Annual Report

Research and Conservation Project of the Green Turtle (*Chelonia mydas*) and Hawksbill Turtle (*Eretmochelys imbricata*) in the South Pacific of Costa Rica

Presented by: M.Sc. Didiher Chacón, WIDECAST

To be presented to: People Trust for Endangered Species

Investigation authorized through permit AJDIP-127-2011 (INCOPESCA)

Sea turtles have an important cultural, ecological and economic value. Indigenous communities of the region, as well as more recent colonialists have benefited from the meat, shell, skin and oil of these turtles. Archaeological studies testify to the evidence of more than 1,000 captures per years. The negative effect of these historical captures without any regulation are even exacerbated by the causes of death that originated with the mid-twentieth century, which include: the incidental entanglement in fishing nets, the fragmentation of nesting and feeding grounds due to coastal development and increased tourism, as well as the diversification of human activities in coastal areas and in the ocean. Latter has caused them to be regarded as an endangered species, being included in Appendix I of the CITES agreement (Convention on International Trade in Endangered Species of Wild Fauna and Flora).

Because of many different reasons, sea turtles have captivated human imagination since ancient times. As nutritional, economic and spiritual support, diverse social groups from around the world have been part of the cultural framework of many coastal regions (Molina, 1981; Frazier, 1999). For example, archaeological investigations have revealed remnants of associations between sea turtles and human settlements in both continental and insular regions dating from 1380 BC A.D. to 1715. It is thus clear that sea turtles were an important component of the diet and culture of many of these ancient social centers (Wing y Reitz, 1982; Versteeg y Effert, 1987).

In recent years, sea turtles have become the cause célèbre in many key issues of modern society, influencing the ways humans display and interact with their environment. Sea turtles play the role of a justice trial that illustrates the complexities associated to the development, continuation and promotion of biological conservation and environmental protection programs. These reptiles have been at the forefront – not by personal choice - on issues of great impact, as international discussions on trade and environment. For a better understanding of the connections between man and sea turtles, it is necessary, as a first step, to understand some basic features of these charismatic animals.

Hawksbill Turtle (*Eretmochelys imbricata*)

The hawksbill turtle is the only species of sea turtle that has a brightly colored keratinous shell, consisting of overlapping shields, known popularly as "shell". The keratin in the shell is also the main structural component found in nails and horns, which is why hawksbill shell is strong, even somewhat flexible. Hawksbill turtles are characterized by a pointed bill and narrow head, with what they can ideally reach their food resources often located in areas of difficult access. Furthermore, they have four lateral carapace shields, two pairs of prefrontal scales, and three post-orbital scales that distinguish them from other sea turtle species.

Figure 1: Captured hawksbill turtle in Dulce Gulf.

Hawksbill turtles can be found in tropical and subtropical waters of the world's oceans. It is thought, that after leaving their nests, hawksbills undertake a "frenetic swim" to reach oceanic areas in where they spend their early years to develop. After several years in the open ocean, they recruit neritic zones where they spend most of their lives as juveniles and adults. The juvenile hawksbills are typically more sedentary than adults of other species, but despite of the migrations of thousands of kilometers undertaken by adults, this species is considered to be typically less migratory than other sea turtles.

Hawksbills traditionally have been known to inhabit marine habitats of rocky substrates, whereas juveniles are more omnivorous, feeding on a great diversity of prey, while adults feed predominantly on sponges. In the Eastern Pacific, however, it has been documented that adults spend most of their time foraging in feeding grounds, that are located in mangrove estuaries (e.g. the Dulce Gulf), which could give a completely different perspective both for their habitat as for their diet. More research is needed to understand this aspect of their natural history in this particular region.

As all other sea turtles, hawksbills are threatened by the poaching of their eggs and meat for consumption and sale. This hazard is most pronounced in regions of

extreme poverty, where turtles serve as an important source of protein and family income. Their bycatch in artisanal coastal fisheries as well as in industrial fisheries also means a big challenge, for one of which there is no easy solution as hundreds of thousands of people depend on fisheries for their livelihood. With the human population growing and an unstoppable and increasingly unsustainable coastal development, the destruction of key habitats for hawksbill nesting and foraging sites is similarly a huge issue. Other threats include pollution, a great scale change in oceanic nutrients and global warming.

