeding, for example, 5/13/12, 34 touches by the boatman during a 20min survey. On many occasions it appears that the boatmen are touching the sharks to reduce the amount the sharks hit the boat with their mouths (see Figure 15).

Figure 15: Foot/mouth contact between feeder and whale shark 5/11/12

Active touches by guests are rare but do occur (4/1/12, 4/7/12, 5/14/12, 5/1/12, 5/10/12). If the Bantay-Dagat were in the area at the time of the violation, the guest has been reported by the researcher, however enforcement does vary. On one occasion a diver was witnessed touching a shark, the Bantay-

Dagat was informed and the diver was followed back to shore and given a warning. On another occasion a snorkeler was seen grabbing a sharks tail, the incident was reported to the Bantay-Dagat, no action was taken, the guest did not even receive a warning whilst he was still in the interaction area.

7.4 Fishing within the interaction area: On multiple occasions researchers have witnessed feeding boats fishing within the interaction area (for example 4/20/12, 4/24/12, 5/3/12, 5/14/12) (see Figure 16). The feeders use a single hook and line with uyap as bait, one attached to the hook with others thrown in to attract the fish. On one occasion a researcher swam into the fishing line whilst undertaking photo ID, as the lines are hard to see in the water. On another occasion one of the whale sharks was seen with a hook in his tail with the line attached (see Figure 17). This is a direct violation of Section 11:5 of the Ordinance. This is not only a health risk for the sharks, who are attracted by the uyap used as fish bait and often approach boats who are fishing, but also for the guests and divers swimming in the water as the lines used are very thin and hard to see when swimming.

Figure 16: Feeding boat fishing in the interaction area 5/24/12

Figure 17: Whale shark tail with hook and line attached 5/7/12

7.5 Guests feeding sharks: On a number of occasions feeding boats have allowed guests to sit on the boat and feed the sharks, or sometimes even touch them (for example 4/25/12, 4/29/12, 5/8/12) (see Figure 18). Guests feeding the whale sharks is in direct violation of Section 10:9 and 11:1 of the Ordinance. It is advised that the practice of allowing guest on to feeding boats should be banned as it may lead to an escalation of visitors expectations.

Figure 18: Guest on a feeding boat, feeding a whale shark 5/17/12.

7.6 Trash disposal: Boat crew have been witnessed throwing plastic bottles, plastic bags and cigarette butts into the water (for example 3/31/12, 4/18/12, 4/21/12). This type of trash will float on the surface (see Figure 19) and could be swallowed by a whale shark during feeding, this was actually witnessed by one guest. Additionally, plastic bottles and bags can take 400 years to degrade, some types of plastic never fully degrade and will lead to long term environmental damage. This is in violation of Sections 6 and 11:4 of the Ordinance.

Figure 19: Multiple plastic bags floating on the surface within the interaction area

8.0 Activities not specifically covered by the ordinance but need attention

8.1 Shore snorkelers: On a number of occasions researchers have witness people swimming to the interaction area from the shore (for example 4/9/12, 4/11/12, 5/10/12). On these occasions researchers were unable to check if the guests had paid for tickets, received a briefing etc or received special permission to swim out, or had not paid at all.

8.2 Feeding from guest boats: Researchers have noted regular feeding of whale sharks from guest boats. Feeding boats will pass food to guest boat crew who will feed the whale shark at the end of the boat or sometimes in between the outriggers and the boat. This practice occurs regardless of whether guests are in the water or not.

8.3 Feeding whale shark proximity: Feeders have a tendency to feed whale sharks very close to each other (3-5m apart) (see Figure 20). Sometimes sharks are fed directly next to each other so that the outriggers of the two feeding boats are touching. This could cause the sharks unnecessary stress as it is unknown how they react to other sharks in such close proximity. Additionally, this can be dangerous for guests in the water. On numerous occasions researchers have witnessed shark on shark contact, whilst feeding too close together, resulting in one or both whale sharks abruptly leaving the feeding boat and swimming off. On one occasion a guest boat was feeding one shark whilst a feeding boat purposefully bought another feeding shark along side it. The sharks were so close they made contact, causing the one feeding from the guest boat to abruptly leave the boat and swim quickly through the guest boat outriggers, where two guests were holding on. Both guests were hit by the shark and pinned to the guest boat.

