



**CORAL TRIANGLE
INITIATIVE**

ON CORAL REEFS, FISHERIES AND FOOD SECURITY

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Coral Reefs, Fisheries and Food Security (CTI-CFF)**

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REPORT OF HUMPHEAD WRASSE BUY-BACK AND RELEASE PROGRAMME IN SABAH, MALAYSIA



February 2013

This publication was prepared by Kenneth Kassem and Irwin Wong (WWF-Malaysia) with partial funding from the United States Agency for International Development's Coral Triangle Support Partnership (CTSP).



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Front cover photo: Humphead wrasse bought back from markets and released back into their habitat. © WWF-Malaysia/Irwanshah Mustapa

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This report would not have been possible without the support of many friends and colleagues. We would like to convey our heartiest gratitude and appreciation to:

Department Of Fisheries Sabah

Sabah Parks

Scubazoo

SSME Tri-national Committee

Fish Traders in Kota Kinabalu, Kudat, Tawau, Semporna

Sabah Wildlife Department

Universiti Malaysia Sabah

Hong Kong University

Mr Kris Kvols

And partners in the field that remain anonymous to protect the location of the release sites.

However, any errors are solely the responsibility of the authors. This report would not be possible without generous funding and continued support from WWF-US.

EXECUTIVE SUMMARY

Introduction

Humphead wrasse (*Cheilinus undulatus*) is an Indo-Pacific reef fish from the Labridae family and ranges from the Red Sea into the Central Pacific. It is one of the largest bony reef fishes attaining sizes up to 229cm (Fishbase 2012). Humphead wrasse (HHW) is a prized species in the live reef fish trade, which supplies live fish to restaurants in East and Southeast Asia. The main destination was traditionally Hong Kong but the trade is spreading into China, Peninsular Malaysia, Singapore and the Middle East. The fish are often caught as juveniles and raised in cages until they reach a marketable size.

In 2008, WWF-Malaysia, Department of Fisheries Sabah and Universiti Malaysia Sabah conducted a non-detrimental finding (NDF) study as per the conditions of the CITES Appendix II listing. From the study, it was concluded that the exploitation of this particular species in Sabah far exceeded the species' threshold to sustain the trade.

In late 2009, the Department of Fisheries Sabah announced its intention to ban all exports of HHW from the state until another NDF study showed that higher export levels could be sustained. Due to the request of traders and exporters of the live reef fish trade (LRFT) in Sabah, Department of Fisheries Sabah had previously postponed this export ban of live Humphead wrasse several times.

A survey of fish cages in November and December 2009 revealed that there was still a large number of cage operators in remote islands who maintained large holdings of Humphead wrasse (up to 300 tails in a single cage location). Through interviews with them, these cage operators reported that they had not been told of the impending export ban by the local authorities. Some cage operators were stocking the fish for local consumption in local seafood restaurants in anticipation of the peak season during the Chinese New Year, which fell in February 2010.

In consultation with Department of Fisheries Sabah and other management agencies, it was decided to buy back some of the remaining stocks from cage operators and release them into reef sites around Sabah. The buy-back and release operation had several objectives:

1. Helping to rebuild populations of HHW
2. Building awareness about the species and coral reefs in Malaysia
3. Building relationships with Live Reef Fish Traders by relieving them of the stocks that they might not have been able to sell.

The operation remained confidential until the final release at Tunku Abdul Rahman Park in Kota Kinabalu, Sabah on 30 July 2010 in conjunction with the annual meeting of the Sulu-Sulawesi Marine Ecoregion Tri-national Committee meeting. All the release sites were also kept confidential to reduce the potential for poaching of the newly released fish.

Methodology

The buy back and release was planned to release fish in 3-5 sites around Sabah. Consideration was given to the need to minimise transportation distances, to release fish in places where they would have the smallest chance to be recaptured, and where the environment would support a new population of the species.

Site selection

Initial consultations were held with partners on the sites of the release. Among the most important criteria identified was intact habitat and formal or informal protected status. The criteria were determined in order to ensure highest possible survival rate of the released fish. A number of sites

were proposed but eventually, only 6 release sites were selected. The final release sites have been kept confidential to reduce the possibility of poaching.

Additional site criteria included, site security, enforcement, suitable natural environment, genetic considerations, transportation of fish, and the release procedures.

During the actual release day, each team was divided into 1 marker (snorkelling at the surface to mark the location of the release site and the diver's location), 1 diver (to receive the fish and release them at depth), 2 floaters (to transport the fish from the boat to the release site) and staff on the transport vessel. There was also an underwater photographer following each team to capture photographic evidence of the release and to support the divers.

