CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT

Organization Legal Name:	Ecosure Pty Ltd
Project Title:	Building community capacity to achieve conservation outcomes for priority bat species in the Polynesia-Micronesia Hotspot: A pilot study on Samoa.
Date of Report:	October 2009
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CEPF Region: **Polynesia-Micronesia Hotspot**

Strategic Direction: ***3****. Build awareness and participation of local leaders and community members in the implementation of protection and recovery plans for threatened species.*

Grant Amount: **$19,996 USD**

Project Dates: **1 February 2009 to 30 September 2009**

Implementation Partners for this Project (please explain the level of involvement for each partner):

Ministry of Natural Resources, Environment and Meteorology (MNREM), Government of Samoa:

Division of Environment and Conservation (DEC) – ACEO (Faleafaga Toni Tipama'a) provided a letter of introduction and support addressed to the Pulenu'u (village mayors). In addition, DEC supported the project by providing a member of staff (Fialelei Enoka) to accompany the Project Lead during field surveys. Fialelei conducted all introductions to the Pulenu'u and other villagers, thereby obtaining permissions to access land and visit sites with local guides. Fialelei also translated questions for the Project Lead, relayed answers and assisted in educating the community about Samoa's bat species, and their conservation and harvesting issues. Therefore, DEC had a crucial involvement in this project. In turn Fialelei, and to a lesser extent, other DEC staff, were educated about bats and techniques for surveying these animals.

Division of Forestry – ACEO (Maturo Paniani) accompanied the Project Lead on a site visit to O le Pupu Pu'e National Park during the reconnaissance trip in April 2009. The Division also supported the field surveys by allowing the Project Lead and Fialelei to use their facilities at Maota and Asau on Savai'i Island. Use of facilities on Upolu Island were also offered to the Project Lead, but lack of information regarding flying foxes in the respective National Parks meant that these sites were not a priority for field surveys in September.

Japanese International Cooperation Agency (JICA) – In conjunction with the Division of Forestry, Hitofumi Abe from JICA offered support of resources in the National Parks. As above, lack of information regarding flying foxes in the respective National Parks meant that these sites were not a priority for field surveys in September.

Conservation International Pacific Islands (CI-Pacific) – CI-Pacific staff allowed the Project Lead to use office facilities and supported the development of in-country partnerships.

Staff at the each of the above mentioned organizations**,** and also at the **Secretariat for the Pacific Region Environment Programme (SPREP)**, provided assistance with gathering background information regarding flying fox records in Samoa.

Conservation Impacts

Please explain/describe how your project has contributed to the implementation of the CEPF ecosystem profile.

This project has directly contributed to CEPF's stated Objective in the Polynesia-Micronesia Hotspot Logical Framework (Conservation International 2007):

"Catalyze action by civil society to counteract threats to biodiversity, especially from invasive species, in key biodiversity areas in the Polynesia-Micronesia Hotspot."

This was achieved through education and awareness raising about Samoa's two flying fox species, *Pteropus samoensis* ("pe'a vao") and *P. tonganus* ("pe'a fai taulaga"). This project additionally helped to raise awareness about *Emballonura semicaudata*, the Polynesian Sheath-tailed Bat ("tagiti"); in particular, how it is a bat and distinct from *Aerodramus spodiopygius*, the White-rumped Swiftlet or Cave Swiftlet ("pe'ape'a") with which it is generally confused. Specifically, information about these bats was relayed to 18 Pulenu'u across Upolu and Savai'i, as well as many other villagers and tourism operators on these islands.

In particular, flying fox behavior during field surveys indicated that flying foxes continue to be hunted in some villages on Upolu and Savai'i. Discussions with the local Pulenu'u confirmed that there was ongoing hunting in these places, and three of the Pulenu'u concerned (Aepo, Asau and Faleolupo on Savai'i) indicated that they would call for flying fox hunting to cease in their villages. Other Pulenu'u (e.g. Uafato on Upolu) indicated that flying fox hunting only takes place in October when they are harvested for the "White Sunday" holiday. All Pulenu'u were already aware that a Government of Samoa ban on hunting native birds and bats was in place. However, the villagers generally felt that the government ban on hunting would not be enforced. Educating the Pulenu'u about the long gestation period of flying foxes (approximately 6 months) and the fact that they only give birth to one young per year appeared to be well received. It became apparent that the general perception of villagers was that flying foxes might have a litter of young like a dog or cat, and therefore might be less vulnerable to hunting pressures than in reality they are.