Figure 20: Two whale sharks being fed less than 5m apart (5/6/12)

8.4 Bad diving practices: Diving standards at the site can be low. It is essential that not only the whale sharks and the guests are protected but also the marine environment as a whole. Divers have been witnessed standing/sitting on corals, holding on to corals, ascending too quickly, uncontrolled buoyancy and diving without a buddy (for example 4/1/12, 4/4/12, 4/18/12, 5/1/12, 5/15/12) (see Figure 21). Dive centres need to ensure that diving guests are capable of maintaining buoyancy and control underwater and should have a sufficient number of dive guides to control all diving guests in their party. Additionally, those divers who rapidly ascend to the surface wearing dive computers set off the in built ascent rate alarm. Whale sharks, and sharks in general, have large ears and are thought to have very good hearing, therefore the dive computer alarm will be much louder to them than to humans and may cause stress.
Activities that result in coral and general habitat damage are a violation of Section 6 of the Ordinance.

Figure 21: Examples of bad diving practices (from left to right) Dive master having to hold onto guest to control buoyancy 5/17/12, Diving without a buddy/separated from group 5/18/12, Standing on coral 5/21/12.

8.5 Unauthorised vessels within the interaction area: On a few occasions (for example 4/19/12, 4/22/12) kayaks have been seen to enter the interaction area. On one of these occasions the man in the kayak did not moor, entered the water and pulled the kayak around with him as he swam.

8.6 Throwing food close to guests or guest boats: Feeders have often been seen throwing food close to guests in the water or towards guest boats to give guests a closer look at the whale shark (5/7/12, 5/9/12, 5/14/12). This practice could lead to increased habituation to humans and the whale sharks may begin to associate people in the water with food. This can result in the whale sharks following guests and coming extremely close to guests (see Figure 22). This has potential health risks for both the whale shark and the guests. Also for many guests this would be extremely intimidating and scary, this could possibly cause panic.

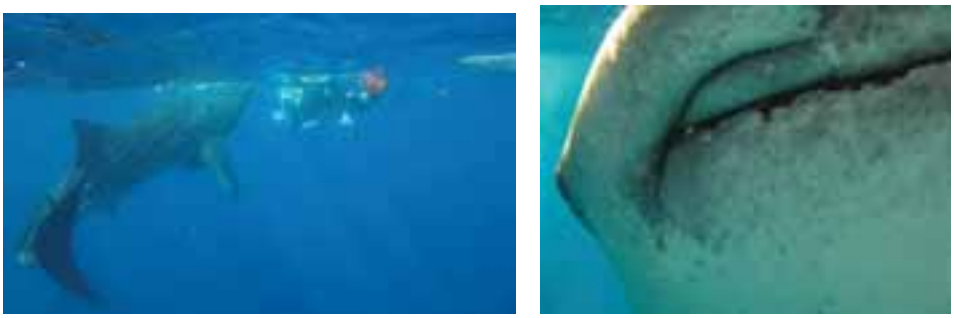

Figure 22: (Left to right) Whale shark following guests 5/7/12; Whale shark approached researcher within less than 1m 5/6/12.

9.0 Suggested Improvements

9.1 More education on site: Education of the public is key to helping conservation of this species. A number of people who come to the interaction area will not know a lot about whale sharks and will not know the history of whale sharks in the area. It is essential to educate people on these rare and amazing creatures and to demonstrate to the public how lucky they are to see a whale shark and how unique this interaction is. The guest questionnaires have demonstrated a number of people feel dissatisfied with the educational value of the experience and would like more information to be provided, both about the animal itself and the history of the area (see section 5.0).

