

CEPF Final Project Completion Report

Organization Legal Name:	Turtle Survival Alliance (TSA)
Project Title:	Securing Local Participation in Conservation of River Turtles in Myanmar
Grant Number:	66322
CEPF Region:	Indo-Burma II
Strategic Direction:	4 Empower local communities to engage in conservation and management of priority key biodiversity areas
Grant Amount:	\$95,368.00
Project Dates:	February 01, 2017 - December 31, 2018
Date of Report:	April 26, 2019

Implementation Partners

List each partner and explain how they were involved in the project

Wildlife Conservation Society - An international NGO with a long history of working in Myanmar. The primary role of WCS in this project was to provide logistic support (transportation and facilities) and technical expertise. WCS also provided key personnel (Steven G. Platt and Myo Min Win) for the project.

Myanmar Forest Department - Local partner that directly supported the project by granting research permits, and providing personnel.

Monywa University - Graduate students from the Department of Zoology at Monywa University worked closely with Community Conservation Volunteers (CCVs) and TSA/WCS staff, and participated in egg collections, assisted with monitoring turtle nesting beaches, and helped with maintenance of turtle rearing facilities in Limpha Village .

Riverside communities - CCVs were recruited from riverside communities and participated in various aspects of the project. CCVs played a critical role in monitoring nesting beaches for signs of turtle activity and assisted with collection and transport of turtle eggs to a secure incubation area. CCVs were responsible for monitoring eggs throughout incubation and caring for hatchlings and other turtles at the Limpha head-starting facility.

Conservation Impacts

Summarize the overall impact of your project, describing how your project has contributed to the implementation of the CEPF ecosystem profile

Overall, there have been several significant outcomes resulting from our project. First, 30 head-started *Batagur trivittata* were released into the Chindwin River at Limpha, significantly bolstering the only surviving wild population in Myanmar. Prior to this release, the wild population consisted of fewer than 10 reproductively mature females and an unknown number of turtles surviving from a previous reintroduction (2015). Moreover, monitoring with sonic telemetry indicates the released turtles remain in the vicinity of Limpha Village, making them less likely to fall victim to fishing gear. Second, all sandbanks known to be used by Roofed Turtles for nesting are now seasonally protected by locally recruited and trained Community Conservation Volunteers (CCVs). Third, clutches of wild female *Batagur trivittata* were successfully collected and incubated during the 2016-17 and 2017-18 nesting seasons. Hatchling turtles from both cohorts are now being reared for eventual release. Fourth, CCVs have established an informal network of informants among riverside villagers and through this network we learned of three *Chitra vandijkii* (critically endangered) and two *Nilssonia formosa* (critically endangered) nests, the eggs of which were collected and successfully incubated; hatchlings are being head-started for release within 12 months (limitations of rearing infrastructure preclude a lengthier head-starting period). Fifth, a cadre of 30-40 CCVs have been recruited and trained to assist with field efforts and serve as "conservation ambassadors" in local communities. Sixth, the potential for community-based fisheries management within the project area has been assessed, and critical fish and turtle habitats (e.g., deep pools, sandbanks) identified. Unfortunately, efforts to further develop community-based fisheries plans met with unforeseen difficulties and except for a stretch of the Chindwin River at Limpha Village (inhabited by the sole remaining reproductive population of wild *Batagur trivittata*), implementation has stalled owing to lack of interest and community support. That said, villagers for the most part remain enthusiastic about turtle conservation and view our efforts as a means to restore a culturally iconic species to its former prominence.

