Pygmy Hippo Conservation Project

Within the

"Across the River – A Transboundary Peace Park for Sierra Leone and Liberia" Project (ARTP)

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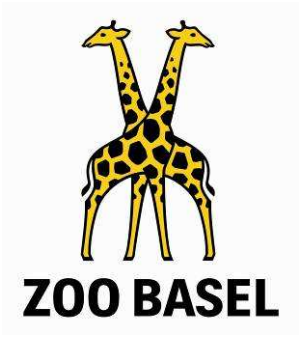

Final Report, July 2010 – June 2011

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This report is dedicated to Andrew M. Muana, Coordinator of the Pygmy hippo conservation project, who died on 3 April 2011. The major part of the data and outcomes of this project is the result of his dedication to the work and his high interest in the environment and in nature conservation in his home country Sierra Leone. We lost a great colleague and friend. It is also dedicated to our Community Conservation Warden Sheku Massaquoi who died on 18 December 2010 and who likewise showed a high commitment to his job and was a wonderful colleague.

Pygmy Hippo Conservation Project:
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Zusammenfassung

Ziel des Zwergflusspferd-Schutzprojekts im “Across the River – A Transboundary Peace Park for Sierra Leone and Liberia” Projekt (ARTP) war es, in enger Zusammenarbeit mit den im Projektgebiet ansässigen Gemeinden Zwergflusspferde zu untersuchen und zu schützen. Das Projekt startete im Juli 2010 und endete im Juni 2011. Das Team bestand aus einem Projektkoordinator, einem Verantwortlichen für Umwelterziehung und fünf „Community Conservation Wardens“. Dieses Team wurde von Kollegen der Forschungseinheit des ARTPs unterstützt. Die Community Wardens wurden in der Nutzung von GPS-Einheiten, Kompass, Fragebögen und im Grundlagenwissen im Bereich Naturschutz und Zwergflusspferde geschult. Von Juli 2010 bis Juni 2011 waren sie regelmäßig im Feld und in den Dörfern unterwegs, um Daten zum Schutzstatus und zur Gefährdung von Zwergflusspferden (Jagd, Habitatzerstörung) sowie Informationen zu ihrer Ökologie (z.B. Ernährung und Bewegungsmuster) und bisher nicht bekannten Populationen zu sammeln. Es wurden 271 Zwergflusspferd-Fragebögen in 103 Gemeinden ausgefüllt und ausgewertet. 258 der Befragten hatten mindestens einmal ein Zwergflusspferd gesehen und machten Angaben zum Habitat (in der Regel entlang von Flüssen und in Sumpfgebieten), zur Jahres- und Tageszeit (Vormittag und Nachmittag während der Trockenzeit wurden am häufigsten genannt, besonders Februar bis April), zur Nahrung, und zur allgemeinen Auffassung zu Zwergflusspferden. Die meisten Befragten beschrieben das Tier sehr positiv, allerdings ist es sehr aggressiv, wenn es Jungtiere hat. Nur 16 Befragte gaben an, dass Zwergflusspferde Schäden in ihren Pflanzungen anrichten und 15 Befragte sagten, dass Zwergflusspferde noch gejagt werden. Dies geschieht vor allem wegen des Fleisches, aber andere Körperbestandteile scheinen besonders in traditionellen Riten eine Rolle zu spielen. Die Mehrheit der Befragten gab an, dass die Population von Zwergflusspferden zurückgegangen ist. Gründe seien vor allem die Zerstörung von Habitaten, das Wachsen der Siedlungen und das Geräusch von Motorsägen.

Geeignete Habitate entlang von Flüssen wurden regelmäßig nach Kot-, Fuß- und Fressspuren abgesucht. Insgesamt wurden 93 solche „Transektbegehungen“ durchgeführt. Basierend auf den Fragebögen und den Surveys erstellten wir Karten zur historischen und aktuellen Verbreitung von Zwergflusspferden in unserem Projektgebiet. Seit Mai 2011 wurden zusätzlich Kamerafallen angewendet, um die Verbreitung der Zwergflusspferde zu untersuchen. Allerdings wurde während der Dauer des Projekts kein Zwergflusspferdbild aufgenommen.

In Hinblick auf zukünftige Pläne für unser Projekt führten wir in Kooperation mit April Conway und Prof. John Carroll von der Universität Georgia sowie mit Gareth Morrissy von der Universität Chester mit unseren Assistenten mehrere Trainingseinheiten zur Radiotelemetrie und zum Sammeln von Kotproben für genetische Analysen durch.

Auch im Bereich Umwelterziehung kooperierten wir mit April Conway und der Environmental Foundation for Africa. Diese Kooperation beinhaltete das Erstellen von Materialien (z.B. Poster und Aufkleber) sowie gemeinsame Aktivitäten, wie Schulbesuche, „Road shows“ und das Malen von Wandbildern in Dörfern. Im Rahmen des „World Environment Day 2011“ organisierten wir einen „Zwergflusspferdtag“, zu dem unter anderem ein Zwergflusspferdmalwettbewerb für vier Schulen durchgeführt wurde. Diese Aktionen sollten weiter dazu beitragen, dass Zwergflusspferde eine Flagship-Art nicht nur für Sierra Leone, sondern für die gesamte Region des Oberguineischen Waldblocks werden.

Summary

The pygmy hippo conservation project within the “Across the River – A Transboundary Peace Park for Sierra Leone and Liberia” project (ARTP) aimed at studying, monitoring and protecting pygmy hippos in the project areas of the ARTP (and Gola Forest Programme) in close collaboration with local communities. The project started in July 2010 and ended in June 2011. The team consisted of a project coordinator, an education officer and five community conservation wardens. Furthermore, the team was supported by other members of the ARTP research unit. The community wardens were trained in the use of GPS, compass, the application of questionnaires and basic knowledge about pygmy hippos and conservation. From July 2010 to June 2011 the pygmy hippo team was regularly in the field, applying questionnaires to monitor the pygmy hippos’ conservation status and threats (hunting, habitat destruction), collect basic ecological information (e.g. diet and movement patterns), and survey for new populations. 271 pygmy hippo conservation questionnaires were completed in 103 communities and analysed. 258 persons stated that they had seen a pygmy hippo at least once and gave further information about the habitat (usually close to rivers and streams and in swampy areas), the best period to see them throughout the day and year (mostly morning or afternoon during the dry season, especially February to April), their diet and the general perception about this animal. Most people see it very positive, but it can be aggressive when it has young. Only 16 persons said that pygmy hippos can cause damage to their crops and 15 persons said that pygmy hippos are still hunted. This is for their meat but also other body parts seem to be important for traditional uses. Most people think that the number of pygmy hippos reduced in our project area. Reasons are habitat destruction, expansion of settlements and the noise of power saws that drive them away.

Suitable habitats along rivers were surveyed searching for signs like dung, foot prints and feeding sites of pygmy hippos. In total 93 such “transect walks” were completed. Maps of the historical and current pygmy hippo distribution in the project area were compiled based on the data from the questionnaires and the surveys. Since May 2011 we also deployed camera traps but no pygmy hippos were photographed until the end of the project.

Considering future plans for our pygmy hippo project, we organised several training sessions for our research technicians with April Conway and Prof. John Carroll (University of Georgia) as well as with Gareth Morrissy (University of Chester). The training was on radio telemetry and dung sampling for genetic analyses.