However and exclusively for hawksbills, one of the main reasons for their population decline is the collection of shells (locally known as carapace shell or "bekko") for the manufacture of handicrafts like cockfighting spurs, combs, glasses and other objects. Individuals are also stuffed and sold to decorate the walls of markets, restaurants and homes. The result of this "value" added to the carapace causes, that if a hawksbill were found, it would probably be slaughtered instead of being returned to the sea. Although the collection of hawksbill shells and has been outlawed in many parts of the world, a strong black market still exists.

Until recent discoveries from end of 2007, it was assumed that hawksbills were essentially extinct in the Eastern Pacific. Nonetheless, it was now revealed that hawksbills in this region use remote nesting beaches, often located in between estuaries, where they land at the foot of mangroves to lay their eggs and it seems, that hawksbills even use these mangrove channels for foraging. These unique patterns in the natural history of Eastern Pacific hawksbills thus might be the reason, why it has gone almost unnoticed for the last decades, but it also makes the conservation of the species in the region particularly complicated.

The Black or Pacific Green Turtle (*Chelonia mydas agassizii*)

The black turtle or Pacific green turtle is characterized by a carapace length of 80 to 100 cm and can reach a weight of up to 100 Kgs, although in Nancite Beach a minimum nesting size of 76 cm in Curved Carapace Length (CCL) has been observed (Luis Fonseca, comm. pers.)

Figure 2: Black turtle, caught in Dulce Gulf.

Green turtles reach sexual maturity between 16 and 25 years and females nest every two or three years. A single turtle can nest up to five times per season,

at an interval of 12-14 days. Nesting season for this species in the Pacific lasts from September till March.

The nest chamber depth is of approximately 50 cm. The average number of eggs laid is from 65 to 87 and average incubation period varies from 42 to 62 days.

On the Pacific coast of Costa Rica, important nesting beaches include Naranjo, Cabuyal, Carate, Punta Pargo, Nombre de Jesús and Río Oro, among others.

Black turtles are mainly herbivorous, feeding on algae and seagrass. Important foraging grounds comprise the proximity of the Galapagos Islands, as well as the seagrass beds and mangroves of the Dulce Gulf. Turtles foraging at the Galapagos Island undertake long journeys between to their nesting sides, whereas tagged turtles can be found in Mexico, El Salvador, Nicaragua, Costa Rica and Colombia.

Black turtles are also endangered, mainly due to the consumption of their meat and poaching of their eggs, as well as they are caught as bycatch. On some beaches of the Costa Rican Pacific, in recent years dozens of dead turtles have appeared, where in most cases human interaction was attributed, either because of observed abdominal injuries, or due to evidence of entanglement and hooks caused by fishing gears, together with some apparent poisoning during red tides.

Location:

Osa Sea Turtle Conservation Project: The *Osa In-Water* project is located on Playa Blanca, close to Puerto Jiménez on the Peninsula de Osa in the southern pacific province of Puntarenas, Costa Rica (Figure 3). Puerto Jiménez is on the Dulce Gulf, the bay between the Osa Peninsula and the mainland of Costa Rica. The surrounding landscape is flat farmland, but most of the Peninsula de Osa has been under the protection of the Corcovado National Park since 1975 when logging became a serious threat to the area. This national park is one of 25 biodiversity hotspots worldwide, with a vast variety of mammals, birds, amphibians, reptiles and insects. You may also spot dolphins and whales in the Dulce Gulf.

Figure 3: Map project location

Methods:

For the duration of one year, a total of 94 sets or nets were casted to catch turtles. All sets were performed by casting the 250 m long and 6 m high net in parallel direction to the coast. 10 different locations were tested, with the occurrence of the seagrass genus *Halodule* sp., *Halophyla* sp. and a combination of sandy and muddy sea bottoms.