The boat transporting the fish usually had to remain some distance from the reef. It was felt that the fish should be released as close to the reef as possible. To transport the fish from the boat to the reef, a laundry basket measuring 30cm in diameter was deployed as a means of transfer, and a standard boat safety ring was employed. The Floater waited in the water beside the stationary boat while the staff on the boat put 2-4 fish in the laundry basket. The basket was lowered to the floater who inserted the basket into the safety ring. The safety ring kept the rim of the basket above the surface of the water but the holes in the basket allowed for water to pass through the basket for the benefit of the fish inside. The Floater then swam with the basket and ring in tow towards the Marker who was indicating the location of the divers below the surface. Once above the Divers, the Floater and Marker removed the basket from the safety ring and made a freedive downwards to the divers who would ascend to receive the basket. The diver took the basket to the reef and allowed the fish to swim free.

Results

A total of 885 fish were purchased and 874 tails were released at 4 sites. The mortality occurred primarily in sites with longer transport distances.

Table 1: Number of fish released at 4 sites

Site	Fish purchased	Fish released	Mortality
1	96	96	0
2	75	72	3
3	682	674	8
Tunku Abdul Rahman Park	32	32	0
Total	885	874	11

Monitoring of release fish were carried out by WWF-Malaysia and our partners in the last quarter of 2011. Results of the monitoring are presented in Table .

Table 2: Results of first monitoring

Site	Date	HHW Sightings	Estimated size (largest) (cm)	Estimated size (smallest) (cm)
Site 1				
North Site 1		0	-	-
North Site 2		0	-	-
Site 2				
North East Site 1		10	60	25
North East Site 2		5	40	25
North East Site 3		2	35	35
North East Site 4		7	35	30
North East Site 5		1	40	40

Site 3				
South East Site 1		9	30	20
South East Site 2		4	25	15
South East Site 3		0	-	-

ABBREVIATIONS

CITES	Convention on International Trade of Endangered Species
cm	Centimetre
CTSP	Coral Triangle Support Programme
gm	Gram
GPS	Global Positioning System
HHW	Humphead wrasse
i.e.	That is
IUCN	International Union for Conservation of Nature
Kg	Kilogram
Km	Kilometre
LRFT	Live reef fish trade
mm	Millimetre
NDF	Non-detrimental findings
NGO	Non-Governmental Organisation
RM	Ringgit Malaysia
TL	Total length
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature
WWF-US	World Wildlife Fund United States
%	Percent

INTRODUCTION

Humphead wrasse (*Cheilinus undulatus*) is an Indo-Pacific reef fish from the Labridae family and ranges from the Red Sea into the Central Pacific. It is one of the largest bony reef fishes attaining sizes up to 229cm (Fishbase 2012). Humphead wrasse (HHW) is a prized species in the live reef fish trade (LRFT), which supplies live fish to restaurants in East and Southeast Asia. The main destination was traditionally Hong Kong but the trade is spreading into China, Peninsular Malaysia, Singapore and the Middle East. The fish are often caught as juveniles and raised in cages until they reach a marketable size.

The species was listed in 2004 as “endangered” on the IUCN Red List of Threatened Species and listed on Appendix II of the Convention on International Trade of Endangered Species (CITES). With the listing on CITES Appendix II, all international trade of the species must be controlled and proven, through a non-detrimental findings (NDF) study, to be sustainable.

The state of Sabah, Malaysia occupies the northern portion of the island of Borneo, borders the South China, Sulu, and Sulawesi Seas, and has Malaysia’s largest concentration of coral reefs. The Philippine provinces of Palawan and Tawi-Tawi lie less than 60km and 100km respectively, from the northern and southeastern towns of Kudat and Semporna. The Indonesian province of East Kalimantan lies to the southeast, also near Semporna.

In 2007, WWF-Malaysia, Department of Fisheries Sabah and TRAFFIC Southeast Asia conducted a programme to determine trade levels of HHW from Sabah. After a series of workshops and consultations with traders, it was estimated that more than 45,000 tails were being exported from Sabah annually (Ng and Ryan 2009). At the same time, Indonesia had an annual quota of 8000 tails nationally, representing a much larger source reef area. It was also determined that many of the fish were sourced in the Philippines and brought into Malaysia illegally and re-exported as a “Sabah fish.”

In 2008, WWF-Malaysia, Department of Fisheries Sabah and Universiti Malaysia Sabah conducted a non-detrimental finding study as per the conditions of the CITES Appendix II listing. From the study, it was concluded that the exploitation of this particular species in Sabah far exceeded the species’ threshold to sustain the trade.

January 2010 HHW Export Ban

In late 2009, the Department of Fisheries Sabah announced its intention to ban all exports of HHW from the state until another NDF study showed that higher export levels could be sustained. Due to the request of traders and exporters of LRFT in Sabah, Department of Fisheries Sabah had previously postponed this export ban of live Humphead wrasse several times.

The message of an impending ban on export of live Humphead wrasse was communicated to the traders as they were renewing their annual export license with the Department in 2009. However, it was assumed that most traders would still have stock in their cages on 31 December 2011. A survey by WWF-Malaysia of several cage operations showed that this was the case.

