PROJECT REPORT

Community-Based Conservation of Sea Turtles on Kolombangara, Solomon Islands

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Submitted to:
Conservation Leadership Programme

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CLP Project ID# 06149813

Location
Kolombangara Island, Western Province, Solomon Islands

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Acknowledgements

We would like to express our gratitude for all the customary landholders of Kolombangara Island who welcomed us into their village and supported our work to conserve turtles around the Island. The contributions of numerous individuals are invaluable, and this report attempts to capture a small part of the wealth of experience and wisdom that we have exchanged over the past year. In particular, we would like to thank the communities of Vavanga, Ghatere, Hunda, Ropa, Tuki, and Iriri. Finally, this work was made possible by generous support from the Conservation Leadership Programme.

SECTION 1

Summary

Across the world's oceans and coastlines, the territories of indigenous peoples often overlap with critical sea turtle habitats. Consequently, the fate of these ancient mariners lies heavily in the hands of indigenous or local communities. Kolombangara Island in the western Solomon Islands is no exception. Over the past year, we have surveyed reefs and lagoons across Kolombangara in order to prioritize areas for future monitoring activities. These areas have been identified, transects have been established, and community members from villages surrounding these sites have been identified to serve as monitors.

Culture and conservation can clash when endangered marine turtles are harvested as a part of ancient and deeply help traditions in the Pacific. Local communities are often the users and primary stewards of these endangered species. Thus, this project sought to actively engage local landholders in on Kolombangara Island in community-based projects to conserve endangered sea turtles. Through a partnership between the Kolombangara Island Biodiversity Conservation Association, the Solomon Islands Community Conservation Partnership, and the American Museum of Natural History, we successfully initiated a series of community engagement sessions and developed the first community-based sea turtle monitoring program on Kolombangara Island, thereby empowering local communities to manage their resources and laying the foundation for long-term marine turtle conservation.

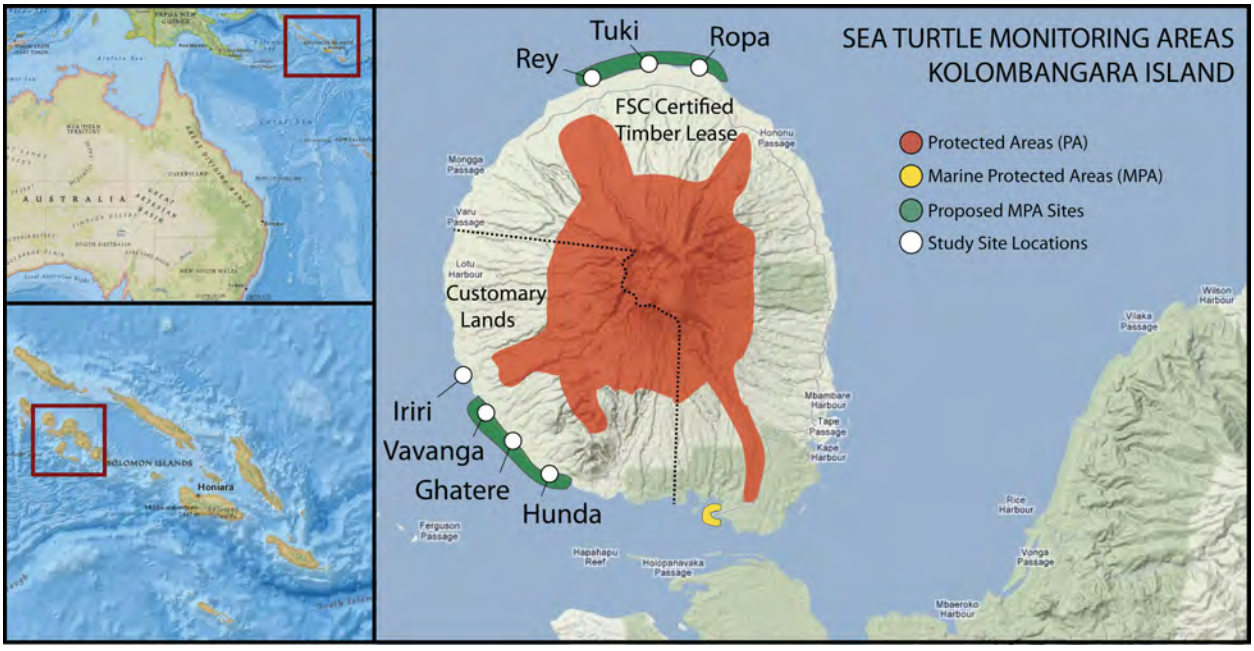
SECTION 1

Introduction

Sea turtle populations are declining globally as a result of a combination of various factors such as over-exploitation, habitat loss, marine pollution and climate change. These global declines also reflect on the health of coastal environments, as sea turtles are a sentinel species. In the Solomon Islands, sea turtles are not only an important source of food, but they also play a vital role in the cultures of many coastal communities. As a result, community knowledge suggests declines in population at many foraging grounds. Despite this knowledge, no studies have examined foraging populations around Kolombangara, hindering management and conservation efforts.

This project sought to engage local landholders on Kolombangara Island in the Solomon Islands in the creation of a locally driven sea turtle monitoring program. To do this, we researched Kolombangara's sea turtle populations, developed the capacity of a group of community members to assess and monitor sea turtle populations, and raised awareness within indigenous communities in an effort to engender a commitment to sea turtle conservation. Through the creation of a community-based monitoring program, this project empowered local communities to manage their resources, laying the foundation for long-term marine turtle conservation.

Project Map



SECTION 2

Goal, Purpose and Objectives

Goal: The higher-level objective of this project is the conservation of critically endangered hawksbill turtles (*Eretmochelys imbricata*) and endangered green turtles (*Chelonia mydas*) in the Solomon Islands. We also seek to empower local communities to manage their own resources during an era when this leadership is urgently required.

Project Purpose: Our primary purpose is to link indigenous community action to direct conservation efforts through the creation of a locally driven sea turtle monitoring program. This monitoring program will record consistent data on sea turtles that can guide the planning processes and the local stewardship of the marine environment.

Project Objectives: Culture and conservation often clash when endangered sea turtles are harvested as a part of ancient and deeply help traditions. Through community engagement, however, local villagers can sustainably manage sea turtle populations. This project seeks to engage local landholders on Kolombangara Island in the creation of a locally driven sea turtle monitoring program. To do this, we will link scientific research with local knowledge to assess current sea turtle populations, build local capacity to monitor these populations into the future, and raise awareness within communities in an effort to engender a commitment to sea turtle conservation.

SECTION 2

Methodology

The foundation for successful conservation management lies in improving our understanding and knowledge of our environment. Our research and monitoring activities seek to record data on green and hawksbill turtles in order to establish bionomic benchmarks that can be used to guide stewardship of marine environments around Kolombangara Island. The data we collect will inform planning processes and support broader sea turtle conservation. Our specific data collection activities for these species will included over 60 days of fieldwork using the following methods:

- Sea turtle counts: teams of approximately three monitors will conduct two-hour surveys on days with good weather conditions and visibility. All data will be entered onto a standard data sheet.
- Sea turtle capture: we will use hand-capture methods to capture turtles that may be sleeping, resting, feeding, or moving. The turtles will usually be approached via boat and captured.
- Body Measurements: measurements of turtles will consist primarily of curved carapace length and width, using a flexible measuring tape. We will also record body weight using an electronic scale.
- Tagging: we will examine all turtles for existing tags and if tags are found, we will record and report identification numbers. If tags are not found or tags are damaged, we will apply new tags. We will apply two flipper tags, one on each front flipper.
- Photography: before release, we will take digital photographs of the turtle as vouchers, to document species, size, and gender if applicable, and to record morphological features that may help identify individuals.

A summary of the data collected over this period can be found in Appendix I. Furthermore, the methods described above were developed into a detailed handbook for monitors to use, at Kolombangara and other locations. This handbook can be found in Appendix II.

SECTION 2

Outputs and Results

Objective 1: Conduct research and establish a sea turtle monitoring program

The foundation for successful conservation management lies in improving our understanding and knowledge of our environment. Our research and monitoring activities sought to record data on green and hawksbill turtles in order to establish bionomic benchmarks that can be used to guide stewardship of marine environments around Kolombangara Island. The data we collected is now informing planning processes and supporting broader sea turtle conservation.

Activity 1: Undertake research and monitoring programs at key turtle foraging grounds

- Over a three-week period, we surveyed lagoons and reefs around Kolombangara to assess priority locations for future monitoring efforts.
- At each site we conducted two-hour sea turtle counts during both the day and night. When possible, turtles were hand captured for tagging, measurement, and photography. Our survey's showed an abundance of critically endangered hawksbill turtles and endangered green turtles.
- All reefs and locations were mapped, along with notable locations with characteristics suitable for sea turtle foraging (e.g. sea-grass, sheltered reefs).

Activity 2: Document traditional knowledge on sea turtles

- At each community engagement session (detailed below) we surveyed participants and documented their knowledge of sea turtle natural history within their customary lands.

Outputs from Objective 1

- Upon completion of our surveys and mapping activities, the project team identified two priority areas for further monitoring of green and hawksbill turtles. These areas include 1) the reef stretching from Vavanga to Hunda, and 2) the reef stretching from Rey to Ropa.
- Three permanent transects were established within each of the two locations described above in order to ensure consistent efforts across the monitoring period.
- With transects in place, teams from each location received intensive training in various turtle monitoring methods and were deployed on a monthly basis in order to monitor turtles. Data from this monitoring period can be found in Appendix I. Overall, only 3 green turtles with a greater than 900mm in curved carapace length (CCL) were captured; turtles smaller than this size are classed as sub-adult (SPC, 2003), supporting our hypothesis that Kolombangara may be either mostly used by juvenile turtles as foraging grounds.
- Historical data on turtle abundance, locations, and use (primarily consumption) were collected within 6 villages across Kolombangara.