Also concerning the pygmy hippo education programme we collaborated with April Conway and the Environmental Foundation for Africa in producing education materials (e.g. posters and bumper stickers) and conducted joint activities such as education tours in schools, road shows, and mural paintings in the villages. Furthermore, in the framework of the “World Environment Day 2011” we organised a “pygmy hippo day”. Activities were e.g. a pygmy hippo drawing competition for four schools. These activities should further contribute to pygmy hippos becoming a true flagship species for Sierra Leone and the Upper Guinean Forests sub region.

Introduction

- ***The "Across the River – A transboundary Peace Park for Sierra Leone and Liberia " project (ARTP)***

The "Across the River – A Transboundary Peace Park for Sierra Leone and Liberia" project (ARTP) aims at establishing an effective project management framework for cross-border corridor forests to ensure their long-term biodiversity conservation and the global carbon storage benefits. These forests, consisting of potentially 50,000 ha of currently unprotected community forests, are linking the 750 km^2 Gola Rainforest National Park in south-eastern Sierra Leone and the 980 km^2 Gola National Forest in western Liberia, thus forming a continuous forest block within the Upper Guinean Forest region (Fig. 1).

The ARTP was launched in May 2009 and is a partnership of different institutions with different roles. The grantee is the "Vogelbescherming Nederland", the Dutch BirdLife International branch. The overall management of the project is under the responsibility of BirdLife International. The Sierra Leonean and the Liberian governments are represented by the Forestry Division (FD) and the Forest Development Authority (FDA), respectively. Two NGOs, the Conservation Society of Sierra Leone (CSSL) and the Society for the Conservation of Nature of Liberia (SCNL) are responsible for the community-based work concerning sensitization, awareness creation, sustainable management of natural resources and alternative livelihood strategies. Finally, the Royal Society for the Protection of Birds (RSPB) is conducting the research work.

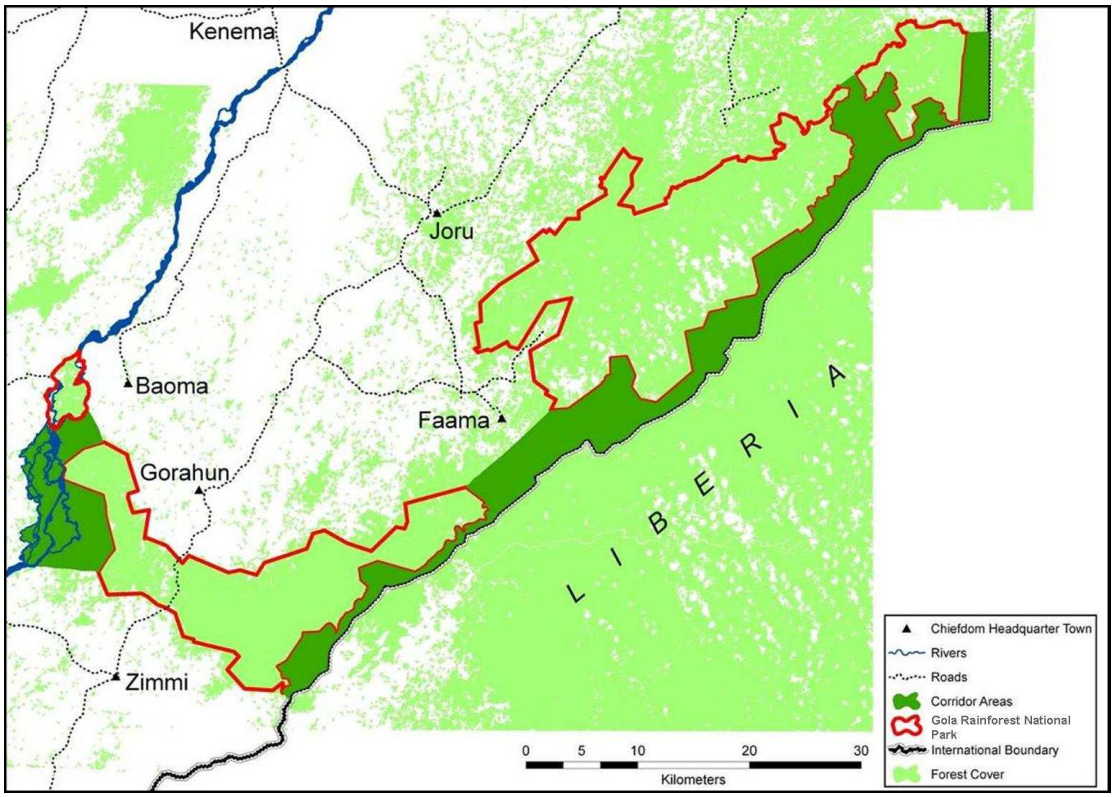

Figure 1: Study area of the ARTP (dark green) in Sierra Leone, linking the Gola Rainforest National Park in Sierra Leone and the Gola National Forest in Liberia.

The research unit of the ARTP, consisting of one conservation scientist, six Sierra Leonean and six Liberian research technicians (as well as seven members of the pygmy hippo conservation team) are responsible for surveying and monitoring flora and fauna, sometimes with the help of external experts. The research especially focuses on key landscape and migratory species such as forest elephants, chimpanzees and pygmy hippos. Based on the findings, recommendations will be made for those corridor areas that are the most important for the key landscape species and biodiversity in general and thus should be priorities for further monitoring and protection.

In the light of pygmy hippo research (and also for some other taxa), the RSPB is conducting predictive range mapping studies to get a better idea on the potential distribution of this species and of areas that should be prioritised for future research (and conservation).

Other activities of the research unit include the collaboration with national and international universities, NGOs and researchers, as well as environmental education.

- ***The pygmy hippo conservation project sponsored by Zoo Basel***

The pygmy hippo conservation project funded by the Basel Zoo aimed at studying, monitoring and protecting pygmy hippos in the project areas of the ARTP (and Gola Forest Programme, GFP) in close collaboration with local communities.

The pygmy hippo conservation project within the ARTP officially started on 1 July 2010 and ended in June 2011. The team consisted of a conservation scientist, a project coordinator, an education officer, ARTP and Gola Forest Programme (GFP) research technicians and five community conservation wardens recruited from communities in the project area. Sadly, one of our community wardens (Sheku Massaquoi) and our project coordinator (Andrew Muana) died in December 2010 and April 2011, respectively, due to serious illness and poor medical care in Sierra Leone. Sheku Massaquoi was replaced in February 2011, Andrew Muana's duties were taken over by the ARTP conservation scientist.

The research technicians and community conservation wardens were trained in basic conservation principles and facts about pygmy hippos, the use of GPS and compass, the application of questionnaires, data sheets etc. They thus were able to work within the communities, to explain the importance and uniqueness of pygmy hippos to community people as well as the need to protect them. Furthermore, they were collecting useful information about the distribution, behaviour and ecology of pygmy hippos. Additionally, in the light of our future plans for the pygmy hippo project, we organised radio telemetry and dung sampling training sessions for our technicians. A detailed overview on the activities performed from July 2010 to June 2011 is given in Appendix 1.

Activities and results

Our activities focused on four different components:

1) ***Awareness creation for project in communities; completing and analysing pygmy hippo conservation questionnaires***

In 2010 the main focus of our activities lay on the visits in the communities and the application of questionnaires (Fig. 2). These questionnaires were digitalised and analysed in 2011. The aim was to get basic information about the distribution of pygmy hippos in the project area and about the threats they face, to get an idea about the villagers' knowledge and view about pygmy hippos and to sensitise the communities about the project and the importance of pygmy hippos. Within the seven chiefdoms in the project area 103 villages were visited (App. 2) and in total 271 pygmy hippo

questionnaires (App. 3) were completed. The questionnaire is a slightly modified version of a questionnaire that was used for an earlier pygmy hippo survey performed by the GFP. As in many of the communities the pygmy hippo team was the first group representing the ARTP, the completed questionnaires and the presence of the pygmy hippo team in the respective communities gave also valuable support and information to the ARTP in general.