Please summarize the overall results/impact of your project against the expected results detailed in the approved proposal.

On Samoa, the most recent readily available population assessments of *Pteropus samoensis* and *P. tonganus* prior to this survey were conducted by Zachary Dembo in collaboration with DEC staff in 2005 (Dembo 2005). At the time of our Letter of Inquiry (LOI) to CEPF in September 2008, both flying fox species were documented as in population decline on the IUCN Red List of Threatened Species, and with their assessments having been conducted in 1996, records for each were also listed as in need of updating at this time (IUCN 2007). Subsequently, in the Global Mammal Assessment update of the IUCN Red List (IUCN 2009) *P. samoensis* has been reclassified as Near Threatened (Brooke & Wiles 2008) and *P. tonganus* as Least Concern (Hamilton & Helgen 2008); both species remain listed as in population decline. The update for *P. samoensis* is largely based on survey work on American Samoa.

Emballonura semicaudata has been protected since 1993 on Samoa, where it was recognised as threatened by development and the effects of cyclone damage, but "there has been no conservation action to protect this species to date" (Hutson et al. 2001). Dembo (2005) found no trace of the species during surveys of caves and lava tubes. At the time of our LOI, *E. semicaudata* had not been recorded on Samoa since Cyclones Ofa and Val 1990/91, when just five individuals were recorded out of 20 caves surveyed on Upolu (IUCN 2007). Subsequently, in the Global Mammal Assessment update of the IUCN Red List (IUCN 2009), *E.*

semicaudata has been reported to have disappeared from Samoa and American Samoa (Bonaccorso & Allison 2008).

This project made excellent headway in getting baseline data on flying fox roost locations and an indication of the minimum population of *Pteropus tonganus* on Samoa – approximately 20,000 (Table 1). Locations were recorded using a hand-held Garmin GPSmap 60CSx set in map datum WGS84 and position format in decimal degrees. Positions were marked when an accuracy of within 7m had been achieved. However, it should be noted that typically the positions were recorded several meters from the roost trees to minimize disturbance of the flying foxes, and in the case of craters or less accessible areas, positions indicate the vantage points from which the flying foxes were observed. Flying foxes were directly counted in trees when they were easily visible using 10 x 40 Nikon Monarch binoculars. When it was not possible to count the flying foxes directly (e.g. they were roosting in multiple trees) they were estimated *in situ* using the methodology described in Shilton et al 2008; and where appropriate, a Leica 32x WW spotting scope was used. Elevations were recorded in meters above sea level (m asl).

Table 1. *P. tonagnus* roosts documented on Samoa in September 2009.

Date m/dd/yy	Village	Site	Elevation (m asl)	S (decimal degrees)	W (decimal degrees)	No. Trees	No. *P. tonganus*	Total estimate
9/02/09	Tapatapao	Ff001	387	13.88124	171.82370	>10	377	500
9/10/09	Uafato	Ff002	71	13.93967	171.51643	3	1,000	1,000
9/09/09	Lalomanu	Ff003	313	14.03807	171.46461	>46	13,800	15,000
9/14/09	Maota-Tafua	Ff004	88	13.78490	172.25162	2	3	3
9/15/09	Gataivai	Ff005	61	13.76718	172.42802	1	662	750
9/16/09	Fagafau	Ff006	31	13.63252	172.67821	>5	200	1,000
9/17/09	Salailua	Ff007	321	13.69690	172.56905	1	951	1,000
9/17/09	Salailua	Ff008	237	13.70128	172.57115	1	202	250
9/19/09	Faleolupo	Ff009	22	13.51845	172.79276	1	127	250
9/19/09	Asau	Ff010	209	13.53661	172.64343	4	125	125
9/20/09	Aopo	Ff011	53	13.52294	172.59370	6	82	100
9/22/09	Vailima	Ff012	395	13.86267	171.77203	2	60	60
9/24/09	Leulumoega	Ff013	365	13.87869	171.96132	2	7	7
9/14/09	Tafua	Ff014	30	13.75549	172.25883	>1	52	100
9/25/09	Manunu	Ff015	163	13.91557	171.61784	>1	10	10
						Total	***17,658***	***20,155***

Locations for sites Ff014 and Ff015 were recorded from the vantage points from which *P. tonganus* were seen taking flight from a roost; in Tafua this was a dusk flyout and in Manunu gunshots could be heard and appeared to be the cause of flying fox disturbance, although we could not say if they were the target animals. Excluding these two sites, 13 *P. tonganus* roosts ranged in elevation from 22-395m asl (mean 196m asl).