Figure 4: turtle net in Set 1, Dulce Gulf.

In every set, the net was casted for seven hours, always beginning with a cycle of high tide. All sets were placed in the interior zone of the Dulce Gulf.

Once the net was casted, it was corrected by free diving, verifying that the entire line was well laid out from the water surface until the bottom. Subsequently, the boat with an average of seven researchers, which included the captain and assistant, withdrew itself to a distance of no more than 500 m and waited until a turtle was caught in the net.

In the manufacturing of the net, plumbs were used with a sufficient weight to prevent the current from lifting it up but at the same time were necessarily light to allow the turtles to reach the surface and to breathe while being entangled.

Once the turtle emerged and stirred up the water surface, the boat approached the net and the turtle was untangled and taken aboard. Once on the boat, a damp cloth was placed over the turtle's head, with the intention of covering its eyes and to stay calm. Afterwards, the turtle was positioned inside a mesh to immobilize it and sustained on a soft surface such as a rubber mattress or tire to not pressure its organs. In this position being positioned in the shadow and the dumb cloth on its eyes, it was proceeded to take its biometrics, blood samples, parasite samples and to apply an external tag, in case it didn't had one already, as well as a microchip. All recaptures were re-measured.

If the turtle showed high incidences of parasites (fig. 5), it was taken to a water tank where the turtle was submerged into a freshwater bath to kill the parasites by an osmotic process, after which they were extracted and the turtle sterilized with Vanodine 5%.

Figure 5: Parasites embedded deep in the skin and muscle of a hawksbill turtle

Upon completion of each procedure the turtles were returned to the sea. A data sheet with all information was filled out for each animal and digitally stored.

Sampling was concentrated basically on the inside of the Dulce Gulf and most samples were taken from site named Set 1 or around its vicinity, due to a cost-

benefit matter as this site was on of the areas where most turtles were captured during the seven hours the net was set.

Table 1: Location of the of set positions.

Set	GPS N	GPS W
Set 1	0839787	08326247
Set 2	0840058	08326507
Set 3	0840256	08326388
Set 4	0840256	08326388
Set 5	0840085	08326245
Set 6	0840085	08326245
Set 7	0840432	08326527
Set 8	0840004	08326234
Set 9	0839787	08326247
Set 10	0831012	08317000
Set 11	0831012	08317000
Set 12	0832640	08317923
Set 13	0839567	08325965
Set 14	0840146	08326277
Set 15	0843770	08324173
Set 16	0844153	08322083
Set 17	0840072	08326190
Set 18	0840060	08326238
Set 19	0829859	08317151
Set 20	0840137	08326455
Set 21	0840027	08326200
Set 22	0840417	08326415
Set 23	0840185	08326402
Set 24	0840211	08326308
Set 25	0840110	08326437

It is also important to considerate that the set locations coincided with those areas that where mostly frequented by turtles equipped with satellite tracking devices, allowing us to identify with certainty that we are sampling in the feeding ground of these organisms.

Results:

A total of 200 turtles of both species were captured, of which 170 were green turtles and 47 were hawksbills, counting a total of 15 recaptures. The catch per unit of effort (CPUE) was 2.27 turtles per set, 0.32 turtles per hour, 0.00004 turtles per meter of net.

Hawksbill turtles represented around 25% of all captures, which shows its lower abundance in the study area.

Biometric records confirm that over 50% of captured green turtles had a carapace size greater than 76 cm, which is considered as the minimum nesting size for this species registered in the North Pacific of Costa Rica. Only two specimen showed macroscopic evidence of sexual differentiation towards being a male, whereas 198 of the individuals captured were presumed to be immature males or females (fig. 7).

For green turtles, the curved carapace size class from 75.1 to 80 cm was with 45 records the most frequent, while the average length was 80.08 cm (SD = 7.87) with a maximum of 102, 2 cm and a minimum size of 47.6 cm.

