Final Programmatic Report Narrative

Instructions: Save this document on your computer and complete the narrative in the format provided. The final narrative should not exceed ten (10) pages; do not delete the text provided below. Once complete, upload this document into the on-line final programmatic report task as instructed.

NFWF Grant #: 2011-0037-000
Eastern Pacific Hawksbill Initiative: Phase III
Final Programmatic Report

1. Summary of Accomplishments - In four to five sentences, provide a brief summary of the project's key accomplishments and outcomes that were observed or measured.

Current nesting numbers of hawksbill turtles (*Eretmocheyls imbricata*) in the eastern Pacific suggest it is one of the most endangered marine turtle populations in the world. The Gulf of Fonseca (GOF) is an at-sea-inlet under joint jurisdiction of El Salvador, Honduras and Nicaragua that was identified by the Eastern Pacific Hawksbill Initiative (ICAPO) as critical habitat for hawksbill turtles. Via this two-year project we conducted systematic surveys of the GOF to identify nesting, foraging and fisheries interactions in the area. These surveys were followed up by the establishment of fisheries observation projects at the sites deemed to have the most interactions with hawksbills, resulting in the documentation of >20 hawksbills incidentally captured in lobster gillnets over the course of the program (which is still ongoing). ICAPO has since initiated experimental trials to test lobster traps as a potential sustainable alternative to gillnets. The trials thus far have not been encouraging, but have nonetheless provided important baseline information that will guide future research and management actions. Regional components of the project included raising awareness, promoting and establishing research and conservation projects throughout the eastern Pacific, and beginning to identify management priorities by combining biological and stock assessment information on the species.

2. Project Activities & Outcomes

Activities - Describe the primary activities conducted during this grant and explain any discrepancies between the activities conducted from those that were proposed.

INTERVIEWS

ICAPO and its partners carried out local fisher and community member surveys (i.e. interviews) along the entire coast of the Gulf of Fonseca (GOF) (Figure 1), including its many islands, to generate information on hawksbill nesting, foraging and fishery interactions during year one of the project. Local field technicians were hired to conduct interviews and were trained on how to properly conduct interviews and accurately complete survey forms. The main goal of the surveys were to determine: 1) if hawksbill nesting occurs within the GOF (at sites other than Bahia Jiquilisco and Estero Padre Ramos) and if so, where the most important sites are located; 2) where hawksbills forage in the GOF; and 3) if fishery interactions occur with hawksbills and if so, which fisheries are responsible for these interactions and where are the located.

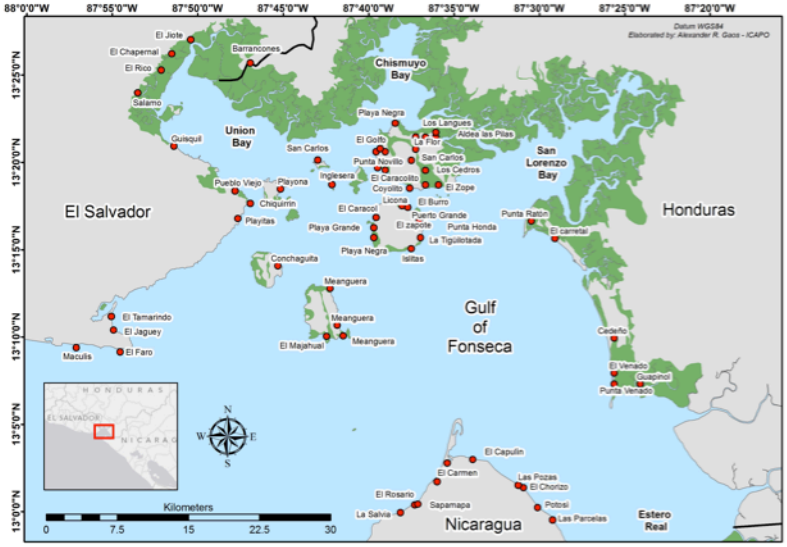

Figure 1. Primary communities where hawksbill interview surveys were carried out in the Gulf of Fonseca. Numerous smaller communities in the vicinity of those shown were also visited.

El Salvador- A total of 22 communities were surveyed in key areas along the Salvadoran portion of the GOF. The areas visited included communities along Punta Amapala in the vicinity of El Maculis-El Tamarindo, near La Unión, along the mangroves leading to the border with Honduras and several communities located on islands under Salvadoran jurisdiction within the Gulf (Figure 1). A total of 97 interviews were successfully administered.

Honduras- A total of 31 communities were surveyed in key areas along the Honduran portion of the GOF. The interviews included communities along the northern and eastern portions of the GOF, as well as at several islands under Honduran jurisdiction (Figure 1). The Bay of Chismuyo and the Bay of San Lorenzo, in the northern portion of the GOF, are entirely surrounded by mangroves with few settlements. Nonetheless, we were able to generate information on hawksbill presence in these areas because that the majority of fishing that occurs is by fishers who travel to the sites from communities we visited. A total of 180 interviews were successfully administered.

Nicaragua- Surveys were carried out in a total of 12 communities along the Nicaraguan coast of the GOF. These interviews were conducted in the Department of Chinandega and focused on the regions of Potosí and Punta San Jose (Figure 1). We also conducted interviews in the community of Mechapa, on the western portion of the peninsula, (not pictured in Figure 1). A total of 34 interviews were successfully administered. Similar to the situation in Honduras, the southern most portions of the GOF are mangrove areas with few human settlements, but we were able to generate information as fishers originate out of the sites we visited.