Although the export ban of live Humphead wrasse was officially decided more than 12 months in advance, the knowledge of the impending export ban was only made known to the relevant authorities, enforcement agencies, traders and business operators in relevant industries. It was not publically announced. As such, a majority of the small-scale fishermen and cage operators located on remote islands off Sabah were unaware of the impending export ban and many traders continued to stock the fish.

These fish are often stocked by small-scale cage operators and located in remote area, which normally do not have access to mass media. As such, the dissemination of information is limited. Coupled with the fact that only export was banned, collectors and cage operators still saw potential lucrative domestic sales.

Humphead wrasse stocks usually reach their apex during the end of the year (October to December) to ensure a good supply during the end-of-year and Chinese New Year holiday and festive seasons. In a normal year when exports are permitted, prices usually increased by as much as 70% from the period beginning in December to February (pers comm. Wong, V.C. 2009).

A survey of fish cages in November and December 2009 revealed that there was still a large number of cage operators in remote islands who maintained large holdings of Humphead wrasse (up to 300 tails in a single cage location). Through interviews with them, these cage operators reported that they had not been told of the impending export ban by the local authorities. Some cage operators were stocking the fish for local consumption in local seafood restaurants in anticipation of the peak season during the Chinese New Year, which fell in February 2010.

The Department of Fisheries Sabah formally enforced the ban on export of Humphead wrasse on 1 January 2010. A relatively large number of small fishermen and cage operators were left with Humphead wrasse in stock. They only had the option of dumping them on the local market, potentially at a lower price, which could have increased demand for the species.

In consultation with Department of Fisheries Sabah and other management agencies, it was decided to buy back some of the remaining stocks from cage operators and release them into reef sites around Sabah. The buy-back and release operation had several objectives:

1. Helping to rebuild populations of HHW
2. Building awareness about the species and coral reefs in Malaysia
3. Building relationships with Live Reef Fish Traders by relieving them of the stocks that they might not have been able to sell.

The operation remained confidential until the final release at Tunku Abdul Rahman Park in Kota Kinabalu, Sabah on 30 July 2010 in conjunction with the annual meeting of the Sulu-Sulawesi Marine Ecoregion Tri-national Committee meeting. All the release sites were also kept confidential to reduce the potential for poaching of the newly released fish.

METHODOLOGY

The buy back and release was planned to release fish in 3-5 sites around Sabah. Consideration was given to the need to minimise transportation distances, to release fish in places where they would have the smallest chance to be recaptured, and where the environment would support a new population of the species.

Selection of fish

Humphead wrasse are usually sold by weight when they are below 1,500 grams. Fish between 600 grams and 1,300 grams command the highest prices. Above 1,501 grams the fish are less desirable and are sold by the tail. Humphead wrasse reach sexual maturity at 52 cm (Fishbase 2011).

Fish for this buy-back and release needed to meet a minimum size of 600 grams and priority was given for breeding adult fish. However finding Humphead wrasse of adult breeding size still stocked in the cages was a major challenge. Because Humphead wrasse above 1.5kg in body weight is sold by the tail, very few mature Humphead wrasse were sourced. Priority was then given to the largest fish available.

When approached by WWF-Malaysia, some traders offered to source more fish for WWF if wanted. It was made clear to these traders that this was a unique operation not to be repeated.

Site selection

Initial consultations were held with partners on the sites of the release. Among the most important criteria identified was intact habitat and formal or informal protected status. The criteria were determined in order to ensure highest possible survival rate of the released fish. A number of sites were proposed but eventually, only 6 release sites were selected. The final release sites have been kept confidential to reduce the possibility of poaching.

Site security

Most of the initially proposed sites lacked security. Considerations were given to the potential commercial and artisanal fishing activities carried out at these proposed sites and it was noted that commercial live reef fish extraction is still being carried out openly near some of the rejected sites.

A number of the proposed sites also did not have formal recognition by the state or local government. Due to the lack of security and recognition under the law of Malaysia, prosecution of poachers would be extremely hard should someone be caught catching the released fish at a later date. As such these sites were dropped from the initial selection. However, sites with *de facto* protection were considered.

Regular patrolling at the release site was also considered. All release sites were required to have regular patrolling and monitoring in place to ensure the security of the release sites.

Enforcement

Routine enforcement of the release site was also a strong consideration in choosing the release sites. Enforcement acts as a deterrent against potential poaching activities in the release sites. Sites with some form of regular and consistent patrolling and enforcement activities were prioritized.

Suitable Natural Environment

During consultation with Dr. Yvonne Sodovy (pers comm.) it was mentioned that Humphead wrasse prefers reefs with well-defined reef slopes. High coral cover and presence of potential prey, including Crown-of-thorn starfish was also desirable. Fish were released to ensure that a density of 10 fish / 100 square metres was attained. As such, no fish were released at Sipadan Island because it was felt that this was the only site in Sabah with an existing population of Humphead wrasse.