Planned Long-term Impacts - 3+ years (as stated in the approved proposal)

Impact Description	Impact Summary
6. Protected deep-water habitats (aikas) that shelter riverine turtles and large fish.	Again, harking back to the previous impact, little was achieved in protecting deep-water habitats (aikas) that shelter riverine turtles and large fish. Our original plan was to incorporate these micro-habitats into Fish Conservation Zones where mutually agreed upon community-based fishing regulations would curtail or eliminate the use of large mesh nets and other destructive gear. However, villagers showed little interest in plans to develop community fisheries regulations when it became apparent that these would interfere with what they view as a common resource. Despite long-term declines in fisheries production being widely recognized among these communities, little enthusiasm existed for conservation. Without agreed-upon community regulations, there was no way to effectively protect these habitats except near Limpha Village (see above).

<p>7. Protected nesting habitats (beaches) for Batagur trivittata and softshell turtles that will also benefit other riverine species of conservation concern (e.g., Black-bellied and River Terns, Greater Thick-knee, River Lapwing, Indian Skimmer).</p>	<p>Our efforts to protect sandbanks used as turtle nesting sites have been highly successful. In addition to turtles, other riverine species of conservation concern benefit from the protection afforded to these sites. The most notable beneficiaries include River Terns and River Lapwings. Both species have repeatedly nested on the major turtle site at Limpha Village (Pagoda Island). Furthermore, our efforts identified a second nesting area for River Terns, River Lapwings, Small Pratincoles, and possibly Greater Thick-knee just upstream at Limpha Island. Although not used as a nesting site by Batagur trivittata (gravel content of substrate may discourage turtle nesting), we have arranged with village authorities to extend protection to the island. Our project compliments on-going effort by WCS to locate and protect critical nesting habitat for River terns along the Chindwin and Ayeyarwady rivers. Unfortunately, populations of Black-bellied Terns and Indian Skimmer are no longer extant within our project area.</p>
<p>1. Progress towards restoring Batagur trivittata as a functional member of riverine ecosystem in upper Chindwin River.</p>	<p>We reintroduced 30 head-started Roofed Turtles into the Chindwin River at Limpha Village in March 2018. Sonic transmitters were attached to a subset of these turtles. Regular monitoring has revealed that most remain in a stretch of the river near Limpha Village, also home to most surviving wild Roofed Turtles and the site of an earlier reintroduction (2015). We are unaware of any mortalities among the most recently reintroduced turtles. Additionally, all known sandbanks used for nesting by wild turtles are completely protected during the egg-laying period from December through March. We have also secured the fishing rights to a 6 km stretch of the Chindwin River where most turtles dwell. In this area cooperative agreements have been implemented with fishermen to use turtle-friendly fishing practices. Reduction in fisheries by-catch is also being achieved in part through a rescue program staffed by CCVs in which captured turtles are secured and later released. Although increases in the number of nesting Roofed Turtles are not expected for several years, all clutches deposited near Limpha in the 2017-18 (and again in 2018-19) nesting season proved viable. Egg viability is attributed to fertilization by males reintroduced in 2015 (a CEPF-funded project).</p>
<p>2. Demonstrated reintroduction methodologies suitable for large, highly mobile river turtles that can be extended to endangered chelonians elsewhere in the world.</p>	<p>The methodologies used in this project hinge on 1) ex-situ techniques for incubating turtle eggs and rearing juveniles to a size suitable for release, and 2) soft-release strategies that engender site fidelity and</p>