Combined- ICAPO interviewed a total of 311 fishers at 65 communities across the GOF (Figure 1) to generate information on hawksbill turtles. In several cases communities were first visited to gather a list of potential interviewees, then a date was set to return and conduct the interviews. These return dates ensured that fishers and community members were available for in-depth interviews, and also instigated an initial level of cooperation from these stakeholders with the interviewers. Interviews targeted experienced fishers and community members (e.g. egg collectors) to maximize the amount and accuracy of data collected.

NESTING REPORTS

Interviews provided important anecdotal information regarding hawksbill nesting along the coast within the GOF (Figure 2). Nesting appears to be sporadic in most cases, with few indications of large rookeries other than those previously identified (Bahia Jiquilisco and Estero Padre Ramos). However, a couple of sites were reported to receive >20 nests per year and merit further investigation. It is important to point out that all information provided in this report is based on interviews and actual hawksbill nesting levels may be greater or less than those reported here.

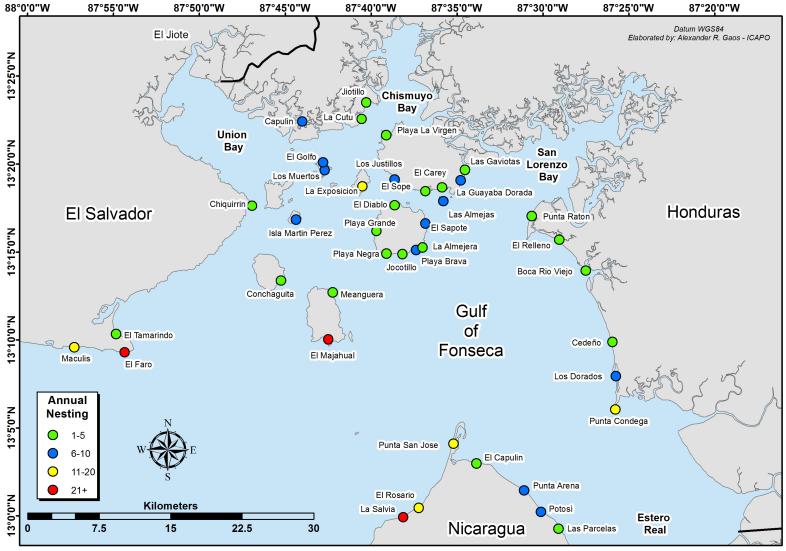

Figure 2. Reported annual hawksbill nesting within the GOF in increments of 1-5 nests/year (green circles), 6-10 nests/year (blue circles), 11-20 nests/year (yellow circles) and 21+ nests/year (red circles).

El Salvador- Interviewees at each community visited were asked the number of nests laid on an annual basis. The majority of nesting fell within the 1-5 nests per season range. Nesting levels of 21+ were reported for two sites; El Faro on Punta Amapala and Majahual on Meanguera Island (Figure 2). Previous research on the former has confirmed hawksbill nesting at the site, however robust monitoring and nest protection has yet to be carried out, thus accurate information on nesting numbers is lacking, but it is estimated that <30 nests are deposited there annually. Majahual represents a particularly interesting site as two of the five interviewees in this area reported >60 nests per season and all reported >20. Further research is needed to confirm hawksbill nesting levels at both sites. Unfortunately, locals reported that the overwhelming majority of nests laid throughout the Salvadoran portion of the GOF, including those on Punta Amapala and Majahual, are currently poached and sold on the black market. The unsustainable and illegal collection of eggs throughout the country represents a major threat to the hawksbill nesting population in the region.

Honduras- Information collected via interviews indicated that nesting sites hosting >20 nests per season do not exist within the Honduran portion of the GOF (Figure 2) and that most sites consist of <10 nests per year. Nonetheless, two areas, La Exposicion island and Punta Condega, were both reported to receive 11-20 nests per season. The former site is reportedly poached at high levels, but less than 100% due to its relative remoteness and lack of inhabitants. Similarly, Punta Condega was reported to have a poaching rate of 50%, with the relatively reduced levels due to an existing sea turtle conservation program in the area. Nonetheless, current sea turtle conservation activities in the area focus on activities during the 25-day national egg ban period in September of each year. Considering that the peak hawksbill nesting season is in June and July, it is likely the majority of hawksbills nests laid in Punta Condega are collected and sold to the black market. Regardless, considering the relatively limited number of nests compared to those reported for El Salvador and Nicaragua, initiating conservation efforts specifically aimed at hawksbills at these sites may not be feasible. Doing so would require support by national organizations and/or the Honduran government. Unfortunately, there are currently only a couple of groups working to conserve sea turtles within the Honduran portion of the GOF and these groups largely lack the capacity and/or motivation to manage such projects effectively. Despite multiple offers by ICAPO to assist in developing projects, the willingness of these organizations to collaborate has been essentially nil.

