PROJECT RIGHT WHALE: EVALUATING THE IMPACT OF TOURISM ACTIVITIES ON SOUTHERN RIGHT WHALES (*EUBALAENA AUSTRALIS*) IN NORTH PATAGONIA, ARGENTINA

Final Report for
RUFFORD SMALL GRANTS FOUNDATON

Project leader:
Msc. ELS VERMEULEN

Project RIGHT WHALE: Evaluating the impact of tourism activities on southern right whales (*Eubalaena australis*) in North Patagonia, Argentina

FINAL REPORT

Presented by MSc. Els Vermeulen – President Marybio Foundation

This project was carried out during the months August-December 2010 and April-September 2011 and was generously supported by the
RUFFORD SMALL GRANTS FOUNDATION.
In this final report, we resume our achievements, results and hopes for the future.

Marybio

GRANT RECIPIENT DETAILS

Name: Els Vermeulen

Project Title: Project Right Whale: "Evaluating the impact of tourism activities on southern right whales (*Eubalaena australis*) in North Patagonia, Argentina"

RSG reference: Jane Raymond

Reporting Period: 11 months

Amount of grant: £ 5,658

Email address: els@marybio.org

Date of this report: 23th of October 2011

ACHIEVEMENTS OF THE PROJECT'S ORIGINAL OBJECTIVES

SCIENTIFIC INVESTIGATION

"To obtain the information needed for the implementation of an urgent and accurate management plan in Northeast Patagonia"

ACHIEVED

A. RESEARCH EFFORT

An ideal transect model was designed in a previous research year using Distance 5.0, with the help of specialist Dr. Rob Williams. The model was developed using a systematic parallel line transect design (2.5km spacing), resulting in 14 parallel lines perpendicular to the coast (total line length=163km), with a total mean coverage probability (MCP) of 0.76 (figure 1).

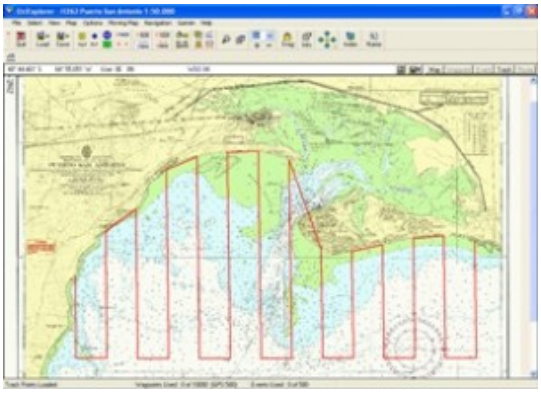

Figure 1: Transect design of the study area Bahía San Antonio

The transect was flown 3 times between the months August-October 2010 and twice more during August and September 2011 with a mono-engine CESSNA (figure 2). Unfortunately in both years we were unable to fly during the month July, in 2010 due to a lack of economic resources and in 2011 due to climatological circumstances.
During the realization of this aerial survey, whales were quantified, group size was determined when possible and as many photo-id pictures as possible were taken.

Figure 2: Researcher Alejandro Cammareri with the airplane used for the aerial surveys

Boat based surveys were carried out between August and December 2010, and during April and September 2011 in the bay of San Antonio, resulting in a total of 192,3h of research effort. These boat-based observations resulted in a total of 47,8h of positive observations of 37 whale groups. All tracks of the boat based effort were recorded using a Garmin GPSmap 62s, show in figure 3.

Figure 3: GPS tracks of boat-based observations

Boat-based behavioural observations were made as previously done, using a focal animal observation to record an instantaneous point sample of the behavioural state of the focal animal every five minutes before a boat approaches (control, >500m), during a boat approach and/or swimmer interaction (impact, <500m), and after swimmers exited the water and/or the boat left the area (post-impact, >500m).

B. RESEARCH RESULTS

Uncorrected abundance estimations from aerial surveys of the two years pooled together indicated that a clear peak in whale abundance can be found during the month September with much less animals present in August and October (figure 4).

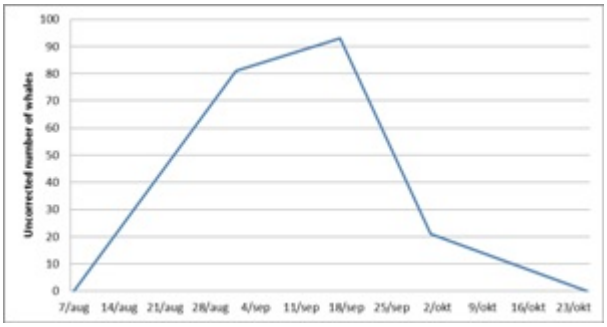

Figure 4: Quantification of whales present in Bahía San Antonio.