Genetic Considerations

Of particular concern was the possibility of introducing genetic material beyond its usual range. However, due to the difficulty in determining the provenance of each fish and the fact that these fish may travel long distances to join spawning aggregations, it was decided that genetic introductions could be minimized by releasing fish as close to the purchase point as possible.

Transporting fish

All attempts were made to minimize the distance that fish would need to be transported to keep stress levels to a minimum. It was assumed that many of the fish in the cages could be from distant reefs, perhaps from as far as Palawan or Tawi Tawi in the Philippines. However, most traders reported that they could not accurately report the origin of the fish. As such, the fish had probably already travelled long distances already and may be weakened from the stress.

All fish were purchased from traders in the Kota Kinabalu, Kudat, Semporna and Tawau areas. Fish were transported using live fish carrier boats or speedboats with seawater tanks to the respective release sites. The live fish carriers were chartered from traders operating within the respective release site proximity. The live fish carriers were equipped with aeration equipment to ensure the highest survival rate of the fish. Tanks on speedboats were aerated manually.

Transportation duration to the respective release sites ranged from 1 to 10 hours depending on the site. During these transportation journeys, WWF-Malaysia personnel were on board to ensure all fish were accounted for from loading to release.

In certain locations, fish were transported by trucks to the nearest jetty prior to being transported by boat. This journey by truck ranged from 1 hour to 3 hours. The trucks used in this exercise belonged to the traders. These are purpose-built live fish carrying lorry capable of delivering 600kg of live fish per trip. These lorries are equipped with dual aeration equipment. Fish were weighed when loaded and again at the delivery point (i.e. the jetty) to ensure no discrepancies in quantity and weight.

On a few occasions, speedboats were used to deliver the fish to its holding pens at the eventual release locations. During these speedboat operations, mobile battery powered aeration device were deployed where possible. In other cases aeration was maintained by hand.

In most cases, fish were transported to the release site one or two days before the release day to enable them to acclimate and calm down before release. The fish were weighed, measured and DNA samples were taken on the day before each release. The Humphead wrasse was weighed using a digital weighing scale and the weight was recorded. A small portion of the fins (measuring approximately 5mm x 5mm) was cut using surgical scissors. The fin clips were then submerged into individual test tubes containing 96% alcohol solution in order to preserve the samples. Test tubes were then sealed.

Releasing fish

Prior scouting of locations for suitable natural habitat was conducted in the months of December – February 2010. Dr Yvonne Sadovy of Hong Kong University also provided input on suitable types of reef habitats. The identified locations were marked with GPS or marked using floating devices.

During the actual release day, each team was divided into 1 marker (snorkelling at the surface to mark the location of the release site and the diver's location), 1 diver (to receive the fish and release them at depth), 2 floaters (to transport the fish from the boat to the release site) and staff on the transport vessel. There was also an underwater photographer following each team to capture photographic evidence of the release and to support the divers.

The boat transporting the fish usually had to remain some distance from the reef. It was felt that the fish should be released as close to the reef as possible. To transport the fish from the boat to the reef, a laundry basket measuring 30cm in diameter was deployed as a means of transfer, and a standard boat safety ring was employed. The Floater waited in the water beside the stationary boat while the staff on the boat put 2-4 fish in the laundry basket. The basket was lowered to the floater who inserted the basket into the safety ring. The safety ring kept the rim of the basket above the surface of the water but the holes in the basket allowed for water to pass through the basket for the benefit of the fish inside. The Floater then swam with the basket and ring in tow towards the Marker who was indicating the location of the divers below the surface. Once above the Divers, the Floater and Marker removed the basket from the safety ring and made a freedive downwards to the divers who would ascend to receive the basket. The diver took the basket to the reef and allowed the fish to swim free (

,

).

Often the fish were somewhat reluctant to leave the basket. Some would leave immediately and swim quickly away from the divers. Some fish would dart directly towards the closest gap in the corals and some would leisurely swim into their new surroundings.

The following steps for the release were strictly followed.

1. Upon reaching the identified location, the marker and diver / photographer enter the water.
2. Marker snorkelled and located the ideal coral reef for the fish release.
3. Diver and photographer standby underwater.
4. During the search for appropriate coral reef, floater team enters water.
5. Upon receiving signal from marker, live fish carrier lower fish baskets to the floater.
6. Floater set out to their respective marker to be lowered to the divers.
7. Diver brings the basket to the bottom of the ocean for the eventual release.
8. Photographic evidence taken.
9. Marker and divers proceed to 2nd site.

Figure 1: Placing the laundry basket into the life ring.