	<p>dampen post-release movements. These methodologies are subject to modification based on an assessment of results. For example, turtle diets have been adjusted after Bronx Zoo veterinarians determined that insufficient protein was being supplied by the captive diet. Strategies with demonstrated success for reintroducing river turtles and softshell turtles are currently lacking. Therefore, the methodologies that we develop in conjunction with this project are not only of value in Myanmar, but can be transferred to other countries that face similar conservation challenges. To this end, we have presented our findings at international conferences and continue to strive to disseminate our results through peer-reviewed scientific literature.</p>
<p>3. Viable populations of large softshell turtles (<i>Nilssononia formosa</i>, <i>Amyda cartilaginea</i>, and <i>Chitra vandijki</i>) in Chindwin River.</p>	<p>Establishing viable populations of softshell turtles in the Chindwin River in the long-term will require years of targeted conservation action. We have taken the first steps in that direction during this project by identifying and monitoring sandbanks used for nesting, collecting eggs, and head-starting hatchlings. We have also made efforts – albeit with some success - to obtain softshell turtles taken as fisheries by-catch and release these animals. Most importantly, the measures we have implemented to protect <i>Batagur trivittata</i> (sandbank protection, cooperative agreements with fishers, etc.) will no doubt also benefit softshell turtles. Evaluating trends in softshell turtle populations is challenging, although monitoring of nesting effort along the river can serve as a potentially robust indicator. Additionally, tracking the body size (carapace length) of softshell turtles incidentally captured in fishing gear can provide crude estimates of population trends (e.g., declining size over time suggests population declines). Furthermore, eDNA methods that have demonstrated success in locating cryptic species of softshell turtles elsewhere (e.g., <i>Rafetus swinhoiei</i>), show promise for population monitoring along the Chindwin River in the future.</p>
<p>4. Reduction in fisheries by-catch of <i>Batagur trivittata</i> and softshell turtles in Chindwin River.</p>	<p>Given our minimal success in establishing Fish Conservation Zones, difficulties have been experienced in reducing fisheries by-catch of softshell turtles. That said, project staff have established strong ties to riverside communities and therefore are able to informally monitor the by-catch of softshell turtles. For a variety of reasons (e.g., placement of nets, mesh size, etc.), the incidental takes of softshell turtles appears low. Those that are captured are often secured by</p>


	project staff who either 1) incorporate these turtles into captive assurance colonies or 2) release them in semi-protected stretch of river near Limpha village.
5. Sustainable fisheries and increased stocks of fish available to communities along the upper Chindwin River.	Given the difficulties we experienced in attempting to establish Fish Conservation Zones and community-based fisheries in villages along the Chindwin River, it is unlikely that our efforts will increase the sustainability of local fisheries. This dire assessment is somewhat tempered by a pilot project initiated in Limpha Village; we purchased the government fishing lease to a section of river and as lease-holders are entitled by law to dictate fishing practices within the concession. However, knowing the concerns of villagers about potential restrictions on their use of a common resource, we have proceeded cautiously. On a related note, employment opportunities in nearby jade and amber mines continue to lure males away from riverside villages, and as a result fishing pressure is probably declining. This is certainly the case with regards to agriculture, which has been largely abandoned by males and now the domain of village women.

Planned Short-term Impacts - 1 to 3 years (as stated in the approved proposal)

Impact Description	Impact Summary
1. Creation of a cadre of Community Conservation Volunteers with a vested interest in ensuring the success of turtle conservation in critical habitats along the Chindwin River.	An operational cadre of Community Conservation Volunteers (CCV) has been established in villages on the upper Chindwin River. CCVs are trained as field technicians and conservation ambassadors whose role is to both actively participate in conservation actions and function as a link between the project and riverside communities. CCVs have been especially useful in assisting with the post-release monitoring of reintroduced Roofed Turtles, monitoring and guarding sandbanks used by nesting Roofed Turtles, collecting eggs for incubation, and caring for turtles being head-started. CCVs have also played a pivotal role in softshell turtle conservation by expanding the search for nests, collecting eggs, and headstarting hatchlings for release. CCVs have strengthened our ties to local communities and independently developed a “rescue” operation to secure the release of turtles inadvertently captured by fishermen. One CCV was recently elected as the Headman of Limpha Village where our most important work is focused. CCVs have also been invaluable in collating anecdotal reports of turtle sightings from villagers; these sighting reports augment our more technologically intensive (e.g., sonic telemetry)