Results further indicated that almost more than half of the observed whale groups were solitary animals (58%), followed by Surface Active Groups (35%) and 2% mother and calves. Only 5% of the observed whale-groups could not be classified. These results are consistent with results of previous years, indicating that the study area does not seem to be a calving area, information important when creating conservation strategies.

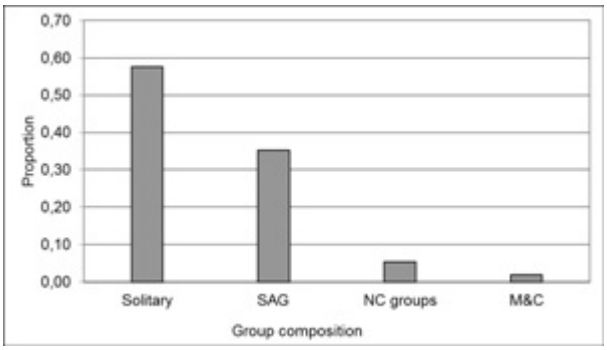

Figure 5: Observed group structures of southern right whales in Bahía San Antonio

During aerial surveys, a total of 8 new whales could be positively identified. The photo-id pictures were added to the identification catalogue for the study area, summing up to an identification of 20 individual whales. This catalogue has been compared with the catalogues from Peninsula Valdes (Argentina), Santa Catarina (Brasil) and Uruguay. Up to now only 1 match could be found of an individual seen in 2010 in BSA that has been identified as a calf in 2001 in Santa Catarina (Brasil; figure 6). The results of the comparison with the largest identification catalogue (Peninsula Valdes, Argentina) are still to be received.

As in previous years, whales identified in one aerial survey could not be seen again in the next survey, suggesting that the animals do not remain for long times in the area.


Figure 6: Examples of photo-id picture taken from the plane (under: southern right whale positively identified in both Santa Catarina (Brasil) and BSA by white blaze on back.

Data of the reaction of the whales to human approaches were very consisted with the data obtained in 2009. During the field seasons of 2010 and 2011, approached groups (chosen ad random) consisted out of Surface Active Groups (SAG; 0.42), solitary animals (0.36) and non-classified groups (0.21).

Results indicated that whales altered their time budget during and after an approach (figure 7).

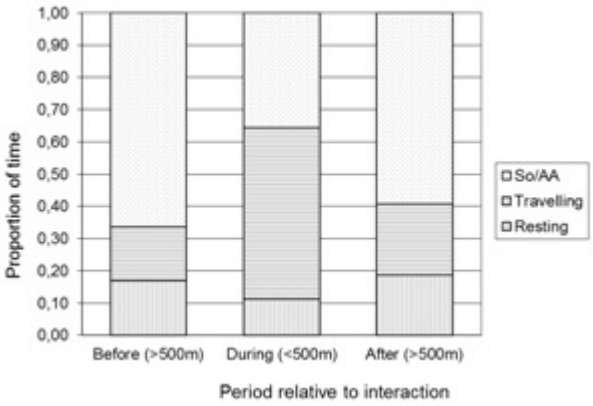

Figure 7: Proportion of time spent in each behavioural state before, during and after an interaction in Bahía San Antonio.

This alteration was also reflected in a change in transition probabilities of the different behavioural states (figure 8).

This way, the probability that a whale remained in a social/aerially active behaviour when affected by anthropogenic approaches decreased notably (-13%) and was tested to be significant. (Z-test for 2 proportions, $p>0.05$). Also the probability that a whale would remain travelling when approached by a vessel and/or swimmers increased significantly (+21%), decreasing the probability of them to start resting (-21%).

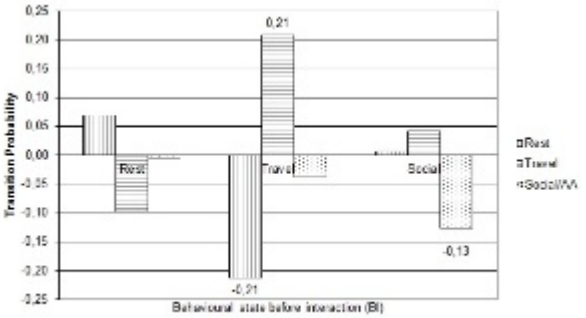

Figure 8: Difference in transition probability between BI and DI segments.