Nicaragua- Similar to the other countries, the majority of nesting in Nicaragua fell within the 1-5 nests per season range. Nonetheless, nesting levels of 21+ were reported for La Salvia, while the neighboring areas (e.g. Punta San Jose) were also reported to receive 11-20 nests (Figure 2). While not pictured in Figure 2, we also carried out surveys in the community of Machapa, on the western coast of the Cosiguina Peninsula, in the Nicaraguan portion of the GOF. Interviewees reported substantial nesting at a site called Aserradores, a mangrove estuary located to the south of Estero Padre Ramos, the latter representing the largest hawksbill nesting rookery in the eastern Pacific and one of ICAPO's principal project sites (in conjunction with FFI). Having originally visited the site in 2009 and using the reports collected during interviews, in 2013 ICAPO teamed up with FFI to conduct a two-week monitoring effort to quantify nesting, during which a total of 39 hawksbill nests were documented. Considering these events coincided with only the latter half of the nesting season, we estimate they represent approximately half of the nests deposited, and that the site hosts 70-90 nests annually. We are currently attempting to initiate a hawksbill conservation project in conjunction with FFI and other stakeholders, as poaching is 100% at the site. The unsustainable and illegal collection of eggs at Aserradores and throughout the country represents a major threat to the hawksbill nesting population in the region.

FORAGING AREA REPORTS

Survey activities generated substantial information on hawksbill foraging areas throughout the GOF. It is important to point out that the findings presented here do not necessarily represent the full extent of hawksbill habitat-use in the region as it is only what fishers and community members were able to report. It is likely hawksbills also use areas where fishers are not present or are not aware of hawksbill presence. Despite this reality, it is apparent that both adult and juvenile hawksbills are present throughout the coastal areas of the GOF, with several regions being identified as particular hotspots (Figure 3). It is also important to highlight that all hawksbill foraging hotspots were reported to be extremely coastal, with very few reports of the species in the open water habitat. This coincides with habitat-use by the species in other areas, where hawksbills are also reported as being highly neritic (Gaos et al. 2012).

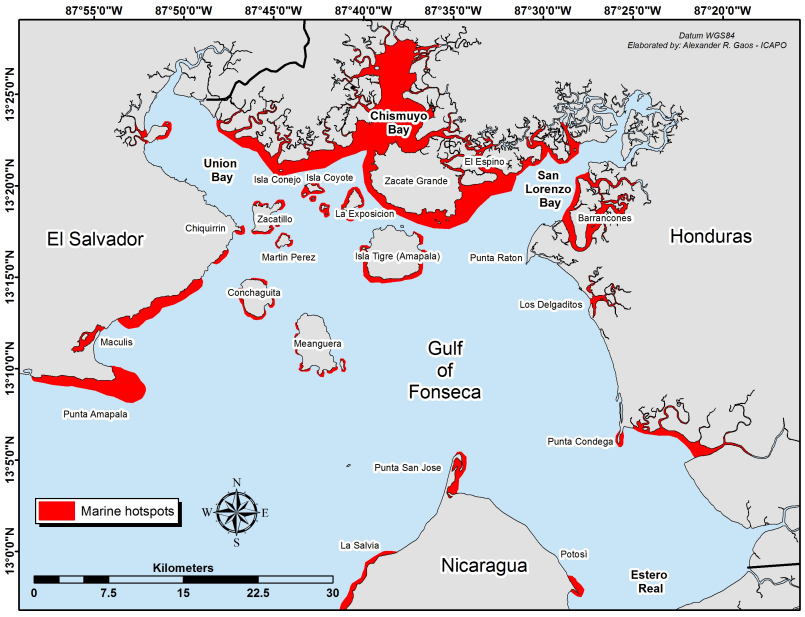

Figure 3. Hawksbill marine hotspots according to interviews in the GOF.

El Salvador- Interviews indicate there are several important foraging areas for hawksbill turtles in the Salvadoran portion of the GOF. Of particular importance is the large coral and rock reef off the coast of Punta Amapala (Figure 3), immediately adjacent to the entrance to the GOF. Locals reported hawksbills feed in these areas during the day and take refuge under rock ledges and caves located throughout the reef. The coastal area between El Maculis and Chiquirrin is

also reportedly frequented by foraging hawksbills. The majority of marine sightings in El Salvador were reported at habitats consisting of rocky substrate, with mangrove habitat also being important.

Honduras- Several hawksbill foraging hotspots were identified in Honduran portion of the GOF, particularly in the northwest region (Figure 3). Most of the rocky habitats surrounding the islands appear to be frequented by the species. Additionally, locals reported that the entire Bay of Chismuyo and the mangrove-estuarine habitats leading into the Bay of Union, around Zacate Grande and into the Bay of San Lorenzo are of particular importance to hawksbills in the region. Previous satellite telemetry supports these reports (Gaos et al. 2012). Sites in the southeast portion of the GOF, particularly the Estero Real, received less reports of hawksbill presence, but the importance of these areas should not be discounted as fewer interviews were conducted in the region. Coinciding with habitat availability in the area, the majority of marine sightings in Honduras were reported at habitats consisting of mangrove estuaries, followed by rocky substrates.

Nicaragua- Fishers in the Nicaraguan portion of the GOF confirmed seeing hawksbill turtles using rocky substrate areas and identified this as their primary habitat, followed by mangrove areas. The rocky habitat in front of La Salvia was identified as an important hotspot, as was a small bay on the point of Punta San Jose (Figure 3).