Objective 2: Strengthen local technical training and capacity to implement sea turtle conservation programs

In order for local community members to assist in these research and monitoring activities, we held a series of workshops and training sessions. Initial workshops took place at the beginning of the project to both share information on sea turtle life history and to gather local traditional knowledge. After a group of turtle monitors was established, we brought experienced rangers from the Tetepare Descendants' Association (TDA) for a joint training workshop on the research and monitoring methodologies explained above. We used a series of handbooks detailing each of these protocols, which we went through both in a meeting and in the field. Field based trainings were hands on with experts from both TDA and the project team. We then practiced each of the protocols a number of days and over multiple, independent sessions. All community monitors attended these workshops and showed compliance with the protocols.

<u>Activity 1: Improve capacity for marine turtle protection, sustainable management, population research and monitoring through workshops, meetings and training opportunities</u>

- A handbook of monitoring protocols for green and hawksbill turtles was developed for use by Kolombangara monitors. This handbook covers basic sea turtle biology, as well as methods for monitoring turtles such as measuring the carapace, weight, and health of turtles that are captured. This handbook can be found in Appendix II.
- A series of capacity building efforts were initiated during this reporting period. In September 2013, KIBCA's partner organization, the Tetepare Descendants' Association (TDA), who have been running a turtle monitoring program for 10 years, sent their Head Turtle Monitor, Hobete Atu, and Senior Ranger, Roy Famo, to Kolombangara to assist CLP Team-Leaders with capacity building and preliminary training activities.
- Community members were identified within villages surrounding priority sites for monitoring. Village elders elected 1 candidate from each village (6 total) to receive preliminary training in sea turtle biology and monitoring.
- Training involved discussion components covering marine turtle biology, research protocols, foraging transect methodology, and data collection. Practical sessions covered field methodologies such as hand-capture, tagging, measuring, photography, and data-sheet entry.
- In November 2013, the 6 newly appointed monitors traveled to Tetepare Island for intensive training with TDA. This field trip proved to be a motivating experience for Kolombangara's new monitors as TDA has been conducting sea turtle monitoring for 10 years. Over the course of 3 days, monitors captured turtles, completed data sheets, and earn a certificate in turtle monitoring offered by TDA.
- In January 2013, sea turtle monitors from Kolombangara began monitoring their reefs (within established transects) on a monthly basis. KIBCA, SICCP, and AMNH staff where often present to assist with the monitoring, as well as the process of migrating information from data to a computer for safe keeping and analysis.

Activity 2: Work with key partners to improve scientific report writing

- In July and August 2014, CLP Team-Leaders met in Vavanga, Kolombangara to hold a writing and data analysis retreat. There the team developed this report, as well as analyzed data and prepared the attached financial report.

Outputs from Objective 2

- Community monitors were identified and trained in both sea turtle biology and monitoring methods by CLP Team-Leaders and experienced community monitors from TDA.
- Community monitors began monthly process of monitoring their reefs for sea turtles and working with the CLP Team-Leaders to enter and analyze data.
- CLP Team-Leaders met together to work on their report writing skills and develop the following narrative and financial report.

Objective 3: Elevate public awareness for sea turtle conservation and stewardship

Activity 1: Provide relevant education and awareness materials to schools, local communities, youths, women groups and other who actively participate in education

- Posters were designed, printed, and distributed to local communities. Copies are also in the KIBCA office in Ringgi and smaller, laminated copies were created for visits to other communities around Kolombangara.

Activity 2: Organize workshops and field visits for local communities to update and share information

- Over the grant period, 11 awareness-raising events were held around Kolombangara Island. Awareness focused on KIBCA's efforts to conserve Kolombangara, particularly its marine environments, and the importance sea turtles not only in the marine ecosystem, but as a species on the brink of extinction. We then introduced our project and desire to monitor turtles within their customary lands. We received overwhelming support in our efforts and will continue to engage with these and other communities moving forward.
- The following table summarizes our initial awareness activities:

Location	**Date**	**Number of Attendees**
Ropa	23-Sept-2013	34
Tuki / Rey	24-Sept-2013	19
Hunda	25-Sept-2013	27
Vavanga	25-Sept-2013	15
Ghatere	27-Sept-2013	22
Iriri	28-Sept-2013	41
Ropa	12-Feb-2014	30
Tuki / Rey	14-Feb-2014	16

Vavanga	7-April-2014	33
Hunda	8-April-2014	25
Ghatere	8-April-2014	30
Ropa	16-June-2014	28
Vavanga	19-June-2014	39

Outputs from Objective 3

- Posters were designed, printed, and distributed along with various awareness campaigns within 6 villages across Kolombangara.
- Workshops were hosted on multiple occasions in priority locations around Kolombangara in order to both raise awareness about sea turtles more generally, but also to inform communities about the type of information being collected and its role in resource management.

Achievements and Impacts

- 292 people participated in awareness raising activities
- 14 people were involved in project implementation
- 9 received training in various monitoring methods
- 6 people directly participated in the monitoring on a monthly basis
- 105 turtles were capture and tagged
- New data on Kolombangara's sea turtle population was provided to the Solomon Islands Ministry of Environment, Climate Change, Disaster Management, and Meteorology for use in their National Marine Turtle Strategic Action Plan.
- Project leaders gained valuable report writing experience.
- Training for one project leader in project planning and implementation.
- Strengthened partnership with other community-based organizations, particularly between SICCP and KIBCA.
- As a result of our sea turtle monitoring and awareness work around the island, the priority site in northern Kolombangara have created their own resource management organization with the ultimate goal of creating a new Marine Protected Area under the Solomons Islands Protected Area Act (2010). A similar initiative is under way in our other priority site, primarily within the customary land of the village of Vavanga on the southern side of Kolombangara, where the community has established the Vavanga Integrated Resource Management Area with the intention of better managing their resources from the reefs, where sea turtles forage, all the way to the terrestrial protected area boundary.

SECTION 3

Challenges

Leadership Capacity

Building capacity for strong resource management leadership is a critical and resource intensive aspect of improving Melanesian conservation initiatives. We expect that improved leadership capacity at KIBCA will translate into improved leadership within priority villages. With CLP support, we have improved leadership capacity which in turn can also strengthen information flow between community members, local governance bodies, funders, and other organizations across the Solomons.

Data Collection

Despite the high abundance of turtles foraging around Kolombangara, they have proven quite difficult to catch given shallow lagoons or rough breaks on the reef's edge. With this in mind, we conducted many or our surveys at night when turtles can be found sleeping along the reef's edge and when the seas are much calmer. As this is also a much more affordable way of monitoring (versus the rodeo method which requires a boat and significant fuel), we were able to conduct monitoring more frequently at night and still remain within our budget.

Conclusion

This project actively engaged local landholders on Kolombangara Island in the Solomon Islands in the creation of a locally driven sea turtle monitoring program. To do this, we researched Kolombangara's sea turtle populations, developed the capacity of a group of community members to assess and monitor sea turtle populations, and raised awareness within indigenous communities in an effort to engender a commitment to sea turtle conservation. Through the creation of a community-based monitoring program, this project empowered local communities to manage their resources, laying the foundation for long-term marine turtle conservation.

SECTION 4:

Appendix I: Summary of Data Collected

During the 2013/14 monitoring period, a total of 105 green and hawksbill turtles were tagged on Kolombangara. Only 3 green turtles with a greater than 900mm in curved carapace length were captured (Fig. 1); turtles smaller than this size are classed as sub-adult (SPC, 2003), supporting our hypothesis that Kolombangara may be either mostly used by juvenile turtles as foraging grounds, or that the capture method favors smaller turtles.

In order to better understand the health of these turtles, KIBCA also measured body weight. In addition, monitors are taking digital photographs of the turtles head and body as vouchers to document species, size, and gender, and to record morphological features that may help identify each individual, any anomalies, and health factors such as tumors. Photographs of the carapace will be used in future geometric morphometric analysis and to identify various color patterns on the carapace.

Continued capture efforts will allow estimates of the number of turtles around Kolombangara, as well as measures of turtle growth rates, health, and foraging site fidelity.