LaMaVe suggests that it be compulsory for each resort to display educational materials and that the briefing be expanded to include at least some basic whale shark facts and the history of whale sharks in the area. Information for educational materials can be provided by LaMaVe, however funding from the LGU would be required for printing these materials if possible.

9.2 Additional training/information provided for boatmen: Providing the boatmen with additional facts about the whale sharks would allow them to talk to the guests and answer questions whilst out in the water. It is important that the boatmen realise how special this situation is and how it is **their** responsibility to protect these animals, not just for the sake of the animals and the ecosystem as a whole, but also for the sustainability of this business and income. If the sharks are injured or over stressed etc they will leave the area and the business will not be able to continue.
LaMaVe can provide IEC workshops for the boatmen to attend. For example, the boatmen can be divided into groups of 20 (around 5 groups), each group attending one workshop for 1-2 hrs in an afternoon.

9.3 Set a maximum number of guest boats in the interaction area at one time: As stated in section 3 the number of people per shark has been as many as 28. This high number of people increases the health and safety risks to the guests and the sharks. It only takes one unfortunate incident for the interaction experience to develop a bad reputation. To reduce the chances of such incidents it is suggested that the number of boats in the water be limited to 8 boats at one time. This would follow the guideline set in Section 10:7 of Ordinance specifying there should be 6 guests per shark. Should the average number of sharks per day increase the maximum number of boats allowed in the interaction area can be reassessed.
A number of guests that completed a guest questionnaire stated that they were dissatisfied with the number of people in the water (see section 5.0), therefore limiting the number of people within the interaction will improve the guests experience as a whole.

9.4 Penalties for bad diving practices in general: As stated in section 8.4 many divers have been seen to perform bad diving practices. Many of these acts are a matter of personal safety for the diver, for example purposefully ascending too quickly can result in decompression sickness (DCS), which can be fatal; lack of buoyancy control can also lead to a fast ascend and DCS or impact on a boat or whale shark; diving without a buddy or becoming separated from the group which is strongly discouraged by all diving organisations, including PADI.
With regard to the ecosystem, divers standing on or holding onto the corals will cause damage that the ecosystem may take years to recover from. It is essential that the whole environment be protected, if one part of the ecosystem is damaged it has a knock-on effect to other parts and ultimately may affect the whale sharks presence in the area.
LaMaVe suggests that dive shops whose divers demonstrate bad diving practices should be warned and penalised if they are repeat offenders. Those who continually allow their divers to cause destruction of the habitat (contrary to Section 6 of the Ordinance) should be banned from diving in the interaction area. Such destruction is also in conflict with the Convention of Migratory Species, of which the Philippines is a member.

9.5 Enforcement of ordinance: Enforcement of the rules set out in the ordinance does vary in the water. It is obvious that many boatmen and Bantay-Dagat do their best to maintain standards and enforce the rules. However, it is impossible for the Bantay-Dagat to be everywhere and see everything. To help with enforcement LaMaVe suggests that the boatmen on feeding boats and on guest boats be encouraged to maintain the rules set out in the ordinance. Those staff members that continually allow guests to break the rules or encourage breaking of the rules should be penalised. Additionally the Bantay-Dagat should be present in the interaction area throughout the entire morning and only leave once the last guest boat has left the area. It is also advisable that at least one member of the Bantay-Dagat be present in each group of guests boats.