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Figure 2: Summary of release procedures

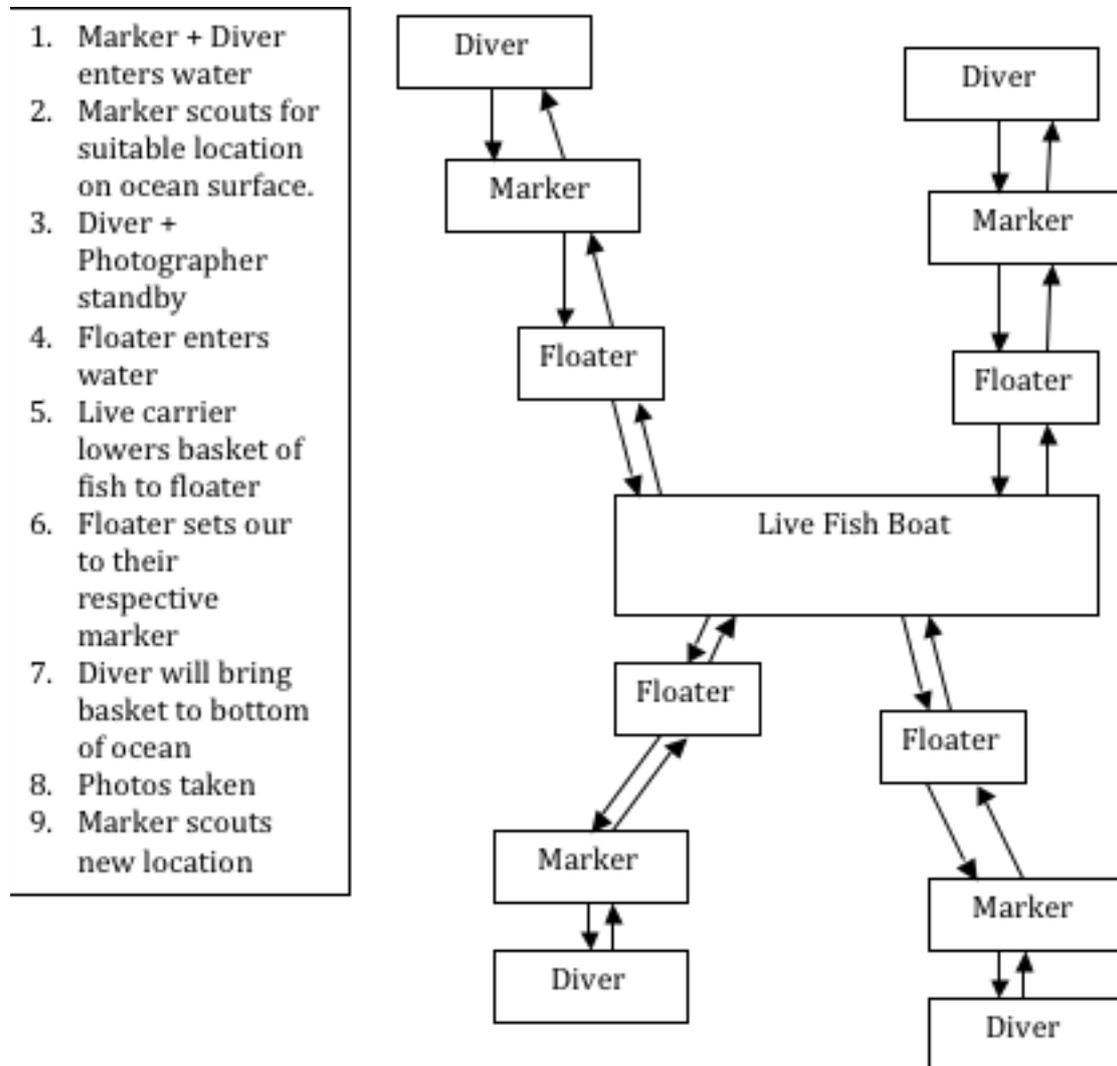
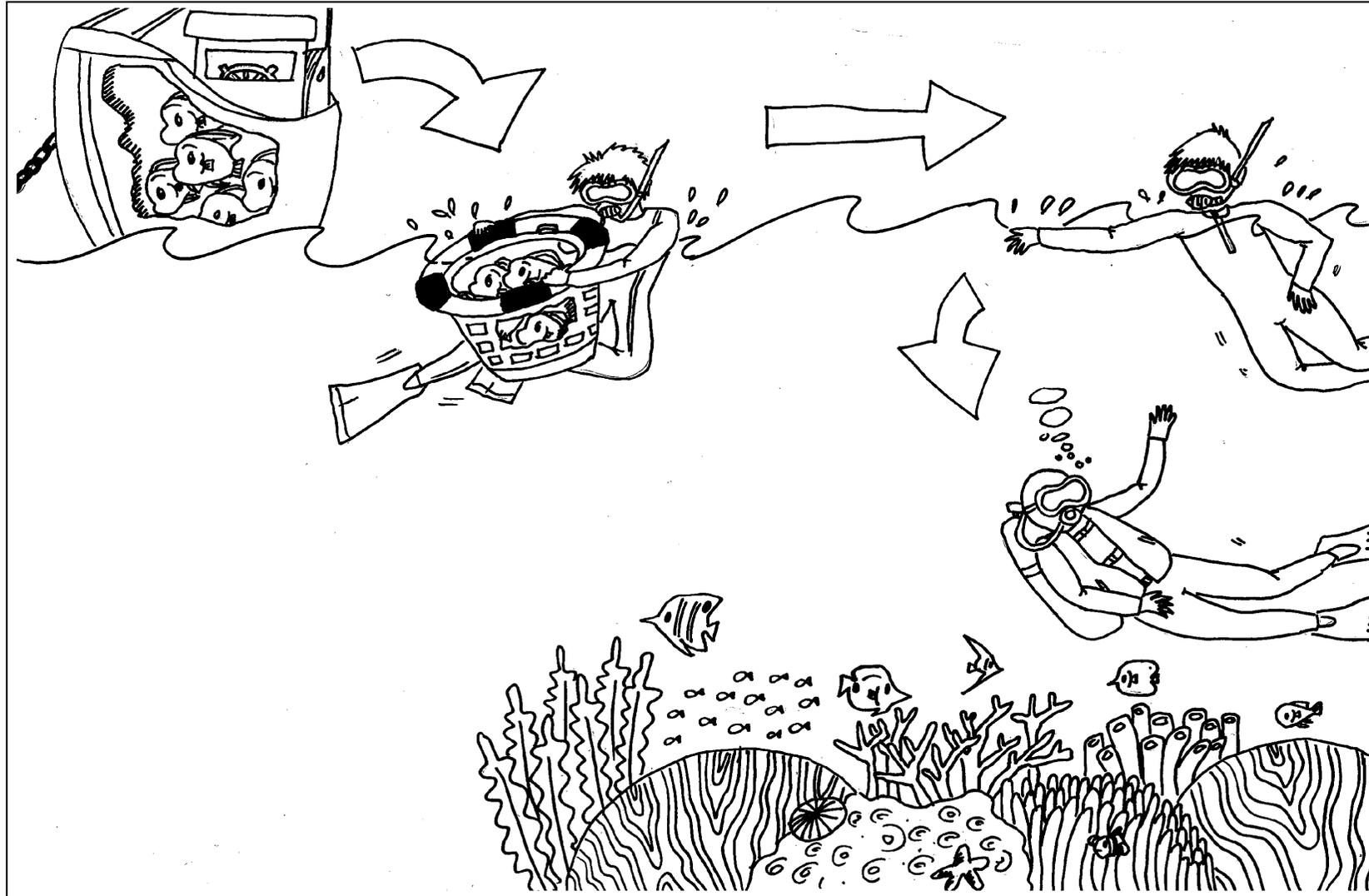