Figure 1: Curved carapace length (CCL) of turtles measured around Kolombangara

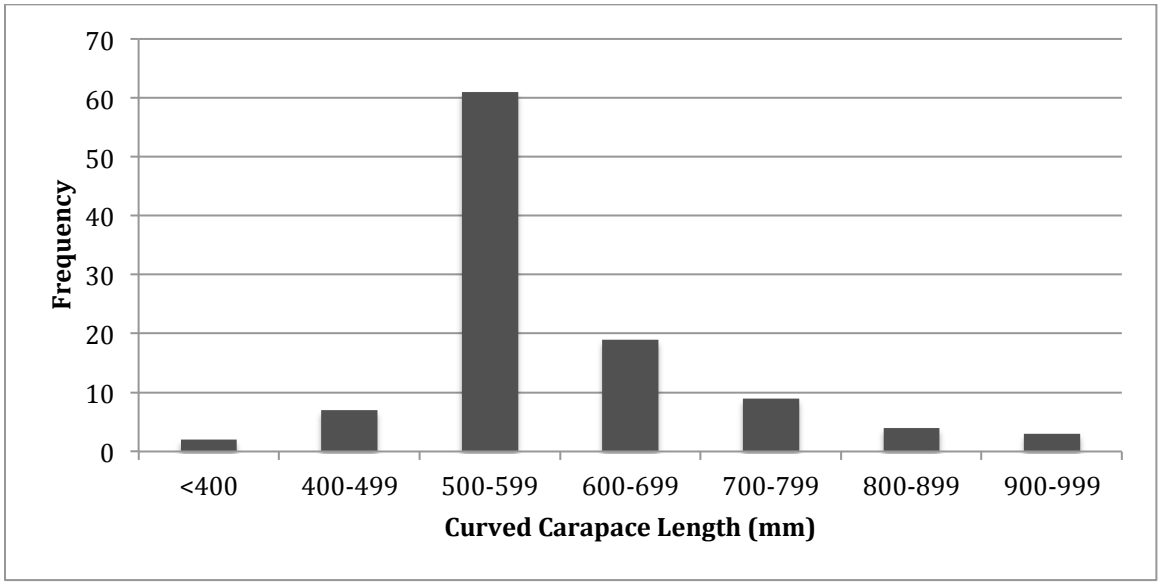
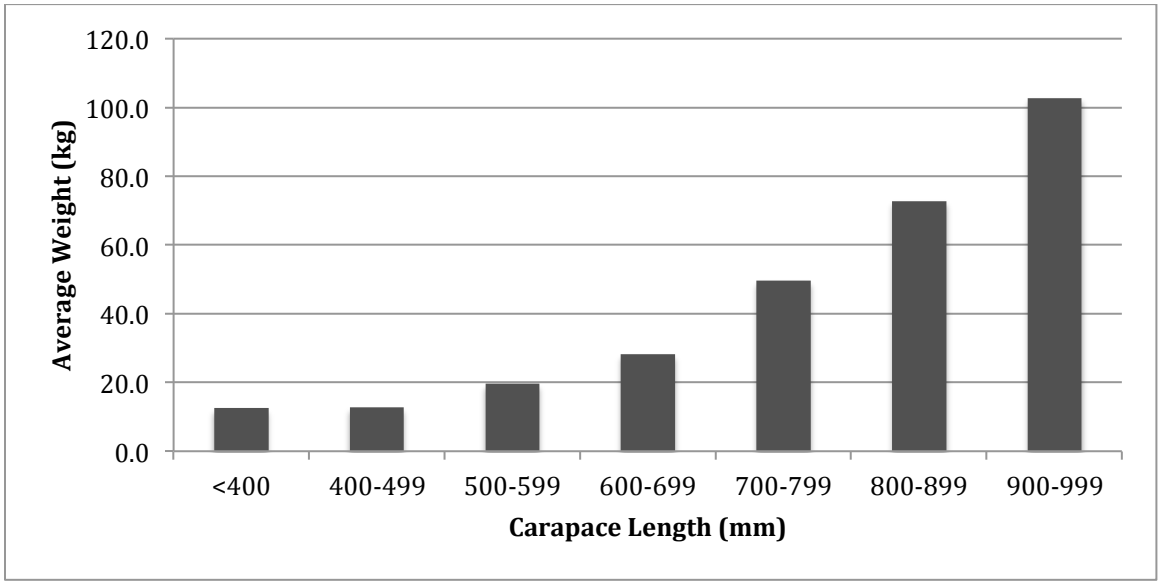


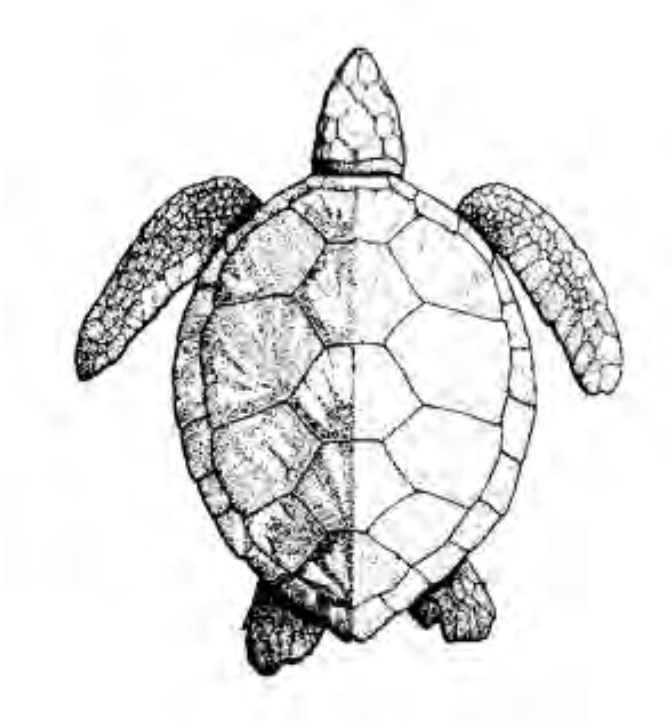
Figure 2: Weight of different sized turtles around Kolombangara



Appendix II: Handbook of Monitoring Protocols

Handbook for Turtle Monitors

A Handbook of Green and Hawksbill Turtle Monitoring Protocols in the Solomon Islands



American Museum of Natural History
Center for Biodiversity and Conservation

SICCP
Solomon Islands Community Conservation Partnership

KBCA
Kolombangara Island Biodiversity Conservation Association

BirdLife International
Conservation International
Fauna & Flora International
Wildlife Conservation Society

Conservation Leadership Programme

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Introduction to Sea Turtles

Sea turtles are one of the Earth's most ancient creatures. The seven species that can be found today have been around for 110 million years, since the time of the dinosaurs. The sea turtle's shell, or "carapace" is streamlined for swimming through the water. Unlike other turtles, sea turtles cannot retract their legs and head into their shells. Their color varies between yellow, greenish and black depending on the species.

Sea turtles are found in all warm and temperate waters throughout the world and migrate hundreds of miles between nesting and feeding grounds. Most sea turtles undergo long migrations, some as far as 1400 miles, between their feeding grounds and the beaches where they nest.

The green turtle is a large, weighty sea turtle with a wide, smooth carapace, or shell. It is named not for the color of its shell, which is normally brown or olive depending on its habitat, but for the greenish color of its skin.

Figure 1. Range of sea turtles around the world.

Figure 2. Green sea turtle on Tetepare Island.

Sea Turtle Data Collection

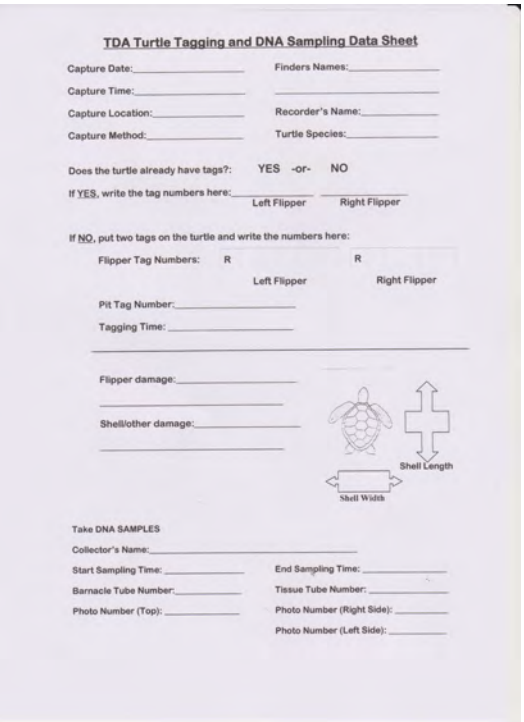
Data Collection:
Collecting data on wild sea turtles is necessary in order to inform the management of sea turtles and their ecosystems across the Solomon Islands, and to contribute to broader regional sea turtle recovery and management aims. Our research will address immediate conservation goals, while also meeting broader recovery, conservation, and management objectives for these species and their ecosystems.

General Data Collection Instructions:
If the information requested on a data collection form is not available or not applicable, leave the data field or code box blank. Describe the situation in the Comments section of the form.

1. Use a soft pencil on all forms. Line out any errors, and write the correct data above the struck item. DO NOT try to make any changes over a number that is already recorded.
2. Print legibly.
3. Observe and accurately record descriptive and quantitative data with explicit notes and explanations. Record data as events occur, trust nothing to memory.
4. Record times as four digits using the 24-hour clock format, for example, 5:30 P.M. is written as 1730, and 5:30 A.M. is written 0530.
5. Sea turtles are top priority. Never allow collection of secondary data to interfere with the collection of sea turtle data.
6. If data are not available in the proper units, write the measurement and units in the margin or comments section for later conversion: for example, pounds to kilograms.
7. If additional space is required on a data form, continue data entries on additional forms.
8. Include all pertinent facts when writing notes or narrative explanations. Remember that people who were not present will read about the event(s) you are describing. Don't assume that the readers will automatically know what you are describing if you did not write it down.

Data Management

Each of the following protocols will have a box like this detailing methods for data management throughout the life-cycle of the project.


TDA Turtle Tagging and DNA Sampling Data Sheet

Capture Date:_____ Finders Names:_____
Capture Time:_____
Capture Location:_____ Recorder's Name:_____
Capture Method:_____ Turtle Species:_____

Does the turtle already have tags?: YES -or- NO
If YES, write the tag numbers here:_____ _____
Left Flipper Right Flipper

If NO, put two tags on the turtle and write the numbers here:
Flipper Tag Numbers: R R
Left Flipper Right Flipper
Pit Tag Number:_____
Tagging Time:_____

Flipper damage:_____
Shell/other damage:_____
Shell Length
Shell Width

Take DNA SAMPLES
Collector's Name:_____
Start Sampling Time:_____ End Sampling Time:_____
Barnacle Tube Number:_____ Tissue Tube Number:_____
Photo Number (Top):_____ Photo Number (Right Side):_____
Photo Number (Left Side):_____

Figure 1. Sample data sheet for turtle tagging and DNA sampling from the Tetepare Descendants' Association.