Roosting *P. samoensis* were recorded roosting at one site on Savai'i, at the Tafua Savai'i crater, Maota-Tafua (Table 2). *P. samoensis* were also recorded feeding or flying on 10 additional occasions (Table 3). Feeding or flying *P. tonganus* were also recorded on 3 separate occasions (Table 3).

Table 2. *P. samoensis* roost documented on Samoa in September 2009.

Date m/dd/yy	Village	Site	Elevation (m asl)	S (decimal degrees)	W (decimal degrees)	No. Trees	No. *P. samoensis*
9/14/09	Maota-Tafua	Ff004	144	13.7874	172.25259	1	8

Table 3. Additional *P. samoensis* and *P. tonganus* sightings on Samoa in September 2009.

Date m/dd/yy	Village	Activity	Elevation (m asl)	S (decimal degrees)	W (decimal degrees)	No. flying foxes	Species
9/02/09	Tapatapao	feeding	387	13.88124	171.8237	1	*P. samoensis*
9/07/09	Uafato	flying	-	-	-	6	*P. samoensis*
9/07/09	Uafato	feeding	-	-	-	1	*P. samoensis*
9/07/09	Uafato	feeding	-	-	-	1	*P. samoensis*
9/07/09	Uafato	flying	-	-	-	5	*P. tonganus*
9/07/09	Uafato	flying	-	-	-	3	*P. samoensis*
9/08/09	Mutiatele	feeding	19	14.01998	171.41637	2	*P. samoensis*
9/11/09	Vailima	flying	387	13.8633	171.76982	1	*P. tonganus*
9/12/09	Nu'utele Island	feeding	64	14.06112	171.42079	1	*P. samoensis*
9/19/09	Faleolupo	flying	-	-	-	1	*P. samoensis*
9/20/09	Aopo/Asau	flying	-	-	-	1	*P. samoensis*
9/23/09	Matafaa	feeding	146	13.94584	171.98329	1	*P. tonganus*
9/23/09	Matafaa	feeding	144	13.94597	171.98355	1	*P. samoensis*

The majority of additional *P. samoensis* sightings were along the road between the villages of Salatele and Uafato. Unfortunately, we did not carry the GPS when we unexpectedly needed to walk along this track in order to meet with the Pulenu'u of Uafato village. However, the *P. samoensis* were sighted at several different locations either side of the near coastal road, in lowland forest and also observed flying up into upland forest areas. *P. tonganus* were also observed along this stretch, and a roost of approximately1,000 *P. tonganus* was recorded a few days later when we visited the Atufala coastal forest with the Pulenu'u of Uafato.

No sightings of *Emballonura semicaudata* were made during our surveys. In addition to keeping an eye out for these microbats during the evenings, we surveyed Pe'ape'a cave in O le Pupu Pu'e National Park in April, and a cave at Satuiatua, southwestern Savai'i, in September 2009**.** Only White-rumped Swiflets were seen in these caves, and no microbat droppings were seen. We also visited Namua Island off the southeast coast of Upolu as we had heard of sightings of the "tagiti" on this island, but again, we did not observe any and the information we had received seemed like it was much longer ago than we had initially understood. We spoke with several villagers, and all Pulenu'u, about the "tagiti". It became apparent that there was great confusion about this animal being a bat, with many people believing that the White-rumped Swiftlet is a bat (probably the confusion continues due to the local name of Pe'a pe'a) and others believing that the "tagiti" is a baby flying fox. Either way, it seems that very few people were aware that a third bat, a different type of bat, had existed on Samoa before cyclones Ofa and Val.

Please provide the following information where relevant:

Hectares Protected: n/a
Species Conserved: population and distribution data acquisition and education and awareness raising for two species of flying fox (*Pteropus samoensis* and *P. tonganus*); additional education and awareness raising about a third species of bat (*Emballonura semicaudata*) which is presumed to now be extinct on Samoa.
Corridors Created: n/a

Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives.