When swimmers were also involved in the interaction, a stronger decrease could be found in the probability of a whale remaining in a social/AA behavioural pattern (-32%) but this change did not test significantly, possibly due to the small sample size ($p=0.07$).

We are very pleased to be able to mention that these results were presented in the Conference of the European Cetacean Society in Stralsund, Germany in 2010 (Figure 9a),

and were recently accepted by the journal Aquatic Mammals to be published in their following edition (Figure 9b)

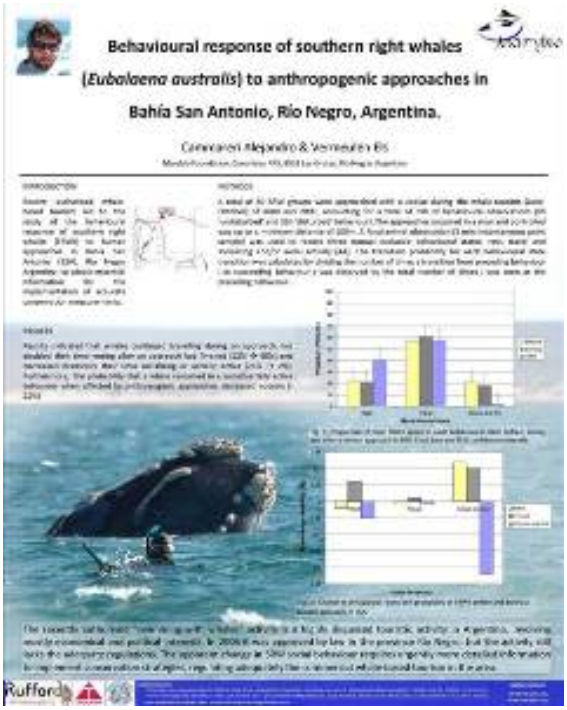

Figure 9a & b: Poster presented at the ECS conference in Stralsund Gerany (March 2010) and 1st page of the paper to be published by Aquatic Mammals.

EDUCATIONAL PROGRAM

"To improve the capacity of individuals and groups of individuals to take responsible decisions at all levels concerning the conservation and the exploitation of their natural resources"

PARTIALLY ACHEIVED

Figure 10: Logo of "Refugio de Delfines"

After last years success of the interpretation centre called "Naturaleza a la Vista", which was a project in collaboration with the local government meant to last only one year, we continued the interpretation centre on our own and gave it the name "Refugio de

Delfines" meaning "dolphin's shelter" (referring to the importance of the study area for a local bottlenose dolphin population). "Refugio de Delfines" has been a dynamic establishment dedicated to provide information and teach about marine mammals to its visitors, increasing the knowledge and awareness of both the local community and tourists. Although the interpretation centre had a positively influence the touristic influx in the area, the centre had merely an education purpose, and not a touristic one.

Thanks to the funding of the Rufford Small Grants Foundation, "Refugio de Delfines" could be improved. In first instance more posters and folders were printed, skeletons were included in the exposition, we were able to create a large panel and two large sized dolphins placed at the entrance of the centre and were able to have several binoculars in place for the visitors to use.

Figure 11: The new view of the interpretation centre, now called "Refugio de Delfines"

Figure 12: Part of a southern right whale skeleton outside the centre

Figure 13 a & b: Folders concerning the biology of southern right whales that were reprinted for distribution

Figure 14: Visitors talking to our researcher Alejandro Cammareri

Figure 15: When more visitors gathered, a spontanious talk would be given to them

Figure 16:

Figure 17: Researchers Alejandro Cammareri and Els Vermeulen at a presentation at a local kindergarten

As done last year, we invited local people and visitors to come and enjoy the view, to actively look for whales with the binoculars we offered, to hear previously recorded whale sounds, to see an informative video about the local marine mammals and to listen to the explanations of our informative posters, all for free.

Every weekend, members of our organization were present to attend the visitors accurately.

We estimate that we were able to reach more than 2,000 people during the whale season!!

Furthermore, with this project we were able to actively invite schools from different regions to learn about whales and dolphins, attending an informative talk and actively looking and observing the whales. On the other hand we also went to different schools to explain the children about whales and dolphins. Thanks to the Rufford Small Grants we were able to by a projector and a screen to improve the quality of our presentations.