FISHERIES INTERACTION REPORTS

El Salvador- A number of fishery gear types/methods were identified as interacting with hawksbills in the Salvadoran portion of the GOF. The most common response was gillnets, followed by long-lines and shrimp trawls. A lobster fishery using gillnets near the town of El Maculis, off the coast of Punta Amapala, was singled out as having the highest interactions with hawksbills. ICAPO has since established a fisheries project at the site (details provided below). Blast-fishing, the unselective and highly destructive nature of the fishing with explosives, was also reported to be common in Bahia Jiquilisco. Indeed, ICAPO has documented numerous hawksbill deaths due to blast-fishing over the years. ICAPO is currently participating in a program run by EcoViva and Asociacion Mangle to increase enforcement and provide financial alternatives to blast-fishers as a means to reduce this destructive practice. Funding and support from the Salvadoran government to reduce blast-fishing will be critical to maintaining the ecological integrity of Bahia Jiquilisco, as well as to reducing incidental mortality of hawksbills. In general, the majority (71.3%) of fishers in El Salvador indicated they did not capture hawksbills. Whether this reflects actual bycatch rates or is a result of fishers not wanting to admit to capturing hawksbills due to the illegal nature of the activity, remains unclear.

Honduras- The most common fishery gear/method identified to interact with hawksbills in the Honduran portion of the GOF was gillnets, followed closely by long-lines, then shrimp trawls and blast-fishing. However, the majority (86.0%) of fishers in Honduras indicated they did not capture hawksbills and reports of gillnets or other gear deployed near shorelines (where we would expect to find hawksbills) were not common. The relatively high reports of blast-fishing in the Honduran portion of the GOF are particularly worrisome as it indicates the technique is more widespread than previously believed. The majority of fishermen sighted their strong opposition to blast-fishing and recognized its destructive, unsustainable nature.

Nicaragua- As with the other countries, the most common gear reported to interact with hawksbills in Nicaragua was gillnets, followed by long-lines. A lobster fishery using gillnets near the town of La Salvia, off the coast of Cosiguina, was singled out as having the highest interactions with hawksbills. ICAPO has since established a fisheries project at the site (details provided below). A far higher percentage (59.5%) of fishers in Nicaragua indicated they did capture hawksbills. Of great concern is the fact that of the fishers that admitted to capturing hawksbills, the majority (40.5%) indicated catching 4+ per season. Thus, interviews indicate that hawksbill bycatch in Nicaragua is higher than that in Honduras or El Salvador, or fishers in Nicaragua are simply more willing to admit to hawksbill bycatch.

FISHERIES OBSERVATIONS

Based on the research conducted during 2011, in 2012 ICAPO spearheaded fisheries observation efforts in the GOF. These efforts were initially conducted out of seven fishing villages distributed across the GOF. Workshops were carried out at each village to train local fishermen and observers, and were broken up into three principal themes; 1) marine turtle species identification, 2) data capture and recording, and 3) equipment use. A total of seven workshops were carried out, which were attended by an average of 11 participants. Fishing observations officially began in August of 2012. After two months of observations we found several fisheries were not operating in zones where we would expect to find hawksbills (i.e., near shore) and hawksbill bycatch was only reported at El Maculis in El Salvador and La Salvia in Nicaragua. These

were also the only two sites we encountered in the GOF where the primary fisheries implemented gillnets to target lobster. Considering the gear used and the initial bycatch reports, we narrowed our fisheries observations efforts to focus on these two sites.

Four fisher groups were trained as observers at each site and collected data on the fisheries, including: net soak times, geographic location of fishing activities, water temperature and depth, substrate type, among other variables. When turtle captures occurred, the observers collected information on the turtles, including morphometrics, status (dead vs. alive) and other parameters, before releasing the turtle back to the sea (dead or alive). Incentives (e.g. life jackets, gloves, rain gear, GPS units) were distributed to fishers as an incentive to promote their collaboration with the program.

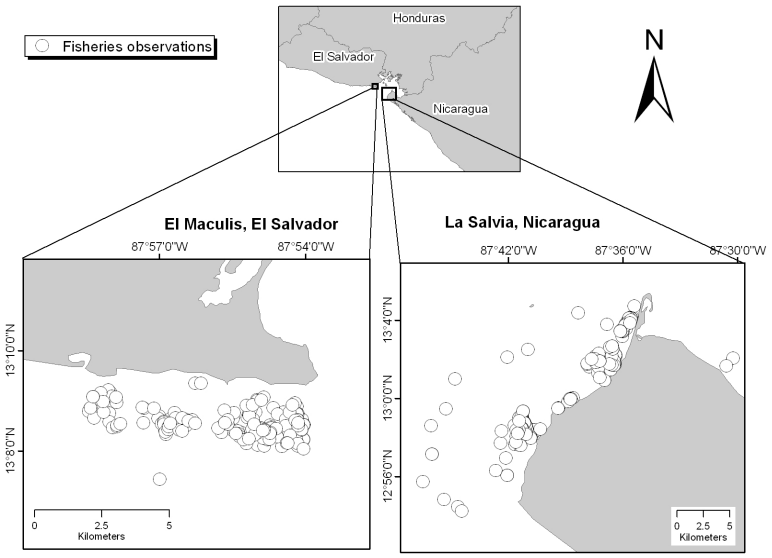

Figure 4. Locations of gillnet deployments observed during 2012 and 2013 at El Maculis (El Salvador) and La Salvia (Nicaragua).