Data Transfer
It is critical that all data collected in the field is transferred to a computer and backed up on a regular basis. In conjunction with the American Museum of Natural History, a database is being developed for all sea turtle data in the near future. This database will allow field data to be entered into a computer in a user-friendly environment. Transferring field data to a computer is a vital step in the process because it ensures its protection into the future and will allow us to analyze the data in ways that can influence sea turtle conservation.

Data Backups
Data should be backed up on a regular basis (e.g., weekly), but depends on how often data are changed or collected. The more data that are collected or changed the more frequently data should be backed up. The simplest backup method is to just make a copy of your data in a dated directory, the date the copy was made. This allows you to recover or find older "versions" of data. More advanced methods can be discussed as needed. Data should be backed up onto a drive or device that is not connected to the same computer that holds the original data. Backups should be kept in a separate room or even building from the computer holding the original data to prevent total loss due to fire or other large scale disaster. As connectivity improves, AMNH will provide backup space that can be accessed over the Internet.

Figure 2. All information from data sheets should be transferred to a computer and backed up on a regular basis.

Measuring Green Sea Turtles

Sea turtles found on foraging grounds are measured to determine the frequency of turtle sizes present as well as to monitor growth rates. Sea turtles may show great variability of growth rates, even within the same species, which may be caused by genetic, sexual, and/or environmental factors.

There are two parts to the shell of a turtle: the upper portion is called the "carapace" and the bottom half is called the "plastron." Both shells are made of many fused bones. Measurements of the shell are to be taken with a fiberglass tape measure (± 0.1 mm) of the Curved Carapace Length (CCL). Curved Carapace Length is measured over the curve of the carapace along the midline from the point closest to the neck (anterior point at the midline of the nuchal scute; see figure 1).

1. Position the measuring tape by the neck so that it starts just where the skin meets the beginning of the shell. Measure from there to the end of the longest scute by the tail (See figures 2-4).
2. Note the length to the nearest millimeter and call out the number clearly.
3. The individual filling out the data sheet then repeats the number to ensure that s/he heard it right and once that is confirmed fills in the data sheet with the information.

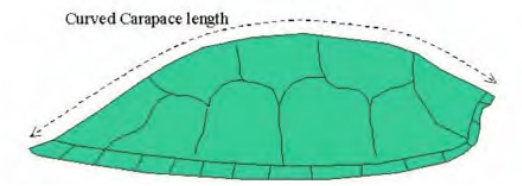


Figure 1. Curved Carapace Length (CCL) measurement

Figure 2. Measuring curved carapace length with a fibreglass tape.

Figure 3. Exact positioning of tape at edge of nuchal scute behind the head.

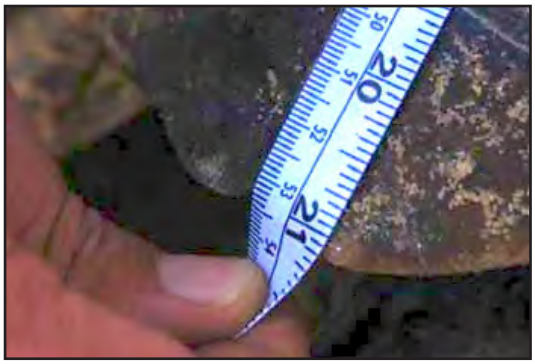


Figure 4. Exact position of tape at midline inside the notch at the rear of the carapace.

Adult turtles can be weighed with a hanging scale (± 0.5 kg; Figure 5.):

1. Hook the scale to the weigh bar and have it assembled. Ensure that the weight is at zero before you attach the net/animal to the scale. A minimum of two people is needed to weigh a turtle.
2. Gently place the turtle into the weigh net, taking care that its flippers are not being damaged and that the net will not scratch the turtle's eyes.
3. Attach the weigh net to the bottom of the scale with an s-hook. Lift the weigh bar, suspending the turtle completely off the ground. Note the weight and call out the number clearly. The individual filling out the data sheet then repeats the number to ensure that s/he heard it right and once that is confirmed fills in the data sheet with the information.
4. After weighing, the turtle should be carefully lowered to the ground.

Figure 5. An example of weighing a turtle safely without damaging the flippers.

Data Management

For each turtle measured, fill out all the measurement information on the data sheet and describe any difficulties encountered in the process. Transfer this data to a computer as soon as possible, double checking each field as you enter it into the computer.

Photography Field Protocols

Photographs of Green sea turtles allow us to identify individuals based on unique scale patterns on the sides of their heads and to document unique features. These photographs allow us to track individuals through time and space, but also tell us about other ecological factors (such as their health or predators) that can inform management strategies for their protection.

General comments:
When taking photos of turtles in the field, try to eliminate as much inessential background as possible; i.e., have the turtle head/carapace/etc. take up as much of the frame as possible (either zoom in or out or move the camera in or away). This should not only give you better detail, but also a better exposure, especially if the background is much lighter/darker than the turtle.

Reminder:
Before taking a camera out into the field, make sure to check the battery and memory card.

If you are taking pictures inside or under a roof or awning, use the flash mode. This will not only help prevent blurring because of the low light, but also give you a better white balance and truer color (especially important if you're taking pictures under, say, a blue tarp). If possible, take the photos in full shade; if not, then full sun. In either case, make sure there are no shadows in frame, since these always become much darker in the photo, making it much more difficult to identify features such as facial scales or carapace color.

Figure 1. A proper picture of the side of the head is directly parallel, with all the scales visible.

Always check the photos after you take them and before you release the turtle to make sure they are in focus and correctly exposed.

Turtle ID photos:
As a minimum, always take the following photos for each turtle captured:

- Profiles of each side of the head, as well as the top of the head (these should all be full frame). Make sure all of the scales are clearly visible. When taking pictures of the side of the head, make sure to take the photo directly parallel to the head (you may have to get down next to the turtle to do this). Photos taken at an angle make it difficult to score the scales for photo identification.

Figure 2. A poor picture of the side of the head will make it difficult to score the scales.

- Full carapace (if possible from directly above. Make sure the carapace is clean and if possible wet before taking the photo (this will bring out the color of the carapace).
- Any distinguishing marks or characteristics (bite marks/scars, unique coloration, barnacles/epibionts, etc). Zoom in as close as possible for small features such as barnacles. For bite marks or scars, place a measuring tape alongside (but not obscuring the view for) the mark/scar so it is possible to get a sense for its actual size.
- If an animal seems to be thin, with a plastron that curves inward, take a picture of the animal while it is sitting vertically, and from the side, so it is possible to see the relative amount of inward curve. In order to take the vertical picture, do not balance the turtle on its shell, but support it on something soft, like a folded-over towel or an inflated car/truck inner tube.

Figure 3. Full carapace from directly above

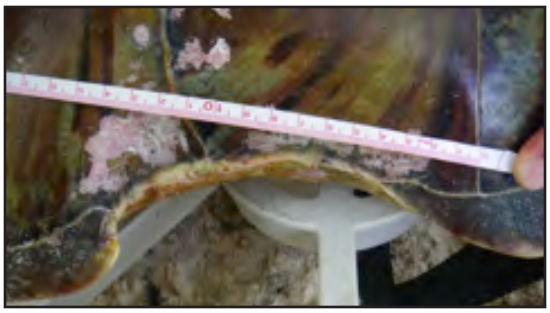


Figure. 4: Carapace damage with measuring tape alongside

Figure 5. Degrees of emaciation.
From left to right: normal, mild, moderate, and severe emaciation.

Data Management

Photographs need to be downloaded onto a computer as soon as possible. See the following page for details on how to manage photographic data on your computer.

Archiving Photographic Data

At the end of each survey, all digital images should be transferred from the camera to the computer that holds the main project archive. Data should be stored in a hierarchical set of folders that complements the structure of the data collection process and data sheets. For example, the top level of the image archive may start with the site or MPA followed by the camera or survey unit/team and then date.

When using dates in file or folder names it is helpful to use the format YYYYMMDD so that files and folders sort chronologically. You may have a camera that starts renumber from 0 each time the flash card is empied, which means that you may have many files called IMG001.jpg. Additional metadata should be similar to the hierarchical folder structure, e,g, SiteA_ Camera001_20111214_IMG0001.jpg,When separating pieces of the metadata (e.g., SiteA from Camera001) you should use "-" or "_" - other special characters like "|" and "*" should be avoided. Remember, your archive holds data that should never change. If you need to modify an image or use it in an analysis you make a copy outside of your archive.