In the case of hawksbill, most captures were below the reproductive size, with an average in the curved carapace length of 55.89 cm (SD = 12.01) and a maximum size of 79 cm CCL. Latter could represent a sexually mature organism, while the minimum size registered of 34.8 cm clearly represented a juvenile specimen. All organisms of *E. imbricata* showed *Stephanolepas muricata* associations, a variety of drill barnacle species that parasite massively and might even cause the turtles death.

Figure 6: Hawksbill turtle infected with *Stephanolepas muricata.*

Individuals that were highly infected and because of their conservation status of being critically endangered, were taken to tanks and for 24 hours immerged in a fresh water bath, in order to kill and extract these parasites carefully with pincers, with the open wounds being sterilized. Latter recaptures shows no re-infections at least for the next four months.

A relevant fact is that two green turtle specimens (LCC 88) were registered with tags originally from the Galapagos Islands, Ecuador. This information was confirmed with the Charles Darwin Foundation who reported that these females were registered in 2007 while nesting on Playa Quinta, Isla Isabela.

Blood samples for cell counts and chemistry analysis were taken from all turtles, whereas the data obtained in veterinary laboratories of the National University are not yet fully evaluated in, averages values are shown in table 2. During this year of

study and conservation activities not climate extreme event happens to monitoring the effects of sediments and other threats over the feeding sea turtles habitats.

Two adult female green turtles were equipped with satellite transmitters with carapace sizes greater than the minimum nesting size reported for the country (76.0 cm). Their registered tracks are shown in figure 6.

No DNA or other genetic studies were done because of limited budget. Nonetheless, ideas about investigations on hormones and stable isotopes of carbon and nitrogen for trophic analysis are explored.

During the entire study, there was no fish bycatch mortality. The only species captured not targeted were a total of 7 types sting rays that were released alive and didn't suffer any harm.

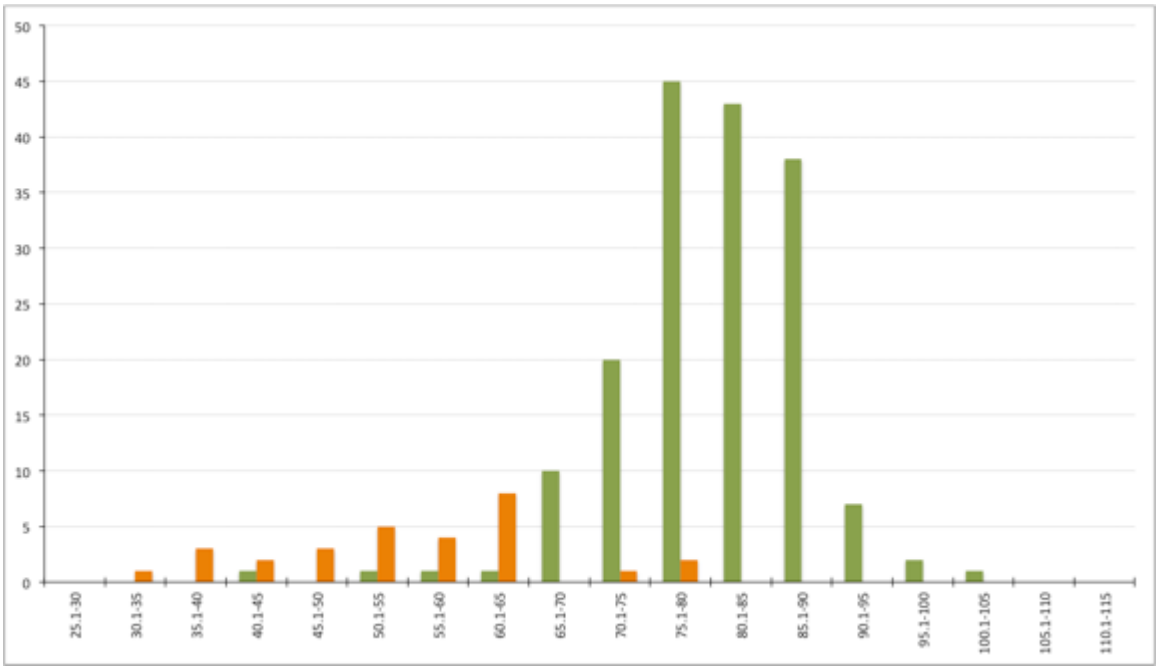

Figure 7: Distribution of turtles captured in a period of one year divided into size classes (Green: green turtles, orange: hawksbill turtles).