<u>*El Maculis, El Salvador.-*</u> A total of 203 lobster gillnet fisheries observation trips were carried out in El Maculis in 2012 and 2013 (through 31 August) (Figures 4 & 5). Nets ranged from 800 m to 3600 m in length, with an average of 1,645 m per set. Sets ranged from 4.2 hrs to 29.0 hrs long, with an average of 19.8 hrs. All gillnets had a height of 1 meter and had gillnet openings ranging from 3" – 5" in size. A total of **14** hawksbills were observed during the 203 trips (Figure 6), with eight directly caught in lobster gillnets and six found adrift at sea. All hawksbills encountered were dead.

<u>*La Salvia, Nicaragua.-*</u> A total of 220 lobster gillnet fisheries observation trips were carried out in La Salvia in 2012 and 2013 (Figure 4 & 5). Nets ranged from 200 m to 3200 m in length, with an average of 2,227 m per set. Sets ranged from 1.1 hrs to 30.0 hrs long, with an average of 14.8 hrs. All gillnets had a height of 1 m and had gillnet openings 4" in size. A total of **8** hawksbills were observed during the 220 trips (Figure 6), with all eight directly caught in lobster gillnets. Five of the hawksbills were dead, while three were released alive.

<u>*Combined.-*</u> A total of 423 lobster gillnet fisheries observation trips were carried out in 2012 and 2013 at El Maculis and La Salvia combined (Figures 4 & 5). Nets ranged from 200 m to 3600 m in length, with an average of 2,227 m per set. Sets ranged from 1.1 hrs to 30.0 hrs long, with an average of 14.8 hrs. A total of **22** hawksbills have been observed during that time (Figure 6) of which 16 were directly caught in lobster gillnets and six of which was found adrift at sea. Nineteen (86.3%) of the 22 hawksbills encountered were dead, while three (13.6%) were alive. The fact that fewer hawksbills have been captured in 2013 compared to 2012 (Figure 6) may be due to a number of factors, including natural fluctuations in hawksbill presence and changes in location of fishing activity, a reduced number of hawksbills surviving in the region (i.e., less possibility of being captured), or that the 2013 fishing season is still underway. It is important to note that the majority of hawksbills encountered adrift occurred in early 2012, when lobster fishers/observers were still hesitant to collaborate with the ICAPO. It is suspected that the early reports of hawksbills found adrift was simply a measure for individual fishers to avoid being blamed for their direct bycatch and that these turtles were killed by gillnets.

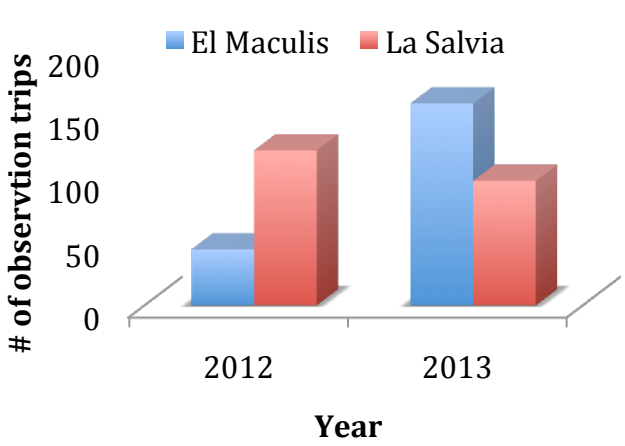

Figure 5. Number of fisheries observation trips during 2012 and 2013 at El Maculis (El Salvador) and La Salvia (Nicaragua)

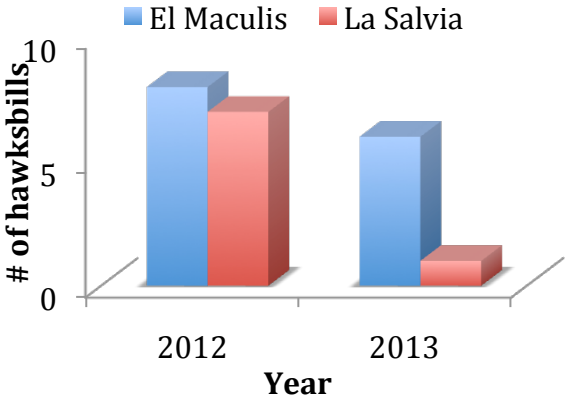

Figure 6. Number of hawksbills observed during 2012 and 2013 at El Maculis (El Salvador) and La Salvia (Nicaragua)

TRAP TRIALS

A shift from highly destructive gillnets to sustainable lobster fishing methods is paramount to the future viability of both coastal fishing communities and hawksbills in El Maculis and La Salvia. Based on the results of our fisheries observations, in 2013 ICAPO has been carrying out lobster trap trials to evaluate this technique as a sustainable alternative to gillnets. While the use of traps to capture lobster is not a technique implemented along the Pacific Coast of Central America, traps have been successfully implemented in the Caribbean for decades. In order to conduct lobster trap trials, it was first necessary for ICAPO's program staff and the local fishers collaborating with the program to learn how to effectively fish with traps. ICAPO carried out two primary steps to build this capacity. First, ICAPO's fisheries program Director was sent on a weeklong trip to the Caribbean Coast of Honduras and Belize to research trap designs and trap fishing methodologies implemented in these areas. The goal of these trips was also to make contact with trap fishing experts. The second capacity building activity was to bring a trap fishing expert from Honduras to both project sites, where the expert worked directly with local lobster fishing cooperatives on implementing lobster trapping techniques.

Figure 7. Lobster trap models tested during the project period, including A) traditional rectangular lobster trap, B) rectangular trap with narrowed entry, C) rectangular trap with two entrances and D) tower trap with two entrances.