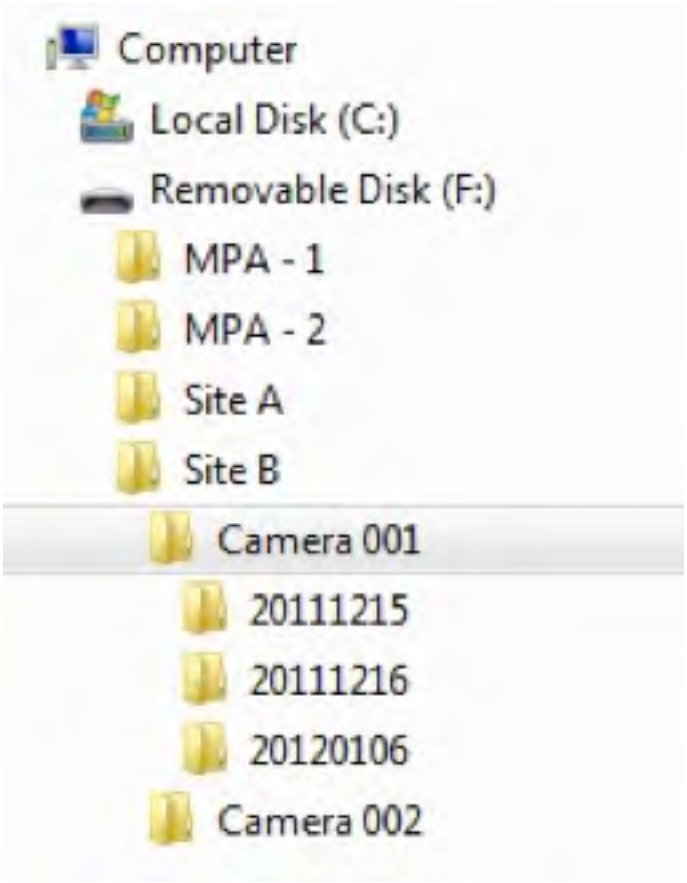


Figure 6. Hierarchical set of folders and sub-folders for all images.

Applying Metal Flipper Tags

Sea turtles are tagged to achieve the recognition of individuals for research purposes. A commitment to rigorous tagging can provide information on sea turtle population, residency, movements, growth rates, and strandings.

Old Tags

All turtles should be checked for presence of previous tags or signs of tag loss prior to placing new tags, and notes should be kept on signs of old tags. Old tags should be replaced when they appear heavily corroded and could be easily lost, and all previous tag numbers are to be recorded to maintain a long-term history of the turtle. Turtles that show signs of having been tagged previously but which have lost their tags should be recorded as such, as this provides information on the rate of tag loss.

1. To remove an improperly closed or old tag, two needle-nose pliers (or similar tool) should be used: one to hold the tag firm and stable and one to snap open the tightly clinched locking end.

Figure 1: Hold a flipper tag in correct orientation to load into applicator. Note that the number side of the tag is up.

Applying New Tags

Turtles are to be tagged on both front flippers with titanium tags bearing a return address and contact numbers. New turtles or turtles who have lost their tags that are over 35 cm in curved carapace length (CCL) should be tagged.

1. Clean and disinfected all tags before beginning. First, wash the tag with soap and rinse thoroughly. Next, rinse the tag with disinfectant. Applicators must be cleaned between animals.
2. Using a disposable alcohol swab or another sterile wipe with rubbing alcohol on it, clean the skin region near the body (proximal) at trailing edge of each front flipper.
3. Remove a tag from the strip and record its alphanumeric number.
4. With the piercing side of the tag up, place your index finger tip inside the bend of the tag. The piercing side of the tag has the numbers stamped into it. (Figs. 1 and 2).
5. Hold the tag applicator pliers in the other hand, making sure the handle with the paint mark (or label) is up. Using your index finger, pull the tag straight back into the open jaws of the applicator pliers.

Figure 2: A fully seated tag in the tag applicator pliers.

A firm pull will be needed to completely seat the tag into its correct position. Take care not to squeeze the applicator handles before you are ready to apply the tag.

6. The tags are to be placed on each of the front flippers, towards the body (proximal) on the trailing edge (see figures 3-5) to reduce the chances of abrasion, entanglement and tag dislocation. The preferred location is to the inside of the first large scale on the trailing edge of the flipper. Ask for assistance holding the turtle still. A 0.5 cm gap should be left between the trailing edge of the flipper and the rear edge of the tag to allow for growth in the coming years (Fig. 3).
7. Apply the tag by squeezing the applicator handles firmly. The tag point will pierce the flipper and lock into place through the other tag end. The piercing tip must be bent over completely to lock the tag (Fig. 5).
8. Repeat the procedure in the same place on the other front flipper. All turtles should be double tagged. Try to use consecutive numbers on the same turtle whenever possible. If a tag is ruined, record the number of the ruined tag, and use another tag. If the recommended tagging site cannot be used, find another site on the rear edge of the front flipper.

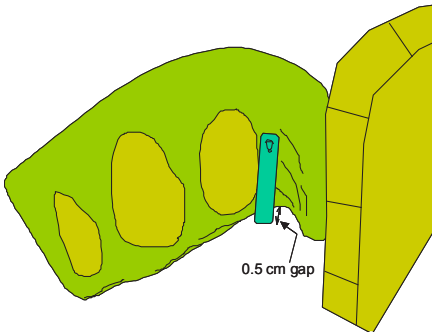


Figure 3. Tag position and gap between outer edge of the tag and the trailing edge of the flipper.

Figure 4: Arrow indicating the preferred location for flipper tag replacement. The next preferred location is between the two large scales to the right of the arrow.

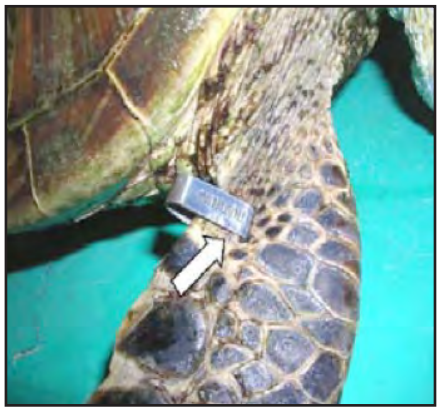


Figure 5: A properly applied flipper tag.

Data Management

Recording tag information is critical for the success of this project. For each turtle, be sure to record the tag numbers for both the left and right flippers. Describe any difficulties encountered while trying to apply the tags, such as old tags that had to be replaced. When possible, transfer this data to a computer, double checking each field as you enter the data.

Collecting Skin Biopsies

Sampling of single or multiple tissues is referred to as a biopsy. Skin biopsies are being collected for genetic studies which can identify discrete breeding populations on the nesting beaches and in corresponding feeding habitats.

1. Turtles are always to be protected from temperature extremes of heat, and kept moist during sampling. Place the turtle on a soft pad for cushioning. The area surrounding the turtle should be clear of materials that could be accidentally ingested.
2. Stabilize the turtle by holding it still, if possible facing away from the ocean and towards shore. If available, a second person should provide assistance.
3. Using a disposable alcohol swab or another sterile wipe with rubbing alcohol on it, clean the skin region between the carapace and the base of the hind flippers. The skin in this area is normally soft and smooth and devoid of hard or enlarged scales and is the preferred area to biopsy. However, if for some reason it is not possible to sample this region, skin at the base of the front flippers may be used.
4. Carefully remove a new biopsy punch from its sealed wrapper. You need a new biopsy punch for each animal. Exercise care in handling the biopsy punch, as the circular cutting end is very sharp. Use caution by holding the cutting edge away from you and other persons at all times.
5. Hold the plastic handle of the biopsy punch using your thumb and index finger. Place the circular cutting end on the cleaned smooth skin at the base of a hind or front flipper and twist the punch while pressing down gently. Do not put your hand or fingers underneath the other side of the flipper and risk cutting it. A circular cut will rapidly be made through the turtle's skin. Continue to rotate and press down to about 3 mm depth, or until the blade cuts through the skin to the fatty tissue. Take care not to cut all the way through the flipper, especially with smaller turtles.

Fig. 1: The skin region between the carapace and the base of the hind flipper is the preferred biopsy site.

Fig. 2. Collecting a biopsy punch sample from the alternate site.

6. Withdraw the biopsy punch from the skin by lifting it straight out. Use clean (completely soaked in rubbing alcohol and air dried) forceps to grasp and remove the thin circular plug of skin resulting from the cut made with the biopsy punch. The plug of skin may momentarily adhere to the underlying tissue, but will easily detach when lifted away. If it does not detach, take forceps and hold the skin while you turn the biopsy punch to the side to use the blade to cut the last of the underlying tissue.
7. Immediately place the plug of skin in a designated container, using forceps if needed. Shake the container for several seconds after placing the skin sample inside, to make sure the sample is covered by the liquid. Using another disposable alcohol swab, clean around and inside the region of the turtle where the skin plug was taken.
8. Repeat this process with the same punch so that each container contains 2 samples from the same animal. Be sure to record the containers unique identification number on the data sheet. If you do not have a prepared data sheet available, record at minimum the date, the turtle's flipper tag number, and /or any other unique identifying information available for the turtle.
9. Put the biopsy punch into a safe, closed container that can hold sharp objects and dispose of later.
10. The vials should be stored at room temperature or cooler. If available, a refrigerator will prolong the life of the sample. Do not store the vials where they will experience extreme heat, and do not freeze the sample. Store the samples in an upright condition, ensuring all tissue is immersed in liquid prior to storage.

Fig. 3. Removing the skin biopsy with forceps.

Fig. 4: Placing biopsy punch sample in storage container.

Data Management

For skin biopsy taken, record all of the container numbers on the data sheet and describe any difficulties encountered while trying to take the biopsy. Transfer this data to a computer as soon as possible, double checking each field as you enter it into the computer.

Epibiont / Parasite Protocol

All turtles have other small animals and plants that live in and on their bodies. Animals and plants living on the outside of a turtle's body are called epibionts. By collecting these creatures from captured turtles, we can learn about where they have been, their health, and more.

Epibiont / Parasite (E/P) studies have 2 main objectives:

1. Estimation of load and
2. Specimen collection

Visually check the turtle's body while it is being measured and photographed. E/P live in the carapace, plastron, crop, and all parts of the skin. Some of the most common epibionts are: small (3-5 mm) crustaceans found in the skin and crop (Figure 1), and barnacles in the skin, scutes and/or sutures (Figures 2 and 3). However, record and collect specimens of any other animal found on or attached to a turtle's body (several other species of E/P, including leeches, have been reported in sea turtles).