Figure 2: Pygmy hippo conservation team applying questionnaires in community.

Table 1 shows the major results of the pygmy hippo questionnaires. Out of 271 respondents 258 stated that they had seen a pygmy hippo at least once. Forty two respondents were able to lead the survey team to the actual location where they had seen the pygmy hippo(s). The map in Figure 3 shows the "historical" distribution of Pygmy hippos in our project area. Most respondents (117) had seen a single individual, while the other respondents saw more individuals, but they did not always clarify if they saw the animals at different occasions or at the same time. At 74 occasions, the respondents saw the pygmy hippo accompanied by a calf (but out of these 74 ten had stated that they only saw one animal in total, which would mean that they should have seen the calf/juvenile being on its own). During the day the best time to see pygmy hippos seems to be in the afternoon (95 respondents) and in the morning (91 respondents), while the best time during the year is the dry season (215 respondents), especially from February to April. Most of the time pygmy hippos are observed to feed in swampy areas (196 respondents). A list of feeding plants based on the knowledge of the respondents is given in Appendix 4. The by far most frequent answer given by almost every respondent was a herbaceous plant called "kPuhun" in the local Mende language (*Triumfetta cordifolia;* family Tiliaceae). Other herbaceous plants were also mentioned many times, e.g. *Ipomoea batatas, Brillantaisia nitens* and *Lonchocarpus cyanescens.* In some cases it was not possible to identify the correct species based on the given Mende name. In addition to herbaceous plants and slippery leaves people believe that pygmy hippos like to eat fish and crabs, garden eggs, beans, cocoa, yams, sweet potatoes, papaya, okra, mud and charcoal. As explained already in the first report, it is a

widespread idea that pygmy hippos like charcoal very much and that they cease fires close to the streams by carrying water in their mouths in order to eat the charcoal.

Table 1: Major results obtained from the pygmy hippo conservation questionnaire that was applied in 103 communities.

Question	**Yes**	**No**	**No answer/ No idea**	**Others** (Answer with number of respondents)
Have you ever seen a pygmy hippo?	258	13		
How many did you see?			1	1 pygmy hippo: 117 persons 2 pygmy hippos: 78 persons 3 pygmy hippos: 32 persons 4 pygmy hippos: 7 persons 5 pygmy hippos: 6 persons 6 pygmy hippos: 1 persons Many: 9 persons Many times: 1 persons Others: 7 persons
Did they have young with them?	74	182	2	
What time of the day can we see them?			18	During the day: 24 During day and night: 5 Morning: 91 Noon: 15 Afternoon: 95 Evening: 18 Night: 7
What time of the year can we see them?			19	Whole year: 11 Whole year, but more in the dry season: 2 Dry season: 213 Rainy season: 26
Where do pygmy hippos feed?			33	Flat land, lowland: 27 Swampy areas: 196 Along rivers/streams: 8 Flood plains: 4 Islands: 2 Land: 1
Are pygmy hippos destructive to crops?	16	243	12	
In your opinion, are there more pygmy hippos now than in the past?	106	148	17	
Are pygmy hippos hunted in this area?	15	244	12	

Only 16 respondents were convinced that pygmy hippos are destructive to crops. Interestingly, all these respondents are from communities closer to Tiwai Island, while in the rest of our project area there seem to be no problems with pygmy hippos encroaching farms.

Concerning the number of pygmy hippos compared to past times, most respondents (148) believe that their number has reduced, while another large number of respondents (106) think that the number has increased. As main reasons for the decrease in the population size of pygmy hippos the respondents see habitat destruction, migration, farming, logging (especially with power saw operation), hunting for bush meat and traps,

noise of gunshots, expansion and creation of settlements, dry streams, and mining. The respondents who stated that there are more pygmy hippos now than in the past explained that pygmy hippos migrate to Sierra Leone from Liberia, that they find a lot of food plants around some areas, and that the hunting pressure as well as some other human activities that might disturb pygmy hippos have reduced.

While during our survey we did not see any direct (and indirect) evidence for hunting activities targeting specifically on pygmy hippos, 15 persons stated that pygmy hippos are hunted. However, two respondents out of these 15 referred to former times. Usually, pygmy hippos are hunted for their meat (private consumption and bush meat trade). The oil is used for cooking and frying. Besides these, there are other uses related to traditional believes and rituals, sometimes of specific secret societies. Pygmy hippos seem to be especially important for pregnant and breast-feeding women and chiefs. If a pygmy hippo is killed, especially pregnant women come around to look at it. The bones are for example used for necklaces and chains, e.g. pregnant women believe that a chain of pygmy hippo bones will help them to have healthy babies as they believe the babies will get a big and fat neck like the pygmy hippo. Likewise the teeth are/were put around the neck of children to protect them (and they are also useful for protection of other people) and members of ruling homes also were identified by wearing pygmy hippo teeth. There are some medical purposes, e.g. some people rub their skin with pygmy hippo oil against pain or chiefs use the tail for medicinal purposes (we did not get any details about these purposes). One respondent reported about a pygmy hippo skin that was sold to a Nigerian herbalist. The oil is also used for certain rituals, e.g. it is a protection for chiefs. Also the private parts of male pygmy hippos are used (but it was not defined for what). Furthermore, special parts of the pygmy hippo body (no clarification which parts) were given to chiefs for compensation. Some secret societies were reported to burry their dead members by first wrapping the corpse in a pygmy hippo skin (and the societies are suspected to have a few pygmy hippo skins in stock). In line with this some respondents said that when pygmy hippos are killed, they are skinned and the skin is kept to burry people. In Liberia, the tails of pygmy hippos were reported to be poisonous and they thus need to be presented to the chiefs and communities after a pygmy hippo is killed, so that no harm can be done with them. No similar belief was reported in Sierra Leone.

In general people have a very positive perception of pygmy hippos and some respondents even said they “love” them and that they need to be protected. They think that the animal is very quiet and secretive, beautiful, nice and harmless, with a very smooth (and thick) skin like humans and with fingers on their feet (that create footprints like from small children). One part of the body people like to look at is the neck. Pygmy hippos only get dangerous when they have given birth and are accompanied by calves or when they are wounded. Some respondents said that pygmy hippos only give birth during the dry season, only to one calf at the time and that there is much parental care. One respondent said that they hate humans and another respondent thinks that they are like devils as it is difficult for humans to see and kill the animal. The latter respondent also said that pygmy hippos are red when they are born and turn black after some days.

While some respondents believe that it is not good to eat pygmy hippos because of their beauty, others think that they are very sweet (with much oil) and that they are food. Some people explained how best to catch pygmy hippos and explained that pitfall traps were used a long time ago (and now are used around Tiwai Island). One respondent said that the dung of pygmy hippos is very sensitive. Another person said that they are important animals because the people from the Gola Forest are interested in them.