Figure 3: Representation of live fish boat, swimmer, floater and diver releasing fish on the reef. Note that the boat is anchored away from the coral reef.



RESULTS

A total of 885 fish were purchased and 874 released at 4 sites. The mortality occurred primarily in sites with longer transport distances.

Table 1: Number of fish released at 4 sites

Site	Fish purchased	Fish released	Mortality
1	96	96	0
2	75	72	3
3	682	674	8
Tunku Abdul Rahman Park	32	32	0
Total	885	874	11

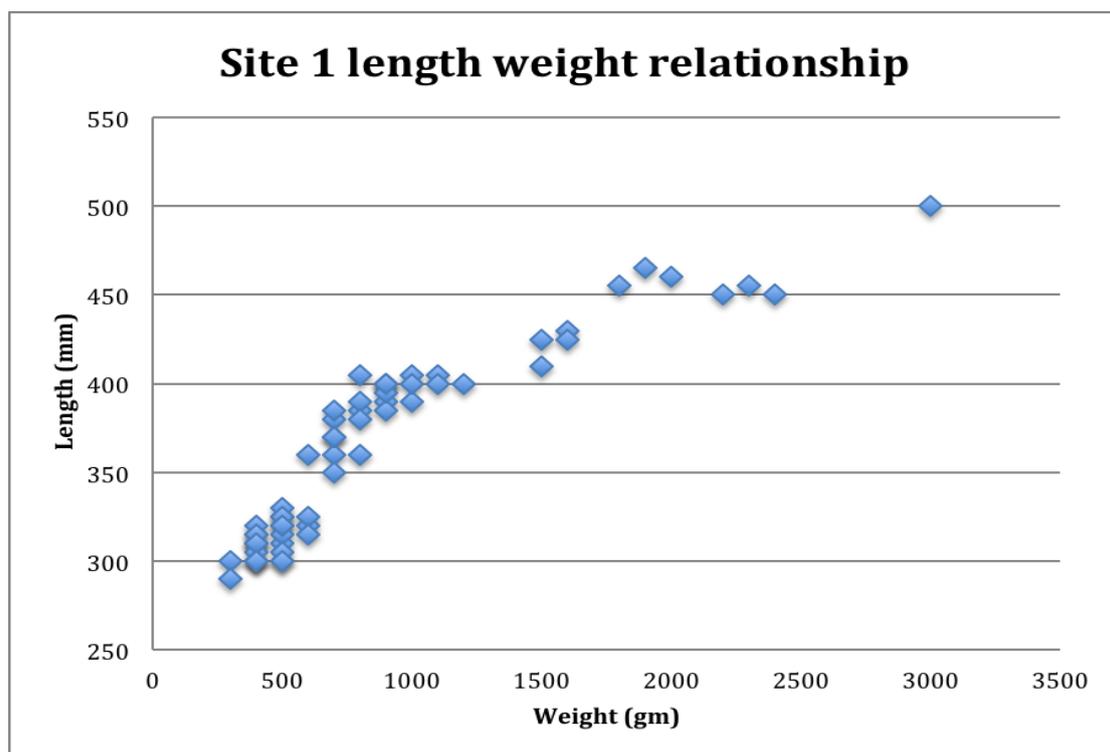
Tagging

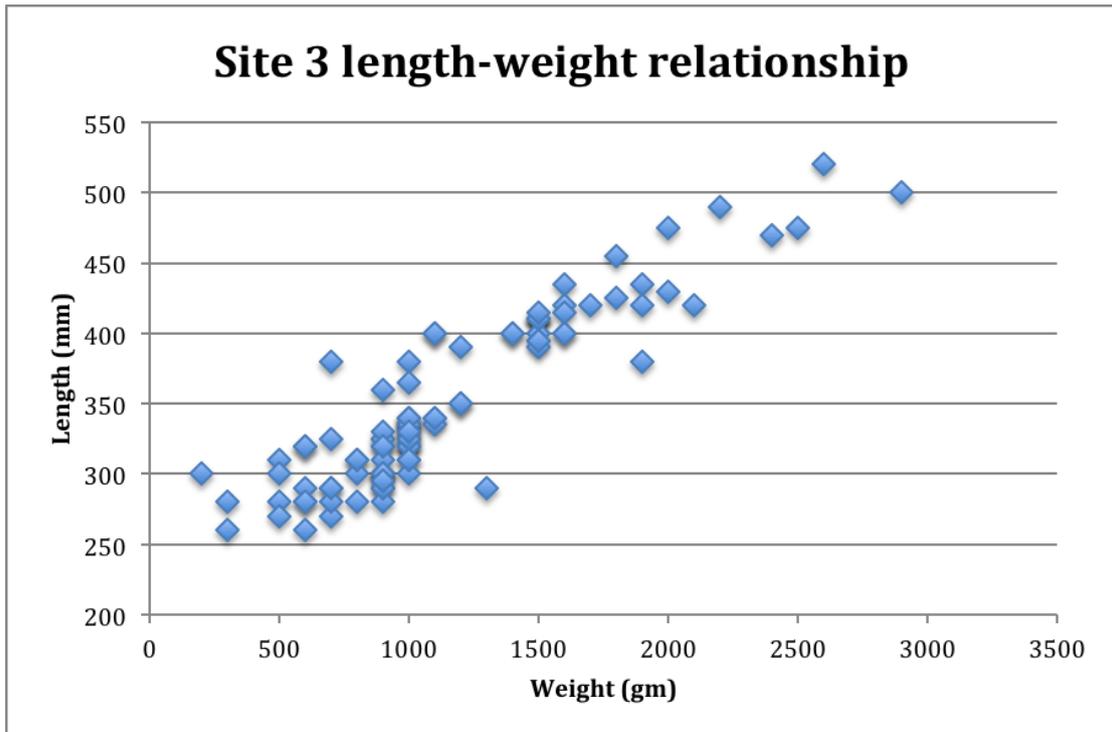
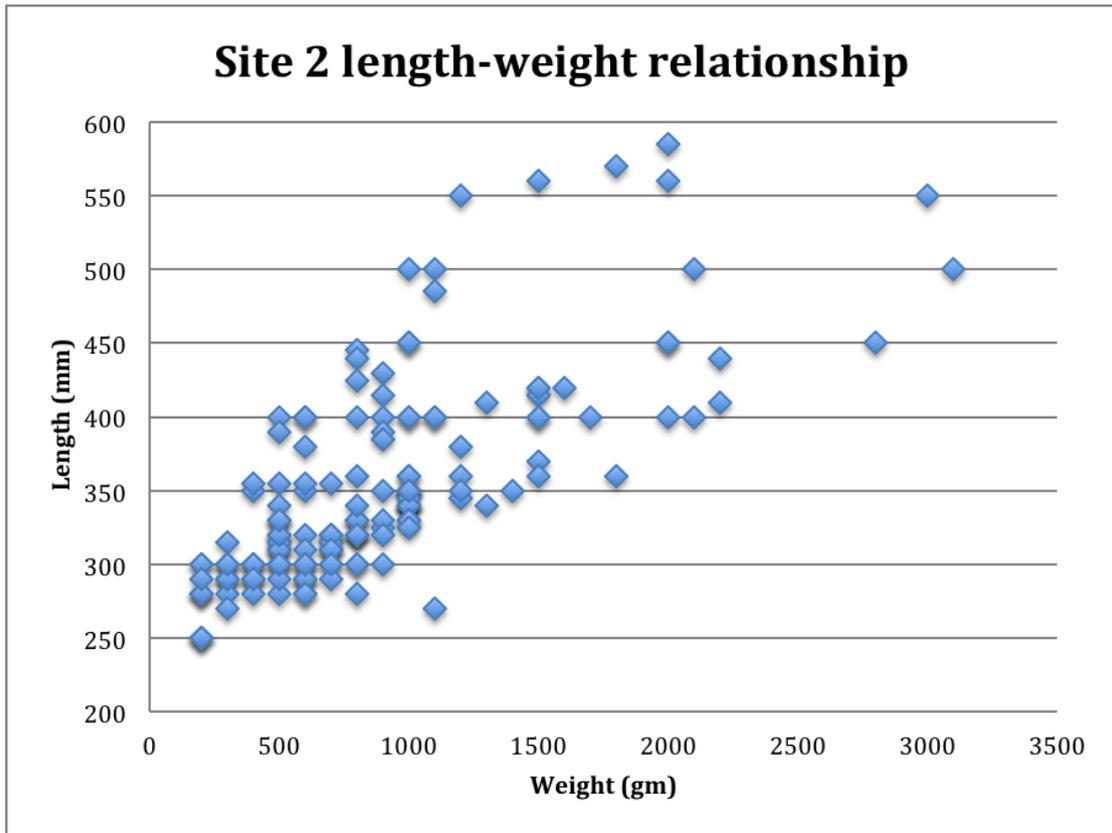
Tagging of fish was planned to facilitate future monitoring of the release sites. Two hundred (200) plastic tipped dart tags were ordered from Australia and arrived a few days before the first release. Unfortunately, the barbs were deemed too large for the fish and only a few were used. Subsequently, fish were tagged with standard plastic clothing tags applied through the dorsal fin.