	monitoring efforts of reintroduced turtles.
2. Increased populations of river turtles (B. trivittata and three softshells) in the Chindwin River as a result of nest protection, egg collection, head-starting, and reintroduction, reduction in fisheries by-catch, and protection of critical habitats	Thirty subadult Batagur trivittata were reintroduced into the Chindwin River, augmenting the known wild population of at least four females and an undetermined number of non-reproductive adults (released in 2015). Likewise, egg collection continues to yield dividends with 60-70 eggs collected and successfully incubated every nesting season (December-March). Importantly, hatching success and first-year survival of neonates are high (>80%) guaranteeing an annual increase in the total (wild + captive) global population of Batagur trivittata. Fewer softshell turtles were released; however, about 40 hatchling Chitra vandijki were released after being hatched from eggs collected from along Chindwin River. Owing to the small body size of these turtles, survival was probably low (<50%), which is not unexpected for this size-class. Effective protection of critical sandbank nesting habitat has been achieved for Batagur trivittata. Fisheries by-catch potentially remains a problem owing to the difficulty we have experienced in attempting to establish Fish Conservation Zones through a community-based fisheries program.
3. Enhanced understanding of risks faced by river turtles, measures that might be implemented to mitigate risks, and the potential impact of these conservation measures on local communities.	We identified the following potential threats to turtles in the Chindwin River: 1) incidental take by fisheries gear, especially large-mesh nets (all turtles) and baited hooks (three species of softshell turtles); 2) electro-fishing by commercial fish poachers; 3) use of nesting sandbanks by seasonal agriculturists; 4) trampling of nests by free-ranging livestock such as water buffalo and cattle. Mitigation measures include limiting the use of certain fishing gear such as large mesh nets, increased law enforcement to thwart fish poachers, prohibiting or managing seasonal agriculture on sandbanks used by nesting turtles, and fencing to deny access to free-ranging livestock. Limiting baited hooks is impractical; however, some mitigatory success has been had by securing captured turtles, surgically removing hooks, and later releasing the turtles. Most mitigation actions impact communities in some way. Restricting use of large-mesh nets is challenging; however, villagers can remove turtles from nets, but prompt action is required to avoid drowning turtles. Fish poachers are widely perceived as thieves and law enforcement efforts receive strong community support. Fencing sandbanks to discourage livestock is unnecessary as the likelihood of nest loss by trampling is minimal.
4. Creation of Fish Conservation Zones	Establishing a network of locally-managed Fish

<p>that will protect critical nesting and foraging habitat of turtles while enhancing fisheries resources available to riverside communities.</p>	<p>Conservation Zones proved more complex than originally anticipated, largely owing to a lack of interest among riverside communities and mistrust of government fisheries staff who are required by law to oversee fish harvests. This lack of interest became readily apparent as we attempted to move past the consultation stage and implement community-based management plans. That said, our efforts did bear fruit. First, all known Roofed Turtle nesting sandbanks are now fully protected (legally) and seasonally monitored by CCVs. Furthermore, two villages with a vested interest in turtle conservation have established nascent community fisheries programs in the stretch of river where most wild Roofed Turtles dwell. Villagers agreed to limit the use of large-mesh nets which pose the greatest danger to turtles, refrain from fishing in two deep pools known to be used by turtles, and forgo the use of baited hooks (never widely deployed in this area anyway). Finally, we assisted the village leadership in leasing this stretch of river from the township administration, ensuring the local control of fisheries resources.</p>
<p>5. Increased support for conservation of turtles and their habitats among riverside communities along the Chindwin River.</p>	<p>Conservation awareness and support is generally high within the project area as demonstrated by the interviews we conducted (n = 92) of villagers dwelling in riverside communities. This is not unexpected given the cultural role that Batagur trivittata once played in these communities (i.e., Cultural Keystone Species). Historically, Roofed Turtles were valued as a source of eggs by villagers. The annual egg harvest was regulated by village leaders who assigned harvesting rights for particular sandbanks to each family. Egg collections were festive annual occasions when families camped together at the sandbanks, feasted, drank, and sang. By proscription, villagers left a few eggs in every turtle nest (about 20% of clutch) to insure continued harvests in the future. Unfortunately, these were too few eggs to maintain population recruitment over the long-term. Because many people, especially the elderly, continue to recognize the cultural importance of Roofed Turtles, conservation efforts are viewed favorably by villages. Conservation is perceived as necessary to restore an important cultural icon that has since been lost. The possibility of sustainably managing a future egg harvest is a major selling point during discussions and conservation education presentations.</p>