2) *Pygmy hippo survey in suitable habitats and in areas where community members indicated presence of pygmy hippos*

The survey work using the pygmy hippo survey data sheet (App. 5) that was developed by the GFP for earlier pygmy hippo surveys was mainly performed after the peak of the rainy season, throughout the dry season and until the end of the pygmy hippo project. During the rainy season signs of pygmy hippos are very often washed away and especially close to rivers, the terrain is flooded and not accessible. During the dry season more suitable habitats were accessible and besides the information from the questionnaires also the maps resulting from the predictive range mapping done at RSPB helped to identify priority areas for the surveys. Also for the surveys, the community wardens used the acquired knowledge concerning GPS, compass and the application of the survey data sheet in the field. During the survey, the team performed "transect walks" (no standardized length, random walks along suitable habitats) along rivers and streams, searching for pygmy hippo signs such as dung, footprints and feeding sites (see also pictures in the first report). In total, 93 such "transect walks" were completed. The results are shown in the map in Figure 4.

In May and June 2011 we deployed camera traps in order to also get direct records of pygmy hippos. Until the end of the project we did not get any pygmy hippo pictures on the camera.

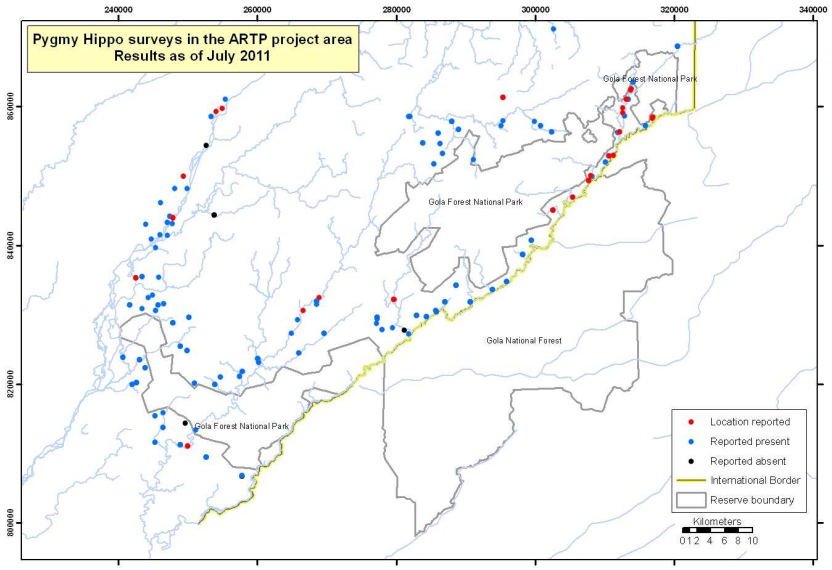

Figure 3: Historical records of pygmy hippos in the ARTP study area around the Gola Rainforest National Park based on the results from the pygmy hippo conservation questionnaires (black dots: respondent never saw a pygmy hippo; blue dots: respondent reports to have seen a pygmy hippo at least once; red dots: respondent saw a pygmy hippo and was able to lead survey team to the actual location).

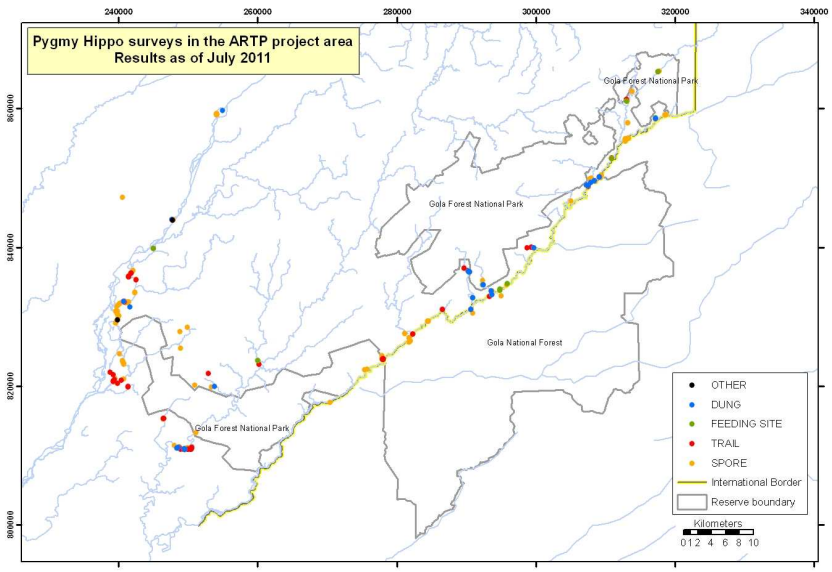

Figure 4: Current distribution of pygmy hippos in the ARTP study area around the Gola Rainforest National Park based on the results from surveys/transect walks (different colours of dots indicate different types of signs recorded; blue: dung; green: feeding site; red: trail, yellow: footprint).

3) Environmental/pygmy hippo education and distribution of posters and other education materials in communities and schools

The environmental/pygmy hippo education activities within the pygmy hippo conservation project focused on the visits in schools and communities as well as on the development of educational materials like a pygmy hippo conservation poster, bumper stickers, and T-Shirts (Figs. 5-6). As also April Conway (University of Georgia; UGA) and the Environmental Foundation for Africa (EFA with the FoSED programme of Welthungerhilfe) were performing environmental education programmes in the same Sierra Leonean sub region, it seemed reasonable to join efforts. From April 2011 on joint activities were also performed with the community development department of the GFP. The latter especially aimed at the revival and the establishment of nature clubs at schools (some with a focus on pygmy hippos) as wells as road shows/film presentations and open dialogues in communities. In total, joint education programmes were performed in 62 schools (App. 6) and at least five additional communities. The programmes contained presentations on wildlife, endangered species, pygmy hippos, deforestation and environmental issues in general, as well as quizzes.

Posters and bumper stickers were also distributed in cities close to the project area (e.g. Kenema and Bo) in order to widen the impact of our conservation project. Bumper stickers were especially distributed to commercial bus and motorbike riders who placed them on their vehicles and bikes. Furthermore, posters and bumper stickers were given to the environmental education unit of the Sierra Leonean Environmental Protection Agency (SLEPA) which is running school programmes all over Sierra Leone and guaranteed a country-wide distribution of the materials.

Figure 5: Community sensitisation and education in schools and communities performed by the education officers from the ARTP pygmy hippo conservation project, GFP and EFA as well as April Conway (UGA), also using the jointly developed pygmy hippo conservation poster.

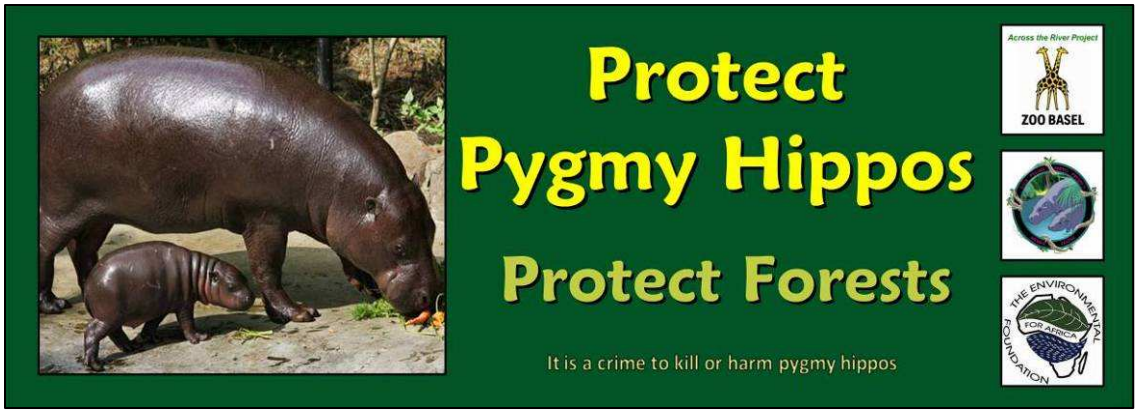

Figure 6: Bumper sticker developed and printed in collaboration with April Conway (UGA) and the Environmental Foundation for Africa (EFA).