To determine which traps might incur the highest lobster catch rates, we designed several experimental traps. The designs were based on input and experience gained through the capacity building activities mentioned above. We tested four trap designs and these included a traditional rectangular lobster trap, a rectangular trap with narrowed entry, a rectangular trap with two entrances and a tower trap with two entrances (Figure 7A-D). As per suggestions by expert trap fishers, in order to compensate for the increased tidal action in the Pacific (compared to that of the Caribbean), all traps were weighted down with extra thick concrete bases. A total of four replicates of each experimental trap model were fabricated and "trial groups" consisting of one replicate of each of the four models were deployed at predetermined locations off the coast of each project site (Figure 8). Individual traps in each trial group were checked daily to quantify lobster catch. During each trial group deployment we also collected information on the benthic substrate (i.e. rocks, sand, etc.), water depth, water temperature and other parameters in order to evaluate how these variables may influence individual trap performance. Lastly, data on lobster yield from gillnets deployed by fishers at the same time as traps were recorded for comparison.

El Maculis, El Salvador.- Traps were deployed at six locations off the coast of El Maculis (Figure 8), with a total soak time of 126.6 hours. The average depth of trap deployment locations was 17.2 meters, while the average water

temperature was 29.3°C. Substrate types included sand, mud and rock, with the latter being the most common. Lobster yield from experimental traps was non-existent off the coast of El Maculis. Similarly, reference gillnets yielded minimal product, with only 3.6 kg of lobster. Locations composed of sand substrate yielded no lobster for either experimental traps or gillnets. The only organism captured by the experimental traps was species of crab with no economic value.

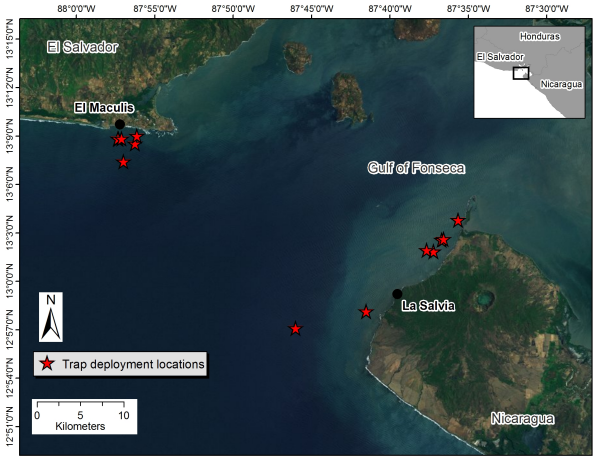

Figure 8. Lobster trap trial locations off the coast of El Maculis (El Salvador) and La Salvia (Nicaragua).

La Salvia, Nicaragua.- Traps were deployed at ten locations off the coast of La Salvia (Figure 8), with a total soak time of 192.2 hours. The average depth of trap deployment locations was 12.3 meters, while the average water temperature was 30.9°C. All substrates upon which traps were deployed consisted of rock. Lobster yield from experimental traps was non-existent off the coast of La Salvia. In contrast, reference gillnets consistently yielded product, with a total of 11.7 kg of lobster per trial and a grand total of 117.5 kg over the course of trials. No other organisms (e.g. crabs) were captured in the traps in La Salvia.

Combined.- Traps were deployed at a total of 16 locations off the coast of El Maculis and La Salvia (Figure 8), with a total soak time of 318.9 hours. The average depth of trap deployment locations was 14.1 meters, while the average water temperature was 30.3°C. Substrate types included sand, mud and rock, with 81.3% of deployment sites consisting of the latter. Lobster yield from experimental traps was non-existent off the coast of both sites. In contrast, reference gillnets consistently yielded product, with a total of 7.6 kg of lobster per trial and a grand total of 121.1 kg over the course of trials (Figure 9).

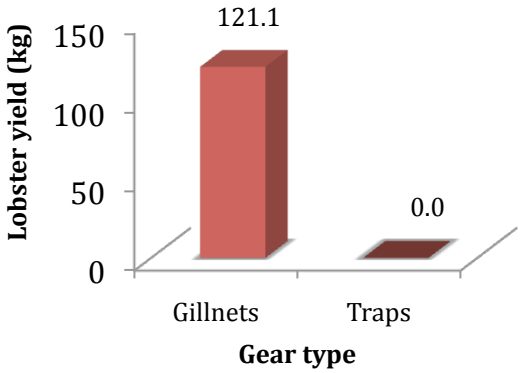

Figure 9. Lobster yield in experimental traps and gillnets at both study sites combined.

EDUCATION AND OUTREACH

More than 25 workshops were carried out in the Gulf of Fonseca during this project, including those focused on information gathering (year 1), observer training (year 2) and trap deployment training (year 3). In 2011 we had a total of 91,116 hits on the ICAPO website (www.hawksbill.org), in 2012 we had a total of 292,723 hits and thus far in 2013 we've had 234,343 indicating a steady increase in visits (Figure 10). We expect the visits over the course of the remaining months of 2013 to continue to increase and surpass totals from 2012. These results demonstrate the effectiveness of this outlet in reaching a broad audience.