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

The greatest challenge to the success of this project was our attempts to establish Fish Conservation Zones (FCZs). Establishing FCZs proved much more complex and difficult than we initially anticipated. First, there appears to be little interest among village leaders for pursuing any sort of community-based fisheries management. Most villagers see few direct benefits in conserving fish stocks as they fear outsiders will simply move and harvest “their” fish (i.e., Tragedy of the Commons). We find this difficult to explain in light of our survey results that show widespread agreement among villagers that fish stocks have been declining for many years. In most villages, planning never progressed beyond the consultation stage, although some rudimentary plans were formulated. Once it became apparent during discussions that villagers would be required to restrict fishing in particular areas, communities rapidly lost interest. Moreover, any community management of fisheries must involve the Fisheries Department of which there is widespread mistrust by villagers. Nonetheless, some progress was made in establishing the rudiments of a community-based fishing management plan in two villages near the TSA/WCS basecamp in Limpha. Villagers agreed to limit the use of large-mesh nets (these are most likely to ensnare turtles) and refrain from placing nets in several deep holes. Encouragingly, villagers are agreeable to protecting turtle nesting beaches as doing so imposes little or no cost on their part; i.e., conservation does not impinge on routine subsistence activities.

Were there any unexpected impacts (positive or negative)?

The only unforeseen impact was our inability to effectively establish a communities fisheries program with Fish Conservation Zones (FCZs) at villages along the Chindwin River. As explained earlier, villagers showed little interest in developing FCZs, which were perceived as an infringing on their access to a common resource (fish). There was also an unwillingness to become involved with the Myanmar Fisheries Department, an institution widely viewed with distrust. Limpha Village and a satellite community were the sole exception and both communities agreed to participate in a scaled-back version of what we originally proposed. Because we were unable to obtain community buy-in, most deep holes in the Chindwin River remain without any form of protection.

Project Components and Products/Deliverables

Describe the results from each product/deliverable:


Component		Deliverable		
#	Description	#	Description	Results for Deliverable
1	Expand the existing core group of Community Conservation Volunteers (CCVs): local villagers who protect and monitor Batagur trivittata nesting beaches along the Chindwin River	1.1	List of at least 30 Community Conservation Volunteers (CCVs) who function as field technicians and conservation ambassadors. This will be accompanied by pre and post-training assessments to demonstrate increased knowledge of turtle conservation among CCVs	A list of Community Conservation Volunteers (CCVs) now serving in the project will be uploaded as a separate document. Some of these individuals are considered key players in our efforts to protect river turtles along the Chindwin River. In particular, several village-level officials in Limpha are considered "mission-essential personnel" and their participation is deemed critical to the ultimate success of our efforts. These individuals are responsible for safeguarding nesting sandbanks, locating and collecting eggs, securing the incubation site, and caring for neonates and head-started turtles. One Limpha resident and long-time member of the Turtle Conservation Team was recently elected as Village Headman and hence, uniquely positioned to influence local conservation decisions in the community. Overall we are quite satisfied with the performance of the majority of CCVs. Pre- and post-testing was conducted, and although the results vary widely, the general trend appears to be an increase in knowledge of turtles in particular and conservation in general. Furthermore, it quickly became apparent that individuals who display the greatest enthusiasm for their assigned duties are also those individuals with the greatest understanding of turtles as evidenced by our testing.
2	Reintroduction of head-started Batagur trivittata to the Chindwin River, building on lessons learned in a previous trial release in the Chindwin River and Nam Thalet Chaung, as well as TSA river turtle conservation	2.1	Thirty head-started B. trivittata released into the upper Chindwin River to augment existing small population of wild and previously (2015) reintroduced turtles.	In late 2017, 30 head-started Batagur trivittata were sourced from TSA/WCS assurance colonies and transferred to Limpha Basecamp. A temporary "soft-release" acclimation pen was constructed in the Chindwin River at a deep pool near Limpha Village known to harbor wild Roofed Turtles. Prior to transferring the turtles into the pen, sonic transmitters were attached to a subset of the group. Assistance for this aspect of the project was provided by a biologist from the WCS Cambodia Program with extensive experience conducting similar work on Batagur affinis. The biologist first conducted a training course for TSA/WCS Myanmar staff and then assisted with attaching the transmitters to each turtle. Although our original plan was to pen the turtles for an extended period (several months), most escaped shortly after