Short-term

The project made excellent headway in getting baseline data on flying fox roost locations and an indication of the minimum population of *Pteropus tonganus* on Samoa:

- GPS locations of flying fox roosts are available to MNRE staff for the first time; these locations can be re-visited, and perhaps prioritized, as part of a long-term in-country monitoring program.
- Pulenu'u at each of the visited villages have been made aware of the need for these animals to be monitored; those already enforcing local bans on hunting have been encouraged to continue to protect flying foxes within their village.

The project also generated some distribution data for *P. samoensis* on Samoa, however:

- This species was not sighted as often as anticipated in lowland forest areas, which may be cause for concern that the population of *P. samoensis* has further declined on Samoa.
- The project approach of seeking information on recent flying fox sightings for targeting survey effort inevitably biases surveys to locations where the more colonial *P. tonganus* are roosting.
- MNRE staff should deploy additional transect surveys in areas of suitable habitat for assessing *P. samoensis* in the longer-term.

Long-term

The population trends of *P. tonganus* and *P. samoensis* are impossible to determine with the results of this three-week survey since there is no recent distribution and population count data with which to compare these findings. The most recent available flying fox data for Samoa is in the report by Zachary Dembo (Dembo 2005). Dembo's (2005) flying fox survey was conducted over a similar three-week period but in the month of November, during which time rain hindered some of the survey effort. Furthermore, Dembo's timing would have coincided with the time when *P. tonganus* young will have weaned. Based on the behavior of other flying fox species (e.g. *P. conspicillatus* in Queensland, Australia; Shilton et al 2008), we would expect *P. tonganus* to be less colonial in November than it is during its birthing season and through the period when there are still dependent young (April to September approx.), which there were in September 2009.

Dembo (2005) reported a total of 388 flying foxes (species were not distinguished) at 15 sites on Upolu and Savai'i, and two repeat site visits (Le Mafa Pass and Nu'utele Island). Over a similar survey period, we documented approximately 20,000 *P. tonganus* across 15 sites (7 Upolu, 8 Savai'i) and 8 *P. samoensis* at a roost on Savaii and 18 in flight or feeding in other areas. Such a huge difference in flying fox numbers over the course of 4 years between these two surveys could not be explained as population increase (as above, these animals only give birth to one young per year), and is likely to be almost entirely the result of differences in the timing and methodological approach of surveys. Notably, Dembo was unable to visit Lua-o fafine Crater (Tuafafine [sic] in Dembo 2005) near Lalomanu, as the Village Council had banned all visits to the crater in 2001 (Dembo 2005). As Dembo (2005) noted, the crater has the largest roost in the area. Indeed, the Lua-o fafine roost alone accounted for approximately 75% of all *P. tonganus* observed during our surveys (see Table 1). When the Project Lead visited the Lua-o fafine Crater five months earlier, in April 2009, approximately 300 *P. tonganus* were roosting there. This indicates a massive influx of *P. tonganus* for the birthing season. In September 2009, ten females were observed with non-volant young, and many other individuals with bulges beneath wrapped wings were also likely to have been females with non-volant young. Three males were also confirmed, indicating that the roost was mixed. A comprehensive sex ratio was not possible because the colony could only be viewed from a vantage point at the southeastern edge of the crater.

The main challenge in maximizing survey effort was the lack of prior population data or precise location information for these species. *P. samoensis* presents additional challenges due to its daytime activity and its solitary nature.

- Other more standard challenges in assessing flying fox populations applied in this project and that is mainly that these animals can change roost locations such that information about where they have been seen is readily out of date. This challenge is increased since they tend to roost in intact forest away from roads and villages, and so are not necessarily noticed unless people are specifically interested in looking for them. On Samoa, interested parties tend to be hunters. Where hunting pressure continues it was apparent that *P. tonganus* tends to roost in smaller numbers and these small groups relocate with greater frequency.

The project was well received by the local community, principally the Pulenu'u, and provides a solid foundation for MNRE to refine the methodology through engagement with the Pulenu'u network.

- 82% of land is under customary ownership in Samoa (T. Tipama'a, personal communication), therefore, the support and interest of local leaders and the community is critical to the success of any biodiversity conservation project.
- Our project directly engaged 18 Pulenu'u and many other members of the local community; each Pulenu'u expressed that they were happy with the project goals and many said that it was important for their village and for Samoa. All Pulenu'u visited gave permission to access land and assisted us by suggesting or arranging a local guide. Small cash incentives were provided to guides and/or Pulenu'u.