9.6 Trash disposal: Trash disposal on land and in the water is an issue and is indirectly covered by Section 6 and 11:4 of the Ordinance. Multiple plastic bags, some used to carry uyap, have been collected by researcher whilst in the interaction area and as stated in section 7.6 researchers have witness the disposal of trash directly into the sea. On land, plastic bags and bottles are left on tables rather than placed in a trash can and can easily be blown into the sea by the wind. Plastic can take hundreds of years to degrade and even then does not fully degrade. Small particles of plastic accumulate in the environment and can lead to major long term problems. In the short term, sea

creatures in the area, such as the whale sharks or the resident turtle, can consume the plastic by mistake or confusing them with jellyfish, this can cause severe health problems and death.
From a guest point of view, it is not a pleasurable experience to snorkel in waters full of trash. LaMaVe suggests that trash cans need to be mandatory within resorts and feeding and guest boats must not discard any trash, including cigarette butts, into the sea. Those caught littering, on land or at sea, should be penalised, for example fined. Educational materials can be provided to educate staff and visitors of the huge negative impact littering has on the environment. To reduce the risk of the plastic bags, used to carry the uyap, purposefully or accidentally entering the water it is advised that tupperware boxes be used to store the uyap whilst on the feeding boats.

9.7 More in-depth, consistent guest briefings: Over the study period it has been noted that on occasion resorts do not take guests to the briefing area to be briefed and give a basic briefing at the resort site. However it has also been noted that in recent weeks this practice has become much less common. It is essential that guests receive a through briefing before entering the water for their own safety, for the protection of the whale sharks and for following the rules set in the ordinance.
As mentioned in section 9.1 briefings have huge potential to help educate the public about the whale shark and help them understand the impact they have on the whale sharks and the environment. LaMaVe suggests that the following points be included in every briefing:

- Basic whale shark ecological/biological facts
- History of the whale sharks in Oslob
- These are wild animals and can act unpredictably
- Viewing time is 30 minutes
- No guests are allowed on the feeding boats or to feed the whale sharks
- Enter the water calmly and quietly. No heavy splashing.
- Life jackets are mandatory on the boat.
- If the current is strong, hold onto the boat.
- Do not chase the whale shark
- Remain a minimum of 2m from the head and 5m from the tail.
- Do not touch the whale sharks
- Do not hold onto the feeding boats
- No flash photography
- Do not litter
- If these rules are broken the violator can be fined up to PHP 2,500.

Additionally, an explanation as to why these rules are in place and possible consequences of breaking the rules, both with regard to the whale shark and the guests personal safety, is important as it helps with the guests understanding and encourages compliance.
It is recommended that all divers receive the same briefing as snorklers in addition to their usual dive briefing.

This information could be provided in the form of a short video along with text and pictorial signage. LaMaVe is happy to help create these materials and assist in training those giving the briefings.

10.0 Potential long term issues

To gain a full understanding of the impact of the feeding interactions and tourism on the whale sharks long term research is essential. The following points are potential long term issues that could arise from prolonged feeding by humans in this manner.

10.1 Disruption of migration patterns: From other research studies conducted on the migration patterns of the whale shark it is thought that they migrate to follow their food source. Exactly where different populations of whale sharks around the world migrate to is still unknown but they are recognised as a highly migratory species and are protected under the Convention on the Conservation of Migratory Species of Wild Animals. The issue raised in Tan awan is that if the whale sharks are fed through out the whole year then they may never migrate, following the food source, because there is a constant food source present. The potential effects on overall health and fitness needs consideration. By remaining in Tan awan the whale sharks are only consuming one type of food, whereas if they followed their migration pattern they may feed in an area richer in nutrients. Also the amount of food provided during the interaction sessions is not enough to sustain the number of whale sharks visiting

the area. Therefore it is assumed that the whale sharks continue to feed during the afternoons in an area near to the interaction site. However, under natural conditions, if this additional food source runs out, it will usually act as a trigger for migration, but if the whale sharks do not migrate then the food provided by the interaction experience would not be enough to maintain a healthy population.
Migration could also be key for reproduction. Many marine species migrate to certain areas each year to mate. Though this has not been confirmed with the whale sharks, it is extremely likely that they will migrate to a certain area for mating. If their migration patterns are disrupted by the feeding practices in Tan awan then it is possible they will not migrate to the breeding grounds and therefore will fail to successfully reproduce, causing the world population to further decline.