Further joint activities with April Conway and the EFA were mural paintings and the realisation of a pygmy hippo day with different activities (e.g. a march pass and a drawing competition) in the framework of the World Environment Day 2011 (5 June 2011; Figs. 7-9). Mural paintings, that were organised and led by April Conway (who got funding for the purchase of the equipment mainly from the American Embassy) were normally done on so-called “court-barries” which usually are in the centre of the town and thus, seen by all people in town, provide very good platforms for sensitisation and conservation messages. Compared to posters and signboards they draw more attention and also have a much longer life span (and of course also the painting process itself provides an opportunity for conversations with community members and thus sensitisation).

Figure 7: Mural paintings, organised by and funded through April Conway’s project were done in three villages, also in collaboration with EFA (pictures: April Conway).

Figure 8: Impressions from the Pygmy Hippo day on the World Environment Day 2011 in Sahun, with the winners of the pygmy hippo drawing competition on top and the pygmy hippo march pass at the bottom.

Figure 9: Mural painted at the Secondary School in Potoru, winner of the pygmy hippo drawing competition on pygmy hippo day (pictures: April Conway).

4) Training for research technicians

In the light of future plans for our pygmy hippo project, we organised three training sessions for our research technicians in close collaboration with April Conway and Prof. John Carroll (UGA) as well as with Gareth Morrissy (University of Chester). Also staff members from the EFA participated in the training that focused among others on radio telemetry and dung sampling for genetic analyses. The training sessions took place from 9 to 12 January 2011 in Sileti (Gola Rainforest National Park; all research technicians; Fig. 10), from 12 to 20 April 2011 on Tiwai Island (intensive training conducted by April Conway and Prof. Carroll for one research technician from ARTP and GFP, each), and from 2 to 4 June 2011 on Tiwai Island (all research technicians; Fig. 11). The pygmy hippo conservation project thus did not only contribute greatly to capacity building of community conservation wardens, but also of research technicians and assistants from different institutions and projects involved in pygmy hippo conservation.

Figure 10: Training for research technicians, organised by the ARTP with April Conway and Prof. John Carroll (University of Georgia) in Sileti from 9-12 January 2011, with a focus on radio telemetry.

Figure 11: Training for research technicians, organised by ARTP and UGA with Gareth Morrissy (on top; University of Chester) and April Conway (at the bottom; University of Georgia) on Tiwai Island from 2 to 4 June 2011, with a focus on dung sampling for genetic analyses and radio telemetry.

Future Plans for pygmy hippo research and conservation in the Gola Forest area

The pygmy hippo conservation project sponsored by the Basel Zoo and the collaboration with other institutions in pygmy hippo research and conservation formed an excellent basis for future pygmy hippo work which is highly recommended in order to protect one of the last thresholds of this species in its natural habitat. The aim of a future pygmy hippo project, that is planned to be conducted in close collaboration with all other active pygmy hippo researchers in Sierra Leone should aim at studying the distribution, ecology, population genetics (in order to e.g. determine population sizes), movement patterns and home ranges of pygmy hippos on Tiwai Island, in the Gola Rainforest National Park and in connecting corridor areas. It also should create awareness and enhance the protection of pygmy hippos through environmental education in and active involvement of adjacent communities. Planned activities include e.g. the deployment of camera traps, radio telemetry, conservation genetics, and environmental education. Effective collaboration will ensure the best contribution of each partner's expertise and resources and will avoid duplications. Potential partners for such a joint project for the neighboring study areas Gola Forests and Tiwai Island are the University of Georgia (UGA), the University of Chester, Njala University/Centre for Biodiversity Research (CBR), RSPB via Gola Forest Programme (GFP) and Across the River – Transboundary Peace Park Project (ARTP) and the Environmental Foundation for Africa (EFA).

The team on the ground would consist of the a PhD student from UGA, one Master student from ARTP/GFP and Chester University, one Master student from Njala University/the Centre for Biodiversity Research, the Research coordinator of ARTP/GFP, the Research technicians of ARTP/GFP, assistants from UGA and EFA as well as

education officers and community mobilisation officers from ARTP/GFP and Education officers from EFA. Lab work would happen at the University of Chester.

Scientific advice and supervision would mainly come from Prof. John Carroll/Sonia Hernandez and Prof. Paul O'Donoghue. Also the research coordinator from ARTP/GFP (currently Dr. Annika Hillers for ARTP who has extensive expertise in field work techniques and genetics) and the PhD student from UGA will be able to supervise the master students and research technicians and to give advice along with Njala University/CBR.

The responsibilities of different collaboration partners could be distributed as follows:

Activity	**Implementing partners**	**Leading partner**
Camera traps	UGA, ARTP/GFP	UGA or ARTP/GFP
Radio telemetry	UGA, ARTP/GFP	UGA
Population genetics	Chester, UGA, ARTP/GFP	Chester
Monitoring, surveys, transects	UGA, ARTP/GFP, Chester	UGA or ARTP/GFP or Chester
Set up data base for camera trap pictures and genetic data	Chester, UGA, ARTP/GFP	?
Predictive range mapping	RSPB	RSPB
Environmental education	Occasionally all partners, but mainly EFA and ARTP/GFP	EFA?

The UGA, ARTP and GFP can provide several very important logistics as well as some funding of part of the works, e.g. ARTP and GFP have 30 camera traps, a portable generator, projector and screen for environmental education, antenna and receiver for radio telemetry, the usual monitoring equipment: GPS, compass etc. as well as project vehicles and project motorbikes.

The potential collaboration partners had first discussions about the design of the work and are seeking for funding to finance this important project in order to conserve one of the last major populations of pygmy hippos in the wild in close collaboration with local communities.

Acknowledgements

We thank the Zoo Basel for the great support that enabled us to conduct this pygmy hippo project and to involve local communities in pygmy hippo conservation. We also thank April Conway and Prof. John Carroll for the fantastic collaboration and the unique training opportunities provided to our staff. Thank you also to the Environmental Foundation of Africa for their good collaboration at several occasions.

We are deeply thankful to Andrew Muana and Sheku Massaquoi who were great colleagues and wonderful team members of our pygmy hippo conservation team. We regret that they passed away and wish we could have worked and lived with them much longer.

Appendix 1: List of activities in the pygmy hippo conservation project from July 2010 to June 2011 with locations (district towns or chiefdoms), dates and participants.