Figure 18: Children of a primary school posing with two large sized dolphins


Figure 19: Children from a primary school looking for whales with the binoculars


Figure 20: Presentation for a secundary school at the centre

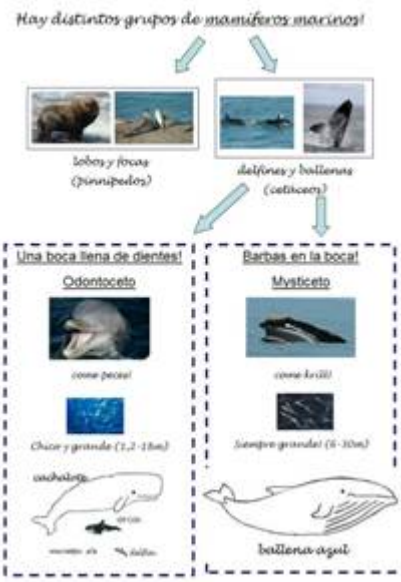

Figure 21: Also thanks to the Rufford Small Grants, we were able to create and print didactic manuscripts about whales that were given to the children and treated during talks. Presented here one of the pages of the manuscript.

POLITICAL INVOLVEMENT

FULLY ACHIEVED

In response to the legalization of commercial activities based on the southern right whales (provincial law 4066/2006), political meeting were held to create an accurate management plan to regulate the whale-based tourism.

In order to do so, we provide the decision makers with accurate information on the whales themselves. As such, we have provided the local and provincial government with a file including all our papers (translated to Spanish), reports, and research results. We further strongly advised, for the wellbeing of the whales and the tourists, to not allow the swimming-with-whales activity but solely to regulate the boat-based whale-watching at this stage, until the reaction of the whales to the swimmers particularly is better understood.

As a result of all the information we could provide, we were assigned by the provincial government as the official scientific advisors regarding southern right whales and the commercial activities involved.

Consequently, we have participated in various meetings with the local and provincial government, tour operators and the coastguard, during which we have given PowerPoint presentations indicating e.g. the sensitivity of the specific whale groups, the reaction of the whales vs. various distances and boat activities, the increase of impact

on the whales when swimmers are involved and the concerns about the safety of the swimmers themselves when involved in a swimming with whales activity. We have then actively participated in the debate with the tour operators about the actual regulation of the whale-based activities.

As for the boat-based tourism, the most important regulations that were set up are the following:

1. Tour operators should ask a special permit and have to be registered by the local and provincial authorities
2. Priority to coastal whale-watching: no whale shall be approached by a vessel within 500m from the coast.
3. There should be at least a pause of 30min between two whale-watching trips
4. A specialized guide should be on board to give accurate information concerning southern right whales to the tourists
5. Max time with a whale should not be longer then 90min
6. At all times the speed of the vessel should be inferior to 20knots
7. When whales are seen the speed of the vessel should be reduced to a max of 10 knots.
8. Within a range of 1000m from the coast, the speed of the vessel should be inferior of 10knots.
9. The vessel should not make sudden turns of more than 70°
10. At no times it remains forbidden to approach mating groups and mothers with calves at less than 1000m.
11. Only 1 vessel can approach a whale at a time
12. As from a distance inferior of 500m from a whale, the speed of the vessel should be reduced to a maximum of 5knots, up to a minimum distance of 100m. At that point, the vessel should be stopped and given the choice to the whale to approach or not.
13. It remains forbidden to intent to approach a whale more than 2 times.
14. In case of strong winds (>10knots) the whale should be approached so the wind will drift the boat in the opposite direction of the whale
15. The swimming path of the whale should never be cut off and the whale should preferably be approached at all times from the side. When the whale is seen to change direction repeatedly, the vessel should abandon this animal.

We are very pleased to be able to mention that our advice has been taken into account regarding these regulations and regarding the fact that the “swimming-with-whales” activity will remain forbidden until we are able to gather more information on the apparent increasing impact on the whales when swimmers are involved.

UNFORESEEN DIFFICULTIES

⇒ General:

- Due to the reception of the Rufford Small Grants support relatively late in the whale season of 2010 (september) caused by an inconvenience with the Argentinean bank, the fund was used in the whale-season of 2010 to the extend needed and was saved up to be used further in the whale-season of 2011 (see timeline for details).

⇒ Research:

- Due to adverse weather conditions, the transect could not be flown in July 2011. Nevertheless the aerial survey could be conducted in total 5 times over two whale seasons.