Between 2011 and 2013 we had hawksbill research published in the four scientific journals: Biology Letters, Marine Ecology Progress Series, Endangered Species Research, the Journal of Experimental Marine Biology and Ecology and the Marine Turtle Newsletter. Additionally, ICAPO members gave >20 oral and poster presentations at national meetings and international symposia, including the 2nd and 3rd Sea Turtle Symposium of the South Pacific and the 31st, 32nd and 33rd Annual International Symposium on the Conservation and Biology of Sea Turtles. The amount of information being generated and shared on hawksbill turtles is astounding, particularly considering that only six years ago most of the research community considered the species extirpated in the region.

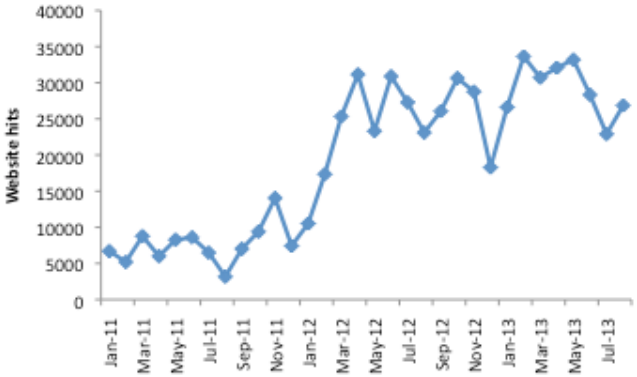

Figure 10. Hits on the ICAPO website between January 2011 and August 2013.

NEW HAWKSBILL PROJECT CULTIVATION

ICAPO has continued to assist with funding acquisition, project planning, development of methodologies, and capacity training for numerous hawksbill research and conservation projects in the eastern Pacific. Currently, we are involved with a total of 18 different projects (Table 1), which have a primary component focused on hawksbill turtles in the eastern Pacific. These include projects focused on gathering data on hawksbills in-water, nesting, and interacting with fisheries, or a combination of these categories. These projects are in various stages of implementation, including several that have been ongoing for several years (e.g. Bahia Jiquilisco and Estero Padre Ramos), as well as others that are just getting underway (e.g. Archipelago Las Perlas and Aserradores). Maintaining long-term operation of conservation activities is among the biggest challenges facing most projects and it is impressive that such a large number of projects remain in operation.

Table 1. Projects with which ICAPO is involved that have a primary component focused on hawksbills.

#	Project site	Country	Research
1	La Paz	Mexico	In-water
2	Punta Mita	Mexico	Nesting & In-water
3	Las Careyes	Mexico	Nesting
4	La Barrona	Guatemala	In-water
5	Los Cobanos	El Salvador	Nesting
6	Bahia Jiquilisco	El Salvador	Nesting & In-water
7	El Maculis	El Salvador	Fisheries
8	La Salvia	Nicaragua	Fisheries
9	Estero Padre Ramos	Nicaragua	Nesting
10	Aserradores	Nicaragua	Nesting
11	Las Rivas	Nicaragua	Nesting
12	Santa Rosa	Costa Rica	Nesting & In-water
13	Punta Coyote	Costa Rica	In-water
14	San Josecito	Costa Rica	In-water
15	Archipelago Las Perlas	Panama	In-water
16	Darien	Panama	Nesting & in-water
17	Machalilla	Ecuador	Nesting & In-water
18	Isla Isabela	Ecuador	In-water

EXPANDING ICAPO

We have continued to expand the ICAPO network to include strategic partners in several countries. We have officially incorporated 12 new members into the ICAPO network over the course of the project timeframe. The incorporated members hail from Guatemala, El Salvador, Costa Rica, Mexico, Nicaragua, Peru and Panama, increasing our access to data on hawksbill turtles in these regions and fomenting the establishment of projects and regional awareness.

Outcomes - Describe progress towards achieving the project outcomes as proposed and briefly explain any discrepancies between your results compared to what was anticipated. Provide any further information (such as unexpected outcomes) important for understanding project activities and outcome results.

We successfully achieved the overwhelming majority of our project outcomes and in several cases, far surpassed our original objectives.

- We conducted more survey trips and interviewed more community members in the GOF to generate information on hawksbills via coastal surveys than originally planned. We also had many more workshops than originally planned. These activities allowed us to identify multiple foraging, nesting and fishery hotspots for hawksbills in the area.

- We had more than five times the number of projected hits on the ICAPO website.

- We acquired a total of five CITES permits and began the critical process of beginning to define hawksbill management units. The preliminary results of this research were shared at the 33rd Annual International Symposium on the Conservation and Biology of Sea Turtles held in Baltimore, Maryland, USA. They identify stock differences between hawksbills in Central and South America, as well as a potential genetic difference based on behavior.

- ICAPO is currently involved with 18 projects with primary components aimed at researching and/or conserving hawksbill turtles. This is more than double the original projection.

- While we originally planned on providing a conservation guidelines for the eastern Pacific, for a number of reasons it has been determined that doing so would be irresponsible at this point. The primary reason for this is that a great deal of hawksbill research is still only getting underway and ICAPO does not feel that it would be prudent to create a guideline document until those project have generated more information. Only in this manner will a management plan be robust and help to focus actions appropriately.

- ICAPO was able to establish fisheries bycatch observation projects that identified two fisheries with catastrophic levels of hawksbill bycatch and mortality. Furthermore, we were able to initiate the process of searching for sustainable alternatives to bycatch.

Lessons Learned - Describe the key lessons learned from this project, such as the least and most effective conservation practices or notable aspects of the project's methods, monitoring, or results. How could other conservation organizations adapt similar strategies to build upon some of these key lessons about what worked best and what did not?