Activity	Location	Dates	Team members
Inception pygmy hippo project, training community conservation wardens	Kenema	5-9 July 2010	5 Community wardens, Kailie, Andrew, M. Koroma, Annika, Prince (GFP)
Pygmy hippo questionnaires & survey	Nomo Chiefdom	13-19 July 2010	5 Community wardens, Kailie, Andrew, M. Koroma, Annika, Prince (GFP)
Pygmy hippo questionnaires & survey	Chiefdom Nomo	26-30 July 2010	5 Community wardens, Kailie, Andrew, M. Koroma, Annika, Prince (GFP)
Training community conservation wardens pygmy hippo project	Kenema	9-12 July 2010	5 Community wardens, Kailie, Andrew, M. Koroma
Pygmy hippo education & collaboration with April Conway, EFA/FoSED	Bo	13 August 2010	Andrew, Kailie, Annika
Pygmy hippo research and collaboration, meeting with April Conway, EFA/FoSED	Tiwai Island	13-15 August 2010	Annika
Pygmy hippo questionnaires & survey	Nomo and Gaura Chiefdoms	17-22 August 2010	Mohamed K., Kallon, Sheku, Umaru
Pygmy hippo questionnaires & survey	Nomo, Malema and Gaura Chiefdoms	27 August-2 September 2010	Mohamed K, Kallon, Sheku, Umaru, Muana, Lahai
Pygmy hippo education & collaboration with April Conway, EFA/FoSED	Bo	16 September 2010	Andrew, Kailie, Annika
Pygmy hippo project & collaboration with April Conway, presentations	Kenema	17 September 2010	Pygmy hippo team, Annika, ARTP and GFP RTs, ARTP CMOs

Activity	Location	Dates	Team members
Pygmy hippo team induction workshop with research unit	Kenema	4-7 October 2010	Andrew, Kailie, Solomon, Kallon, Umaru, Muana, Lahai, Sheku, Mohamed K., Annika
Pygmy hippo conservation project integration into ARTP; experience sharing and project implementation workshop	Kenema	12-14 October 2010	Andrew, Kailie, Solomon, Kallon, Umaru, Muana, Lahai, Sheku, Mohamed K., Annika
Pygmy hippo education & collaboration with April Conway, EFA/FoSED: Joint school programme	Barri and Pejeh Chiefdoms	11-15 October 2010	Kailie
Pygmy hippo education & collaboration with April Conway, EFA/FoSED	Bo	19 October 2010	Andrew, Kailie, Annika
Pygmy hippo questionnaires & survey	Malema, Makpele, Tunkia and Barri Chiefdoms	19-26 October 2010	Umaru, Muana, Solomon, Kallon, Sheku, Lahai
Pygmy hippo questionnaires & survey	Malema Chiefdom Makpele Chiefdom	29 October-4 November	Umaru, Muana, Solomon, Kallon, Sheku, Lahai, Andrew
Pygmy hippo questionnaires & survey	Malema and Nomo Chiefdom	8-12 November	Umaru, Muana, Solomon, Kallon, Sheku, Lahai
Pygmy hippo questionnaires & survey	Koya and Barri Chiefdoms	17-23 November 2010	Solomon, Kallon, Umaru, Muana, Lahai
Pygmy hippo conservation strategy workshop from IUCN in Monrovia	Monrovia, Liberia	22-24 November 2010	Andrew, Annika
Pygmy hippo education & collaboration with April Conway, EFA/FoSED: Joint school programme	Gorahun and Pewa in Tunkia and Malema Chiefdoms	29-30 November 2010	Kailie, Annika

Activity	Location	Dates	Team members
Pygmy hippo education & collaboration with April Conway, EFA/FoSED	Kenema	1 December 2010	Andrew, Kailie, Annika
Pygmy hippo survey	Tunkia and Nomo Chiefdoms	2-9 December 2010	Solomon, Kallon, Umaru, Andrew, Lahai
Pygmy hippo education: school visits	Kenema	6-8 December 2010	Kailie
Pygmy hippo survey	Malema and Momo Chiefdoms	12-17 December 2010	Solomon, Kallon, Umaru, Andrew, Lahai
Training (also radio telemetry) with April Conway and Prof. John Carroll	Sileti	9-12 January 2011	All research technicians ARTP and GFP, assistants UGA and EFA, Andrew, Annika
Pygmy hippo education	Faama, Nomo Chiefdom	10-13 January 2011	Kailie
Pygmy hippo survey	Malema Chiefdom	10-17 January 2011	Lahai Umaru
Pygmy hippo survey	Nomo Chiefdom	10-17 January 2011	Kallon, Muana
Pygmy hippo survey	Malema Chiefdom	24-29 January 2011	Lahai, Umaru
Pygmy hippo survey	Tunkia and Barri Chiefdoms	25-31 January 2011	Solomon, Kallon, Muana
Pygmy hippo survey	Koya Chiefdom	1-7 February 2011	Andrew, Lahai, Umaru
Pygmy hippo survey	Makpele Chiefdom	2-8 February 2011	Solomon, Muana, Kallon, Fofanah
Pygmy hippo survey	Tunkia Chiefdom	11-18 February 2011	Andrew, Muana, Umaru, Fofanah
Pygmy hippo survey	Koya Chiefdom	14-21 February 2011	Solomon, Lahai, Kallon
Pygmy hippo survey	Malema Chiefdom	27 February-4 March 2011	Andrew, Muana, Umaru
Pygmy hippo survey	Nomo Chiefdom	1-5 March 2011	Solomon, Kallon, Lahai, Fofanah

Activity	Location	Dates	Team members
Pygmy hippo survey	Tunkia Chiefdom	7-11 March 2011	Andrew, Muana, Umaru, Fofanag
Pygmy hippo education	Malema Chiefdom	10-12 March 2011	Konneh
Pygmy hippo survey	Barri Chiefdom	15-19 March 2011	Solomon, Kallon, Lahai
Pygmy hippo education, school visits	Malema and Gaura Chiefdoms	15-30 March	Konneh
Pygmy hippo survey	Tunkia Chiefdom	1-4 April 2011	Fofanah, Kallon, Gareth (Chester University)
Pygmy hippo education (visit school to implement nature clubs with GFP)	Gaura Chiefdom	6-8 April 2011	Konneh, Samai (GFP)
Pygmy hippo education (visit school to implement nature clubs with GFP)	Gaura Chiefdom	11-15 April 2011	Konneh, Samai (GFP)
Pygmy hippo survey	Nomo Chiefdom	11-18 April 2011	Muana, Kallon
Pygmy hippo survey	Makpele Chiefdom	11-18 April 2011	Fofanah, Umaru
Training (radio telemetry) with April Conway and Prof. John Carroll	Tiwai Island	12-20 April 2011	Patrick S., Sullay (GFP)
Pygmy hippo education (visit school to implement nature clubs with GFP)	Koya Chiefdom	18-22 April 2011	Konneh, Samai (GFP)
Pygmy hippo survey	Makpele	2-9 May 2011	Fofanah, Kallon, Gareth (Chester University)
Pygmy hippo survey	Koya Chiefdom	2-9 May 2011	Muana, Umaru
Pygmy hippo education (visit school to implement nature clubs with GFP)	Nomo Chiefdom	4-6 May 2011	Konneh, Samai (GFP)
Pygmy hippo education (visit school to implement nature clubs with GFP)	Tunkia Chiefdom	9-12 May 2011	Konneh, Samai (GFP)
Pygmy hippo survey	Nomo Chiefdom	18-25 May 2011	Kallon, Umaru
Pygmy hippo survey, Camera traps	Makpele Chiefdom	18-25 May 2011	Fofanah, Patrick