	efforts in India and Bangladesh			transfer into the pen (constructing escape proof pens without netting is proving extremely difficult). Post-release monitoring began immediately. For the most part, the reintroduced turtles have remained within 2 km of the acclimation pen and appear to spend much time in deep holes.
3	Establish a network of community-based Fish Conservation Zones (FCZs) on the upper Chindwin River. A participatory planning process will be used to establish boundaries of FCZs, develop site-specific management guidelines, and insure compliance with same	3.1	A comprehensive community-based fisheries management plan and network of at least 15 Fish Conservation Zones comprising a total of 30-45 ha on the upper Chindwin River. FCZs will protect critical turtle habitat and enhance local fisheries.	Establishing Fish Conservation Zones proved much more complex and difficult than anticipated. For starters, there appeared to be little interest among riverside communities for any sort of community-based fisheries management. Villagers see little direct benefit in conserving fish stocks as they fear outsiders will simply move and harvest “their” fish. In most villages, planning did not proceed past the consultation stage. Moreover, any community management of fisheries must involve the Fisheries Department of which there is widespread mistrust by villagers. Nonetheless, some progress was made towards establishing community-based fishing management in several villages near the TSA/WCS basecamp in Limpha. Villagers agreed to limit the use of large-mesh nets (most likely to ensnare turtles) and refrain from placing nets in several deep holes. On the whole, villagers are agreeable to protecting turtle nesting beaches as doing so imposes little or no cost on their part; i.e., there is little impact on routine subsistence activities. Owing to these unforeseen difficulties we were unable to develop a comprehensive community-based fisheries management plan nor a network of Fish Conservation Zones.
4	Compliance with CEPF Social Safeguards Policies monitored and reported to CEPF	4.1	Safeguard monitoring conducted and report submitted to CEPF.	The safeguard and monitoring report detailing compliance with CEPF policies has been prepared and submitted.
5	Enhanced understanding of the risks faced by river turtles, appropriate conservation measures that can be implemented to safeguard	5.1	Technical report detailing risks faced by turtles in the Chindwin River with recommended mitigation measures,	We identified the following potential threats to turtles in the Chindwin River: 1) incidental take by fisheries gear, especially large-mesh nets (all turtles) and baited hooks (three species of softshell turtles); 2) electro-fishing by commercial fish poachers; 3) use of nesting sandbanks by seasonal agriculturists; 4) trampling of nests by free-ranging livestock such as water buffalo and cattle. Mitigation measures include limiting the use of certain fishing gear such as large mesh nets, increased law enforcement to thwart fish poachers, prohibiting or