For the Universiti Malaysia Sabah DNA analysis, 30% of the fish were targeted for tissue sampling. Fin clips were excised from the back of the dorsal fin and preserved in 96% alcohol solution. Each tagged and sampled fish was weighed, measured and photographed for future reference. The length-weight relationships are presented in

Figure 4

Figure 4: Length-weight relationships of released fish at 3 sites





The release at the fourth site was made public to help achieve the awareness-raising goal of the programme. A small number of fish were released in the Tunku Abdul Rahman Park near Kota

Kinabalu, Sabah. This release was officiated by the Department of Fisheries Sabah and attended by the Sulu-Sulawesi Marine Ecoregion's Tri-national Committee.

A press conference, press release and filming posted online received good mass media coverage (APPENDIX I: NEWSPAPER CLIPPINGS AND PUBLICITY).

Video footage of the public release can be viewed at: <http://www.scubazoo.com/updates/blog/humphead-wrasse-release-at-tunku-abdul-rahman-park/>



Figure 5: HHW being placed into the laundry basket in preparation for release. The swimmer will take the fish, in the basket and ring, to the spot where the diver is waiting.

Post-release Monitoring

Monitoring dives are planned to be carried out on an annual basis to track the populations of HHW at the release sites. The first monitoring was conducted between October 2012 and December 2012. Monitoring was conducted by groups consisting of 3 divers each. Divers returned to the release site in groups of three and swam parallel to the reef top and reef slope 6 meters apart. On each dive, the location was marked with GPS. Divers swam the same direction with the same speed. Upon sighting of a Humphead wrasse diver will record the count and estimate the total length (TL) to the nearest 5cm. If the Humphead wrasse is sighted within the line of vision of two divers, both divers will provide hand signal to the other diver that the fish has been counted. This is to avoid double counting.

Monitoring of release fish were carried out by WWF-Malaysia and our partners in the last quarter of 2011. Results of the monitoring are presented in Table .

Table 2: Results of first monitoring

Site	Date	HHW Sightings	Estimated size (largest) (cm)	Estimated size (smallest) (cm)
Site 1				
North Site 1		0	-	-
North Site 2		0	-	-
Site 2				
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North East Site 5		1	40	40
Site 3				
South East Site 1		9	30	20
South East Site 2		4	25	15
South East Site 3		0	-	-

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Figure 8: Utusan Borneo, Sabah (Bahasa Malaysia)



Figure 9: See Hua Daily, Sabah, Malaysia (Chinese)



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