For now, values of chemical analysis and cell count of blood samples do not confirmation any alteration due to environmental stress or greater physiological changes. However, there are only few data available to comparison considering these topics.

One of the major benefits of this information is to be able to establish the basic parameters of wild populations, which then can be compared to the condition of individuals in captivity that are undergoing rehabilitation. In that way, our work contributes to science by establishing the baseline values in area of conservation biology.

Table 2: Chemistry and cell count in blood samples from turtles of the Dulce Gulf.

Blood chemistry (both species)	**Values (range)**
Total Protein	4.3 - 6.7 g/dl
Albumin	1.5 - 2.9g/dl
Globulin	1.2 - 4.1 g/dl
Glucose	58 - 127 mg/dl
Cholesterol	72 - 257 mg/dl
Urea nitrogen	1 - 16 g/dl
Creatinine	0.1 - 0.7 mg/dl
Phosphorus	6.6 - 13.4 mg/dl
Calcium	5.8 - 10.2 mg/dl
Magnesium	6 - 13.3 mg/dl
Uuric acid	0.7 - 2.1 mg/dl
Triglycerides	67 - 208 mg/dl
SAP	91 - 298 U/L
ALT	1 - 13 U/L
Cell count	**Value range**
Hematocrit	35 - 42%
Hemoglobin	10.8 - 14.4 g/dl
MCHC	32 - 36
Leukocyte Count	889 - 2560 ul
Heterophile	861 - 1091 ul
Eosinophils	44 - 231 ul
Basophils	0 - 15 ul
Lymphocytes	55 - 451 ul
Monocytes	11 - 64 ul

The two females of adult carapace size, which were equipped with satellite transmitters (September 2010 and November 2011), showed what we have called a feeding behavior and a habitat use for this purpose. Several important data derive from this information associated to the integrated management of the Gulf and its food web, as the data show that these individuals even travel upriver and incorporate especially mangrove areas in their foraging movement pattern, which ultimately leads to determine the importance of these ecosystems and the need to extend conservation efforts with the aim to maintain the ecosystem structure of these coastal forests.