	turtles, and an understanding on how these measures might impact local communities.		including an assessment of the potential impact of these measures on local communities.	managing seasonal agriculture on sandbanks used by nesting turtles, and fencing to deny access to free-ranging livestock. Limiting baited hooks is impractical; however, some mitigatory success has been had by securing captured turtles, surgically removing hooks, and later releasing the turtles. Most mitigation actions impact communities in some way. Restricting use of large-mesh nets is challenging; however, villagers can remove turtles from nets, but prompt action is required to avoid drowning turtles. Fish poachers are widely perceived as thieves and law enforcement efforts receive strong community support. Fencing sandbanks to discourage livestock is unnecessary as the likelihood of nest loss by trampling is minimal.
6	Increased support for conservation of turtles and their habitats among riverside communities along the Chindwin River.	6.1	Increased conservation awareness and support for conservation of turtles and their habitats among riverside communities as evidenced by awareness surveys conducted at the beginning and end of the project.	Conservation awareness and support is generally high within the project area as demonstrated by the interviews we conducted (n = 92) of villagers dwelling in riverside communities. This is not unexpected given the cultural role that Batagur trivittata once played in these communities (i.e., Cultural Keystone Species). Historically, Roofed Turtles were valued as a source of eggs by villagers. The annual egg harvest was regulated by village leaders who assigned harvesting rights for particular sandbanks to each family. Egg collections were festive annual occasions when families camped together at the sandbanks, feasted, drank, and sang. By proscription, villagers left a few eggs in every turtle nest (about 20% of clutch) to insure continued harvests in the future. Unfortunately, these were too few eggs to maintain population recruitment over the long-term. Because many people, especially the elderly, continue to recognize the cultural importance of Roofed Turtles, conservation efforts are viewed favorably by villages. Conservation is perceived as necessary to restore an important cultural icon that has since been lost. The possibility of sustainably managing a future egg harvest is a major selling point during discussions and conservation education presentations.

Please describe and submit any tools, products, or methodologies that resulted from this project or contributed to the results.

Our methodologies used in this project hinge on 1) in-situ protection of turtles and their habitat (especially deep holes used for foraging and sandbanks used for nesting), and 2) ex-situ methods for incubating turtle eggs and rearing juveniles to a size suitable for release. In-situ protection of



sandbanks has been overwhelmingly successful and relatively easy to achieve through the employment of dedicated CCVs. Unfortunately, protection of foraging habitat (i.e., deep holes) has been less-than-successful as we have been unable to interest villagers to participate in community fisheries programs. The methods we developed for incubating turtle eggs are relatively straightforward and simply involve burying eggs at a secure site under conditions that replicate the natural nest environment. Nest temperatures are monitored throughout incubation and if needed, nests are shaded on extremely hot days. Similarly our methods for head-starting young turtles involve husbandry protocols developed and modified since conservation efforts were first initiated in 2006. Most recently, turtle diets have been adjusted after Bronx Zoo veterinarians determined that insufficient protein was being supplied by the captive diet. Likewise, our husbandry protocols for rearing young softshell turtles have involved considerable trial-and-error, although now appear suitable. The protocols we developed for *Batagur trivittata* and softshell turtles are probably suitable (with minor modification) for rearing other species of *Batagur* and endangered softshell turtles. A lengthy manuscript describing our conservation and rearing methodologies is now being prepared for submission to an international, peer-reviewed scientific journal.


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:

- Project Design Process (*aspects of the project design that contributed to its success/shortcomings*)
- Project Implementation (*aspects of the project execution that contributed to its success/shortcomings*)
- Describe any other lessons learned relevant to the conservation community

Perhaps the most important lesson-learned during this project concerns the establishment of community-based fishing programs along the Chindwin River. Prior to the project and in part, based on preliminary discussions with villagers, we assumed the potential for community-based fisheries management to increase fish stocks would be readily apparent to riverside villages. This proved not to be the case. Although not overtly hostile to the idea, villagers had no desire to participate in a program they perceived as limiting their access to a common resource despite the widespread recognition that fish stocks have been declining for many years. The situation was exacerbated by their poor relationship and suspicion of the Myanmar Fisheries Department. In retrospect, an approach more likely to succeed would be to focus on one or two villages, convince villagers to participate in a pilot project, and then let the results speak for themselves. The results of a successful pilot project would not doubt spread via word-of-mouth from village-to-village and probably spur interest in other communities. In addition to our experiences with community fisheries, we also learned a great deal about softshell turtle conservation, particularly husbandry and natural history of the species concerned. During three field seasons we defined the reproductive phenology of the three species along the Chindwin River and determined nesting habitat preferences for two species; taken together this information allows us to 1) identify and protect nesting habitat and 2) specifically tailor our search strategy to locate nests for incubation and head-starting. Finally, our experience with