Activity	Location	Dates	Team members
Pygmy hippo survey	Malema Chiefdom	19-26 May 2011	Muana, Lahai
Pygmy hippo education (mural painting with April Conway and EFA)	Potoru	19-22 May 2011	Konneh, April Conway & team, EFA
Pygmy hippo education (Drawing Competition World Environment Day), distribution of materials	Zimmi and Potoru	24-25 May 2011	Konneh
Pygmy hippo education (mural painting with April Conway and EFA)	Baoma	27-29 May 2011	Konneh, April Conway & team, EFA
Pygmy hippo survey	Malema Chiefdom	1-10 June 2011	Lahai, Fofanah, Muana
Pygmy hippo survey	Nomo Chiefdom	1-7 June 2011	Kallon, Umaru
Pygmy hippo education (Drawing Competition World Environment Day)	Zimmi and Potoru	1-2 June 2011	Konneh
Training (e.g. radio telemetry, dung sampling, genetics) with April Conway, Gareth Morissy, Annika	Tiwai Island	2-4 June 2011	All research technicians ARTP and GFP, assistants UGA and EFA, Annika
World Environment Day, Announcing winner of Pygmy hippo drawing competition	Sahun	5 June 2011	All research technicians ARTP and GFP, assistants UGA and EFA, Annika, Konneh
Pygmy hippo survey, Camera trap collection	Makpele Chiefdom	9-11 June 2011	Fofanah, Annika
Pygmy hippo education (mural painting with April Conway and EFA)	Potoru	10-13 June 2011	Konneh, April Conway & team, EFA
Pygmy hippo survey, Camera trap deployment	Makpele Chiefdom	16-21 June 2011	Solomon Fofanah
Pygmy hippo education (mural painting with April Conway and EFA)	Koya Chiefdom	17-20 June 2011	Konneh, April Conway & team, EFA

Activity	Location	Dates	Team members
Pygmy hippo survey	Malema Chiefdom	20-28 June 2011	Muana, Lahai, Koroma
Pygmy hippo survey	Nomo Chiefdom	21-28 June 2011	Umaru, Kallon

Appendix 2: List of chiefdoms and communities (103) that were visited by the community wardens and where pygmy hippo conservation questionnaires were completed.

1) **Malema Chiefdom** (19 communities): Mayengema, Mogbaima, Makpoima, Seyama, Banni, Kongo, Gori, Konnela, Giema, Missila, Levuma, Fobu, Njagolahun, Takpoima, Teyama, Bandajuma, Potama, Dambala, Jojoima
2) **Makpele Chiefdom** (10 communities): Nyeyama, Jeniva, Sendebuma, Palima, Pewa, Baguihun, Bayama, Gbaa, Wunde, Matai
3) **Nomo Chiefdom** (21 communities): Kwadima, Ngedola, Faama, Waima, Kanela 1, Kanela 2, Pelewama, Kpandebu, Taninahun, Manjama, Tolobu, Libbie, Kponubu, Peiyema, Dambala, Levuma, Ngida, Boiboiwoima, Yeima Bubo, Kpomuima
4) **Gaura Chiefdom** (8 communities): Gbahama, Golala, Mendekelema, Bonoryiema, Gbadiwoh, Bo Gaura, Sembehun, Jenneh
5) **Tunkia Chiefdom** (19 communities): Gbonumbu, Golawoma, Fatio, Bikoma, Bongoma, Nemahugoima, Geiwumba, Folima, Tigbwema, Nagbwena, Buma, Masaila, Mano Njeigbla, Njagbaka, Vaama, Njama, Geindema, Matago, Bo
6) **Barri Chiefdom** (2 communities): Samatia, Teiwoma
7) **Koya Chiefdom** (24 communities): Baoma, Geiya, Gobioma, Jajei, Kokerma, Mapuma, Vaama, Segbema, Kpandema, Kortumahun, Bangoma, Nyewalagor, Madiana, Jagbwema 1, Jagbwema 2, Tolobu, Gbongay, Kamasu, Joi, Bogboabu, Bongor-Jaelah, Bandajuma, Diama, Senehun

Appendix 3: Pygmy hippo conservation questionnaire applied in targeted communities by the community wardens and other team members of the pygmy hippo conservation project.

PYGMY HIPPO CONSERVATION VILLAGE QUESTIONNAIRE :

Date		Team		GPS NO.	
Village		on			

1. Have you ever seen a pygmy hippo? Yes_____ No_____

2. If yes, where did you see it? _____

3. How many did you see? _____

4. Did they have young with them? Yes_____ No_____

5. Can you take me to the place where you saw it? (If agreed record)

(a). GPS location_____ (b) Waypoint_____

6. Apart from this area, where else can we find pygmy hippos? _____

7. What time of the day can we see them? _____ and what time of the Year can one see them? _____

8. Where do pygmy hippos feed? _____

9. What kind of food do they eat? List _____

10. Are pygmy hippos destructive to food crops? Yes_____ No_____

11. In your opinion, are there more pygmy hippos now than they were in the past?
Yes_____ No_____

12. If no, what do you think has caused this?_____

13. Are pygmy hippos hunted in this area? Yes_____ No_____

14. If yes, what are they hunted for? _____

15. Except from bushmeat, do you know any other way people use their body or body parts? (Explain)_____

16. Where do pygmy hippos spend most of their time? _____

17. Comments and Remarks_____

Appendix 4: List of food plants for pygmy hippos based on the results of the community conservation questionnaires.

Family	Scientific name	Mende or common name
Acanthaceae	*Brillantaisia nitens*	Putaputa
Araceae	*Cyrtosperma senegalense*	Dinei/Dina
	Xanthosoma sagittifolium	Koko (Cocoyams)
Caricaceae	*Carica papaya*	Powpow (Papaya)
Compositae	*Aspilia latifolia*	Tonye
Convolvulaceae	*Ipomoea batatas*	Joella (Sweet potato)
	Ipomoea digitata	Hoke-Yowo
	Ipomoea hispida	kPokpoi
	Ipomoea involucrata	nDondokoe
Dilleniaceae	*Tetracera potatoria*	Katata
Dioscoreaceae	*Dioscorea* spp.	Yams
Euphorbiaceae	*Alchornea cordifolia*	nJeko/nJekoei
	Manihot esculenta	Tagay, Cassava (Maniok, Tapioca)
Hydrocharitaceae	*Ottelia ulvifolia**	Nengbe*
Nympheaceae	*Nymphaea* spp.	Pupendei/Pupenda, Water lilies
Olacaceae	*Coula edulis*	nDoko (nDokei)
Papilionaceae	*Lonchocarpus cyanescens*	nJala
Rhamnaceae	*Gouania longipetala*	Sawa/Sawai (1)
Rhizophoraceae	*Rhizophora racemosa*	Jaiya
Rubiaceae	*Geophila uniflora*	Sawa/Sawai (2)
Solanaceae	*Solanum verbascifolium*	Kondogbo
Tiliaceae	*Triumfetta cordifolia*	Kpuhun

* In contrary to the other plants in this list, the authors have doubts that this plant is really eaten by pygmy hippos.

Appendix 5: Pygmy hippo survey data sheet.

ARTP—PYGMY HIPPO survey data sheet Date

Start location GPS Waypoint Time:

HIPPO SIGNS:

Way point	Location		Time	Altitude	Type of sign encountered (mud wallow, dung, trail, footprints)	Habitat type sign encountered in (river, forest, swamp, farmbush, other)	Distance to nearest strm/rvr	Estimated stream/river width	Estimated stream/river depth a) <20 cm b) 20 -50 cm c) >50 cm

End location GPS Additional comments/obervations

Appendix 6: List of 62 schools visited by the education officers (Abraham Kailie, July 2010 to February 2011 and Mohamed Konneh, March to June 2011) of the pygmy hippo conservation project. Visits were mainly done either in collaboration with April Conway (University of Georgia) and Victor Momoh (EFA/FoSED) or with the education officer Senesie Samai from the Gola Forest Programme.