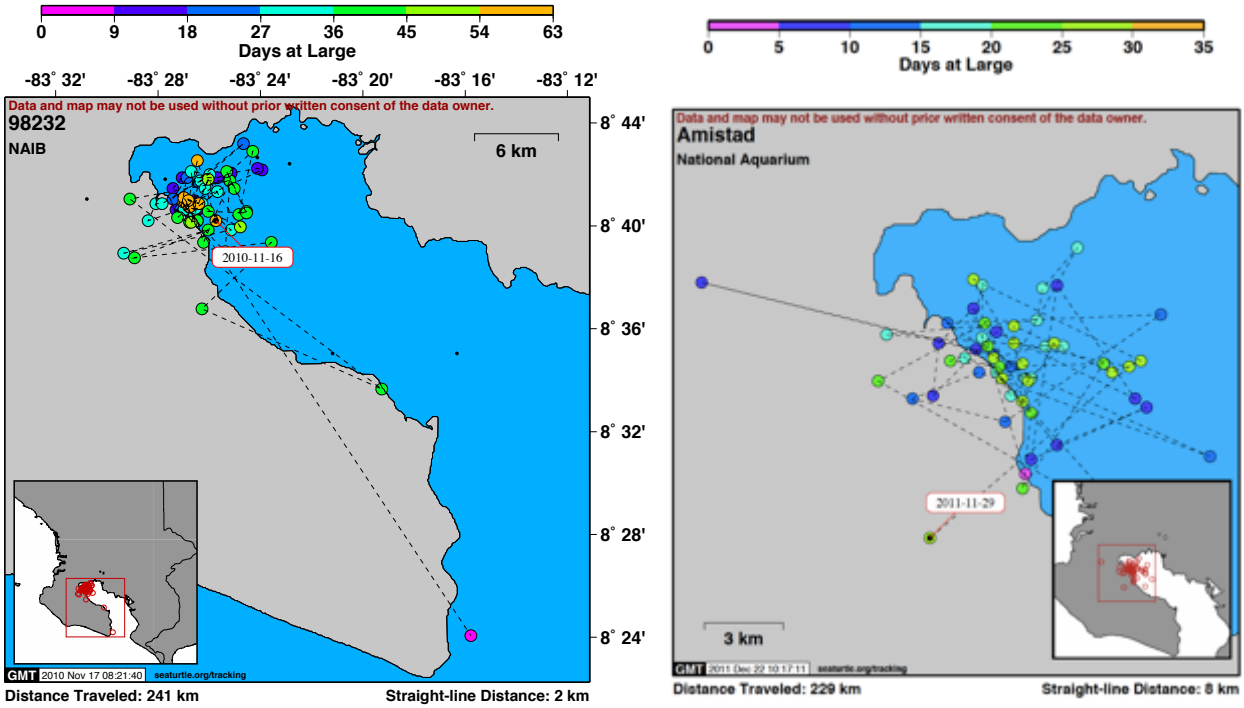

Figure 8: Migratory movements of two green turtles in the foraging area studied within the Dulce Gulf tagged in 2010 and 2011. The almost identical movements of different animals are evident.

The obtained results not only allowed gaining more information on the health characterization of green and hawksbill turtle populations, but also to describe health problems and to propose procedures for possible solutions. These data also showed the importance of the marine areas of the Gulf in connection to the feeding grounds for nesting populations such as from the oceanic islands like the Galapagos Islands. It is worthwhile to continue this investigation, tagging these animals to obtain recapture data from nesting beaches and in that sense to close the lifecycle of these species and to identify the location of their critical habitats.

The methodology applied proves to be completely friendly with other species, since no mortality in other species including fish, dolphins, etc. was registered.

Capture rates show a greater abundance of turtles of the *Chelonia* genus compared to *Eretmochelys*. Records of the respective species and applied metal tags are and detailed in table 3.

Table 3: Specie and identification of external metal tags applied to turtles captured in Dulce Gulf.

Species	Left tag	Right tag
Green	LC453	LC452
Green	OSA04622	OSA04623
Green	OSA04624	OSA04625
Green	OSA04620	OSA04621
Green	OSA04618	OSA04619
Green	OSA04617	OSA04616
Green	OSA04615	OSA04614
Green	OSA04611	OSA04612
Green	OSA04603	OSA04604
Green	OSA04607	OSA04608
Green	OSA04601	OSA04602
Green	OSA04609	OSA04610
Green	OSA04605	OSA04606
Green	NG972	NG973
Green	NG974	NG975
Green	NG953	NG954
Green	NG951	NG952
Green	NG967	NG968
Green	NG969	NG970
Green	NG963	NG964
Hawksbill	NG962	NG963
Hawksbill	NG955	NG956
Green	NG957	NG958
Green	LC455	LC456
Green	LC457	LC458
Green	LC402	LC403
Green	LC459	LC460
Green	LC461	LC462
Green	LC463	LC464
Green	LC465	LC466
Green	LC468	LC469
Green	NG959	NG960
Hawksbill	NG965	NG966
Green	LC478	LC483
Green	LC471	LC454
Green	LC481	LC482
Green	LC479	LC480
Hawksbill	LC485	LC487
Green	OSA04622	OSA04623
Green	NJ750	NJ749
Green	NJ716	NJ715
Green	NJ718	NJ717