constructing pre-release acclimation pens has resulted in a significant change in pen design. Rather than attempt to maintain turtles in temporary bamboo pens built along the shoreline, we now use a floating pen similar to that used by fish farmers. This design is more effective in containing turtles and keeps them in the water column and exposed to strong currents, which physically conditions our charges prior to liberation.

Sustainability / Replication

Summarize the success or challenges in ensuring the project will be sustained or replicated, including any unplanned activities that are likely to result in increased sustainability or replicability.

Ensuring the sustainability of any turtle conservation project is always challenging because turtles are extremely long-lived organisms and owing to a unique suite of life history characteristics, turtle populations are generally slow to recover. Thus, successful outcomes can only be realized after many years of sustained effort. That said, we continue to generate donor support for our work on the Chindwin River, which donors view as successful and worthy of funding; i.e., their contribution is “reinforcing success”. Given the long-term nature of our project, conceiving an appropriate exit strategy is difficult at this point so the increasing willingness of donors to fund this work is encouraging and bodes well for the future.

Safeguards

If not listed as a separate Project Component and described above, summarize the implementation of any required action related to social, environmental, or pest management safeguards

The social safeguards implemented during our project are explained in greater detail in the attached safeguard report. I briefly summarize, protection of sandbanks used by nesting *Batagur trivittata* might have displaced a limited number of seasonal agriculturalists; however, sandbanks were protected for only four months and no conflict with seasonal agriculturalists resulted. The use of large-mesh fishing nets by villagers is perhaps the most serious threat to turtles in the Chindwin River. However, restricting or prohibiting the use of these gear is not within our power and would require formal legal actions by the Myanmar Department of Fisheries. We encouraged villagers to voluntarily restrict the use of these nets with limited success. That said, fishermen were quite willing to participate in a turtle “rescue” program, i.e., efforts are made to remove captured turtles from fishing nets and turn these animals over to the TSA/WCS Turtle Conservation Team. These turtles are either released in an area of less intense fishing activity, or if necessary, rehabilitated at our Limpha facility and then released back into the river. Grievance procedures were established as described in our safeguard report. These included handbills and posters (in Burmese and Shan) with the required contact information. To our knowledge, no grievances were reported. Finally, no negative social or environmental impacts were identified during this project.

Additional Comments/Recommendations

Use this space to provide any further comments or recommendations in relation to your project or CEPF

We have no further comments or recommendations in relation to the project or CEPF.

Additional Funding

Provide details of any additional funding that supported this project and any funding secured for the project, organization, or the region, as a result of CEPF investment

Total additional funding (US\$)
\$110,000.00

Type of funding

Please provide a breakdown of additional funding (counterpart funding and in-kind) by source, categorizing each contribution into one of the following categories:

- A Project Co-Financing (other donors or your organization contribute to the direct costs of this 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 funded project)*
- C Regional/Portfolio Leveraging (other donors make large investments in a region because of CEPF investment or successes related to this project)*

We obtained Project co-financing (A) from two donors:

Panaphil Foundation - \$30,000.00 over two years (2017 and 2018).

Margaret A. Cargill Foundation - \$80,000.00 over three years (2016, 2017, 2018).

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.

1. Please include your full contact details (Name, Organization, Mailing address, Telephone number, E-mail address) below

Kalyar Platt, Wildlife Conservation Society - Myanmar Program, No. 12, Nanrattaw St., Kamayut Township, Yangon, Myanmar: telephone: 95-1-53-5711; kalyarplatt@gmail.com