The information provided via interviews is anecdotal (i.e. empirically unconfirmed) and research is needed to confirm the validity of findings on nesting, foraging and fisheries interactions.

Hawksbill nesting is reported as fairly sporadic throughout the GOF. However, relatively high levels of nesting appear to occur in areas near the mouth of the GOF. Sites of particular importance include: Punta Amapala and Majahual (Meanguera) in El Salvador, and La Salvia/Punta San Jose and Aserradores in Nicaragua

The results of this study, as well as previous satellite telemetry research on hawksbills, indicate the GOF is a critical foraging ground for hawksbill turtles. Hawksbills were reported inhabiting neritic (i.e. coastal) areas consisting predominantly of rocky substrates and mangrove estuaries throughout the GOF. Sites of particular importance include: The reef areas off of Punta Amapala in El Salvador, the Bay of Chismuyo and neighboring estuaries in Honduras and La Salvia/Punta San Jose in Nicaragua

Hawksbill bycatch and mortality is common in the lobster gillnet fisheries of El Maculis and La Salvia. Considering the extremely endangered state of hawksbills in the eastern Pacific, these catastrophically high levels of bycatch represent a primary threat to the species. Efforts to limit this gear type and reduce hawksbill bycatch and mortality are fundamental to recovery efforts.

Adequate regulation of lobster gillnet activities is paramount to sustainable fisheries at both El Maculis and La Salvia. Currently, there is little to no oversight of these fisheries. Lobster fishers almost always tend gillnets directly over rocks, which is prohibited by both Salvadoran and Nicaraguan fisheries laws. Also, gravid lobsters or those under the legal size limit are always kept (unless extremely small), despite the fact that doing so is illegal. While most fishers in the region have demonstrated a willingness to collaborate with research and conservation measures, without enforcement of local regulations, illegal practices will continue as fishers can still sell the lobster. With extremely limited alternative sources of income for local fishers, any regulations must also include some sort of socio-economic improvement programs. Herein lies perhaps the biggest challenge; reducing or eliminating lobster gillnet fisheries at El Maculis and La Salvia without negatively impacting the economies of these already impoverished coastal communities. ICAPO will continue spearheading efforts to achieve this objective.

The initial results of the experimental trap trials are discouraging as they suggest none of the traps are effective at capturing lobster. By examining solely the results of the gillnets at EM, which also yielded little lobster product, one might erroneously conclude that neither traps nor gillnets are effective at capturing lobsters. However, considering the results from La Salvia, it is evident that gillnets were still capturing lobster, while the experimental traps were not.

The apparent ineffectiveness of the experimental traps to date may be due to several factors. The tidal movements along the Pacific Coast of Central America are much more pronounced than those experienced along the Caribbean Coast. Indeed several of the experimental traps were severely damaged by tides, despite increased weighting. Tidal fluctuations are likely also negatively impacting visibility near the study sites as water clarity was recorded as poor during all trials. This is also likely a determining factor in low lobster yield in traps and may be conversely increasing lobster yield in gillnets as in both cases poor visibility inhibits lobsters' ability to detect these gear types, resulting in reduced capture in the traps and increased capture in the gillnets. The bait type used in the experimental traps is also an important factor to consider when looking at the low yield in lobster traps. While the Contractor used cowhide in all traps, as recommended by Caribbean trap fishers, it may not be an efficient bait type in Pacific waters. Fishers at the project sties have recommended baiting traps with the "feed" provided to shrimp in local shrimp farms, citing that lobsters often aggregate at the effluent channels from these shrimp farms. ICAPO is currently organizing to conduct additional trials with this bait type.

A final, yet important fact to take into account regarding the ineffectiveness of traps to date is that lobster fishers at both study sites report that the peak season for lobster capture is between February and May each year and lobster capture rates are relatively poor from June through January. Due to time pressures associated with this project, all of the Contractor's trap trials were conducted in June and July, corresponding with the reported lull in lobster catches. This may be

confounding the fact that experimental traps are not capturing lobsters, but still does not negate the fact that gillnets (those in La Salvia) were still capturing lobsters while the traps were not.

If trap trials continue to demonstrate their inadequacy in catching lobsters, additional sustainable gear types should be tested in an effort to reduce mortality of hawksbills. Additional experimental gear options include UV emitters, predator cutouts and reduced net heights, all of which have been shown to reduce marine turtle bycatch on some occasions. As the effectiveness of these gear types varies by habitat and species, it is important they be tested for hawksbills at the ICAPO's study sites.

Regardless, from the observations carried out to date it is evident that gillnets have serious negative impacts on a plethora of non-target species as well, including various skates and rays, fish, crustaceans, corals and other organisms. The overwhelming majority of these organisms were either dead upon capture or sufficiently damaged where death likely occurred shortly after being tossed back to sea. Many of these species play important, albeit not yet fully understood roles in local marine ecosystems, while sponges and corals are also a fundamental structural component in these habitats. It is likely that the ongoing, unregulated use of gillnets at these sites will continue to degrade these habitats indefinitely.

4. Dissemination

Briefly identify any dissemination of project results and/or lessons learned to external audiences, such as the public or other conservation organizations. Specifically outline any management uptake and/or actions resulting from the project and describe the direct impacts of any capacity building activities.

Please see section on Education and Outreach for information regarding dissemination