Green	NJ722	NJ721
Green	NJ734	NJ735
Green	NJ726	NJ727
Green	NJ730	NJ731
Hawksbill	NG956	NG955
Green	NJ704	NJ703
Green	NJ702	NJ701
Green	NJ710	NJ709
Green	NJ708	NJ707
Green	NJ706	NJ705
Green	NJ732	NJ733
Green	NJ736	NJ737
Green	NJ751	NJ752
Green	NJ777	NJ778
Green	NG955	NG956
Green	NJ779	NJ7780
Green	NJ781	NJ782
Green	NJ783	NJ784
Green	NJ785	NJ786
Green	NJ787	NJ788
Green	NJ775	NJ774
Green	NJ773	NJ772
Green	NJ789	NJ790
Green	NJ751	NJ752
Green	NJ800	NJ799
Hawksbill	NJ747	NJ748
Green	NJ753	NJ754
Green	NJ796	NJ795
Green	NJ797	NJ798
Green	NJ769	NJ768
Green	NJ766	NJ767
Green	NJ764	NJ765
Green	NJ762	NJ763
Green	NJ760	NJ761
Hawksbill	NJ753	NJ754
Green	GAL3608	GAL3607
Hawksbill	NG961	NG962
Green	NJ755	NJ756
Green	NJ757	
Green	NJ740	NJ741
Green	OSA-04604	OSA-04603
Green	LC465	NJ759
Green	NJ738	NJ735
Green	NJ742	NJ743
Green	NJ744	NJ745
Green	NJ749	NJ723

Green	PE251	PE252
Green	PE253	PE254
Green	PE255	PE256
Green	PE257	PE258
Green	PE272	PE273
Green	PE267	PE268
Green	PE270	PE271
Green	PE227	PE226
Green	PE225	PE228
Green	PE275	PE232
Green	PE231	PE230
Green	NJ732	NJ733
Hawksbill	NG955	NG956
Hawksbill	PE238	PE240
Hawksbill	PE236	PE237
Green	PE234	PE235
Hawksbill	PE 241	PE242
Green	Gal3608	Gal3607
Green	PE261	PE262
Green	PE259	PE260
Green	PE281	PE280
Green	PE278	PE279
Hawksbill	PE277	PE278
Green	PE265	NJ746
Green	NJ705	PE263
Green	PE287	PE286
Green	PE289	PE288
Green	PE285	PE284
Green	PE243	PE244
Green	PE283	PE282
Green	PE292	PE293
Green	PE295	PE294
Green	PE291	PE290
Green	PC781	PC780
Green	NG877	NG878
Hawksbill	NG965	NJ776
Green	PE299	PE300
Green	PC741	PC742
Green	NG879	NG880
Green	PC783	PC782
Green	LC458	PC740
Green	PC722	PC723
Green	PE285	PE284
Green	PC761	PC760
Hawksbill	PC747	PC748
Green	NG887	NG888

Green	PC726	PC727
Green	PC792	PC793
Green	PC712	PC713
Green	NJ705	NG893
Green	PE297	PE298
Green	PC733	PC734
Green	PC775	PC774
Hawksbill	NG965	PC745
Hawksbill	PC791	PC790
Green	PC799	PC798
Green	PC739	PC738
Green	PC731	PC730
Hawksbill	PC763	PC762
Hawksbill	PC721	NG896
Green	PC701	PC702
Green	PC751	PC750
Green	PC737	PC736
Hawksbill	NG885	NG886
Green	PC773	PC772
Green	PC707	PC708
Green	PC769	PC710
Green	PC755	PC754
Green	PC759	PC758
Hawksbill	PC725	PC724
Green	NJ702	NJ701
Green	PE296	PC771
Hawksbill	PC719	PC718
Green	PC703	PC704
Green	PC794	NG884
Green	PC753	PC752
Hawksbill	PC779	PC778
Hawksbill	NG881	NG882
Hawksbill	PC705	PC706
Hawksbill	PC785	PC786
Green	PC757	PC756
Green	PC717	PC716
Hawksbill	PC797	PC768
Hawksbill	PC243	PC784
Hawksbill	PC777	PC776
Hawksbill	PC735	PC734
Hawksbill	PC729	PC728
Green	PC720	PC764
Green	NG889	NG890
Hawksbill	PC407	PC906
Green	PC909	PC908
Green	PC971	PC970