Were there any unexpected impacts (positive or negative)?

We are not aware of any negative impacts from the project. It is unlikely that hunting pressure on flying foxes would have been increased due to the flying fox roost survey work as it's clear that members of each village have knowledge on the location of at least one flying fox roost.

In contrast, education and awareness raising about flying foxes, and confirmation of where local hunting still occurs, encouraged three Pulenu'u to say that they would call for flying fox hunting to cease in these areas.

Lessons Learned

Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building. Consider lessons that would inform projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community.

Project Design Process: (aspects of the project design that contributed to its success/shortcomings)

The project design was of a responsive nature and this contributed both to the success and shortcomings of the project. By responsive nature, we mean that survey effort was determined on the basis of local information obtained during the survey as opposed to conducting surveys at predetermined sites based on the available literature or past data. A responsive survey effort was necessary because flying foxes are highly mobile animals and in certain landscape contexts they can switch roost locations regularly (e.g. Brooke et al 2000; Shilton et al 2008). Disturbance, either from natural events or hunting, contribute to the movements and roost switching of flying foxes. Furthermore, as mentioned above, little data of flying fox roost locations on Samoa was available prior to this project.

Being responsive to local information meant that we were able to schedule site visits on the same day as meeting with Pulenu'u in most cases, or at the nearest mutually suitable time. In this way there was little or no delay in visiting sites where flying foxes had been recently seen. We were successful in recording flying foxes at 16 of 19 sites visited. A shortcoming of this approach is that survey effort is inevitably biased towards where villagers recall seeing flying foxes. In addition, we learned that flying foxes are also present in the forests of Lotofaga (Upolu) and Salelologa

(Savai'i), but that there was no specific knowledge of where the roost sites were at the time and there wasn't sufficient time to undertake more exploratory forest visits. Flying foxes were not successfully located in Taga (Savai'i). Here it seems that ongoing hunting has caused the flying foxes to relocate. In addition, 'Da Craterman' also confirmed that small numbers of flying foxes can be seen at the Mt Matavanu Crater at northeastern Savai'i, but only on dusk, which suggests that these are *P. tonganus*. We did not spend time at the crater during to heavy rain limiting visibility during our brief window of opportunity.

Project Implementation: (aspects of the project execution that contributed to its success/shortcomings)

The strongly colonial nature of *P. tonganus*, as for most flying fox species, means that many methods deployed for surveying birds (e.g. spot counts, transects) and density calculations are not appropriate for these animals. As a result, attempts to census flying fox populations usually focus on known roost locations and deploy either a flyout count methodology (typically around dusk when flying foxes leave the roost to commence foraging; e.g. Forsyth et al 2006) or a daytime count methodology (whereby animals are counted or estimated in the roost trees; e.g. Shilton et al 2008). From personal experience of monitoring flying foxes, the Project Lead believes that daytime counts are generally preferable to dusk flyout counts. Advantages of daytime counts compared with flyout counts include: a) more than one roost site can potentially be monitored in a day; b) a single observer can conduct the monitoring; c) counts can be repeated during the day, for example, if flying foxes are seen in an additional tree; d) sexing and identification of non-volant or recently weaned young is possible; e) vantage points or walk-in approaches can be used, depending upon the accessibility of the site; and f) roost tree type and other habitat characteristics can be recorded. The only real disadvantage of a daytime count compared with a flyout count is when sites are not readily accessible and the full extent of the colony may not become apparent until flyout. Therefore, when time is not so limiting, observation of flyouts can be used to determine roost locations and should be then visited the following day.

Deploying daytime roost counts as opposed to dusk flyout counts contributed to the success of this project in several ways. For example, willingness of local villagers to guide us to sites within forest where flying foxes had been seen was potentially greater than if we had wanted to visit sites in the evening. Visibility of flying foxes is much greater during the day such that at Lua-o fafine Crater in particular, we were able to observe non-volant young attached to their mothers. We were also able to see flying foxes roosting in 46 distinct trees at this site.

Other lessons learned relevant to conservation community:

The Project Lead was not aware that there was a CEO of the Pulenu'u until the final stages of the survey. Two of the Pulenu'u mentioned that it would have been preferable to have a letter of support signed by the Pulenu'u CEO, whereas our letter of support was from MNREM. In one of these villages we were charged a land access fee that we understand would have been waived if we had had a letter from the Pulenu'u CEO. Therefore, we would encourage any other members of the conservation community to have a letter of support signed by the Pulenu'u CEO in addition to contacting the Pulenu'u network via the Ministry for Internal Affairs, and having a letter of project support from the relevant Division of MNREM.