10.2 Habituation to humans and boats: Over the duration of the behavioural studies it has been noted that the whale sharks, especially the regulars, are becoming more familiar with humans and boats therefore are not displaying the usual avoidance behaviours associated with the species as demonstrated in Donsol, for example. The regular whale sharks will often voluntarily approach boats, both guest and feeding, even nudging the boats to gain attention. They are also extremely accustomed to humans and regularly swim within 2 metres of swimming guests. This behaviour can result in immediate problems within the interaction area, for example guests in the water may cause the whale sharks harm by kicking etc, or the whale shark may cause the guests harm. This behaviour can also lead to more serious long term issues. If the whale sharks learn to associate boats and people with food then, should they migrate to other areas, they may approach boats to be fed. This can greatly increase the chances of entanglement, boat strikes and propeller injuries (see Figure23). Additionally, some countries have not banned whale shark hunting and should the whale sharks migrate through these areas and approach such hunting boats for food, they will be slaughtered.

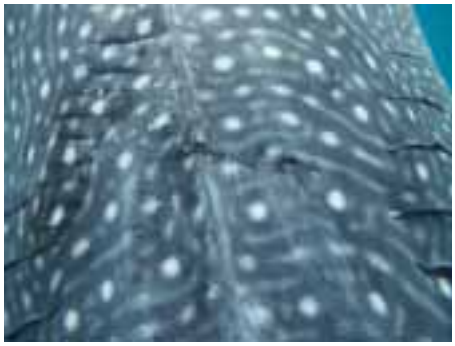

Figure 23: An example of propeller injuries (healed)

10.3 Development of abnormal social behaviours: Little is known about how whale sharks interact with each other on a daily basis. It is very rare to see so many whale sharks in such a small area, so regularly. The act of feeding from a boat, in such close proximity to humans, is extremely unnatural and could lead to the development of abnormal social behaviours, including increased aggression or competition between whale sharks. All whale sharks sighted in Tan awan have been juvenile, therefore are potentially still learning social interaction behaviours. If they learn incorrect behaviours, due to the unusual circumstances surrounding the feeding practices, their ability to find and secure a mate may be reduced.

10.4 Increased spread of diseases and parasites: From previous studies it is unusual to see this number of whale sharks consistently in such close proximity to each other for such extended periods of time, therefore it is unknown how this will effect the spread of diseases or parasites. It is thought that the parasites seen on the whale sharks at Tan awan feed on the bacteria on the skin of the whale sharks and therefore may not have a huge impact on the overall health of the animal. However, lab analysis of the parasites would be needed to confirm this. It is possible that other parasites are present but not visible during in-water surveys and the effect or transfer of these parasites are unknown.
Whale sharks are susceptible to diseases and close proximity to infected sharks can increase the spread of disease.

11.0 Conclusion

It is essential that both staff and guests understand the rarity and uniqueness of this experience and most importantly, appreciate and learn from it. In normal, more natural circumstances, a person is considered extremely lucky to see a whale shark in the wild, some have waited years for the honour of that experience. Here, in Oslob, visitors are able to see six or more for extended periods of time. These are wild animals, they are not pets and they need to be treated with the respect they deserve.

By entering the water, people are entering the whale shark's environment and must respect that habitat. Visitors should leave Oslob feeling honoured to have seen a whale shark, and proud that those running the interaction experience are doing a good job.

With the support of the authorities, guidelines have been set by the Ordinance with the purpose of ensuring the safety and protection of the whale sharks and their environment, whilst also ensuring visitors are safe and satisfied. Considering this is a relatively new tourism business, that has developed in a small town not accustomed to such high numbers of tourists, the system that is set in place has a good structure supporting sustainable development of eco-tourism. However, as with many forms of developing eco-tourism, enforcement of those rules is not consistently up to standard and needs further attention. Adherence to the rules set in the Ordinance varies greatly and needs further support if the whale sharks welfare, and sustainable development, are not to be compromised.