⇒ Education:

- It was possible to prepare skeletons of both a whale and a dolphin, although not to the extend as was indented due to logistical reasons. We therefore created an exposition table where different parts of the skeletons were presented with the necessary explanation.

MOST IMPORTANT OUTCOMES

A. FIRST PAPER ON THE BEHAVIOURAL REACTION OF SRW TOWARDS SWIMMING-WITH-WHALES ACTIVITIES

The results of this project were analysed, written in a paper and submitted to the journal Aquatic Mammals, where it has been accepted to be included in the upcoming edition. The results of the aerial surveys are being analysed at this moment and will be submitted for publication before the end of the year.

B. FIRST PHOTO-ID MATCH WITH OTHER ID-CATALOGUES

As a result of the photo-identification we conducted during the aerial surveys, and the subsequent comparison with identification catalogues of other regions/countries, we were able to find a match with the catalogue of Santa Catarina (Brasil). It concerns an

animal that was first seen in Santa Catarina in 2001, and was estimated to have been born that year in that region. Due to a very distinctive white spot in his/her back, we were able to identify it in 2010 in Bahía San Antonio, then 9 years of age and thus just in adulthood.
Further results of a comparison with South-America's largest identification catalogue (of Peninsula Valdes) are yet to come.

C. PARTICIPATION OF RESEARCHERS OF MARYBIO IN INTERNATIONAL WHALING COMMISSION

A researcher of the Marybio Foundation (Els Vermeulen) has been actively invited on the annual meeting of the International Whaling Commission (Jersey, July 2011) and at the intercessional meeting of the IWC regarding southern right whales (Buenos Aires, September 2011), due to her experience working with Southern right whales. This way we were able to advise and share our experience regarding the wellbeing of southern right whales on an international level.
As the Marybio Foundation is part of the Buenos Aires group, another researcher of Marybio (Alejandro Cammareri) has been invited on several meetings of this group, to share his knowledge and experience regarding these whales.

D. COMPLETION OF MASTER THESIS CONCERNING THE BEHAVIOURAL RESPONSE OF SOUTHERN RIGHT WHALES TO HUMAN APPROACHES

As part of our capacity building, we receive students from all over the world to conduct their master thesis with us. As such, in August 2010 a student from the university of Gent (Belgium) came to Argentina for 1,5months to dedicate her master research on the behavioural impact of southern right whales towards human approaches. The student graduated in June 2011 with Cum Laude and a final mark on her thesis being 16/20.

E. CONTINUATION OF EDUCATIONAL OUTREACH

This project gave the possibility to continue with a small interpretation centre in the town located in Bahía San Antonio, which has continued to increase the interest of local habitants and visitors. Thanks to the support of the Rufford Small Grants we were able to improve the quality of our educational material and presentations, and were able to go to the schools that were unable to come to the centre. The increasing demand of such visits shows the success of the educational project in the region!

F. REGULATIONS FOR BOAT-BASED WHALE-WATCHING AND PROHIBITION OF SWIMMING WITH WHALES

As a result of our research, we have been indicated as official scientific advisors of the provincial government regarding southern right whales and all commercial activities related to them. The most important outcome of our effort at this stage is the

regulation of the boat-based whale watching and the prohibition of any "swimming-with-whales" activities at this stage, at least until more information on the increased impact on whales can be presented.

Involvement of Local Community and their Benefit

The local community was involved actively during the entire whale-season through the interpretation centre (see achievement of objectives - educational program), and the younger part of the community has additionally been involved through the visits and presentations made in their schools. All these learning opportunities have been beneficial for the local community on both an adult and younger level.

Furthermore, we believe that the attention we drew towards visitors and teachers/children concerning the southern right whales and their wellbeing (lack of management plans), has increased the political pressure to actually create the regulations for the boat-based whale-watching. The presence of these regulations made that the activity can be executed now and commercialized on a regulated level, which is in the economic benefit of the entire community.

Plans for the Future

Our plans for the future are very similar to the ones from last year, as in to continue this research (boat-based and aerial) to be able to count on more data to provide the decision-makers with the information they need, especially in regards to the "swimming-with-whales" activities. We aim with our research to improve our data with the mind on the present regulations, and to monitor the commercial boat-based whale-watching whenever we are on the field ourselves, in order to improve the regulations where necessary and to fill the possible gaps that might be present.

As good relationships on a political level have been achieved, it is in our intention to continue working with the local and provincial government, ready to provide information on any level they might need.