Figure 1. Crustacean epibionts (arrow) on a green turtle's skin.

Estimation of load:
Score the E/P load in four parts of each turtle's body: carapace, plastron, anterior surfaces (this includes the head, fore limbs, and the skin in between them), and posterior surfaces (this includes the tail, hind limbs and the skin in between them). Scoring is based on a 1-3 scale, as follows:

1 for <20 E/P
2 for 20-50 E/P
3 for > 50 E/P

Record four scores for each turtle: plastron, carapace, anterior, and posterior surfaces. Take a picture of at least one of the infested surfaces, particularly if there are numerous E/P.

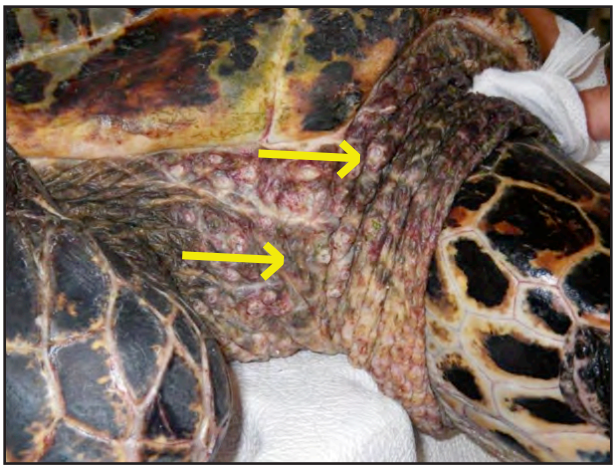


Figure 2. Barnacles (arrows) on a green turtle's skin.

Specimen collection:
Collect animals with tweezers and put them in vials with alcohol. When possible, collect at least 5 individuals of each kind you observe (there may be more than one species and/or developmental stage). Label the vial with the turtle's ID number. Specimens should be stored in a safe location, upright and covered completely with alcohol.

Live barnacles can be lifted from the turtle's skin (or sutures) using tweezers. A living barnacle has a cover over the opening in its shell, while a dead one has an open hole. Gently work with the tweezers around the barnacle shell's edges, grab the barnacle shell with the tweezers, and gently pull up to remove the barnacle in its shell from the skin. When done gently, this will not harm the turtle's skin. Larger barnacles embedded in the skin can often be removed by gently grabbing the edges with your fingers and pulling up. If barnacles are found in the skin and/or scutes, and/or sutures in the same individual, collect a sample from each location. When possible, collect at least 5 individuals (more would be better) and label the vial with the turtle's identification number. Barnacles found in the plastron or carapace should be collected by gently scraping them using a knife or foreceps. In some cases there may be large aggregations of barnacles growing in a "colony" of sorts; if that is the case, try to scrape off the whole colony (as opposed to individual barnacles).

Figure 3. A barnacle attached to the plastron.

Data Management

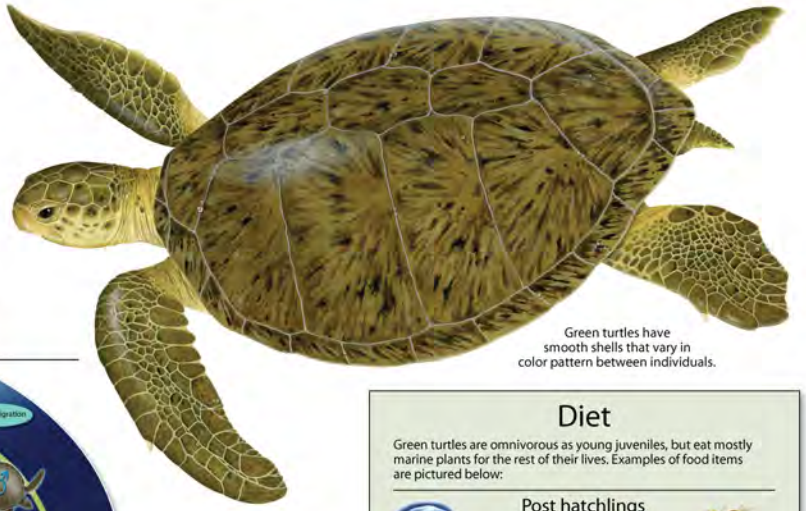
Record the number of samples taken from each animal on your data sheet and any identification numbers located on the container. Describe any difficulties encountered in the process. Transfer this data to a computer as soon as possible, double checking each field as you enter it into the computer.

Appendix III: Posters Created and Distributed

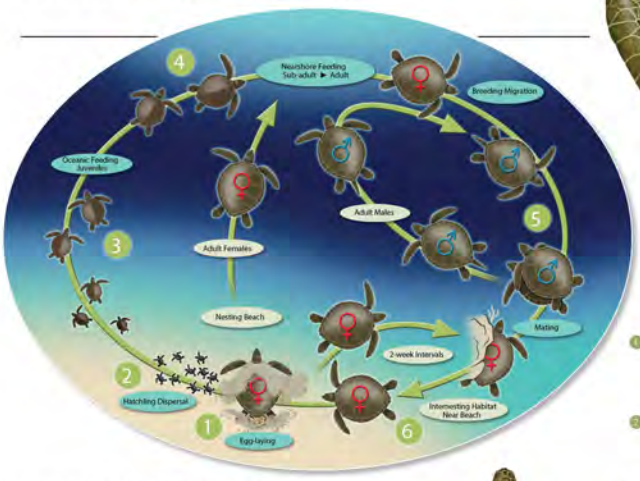
GREEN TURTLE

Chelonia mydas

Extensive harvest for meat has caused severe declines in green turtle numbers, but their populations are recovering where they have been protected. The green turtle's name comes from the color of the fat lining the inside of their shell and reflects the turtle's historical use as food.



Green turtles have smooth shells that vary in color pattern between individuals.



Life Cycle

A green turtle may travel thousands of miles between many developmental habitats in the 2-4 decades it takes to mature.

1. Nests average 135 eggs which incubate under sand for 50–60 days. Warmer sands produce mostly female turtles and cooler sands result in mostly males.
2. A few days after they hatch, the hatchlings emerge together from the nest at night, scramble quickly to the sea, and are dispersed by ocean currents.
3. Juveniles live near the surface of deep ocean waters and are carried widely by currents.
4. At about three years of age, juveniles swim into nearshore waters and inhabit reefs and seagrass pastures. Sub-adults nearing maturity move into more tropical waters.
5. Adults mate along migration routes between foraging and nesting areas and immediately off the nesting beach.
6. About every 2 years, adult females migrate to the beach where they hatched and make about 4 nests at two-week intervals.

Nesting/hatching season: June – November
Adult shell length: 83 – 114 cm
Adult weight: 110 – 190 kg
Age at maturity: 20 – 40 years
Status: Endangered

Hatchling to oceanic juvenile
First 3 years, 1 – 35 oz (25 – 1000 g)

Juvenile
3 – 10 years old, 2 – 55 lb (1 – 25 kg)

Sub-adult
10 – 30 years old, 55 – 200 lb (25 – 91 kg)

Adult
to 70+ years old, average 310 lb (140 kg)

Diet

Green turtles are omnivorous as young juveniles, but eat mostly marine plants for the rest of their lives. Examples of food items are pictured below:

Post hatchlings

Jelly animals | Copepods | Dead insects | Hydroids

Juveniles and Adults

Seagrasses | Red algae

Natural Predators

Although eggs and small green turtles have many natural predators, large green turtles have few.

Eggs and Hatchlings

Monitor Lizards | Sea birds

Post Hatchlings

Predatory fish

Juveniles and Adults

Large sharks

Habitat

The youngest juveniles feed at open-ocean fronts and "weedlines." But for the rest of their lives, green turtles graze on seagrasses or algae within shallow seagrass pastures, reefs, and "hard bottom." Nesting females need soft, sandy beaches.

Conservation

In the Solomon Islands, communities are managing efforts to conserve sea turtles by protecting nesting beaches and conducting monitoring programs to better understand populations.

Nesting

Females take about an hour to dig a body pit and egg chamber, lay their eggs, and scatter sand to camouflage their nest.

Tracks

Green turtle tracks have slash-like marks at the margin with a tail-drag mark down the center.

Distribution

The green turtle has a circumglobal distribution, occurring throughout tropical and, to a lesser extent, subtropical waters. Green turtles are highly migratory and they undertake complex movements and migrations through geographically disparate habitats. Nesting occurs in more than 80 countries worldwide. Their movements within the marine environment are less understood but it is believed that green turtles inhabit coastal waters of over 140 countries.

Distribution across the world

Threats

Harvesting of eggs and mortality associated with entanglement in marine fisheries threaten green turtle populations across the world.

Other important threats:

- Marine plastics are an ingestion hazard
- Illegal Harvest takes place range-wide
- Coastal Armoring prevents nesting
- Gill Nets capture and drown turtles
- Fishing Debris entangles and drowns turtles
- Boat Strikes kill and injure turtles

How to Help

Although green turtles are international marine animals that need help throughout their range if they are to survive, there are many things we can do for them here at home. Make informed seafood choices, hide lights visible from beaches, pick up marine litter, observe nesting turtles only with a trained guide, contribute to marine conservation organizations, and share your interest in sea turtles with others.