Continuing education is key to achieving the levels of adherence required. Visitors need to be educated on their impact on the lives of the whale sharks and on the environment, both in the water and on land. Staff need to understand the key role they play in the protection of these creatures and the environment and their responsibility to the whale sharks, the guests, the environment and habitat and the sustainable opportunities for the local community.

With the continuing co-operation of all parties the current research of the whale sharks and the feeding interaction will lead to a better understanding of the whale sharks, their biology and ecology and ultimately the long term impacts of the feeding practices in Tan awan. Such understanding will support global conservation efforts and approaches to sustainable eco-tourism.

LaMaVe is keen to be involved with the local government in implementing the necessary education for both staff and visitors.

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Statement from LaMaVe

Research undertaken by LaMaVe aims to provide a tool for authorities to aid proper management of the whale shark tourism and minimise the impact on the whale sharks and their environment. LaMaVe has no direct or indirect involvement of the tourism business and we strongly discourage the feeding practices currently taking place. All data collected are property of Physalus NGO and the LGU of Oslob and cannot be used in part, or as a whole, without prior consent from the owning parties. Further information can be obtained from:

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Appendix 1:

Oslob Whale Shark Interaction Participant Survey

La.Ma.Ve is an non-profit conservation organisation conducting research on all large marine vertebrates in the Philippines, including whales, dolphins, sharks and turtles. We are carrying out research on whale shark behaviour in Tan awan. Very little is known about whale sharks world wide and any information you provide will be valuable to our research and allow us to learn more about these amazing gentle giants.
Please fill in the following questions and put the completed survey in the coloured boxes provided. Thank you!!

Date:_____ **Resort (circle one): Green/Yellow/Blue**

Nationality:_____ **Age:** _____ **Male ☐ Female ☐**

Last location prior to visiting Oslob: _____

Visiting Oslob with (circle one): Alone / With a tour / With family / With a group

Primary reason for visiting Oslob (check one):

☐ Local (live here)
☐ Whale shark interaction
☐ Other tourism
☐ Passing through
☐ Other

How did you hear about the whale sharks in Oslob:

☐ Traditional Media (newspaper, television etc)
☐ Online Media
☐ Word of mouth
☐ Advertisement
☐ Road Signage
☐Tourist guidebook/office/literature
☐Other (please specify):_____

Have you ever seen a whale shark prior to today?

☐ Yes, in Oslob
☐ Yes, elsewhere in the Philippines
☐ Yes, elsewhere internationally
☐ No

Did you enter the water during your whale shark experience?

☐ Yes, held onto boat
☐ Yes, snorkeled freely
☐ Yes, scuba diving
☐ No, I stayed in the boat

Prior to your interaction, did you receive a briefing? ☐ Yes ☐ No

Which components were covered in your briefing (check only those that you heard during your briefing):

☐ Swimmers must remain 5 m from the shark
☐ No touching of the shark
☐ No sunscreen allowed
☐ 30 minute viewing limit
☐ Enter water slowly and carefully
☐ Do not dispose of garbage in the water
☐ Camera flash not permitted
☐ Lifevests mandatory
☐Visitors that break the rules will be removed from the water and may be subject to a fine or prosecution.

Please turn page over…

Please rate the following aspects of your interaction:

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisified
Overall experience	1	2	3	4	5
Proximity to sharks	1	2	3	4	5
Number of sharks	1	2	3	4	5
Number of other people in the water	1	2	3	4	5
Personal safety	1	2	3	4	5
Safety of shark	1	2	3	4	5
Educational value	1	2	3	4	5
Value for money	1	2	3	4	5
Viewing time	1	2	3	4	5

Would you recommend this experience? ☐ Yes ☐ No

Additional comments:_____
_____
_____
_____
_____

Thank you for your participation in this survey! Your information will be kept confidential.