As last year, we have every intention to continue what we were able to start last year very successfully, with the aim to improve scientific information, increase the public's awareness and achieve political decisions in order to safeguard the whales in the region.

The results of our scientific research and educational project were shared through the interpretation centre and local presentations (see achievement of objectives - educational program , presentations at congresses, scientific papers to be published, notes in local and Belgian newspapers, our newsletters, reports presented to the local government and through our website.

The project also drew the attention of the Belgian television. As such, a film crew came to film the Marybio in May 2011, and documented the research Marybio is conducting on the southern right whales and bottlenose dolphins. This way we were able to explain a broader public on our research and conservation issues related to the southern right whale. The documentary will be broadcasted on the Belgian television in January 2012.


Marybio helpt overheid ivm reglementering walvistoerisme

Figure 22: Example of a newsletter of Marybio

Figure 23 a & b: Article in Belgian magazine


Figure 24: Belgian film crew on board the vessel "Marybio I" to document the research

TIME SCALE

As the economic support of the Rufford Small Grants was granted in July 2010 but not received until in September 2010, the whole project lasted in total 5 months in 2010 (August until December) and 6 more from April until the end of September, with the different steps divided as follows:

	2010					2011					
	A	S	O	N	D	A	M	J	J	A	S
Reception of support Rufford Small Grants		x									
Boat based observations	x	x	x	x	x	x	x	x	x	x	x
Aerial surveys	x	x	x							x	x
Belgian student working on project RIGHT WHALE	x	x									
Design + printing didactic material		x	x								
Preparation of skeletons				x	x	x					
"Refugio de Delfines"			x	x	x	x	x	x	x	x	x
Talks in schools								x	x	x	x
Political meetings		x	x						x	x	x
Achievement of regulations										x	x
Participation IWC and related meetings		x		x				x	x		x
Belgian Film crew in Argentina							x				
Analysis data			x	x	x						
Submission of paper + acceptance in Aquatic Mammals					x					x	
Preparation Final Report											x

BUDGET BREAKDOWN

Item	Budgeted amount (£)	Actual amount (£)	Difference (£)	Comments
Aerial surveys	684	976	-292	5 aerial surveys were conducted instead of 4, and there hs been a slight increase in fuel price
Boat-based surveys	1231	2654	-1423	increase of fuel price + more boat-based surveys due to longer time scale the fund was used on
Logistics	77	81	-4	
Identifiable clothing	428	356	72	
Communication	226	354	-128	
Fuel	462	365	97	

educational program				
Brochures	513	503	10	
Panel for exterior	257	241	16	
Posters	154	146	8	
Preparation skeletons	86	45	41	
Projector/screen	599	512	87	
Binoculairs	86	71	15	
Didactic manuscripts	855	698	157	
RESULT	**5658**	**7002**	**-1344**	

Thanks to the Rufford Small Grants, and the support of Trigon N.V and members of Marybio, we were able to complete most of the second ánd third year of the project RIGHT WHALE!

NEXT STEPS TO TAKE

After another succesfull year of Project RIGHT WHALE, it remains important to continue the scientific research regarding the southern right whales and their reaction towards the human approaches, in order to improve the regulations in place and to be able to deal with the challenge of regulating a possible “swimming-with-whales” in the next year.
It seems further important to be actively involved in the subcommittee group of Southern Right Whales of the International Whaling Commission, understanding that this project is the only project that deals with a swimming-with-whales interaction with this species. It is thus of great importance of publishing scientifically all the results obtained, which will be completed in the near future.
On a political level it seems of high importance to maintain the collaboration with local and provincial decision-makers and provide them with more information on the impact of “swimming-with-whales” specifically.
On an educational level, it is important to continue with the interpretation centre and the presentation in schools that cannot come actively to the centre.

RSG PUBLICITY

Besides on our website (www.marybio.org), the Rufford Small Grants Foundation logo was used on our newsletter (see picture below), on all the educative folders and posters used in the interpretation centre and on the posters that was presented in the ECS congress in Stralsund, Germany. The support of the Rufford Small Grants has been

mentioned in the submitted paper and will be published in Aquatic Mammals soon, and will be mentioned in the upcoming paper concerning the results of the aerial surveys specifically.

Figure 25

I AGREE TO THIS REPORT BEING PUBLISHED ON THE RUFFORD SMALL GRANTS WEBSITE

Signed (or print name)

ELS VERMEULEN