ADDITIONAL FUNDING

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Donor	Type of Funding*	Amount	Notes
Ecosure Pty Ltd	Project co-financing	$22,640	50% contribution to staff salary costs, contribution of laptop, binoculars, spotting scope, camera, first aid and safety equipment.
Ministry of Natural Resources, Environment and Meteorology	Project co-financing	$5,500	In-kind staff salary - participation in meetings, on field trips, meeting villagers, and field station facilities.
Dr Louise A. Shilton	Project co-financing	$1,200	Personal contribution of camping equipment, field equipment, and some additional accommodation and subsistence expenses.
Japanese International Cooperation Agency	Project co-financing	$1,000	In-kind staff salary, plus transportation and field costs in National Parks.
Lubee Bat Conservancy	n/a	n/a	Co-financing was not possible due to impacts of the global recession

Additional funding should be reported using the following categories:

A *Project co-financing (Other donors contribute to the direct costs of this CEPF project)*

B *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*

C *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

Sustainability/Replicability

Summarize the success or challenge in achieving planned sustainability or replicability of project components or results.

We were successful in recording a GPS location for all roost sites or vantage points to roost sites, such that repeat site visits for any follow up surveys by DEC will be possible (DEC have been supplied with the detailed survey data, these data are only summarised in this report). In addition, many Pulenu'u indicated that they would welcome follow up surveys as part of longer-term monitoring of flying foxes.

The acquisition of GPS coordinates for roost sites also allows spatial analyses of roost habitat using remotely sensed images or aerial photographs in MapInfo or ArcGIS software, for example.

There are challenges in having easily replicable flying fox roost count methodology as inevitably visibility on the day and accessibility of individual sites influences whether or not flying foxes can be directly counted. At sites such as Lua-o fafine Crater, for example, we had an excellent vantage point for the trees being used as roost trees to the west of the crater in September. However, it's conceivable that on another occasion, the flying foxes might be roosting in different trees within the crater, and the vantage point that we accessed to the southeast may not enable the extent of the roost to be determined. Further challenges in replication of surveys are that flying foxes may change roost sites seasonally or in response to disturbance, such as hunting.

Summarize any unplanned sustainability or replicability achieved.

We documented the name and contact details of the Pulenu'u visited, as well as the local guides. We would encourage DEC to follow up with these Pulenu'u to arrange additional surveys.

Safeguard Policy Assessment

Provide a summary of the implementation of any required action toward the environmental and social safeguard policies within the project.

n/a

Performance Tracking Report Addendum

CEPF Global Targets

(Enter Grant Term)

Provide a numerical amount and brief description of the results achieved by your grant.
Please respond to only those questions that are relevant to your project.

Project Results	Is this question relevant?	If yes, provide your numerical response for results achieved during the annual period.	Provide your numerical response for project from inception of CEPF support to date.	Describe the principal results achieved from July 1, 2007 to June 30, 2008. (Attach annexes if necessary)
1. Did your project strengthen management of a protected area guided by a sustainable management plan? Please indicate number of hectares improved.	Potentially	n/a	n/a	Although information was not gained about recent sightings of flying foxes in O le Pupu Pu'e National Park during the course of this project, subsequent observations by James Atherton indicate that a colony of about 1,000 *P. tonganus* may reside in the National Park. This number of flying foxes were observed leaving the National Park heading south during the afternoon on 10/10/09 while gunshots were heard (J. Atherton, personal communication). Surveys were also conducted in three other key biodiversity areas identified in the CEPF ecosystem profile (see question 3.).
2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or	No	n/a	n/a	

community agreement?				
3. Did your project strengthen biodiversity conservation and/or natural resources management inside a key biodiversity area identified in the CEPF ecosystem profile? If so, please indicate how many hectares.	Yes	n/a	n/a	Surveys were conducted in key biodiversity areas identified in the CEPF ecosystem profile: Aleipata Islands (Namua and Nu'utele islands) – flying foxes recorded feeding, past daytime roost trees documented. O le Pupu Pu'e National Park – recent sighting of large (c. 1,000) *P. tonganus* colony in the National Park. Uafato-Tiavea Coastal Forest – large (c. 1,000) *P. tonganus* colony plus several sightings of *P. samoensis*. Savai'i Lowland and Upland Forest - *P. tonganus* colonies documented plus several sightings of *P. samoensis*.
4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares.	Yes	18 villages and Pulenu'u	18 villages and Pulenu'u	Pulenu'u of 18 villages are better informed about need for flying fox conservation; Pulenu'u implementing local flying fox hunting bans were encouraged to continue enforcing these, and those in villages where ongoing hunting is evident were encouraged to call for a hunting ban.
5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits? Please complete Table 1below.	No	n/a	n/a	