Number	Town/village	Name of the School
1	Kenema	Holy Rosary Secondary School
2	Kenema	Every Nation Academy School
3	Kenema	Saint Paul's Primary School
Gaura Chiefdom		
4	Joru	Ahmadiyya Muslim Senior Secondary School
5	Joru	National Islamic Primary School
6	Joru	Methodist Primary School
7	Niawama	Alfatta Islamic Primary School
8	Lalehun	Km. DC. Primary School
9	Jaivulahun	National Islamic Primary School
10	Njala	Nationl Islamic Primary School
11	Njagbwema	National Islamic Primary School
12	Sembehun	Km. DC. Primary School
13	Mendekelema	Roman Catholic Primary
Tunkia Chiefdom		
14	Gorahun	Tunkia Junior Secondary School
15	Gorahun	National Islamic Primary School
16	Gorahun	Km. DC. Primary School
17	Gorahun	Roman Catholic Primary School
18	Gegbwema	Ahmadiyya Muslim Junior Secondary School
19	Gegbwema	National Islamic Primary School
20	Gegbwema	Methodist Primary School
21	Kulawoma	Ansaru Islamic Primary School
22	Belebu	Roman Catholic Primary School
23	Belebu	Alfatta Islamic Primary School
24	Mano Njeigbla	Charitable Community Primary School
Nomo Chiefdom		
25	Faama	Govt. Agricultural Junior Secondary School
26	Faama	National Islamic Primary School
27	Faama	Roman Catholic Primary School
28	Lowuma	National Islamic Primary School
29	Baoma	United Muslim Association School
30	Kpandebu	National Islamic Primary School
31	Wayeihun	Islamic Call Primary School
Koya Chiefdom		
32	Baoma	Government Secondary school Koya
33	Baoma	Roman Catholic Primary School
34	Pewama	Km. D.C. Primary School
35	Nyandehun	United Muslim Community Primary School
36	Nyandehun	Alcodus Islamic Primary School
37	Menima	Roman Catholic Primary School
38	Joi	National Islamic Primary School
39	Serabu	Islamic Call Society Primary School
40	Bongor	Km. D.C. primary School
41	Gorahun 1	Km. D.C. Primary School

Number	Town/village	Name of the School
42	Borgbuabu	AL-Qudus Islamic Primary School
43	Gbongay	McGrath Primary School
	Makpele Chiefdom	
44	Zimmi	Zimmi Secondary School
45	Pewa	National Islamic/SLMB Primary School
	Barri Chiefdom	
46	Potoru	Barri Islamic Secondary School
47	Potoru	National Islamic Primary School
48	Saahun	National Islamic Primary School
49	Vaama	Roman Catholic Primary School
50	Massah/Massawo	District Council Pri. School School
51	Futtah Pejeh	Roman Catholic Primary School
52	Kambama	Primary School
	Malema Chiefdom	
53	Jojoima	Law Memorial Methodist Secondary School
54	Jojoima	Sierra Leone Church Primary School
55	Jojoima	Methodist Primary School
56	Madina	Methodist Primary School
57	Fobu	KI.D.C. Primary School
58	Giema	KI.D.C. Primary School
59	Jojoima	Provincial Islamic Secondary School
60	Jojoima	Provincial Islamic Primary School
61	Bumpeh	Methodist Primary School
62	Giehun	Methodist Primary School

Appendix 7: Programmes of three training units for research technicians conducted in collaboration with the University of Goergia, University of Chester, the Gola Forest Programme and the Environmental Foundation for Africa.

Joint training Sileti, 9-12 January 2011

Training programme:

Sunday, 9 January				
13:00	Departure from Kenema, office GFP			
16:00-18:00	Arrival in Sileti, pitching tents			
19:00	Welcome and Ice breaking			
19:30	Overview over training programme			
19:45	Dinner			
Evening	Presentations/Films			
20:15-21:15	Chimp Survey training in Liberia: Patrick D.			
Monday, 10 January				
06:00-7:00	Birding			
7:30-8:00	Breakfast			
Morning	Presentations			
8:30-11:30	1) GPS & Monitoring: Andrew & Denis 2) Transect Sampling: John 3) Radio telemetry: April			
12:00-13:00	Lunch			
Afternoon	**1) Radio telemetry**	**2) GPS, compass, binoculars**	**3) Tree/Plant identification**	**4) Transect sampling, camera traps, mammals**
13:30-15:30	**Group 1**	**Group 2**	**Group 3**	**Group 4**
Trainer:	Prof. John Carroll	Denis/Andrew/Lumeh	Turay/Solomon	Patrick D./ Swaray/Koroma
15:30-17:30	**Group 4**	**Group 1**	**Group 2**	**Group 3**
Trainer:	Prof. John Carroll	Prince/Annika/Ehlogima	EFA/Denis/Lumeh	Sullay/Turay/ Solomon
18:00-18:30	Dinner			
Evening	Presentation/Films			
19:30-20:30	Population Dynamics: Prof. John Carroll			
Tuesday, 11 January				
06:00-7:00	Birding			
7:30-8:00	Breakfast			

Morning	**1) Radio telemetry**	**2) GPS, compass, binoculars**	**3) Tree/Plant identification**	**4) Transect sampling, camera traps, mammals**
8:30-10:30	**Group 3**	**Group 4**	**Group 1**	**Group 2**
Trainer:	Prof. John Carroll	Koroma/ Patrick D./Swaray	EFA/Prince	Denis/Andrew/ Senesie/Lumeh
10:30-11:30	Question hour			
12:00-13:00	Lunch			
Afternoon	**1) Radio telemetry**	**2) GPS, compass, binoculars**	**3) Tree/Plant identification**	**4) Transect sampling, camera traps, mammals**
14:00-16:00	**Group 2**	**Group 3**	**Group 4**	**Group 1**
Trainer:	Prof. John Carroll	Sullay/Turay/Solomon	Swaray/Patrick D.	Prince/Annika/ Gbessay
16:00-18:00	Questions, Chatting, Relaxing			
18:00-18:30	Dinner			
Evening	Presentation/Films			
19:30-20:30	Pygmy hippo films and others: April			
Wednesday, 12 January				
7:30-8:00	Breakfast			
8:00-9:30	Packing			
9:30-10:00	Departure			

Joint training Tiwai 2-4 June 2011

Thursday, 2 June			
19:00	Overview+Icebreaking		
20:00	Movie		
Friday, 3 June			
8:00	Breakfast		
Presentations			
9:00	Radio telemetry		
10:00	Primates		
11:00-12:00	Lunch		
12:30-14:30	Session 1		
Group 1	**Group 2**	**Group 3**	**Group 4**
Radio telemetry	Dung	Plants	Forest exploration and exchange
15:00-17:00	Session 2		
Primates	Radio telemetry	Forest exploration	Plants

		and exchange	
17:30-18:00	Questions		
18:30	Dinner		
Presentations			
19:30	Genetics		
20:00	Dung and Conservation genetics		
20:30	Movie		
Saturday, 4 June			
6:30	Birding		
8:00	Breakfast		
9:00-11:00	Session 3		
Group 1	**Group 2**	**Group 3**	**Group 4**
Forest exploration and exchange	Primates	Radio telemetry	Dung
11:00-12:00	Lunch		
12:30-14:30	Session 4		
Dung	Plants	Primates	Radio telemetry
15:00-17:00	Session 5		
Plants	Forest exploration and exchange	Dung	Primates
17:30-18:00	Questions		
18:30	Dinner		
20:00	Nightwalk and Frogging		