BirdLife International | Conservation International | Fauna & Flora International

Conservation Leadership Programme

American Museum of Natural History — Center for Biodiversity and Conservation

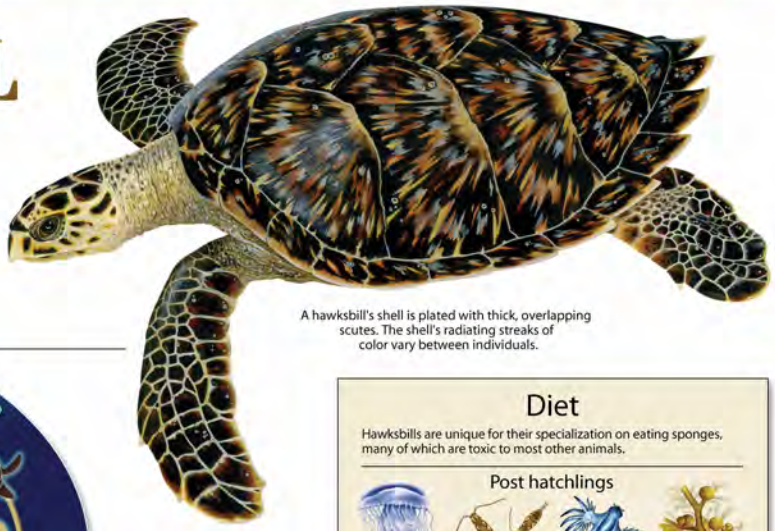
KIBCA — Kolombangara Island Biodiversity Conservation Association

SICCP

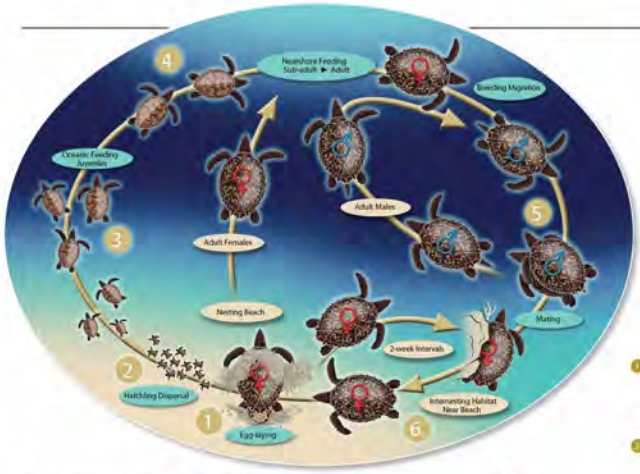
HAWKSBILL TURTLE

Eretmochelys imbricata

This sea turtle of tropical reefs has become rare. Although the hawksbill's center of abundance in the Atlantic is the Caribbean Sea, significant numbers of juvenile hawksbills feed on reefs in southern Florida and the Keys. Hawksbills are named for their narrow, slightly hooked beak.



A hawksbill's shell is plated with thick, overlapping scutes. The shell's radiating streaks of color vary between individuals.



Life Cycle

Hawksbills progress through different habitats as they mature, but apart from their breeding migrations, adults tend to remain within a familiar home range.

1. Nests average 140 eggs which incubate under sand for 55–75 days. Warmer sands produce mostly female turtles and cooler sands result in mostly males.
2. A few days after they hatch, the hatchlings emerge together from the nest at night, scramble quickly to the sea, and are dispersed by ocean currents.
3. The youngest juveniles live near the surface of deep ocean waters and are carried by ocean currents.
4. At about two years of age, juveniles swim into nearshore waters to inhabit reefs and other shallow habitats. Subadults may occupy deeper reefs.
5. Adults mate along migration routes between foraging and nesting areas and off the nesting beach.
6. Every 2–4 years, adult females migrate to the beach where they hatched and make about 3-6 nests at two-week intervals.

Nesting/hatching season: Varies by location
Adult shell length: 71 – 89 cm
Adult weight: 46 – 70 kg
Age at maturity: Approximately 25 years
Status: Critically Endangered

Hatchling to Post-hatchling
First year, 1 – 35 oz (20 – 1000 g)

Juvenile
1 – 10 years old, 2 – 46 lb (1 – 21 kg)

Sub-adult
10 – 25 years old, 46 – 101 lb (21 – 46 kg)

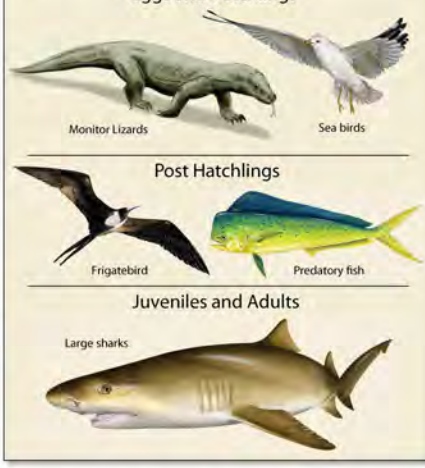
Adult
to 45+ years old, average 130 lb (59 kg)

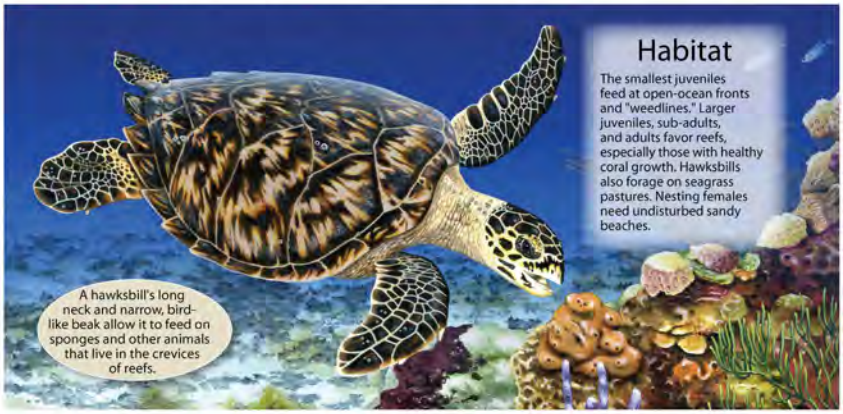
Diet

Hawksbills are unique for their specialization on eating sponges, many of which are toxic to most other animals.

Natural Predators

Although eggs and small hawksbills have many natural predators, large hawksbills have few.





Habitat

The smallest juveniles feed at open-ocean fronts and "weedlines." Larger juveniles, sub-adults, and adults favor reefs, especially those with healthy coral growth. Hawksbills also forage on seagrass pastures. Nesting females need undisturbed sandy beaches.

A hawksbill's long neck and narrow, bird-like beak allow it to feed on sponges and other animals that live in the crevices of reefs.

Conservation

Efforts to restore hawksbill populations rely on international cooperation. Conservation efforts include projects to monitor and safeguard nesting beaches, and international agreements to stop tortoiseshell trade and protect coral reef habitat.

Nesting

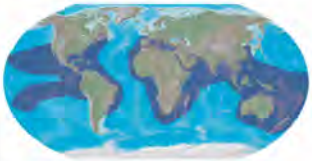
Females take about an hour to dig a body pit and egg chamber, lay their eggs, and scatter sand to camouflage their nest.

Tracks

Alternating rear-flipper swirls are at the margin, and a wavy tail-drag line runs down the center.

Distribution

Hawksbill Turtles have a circumglobal distribution throughout tropical and, to a lesser extent, subtropical waters. Hawksbills are migratory and individuals undertake complex movements through geographically disparate habitats during their lifetimes. Hawksbill nesting occurs in at least 70 countries, although much of it now only at low densities. Their movements within the marine environment are less understood, but Hawksbills are believed to inhabit coastal waters in more than 108 countries



Distribution across the world

Threats

Killing for tortoiseshell nearly drove the hawksbill to extinction. This raw material comes from the turtle's beautiful plastic-like shell scutes and is made into decorative items. A recent international ban on tortoiseshell trade is helping to reverse hawksbill declines.

Other important threats:

- Marine Plastics are an ingestion hazard
- Light Pollution misleads and kills hatchlings
- Climate Change destroys coral reef habitat
- Fishing Debris entangles and drowns turtles
- Boat Strikes kill and injure turtles

How to Help

Although hawksbills are international marine animals that need help throughout their range to survive, there are many things we can do for them here at home. Make informed seafood choices, pick up marine litter, never purchase tortoiseshell products, consider beach conservation in tropical vacation decisions, contribute to marine conservation organizations, and share your interest in sea turtles with others.

BirdLife International · Conservation International · Fauna & Flora International
Conservation Leadership Programme
American Museum of Natural History
Center for Biodiversity and Conservation
KIBCA Kolombangara Island Biodiversity Conservation Association
SICCP

Appendix III: Photographs

A green sea turtle makes its way back to the ocean on Kolombangara Island

TDA Senior Ranger, Roy Famo, discusses sea turtle monitoring with community members in Hunda Village, Kolombangara.

Kolombangara sea turtle monitors at Tetepare Island after completing their training in sea turtle monitoring

Kolombangara sea turtle monitors photographing a green sea turtle for potential future facial identification

CLP Team Member, Michael Esbach, with sea turtle monitors after completion of a training workshop.