If you answered yes to question 5, please complete the following table.

Table 1. Socioeconomic Benefits to Target Communities

Please complete this table if your project provided concrete socioeconomic benefits to local communities. List the name of each community in column one. In the subsequent columns under Community Characteristics and Nature of Socioeconomic Benefit, place an X in all relevant boxes. In the bottom row, provide the totals of the Xs for each column.

Name of Community	Community Characteristics								Nature of Socioeconomic Benefit													
									Increased Income due to:													
	Small landowners	Subsistence economy	Indigenous/ ethnic peoples	Pastoralists/nomadic peoples	Recent migrants	Urban communities	Communities falling below the poverty rate	Other	Adoption of sustainable natural resources management practices	Ecotourism revenues	Park management activities	Payment for environmental services	Increased food security due to the adoption of sustainable fishing, hunting, or agricultural practices	More secure access to water resources	Improved tenure in land or other natural resource due to titling, reduction of colonization, etc.	Reduced risk of natural disasters (fires, landslides, flooding, etc)	More secure sources of energy	Increased access to public services, such as education, health, or credit	Improved use of traditional knowledge for environmental management	More participatory decision-making due to strengthened civil society and governance.	Other
Total																						

If you marked "Other", please provide detail on the nature of the Community Characteristic and Socioeconomic Benefit:

Additional Comments/Recommendations

Only through an increased understanding of flying fox population status and dynamics can informed decisions be made about whether or not harvesting of flying foxes is sustainable. It was clear during our surveys that engaging the Pulenu'u network is crucial to the success of any conservation project on Samoa. We strongly encourage any future conservation workers, or eco-tourism operators, to act appropriately by meeting with the appropriate Pulenu'u before visiting any site. During the course of our work we heard stories about visitors that did not do this, and thus accessed private land without permission. Unfortunately, such actions reflect poorly on all non-locals. We would further recommend that a letter of support is signed by the Pulenu'u CEO, and that sufficient time is allocated to make these arrangements prior to commencing on-ground surveys.

The former ban, and ongoing restriction, of visitors to Lua-o fafine Crater by Lalomanu Village Council should be commended. This is an important site for *P. tonganus* on Upolu, and potentially also for *P. samoensis*. We are not aware of reports of flying fox movements between Upolu and Savai'i, but it is conceivable that such highly mobile animals would cross the less than 20 km stretch of ocean (see for example, Shilton et al 1999; McConkey & Drake 2007). Therefore, the influx of *P. tonganus* to Lua-o fafine Crater could also be by animals that spend non-birthing periods on Savai'i. We recommend monitoring the flying fox roost at Lua-o fafine Crater as a priority for understanding the population dynamics of *P. tonganus*. Ideally, several additional roost sites should be monitored regularly, but given resourcing issues, and understandable socio-economic priorities following the devastation caused by the tsunami on 29 September, regular monitoring of this site would be an excellent start. Prior to the tsunami, a small eco-tourism operation was being conducted by family of the landowners from Litia Sini Beach Fales. It remains to be seen how and when tourism operations to this area will resume, but we would encourage the family run eco-tourism visits to the crater to continue, and visitors to support this. As well as supporting local livelihoods and respecting land ownership, this is an excellent opportunity to provide education material and raising awareness about the importance of flying foxes for seed dispersal and pollination of native forest trees.

We would like to acknowledge and thank all the Pulenu'u, landowners and other villagers for supporting this project, and thereby supporting efforts to conserve flying foxes on Samoa. This project would not have been possible without their generosity and understanding.

Last but not least, we would like to dedicate this report to all people of Samoa and foreign workers living there – all have been touched by the devastation of the tsunami.

Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, www.cepf.net, and publicized in our newsletter and other communications.

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