Green	PC865	PC864
Green	PC926	PC965
Green	PC937	PC938
Green	PC951	PC952
Green	PC893	PC894
Green	PC945	PC946
Green	PC993	PC992
Green	PC923	PC922
Green	PC917	PC916
Green	PC959	PC958
Green	PC983	PC982
Green	PC955	PC954
Green	PE269	PE274
Hawksbill	PC975	PC976
Green	PC867	PC866
Green	PC913	PC996
Green	PC939	PC940
Green	PC977	PC986
Green	PC899	PC900
Green	PC887	PC888
Green	PC989	PC988
Green	PC873	PC872
Green	PE931	PE892
Green	PC981	PC980
Green	PC879	PC878
Green	PC994	PC998
Green	PC889	PC890
Green	PC987	*
Hawksbill	PC928	PC927
Green	PC903	PC904
Green	PC895	PC896

*: Amputated flipper.

During this year the project also operated a mangrove plant nursery (Fig. 9) to help this critical habitat to recover, over 4000 plants were growth up and were planted in around 2 km of coast front line in the internal area of the Dulce Gulf. For this work WIDECAST recruited around 200 volunteers (international and national) to take care the plants and to make the reforestation on muddy areas.

The WIDECAST Team, also design and test the methodology to record the condition and biomass of the sea grass in the area (Fig. 10b). This work starts with the participation of a student from San Diego, California and now we monitored 6 transepts with at least 5 pins that include 4 quadrats each, soon we will have more information about condition and biomass of this important ecosystem.

Figure 9: Mangrove nursery in Osa Project

Figure 10. A. Filling the plant boxes with marine mood. B. Installing pins and quadrats on the sea grass during the full moon low tide for further studies of this important feeding critical habitat.

The activities of the project focus on Sea Turtles and the critical habitats also supported work with some threats as plastics in the stomach, wounds, intestinal obstructions, boat crash and float problems as the most common injuries in the rescue turtles. In total we rescue and release 35 sea turtles during 2012, this amount do not include the hawksbills with parasites.

The team project also visit the La Palma and Playa Blanca primary schools and work with the kids teaching them about the turtles and the importance of the conservation of the marine critical habitats. An estimation of 150 children participate in our environmental activities, each receive an activities manual, 2 presentations and 2 hands on activities like sea turtle release or rescue center visit.

To increase our reach and positive impact local and globally we based some of our activities in the Voluntourism, ecotourism to increase the visit to Playa Blanca location and increase the income in the home stay families and volunteers to increase the frequency and the reach of our conservation activities.

Figure 11: Volunteer in front of our rescue center, Veterinary students learning about sea turtles and local school kids receiving our project presentation.

Next step:

For a continuation of the project, a bi-weekly monitoring of respectively seven hours of net deploy is proposed in the inner zone of the Gulf until gaining a recapture rates of 95% that has still not been achieved for either species. This sampling model will be adaptive to the personnel available as well as to the weather and especially to the condition of the sea.

More frequent sampling could be realized depending on the resources available. Each survey is completed by using the vessel called **WIDECAST**, being 8.15 m long, 1.80 m wide and 0.72 m high, with an engine brand MERCURY series 1B857566 and registration number PG-9267 and its departure port being Playa Blanca de Osa at 3 km from La Palma.

Our plan is not only be the unique option for sea turtles with health problems in Costa Rica also we want:

- Be a training center for marine biologist and veterinaries.
- Develop studies on the critical habitats as Sea Grass, Mangroves and Pacific Coral Reef.
- Study the choice to develop a pilot project with “Bio-Rock” to recovery the reef around Playa Blanca.
- Install satellite tracker in males for both species.
- Develop a health data center for both species to be used by local and international partners including DNA, blood, stomach contents and other.
- Increase the medical procedures precision to manipulate sea turtle health problems and share with the national and international society.

We are developing an effort to give stable and permanent resources to the project by support from proposals, volunteer fees and sea turtle adoptions.

Finally, we appreciate all support receive by PTES to this project, particularly their special consideration to help our project in this area by continuation funds.