Turtle monitor, Wayne Tefenoli, with a juvenile hawksbill sea turtle on Kolombangara

Date	Phase	Budget line	Receipt Number	Description	Unit cost (local currency)	Quantity	Total price (local currency)	Exchange Rate	Total USD ($)	Reason for Purchase
8/14/13	C-Phase 2 Project implementation	Travel and local transportation (including fuel)	1	International airfare	2,569.25	1	2,569.25	1.00	2,569.25	Travel from New York to the Solomons Islands
9/3/13	B-Equipment	Photographic equipment	2	Digital Camera	271.02	1	271.02	1.00	271.02	Photographs and turtle ID method
9/3/13	B-Equipment	Scientific/field equipment and supplies	3	Collecting Supplies	489.19	1	489.19	1.00	489.19	DNA collection supplies for lab analysis (through AMNH)
9/3/13	B-Equipment	Scientific/field equipment and supplies	4	Clipboard	45.00	4	180.00	1.00	180.00	Clipboards to hold data sheets
9/3/13	B-Equipment	Scientific/field equipment and supplies	5	SPREP tags	176.41	1	176.41	1.00	176.41	Turtle tags for mark-recapture
9/3/13	B-Equipment	Scientific/field equipment and supplies	6	Tag applicators	110.35	2	220.69	1.00	220.69	Device for securing tags to turtles
9/3/13	B-Equipment	Camping equipment	7	Headlamps (x4)	49.95	4	199.80	1.00	199.80	For night surveys
9/3/13	B-Equipment	Camping equipment	8	Tents (x2)	600.00	1	600.00	1.00	350.00	For sleeping in remote villages
9/9/13	C-Phase 2 Project implementation	Travel and local transportation (including fuel)	9	Domestic airfare	422.98	1	422.98	1.00	422.98	Honiara-Munda return
9/12/13	A-Phase 1 Project preparation	Communications (telephone/internet/postage)	10	Telekom	800.00	1	800.00	7.25	110.34	Phone and internet access
9/16/13	A-Phase 1 Project preparation	Team training	11	Munda Training Venue	500.00	3	1,500.00	7.25	206.90	CLP team training event
9/16/13	A-Phase 1 Project preparation	Team training	12	Munda Training Travel	2,350.00	1	2,350.00	7.25	324.14	Travel to team training event
9/20/13	B-Equipment	Boat/engine/truck (including car hire)	13	TDA Travel to Kolombangara	2,000.00	1	4,000.00	7.25	551.72	TDA rangers return boat fare from Munda to Ringgi
9/22/13	C-Phase 2 Project implementation	Accommodation for team members and local guides	14	Accomodation for CLP Team + TDA	1,200.00	1	1,200.00	7.25	165.52	Accomodation for TDA rangers, Michael, KIBCA
9/22/13	C-Phase 2 Project implementation	Food for team members and local guides	15	Food for CLP Team + TDA	590.00	1	590.00	7.25	81.38	Food for field event
9/23/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	16	Ropa Expenses	1,200.00	1	1,200.00	7.25	165.52	Ropa (venue hire, materials, etc)
9/24/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	17	Tuki/Rey Expenses	1,200.00	1	1,200.00	7.25	165.52	Tuki/Rey (venue hire, materials, etc)
9/25/13	B-Equipment	Boat/engine/truck (including car hire)	18	Boat Hire and Fuel	1,530.00	1	3,000.00	7.25	413.79	Boat hire and fuel
9/25/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	19	Vavanga Expenses	1,200.00	1	1,200.00	7.25	165.52	Vavanga (venue hire, materials, etc)
9/25/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	20	Hunda Expenses	1,200.00	1	1,200.00	7.25	165.52	Hunda (venue hire, materials, etc)
9/26/13	B-Equipment	Boat/engine/truck (including car hire)	21	Boat Hire and Fuel	1,530.00	1	3,500.00	7.25	482.76	Boat hire and fuel
9/27/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	22	Ghatere Expenses	1,200.00	1	1,200.00	7.25	165.52	Ghatere (venue hire, materials, etc)
9/28/13	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	23	Iriri Expenses	1,200.00	1	1,200.00	7.25	165.52	Iriri (venue hire, materials, etc)
11/11/13	C-Phase 2 Project implementation	Workshops	24	Kolombangara Monitors to TDA Wor	3,500.00	1	3500	7.25	482.76	Support for training workshop on Tetepare
11/15/13	C-Phase 2 Project implementation	Accommodation for team members and local guides	25	Accomodation at Tetepare Training	1,200.00	1	1200	7.25	165.52	Accomodation at Tetepare Eco-lodge
11/15/13	C-Phase 2 Project implementation	Food for team members and local guides	26	Food at Tetepare Training	720.00	1	4500	7.25	620.69	Food and cook at Tetepare Eco-lodge
1/6/14	C-Phase 2 Project implementation	Other (Phase 2)	27	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
1/14/14	A-Phase 1 Project preparation	Communications (telephone/internet/postage)	28	Telekom	800.00	1	800	7.25	110.34	1 GB of Data
2/3/14	C-Phase 2 Project implementation	Other (Phase 2)	29	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
2/11/14	C-Phase 2 Project implementation	Workshops	30	Refresher Training for North	4,000.00	1	4000	7.25	551.72	Refresher workshop for northern communities
2/11/14	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	31	Ropa Expenses	1,200.00	1	1200	7.25	165.52	Ropa (venue hire, materials, etc)
2/11/14	B-Equipment	Boat/engine/truck (including car hire)	32	Boat Hire and Fuel	800.00	1	1200	7.25	165.52	Boat hire and fuel
2/13/14	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	33	Tuki/Rey Expenses	1,200.00	1	1200	7.25	165.52	Tuki/Rey (venue hire, materials, etc)
2/14/14	B-Equipment	Boat/engine/truck (including car hire)	34	Boat Hire and Fuel	1,275.00	1	2000	7.25	275.86	Boat hire and fuel
3/3/14	C-Phase 2 Project implementation	Other (Phase 2)	35	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
4/7/14	C-Phase 2 Project implementation	Other (Phase 2)	36	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
4/6/14	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	37	Vavanga/Ghatere Expenses	1,200.00	1	1200	7.25	165.52	Vavanga/Ghatere/Hunda (venue hire, materials, etc)
4/6/14	B-Equipment	Boat/engine/truck (including car hire)	38	Boat Hire and Fuel	1,275.00	1	2500	7.25	344.83	Boat hire and fuel
4/7/14	C-Phase 2 Project implementation	Workshops	39	Refresher Training for South	4,000.00	1	4000	7.25	551.72	Refresher workshop for southern communities
5/5/14	C-Phase 2 Project implementation	Other (Phase 2)	40	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
6/2/14	C-Phase 2 Project implementation	Other (Phase 2)	41	Monthly Monitoring	500.00	1	500	7.25	68.97	Monthly monitoring
6/16/14	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	42	Ropa Expenses	917.00	1	917	7.25	126.48	Ropa gathering (assessment / results)
6/16/14	C-Phase 2 Project implementation	Accommodation for team members and local guides	43	Village Accomodation	1,200.00	1	1200	7.25	165.52	Accomodation in village
6/16/14	C-Phase 2 Project implementation	Food for team members and local guides	44	Village Food	590.00	1	590	7.25	81.38	Food in village
6/17/14	B-Equipment	Boat/engine/truck (including car hire)	45	Boat Hire and Fuel	1,275.00	1	4000	7.25	551.72	Boat hire and fuel
6/18/14	C-Phase 2 Project implementation	Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	46	Vavanga Expenses	725.00	1	725	7.25	100.00	Vavanga gathering (assessment / results)
6/20/14	C-Phase 2 Project implementation	Accommodation for team members and local guides	47	Village Accomodation	1,200.00	1	1200	7.25	165.52	Accomodation in village
6/1/14	B-Equipment	Boat/engine/truck (including car hire)	48	Village Food	1,275.00	1	3200	7.25	441.38	Food in village
7/14/14	D-Phase 3 Post Fieldwork Expenses	Report production and results dissemination	49	Ringgi Report Preparation	1,050.00	3	1050	7.25	144.83	Week meeting in Ringgi to prepare reports
7/15/14	D-Phase 3 Post Fieldwork Expenses	Report production and results dissemination	50	Results Dissemination	2,375.00	1	2375	7.25	330.59	Reults dissemination in north and south

Itemized expenses	Total CLP Requested (USD)*	Total CLP Spent (USD)	% Difference	Details & Justification (Justification must be provided if figure in column D is +/- 25%)	Proposed Spending (Preliminary Report Only)
PHASE I - PROJECT PREPARATION					
Communications (telephone/internet/postage)	200.00	220.69	10%		
Field guide books, maps, journal articles and other printed materials	0.00	0.00	0%		
Insurance	100.00	0.00	-100%	M. Esbach insurance fully covered by AMNH	
Visas and permits	0.00	0.00	0%		
Team training	500.00	531.03	6%		
Reconnaissance	0.00	0.00	0%		
Other (Phase 1)	0.00	0.00	0%		
EQUIPMENT					
Scientific/field equipment and supplies	1,165.00	1066.29	-8%		
Photographic equipment	335.00	271.02	-19%		
Camping equipment	600.00	549.80	-8%		
Boat/engine/truck (including car hire)	3,700.00	3227.59	-13%		
Other (Equipment)	0.00	0.00	0%		
PHASE II - IMPLEMENTATION					
Accommodation for team members and local guides	700.00	662.07	-5%		
Food for team members and local guides	950.00	783.45	-18%		
Travel and local transportation (including fuel)	2,800.00	2992.23	7%		
Customs and/or port duties	0.00	0.00	0%		
Workshops	1350	1586.20	17%		
Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	1,650.00	1716.14	4%		
Other (Phase 2)	0.00	413.82	41382%	As project advanced, community support funds were given in exchange for participation in a regular monthly monitoring program. These funds are used at the community's discretion on a monthly basis, but have supported a emergency medical fund, support towards ecotourism infrastructure, and scholarships that cover schools fees for students from form 3-6.	
PHASE III - POST-PROJECT EXPENSES					
Administration	0.00	0.00	0%		
Report production and results dissemination	450.00	475.41	6%		
Other (Phase 3)	0.00	0.00	0%		
Total	**14,500.00**	**14,495.74**			