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Minister Jorge Rodriguez
Ministero de Ambiente, Energia y Telecomunicaciones
Apdo. Postal 10.104-1000
San Jose, Costa Rica

Dear Minister Rodriguez,

Thank you for asking for my opinion on the situation of the Las Baulas National Marine Park. I have carefully considered your questions and have answered them based on what I have seen in the area since November 2007. As I state in some of my answers, the dispute in the area of the Las Baulas National Marine Park must be settled soon since development will continue in an uncontrolled manner until fair laws are defined to protect the National Park, which is also a National Treasure. Uncontrolled development such as that in Tamarindo has a severe negative impact on the local environment, including the Las Baulas National Marine Park. Such uncontrolled development threatens to destroy what most tourists visit Costa Rica to see, a unique and thriving environment rich in wildlife and vegetation with a population of friendly people.

There are examples of working National Parks in Costa Rica that successfully help recover the sea turtle populations as well as educate the public so they can help. The best example can be found at Tortugero National Park where the US-based Caribbean Conservation Corporation works with the Costa Rican Government to the benefit of the local community. The Las Baulas National Marine Park apparently lacks similar cooperation.

I do believe that, at minimum, the Las Baulas National Marine Park should include the 50 meter public zone as this area is the actual nesting area of the leatherback sea turtle. Because I am unfamiliar with the laws of Costa Rica, I cannot adequately interpret the previous laws that created the Refuge Areas then the National Marine Park. As a conservation scientist and field biologist I can say with confidence that the 50 meter public zone should be an integral part of the Las Baulas National Marine Park regardless of how the actual borders are finally settled.

All parties involved in this dispute seem to want laws, environmental controls, and building codes to protect the Park area. I am confused as to why they do not negotiate a solution rather than stand at odds and not communicate. An organization in Costa Rica that I have found particularly impressive is PRETOMA. They are involved in monitoring many beaches that are not being monitored by other organizations and are very knowledgeable of sea turtle conservation and education methods in Costa Rica. I was very impressed with the President of PRETOMA, Randall Arauz who also was one of the first Directors in the Las Baulas National Marine Park. He has extensive knowledge of the history and situations surrounding the Las Baulas National Marine Park. I believe he would be an ideal person to serve as a mediator in

this dispute as I believe he has the ability to see both sides of the argument and he will work hard for what is best for the turtles and the people of Costa Rica. Las Baulas National Marine Park

As long as the Las Baulas National Marine Park's boundaries remain in dispute, the area surrounding the Park will continue to develop which will negatively impact the Park in the future. It is time for all parties to sit down and negotiate clear Park boundaries and a law such as to the "Bill of Law" that restricts the manner in which the area outside the Park will develop. Without both of these necessities, long-term survival of the Park will be in doubt.

It is important to note that I have not received payment for my participation in this situation other than having the cost of airfare and room and boarding for 6 days in November 2007 and room and board for 6 days in January 2009. I paid my own airfare and one night room for the January 2009 visit to Playa Grande.

Please do not hesitate to contact me by e-mail (krusenko@ci.boca-raton.fl.us or rusenkoki@aol.com) if you have any questions or would like any further information.

Sincerely,

Kirt W. Rusenko, PhD

COSTA RICA QUESTIONS- RESPONSE

1. Do you consider the regulations stated in this project of law adequate enough for the protection of the leatherback turtles?

Yes, it is important to correctly and legally set the borders of the Las Baulas National Marine Park for the protection of the leatherback and olive ridley turtles and for the government of Costa Rica to maintain the integrity of the National Park. I firmly believe that the 50 meter "Public Zone" should be included in the Las Baulas National Marine Park to provide safety for the nesting site of the leatherback sea turtle. Many developed areas of Costa Rica have eliminated the 50 meter public zone by developing right to the high tide line even though some of these areas were also located in protected refuges. The "Bill of Law, Rectification of Limits of Marine National Park Las Baulas and Creation of Natural Wild Life Refuge Las Baulas of Mixed Property" (translated by Eugenia M. Cartin Y Asociados, S.A.; hereafter "Bill of Law") does define the borders of the National Park and additionally creates a wildlife refuge with important restrictions and guidelines for development outside of the Park boundaries. The "Bill of Law" defines the existing 50 meter public zone as a part of the Las Baulas National Marine Park. Because the actual borders of the National Park are disputed by several groups, this law offers the chance to get all disputing parties together to negotiate a final undisputed boundary for the National Park.

The setbacks from the 50 meter public zone and minimum lot size requirements defined in the "Bill of Law" are important to reduce the density of potential development in the area of the National Park. More vegetation between the houses and the beach will reduce negative human impacts on sea turtle nesting by separating human activities from sea turtle activities. Minimum lot size, maximum area of allowable build, and building height restrictions will keep Playa Grande an attractive nesting site to leatherback and other sea turtle species in the area. Such limitations will insure that adequate native vegetation will remain on the lots to reduce negative impacts on terrestrial native wildlife such as Howler Monkeys. Reducing the population density through minimum lot size restrictions will also reduce potential human/sea turtle interactions on the beach during nesting season. Even minimal lighting restrictions such as those addressed in the "Bill of Law" will help protect the nesting site of the leatherback sea turtle in Playa Grande. If these minimal lighting restrictions were applied to the present City of Tamarindo, there would be a positive result for nesting sea turtles in Playa Grande. I do not understand why lighting restrictions have not been implemented for Tamarindo given its close proximity to one of the most important leatherback nesting areas in the Pacific. Despite thin resources, the Government of Costa Rica must work to enforce existing laws and seek to create new; enforceable laws to protect the National Parks and Refuges such as the "Bill of Law". It would be helpful if local environmental organizations would work with all parties involved to create and help the Government of Costa Rica enforce such a law. Presently local NGO's such as the Leatherback Trust seem solely determined to claim the disputed 75 meter landward is required for the nesting sea turtles protection. Even if the Park existed 125 meters landward of the high tide, the Park would not survive uncontrolled development and lack of lighting restrictions. I truly feel that however others interpret this "Bill of Law"; such a bill in the past would have prevented the deplorable situation caused by the development of the Tamarindo area which has resulted in the loss of significant leatherback nesting area caused by unrestricted development. The "Bill of

Law” will address unrestricted development if properly enforced. Costa Rica has some outstanding, groundbreaking environmental laws; without enforcement, such laws become worthless papers.

Because properties can be developed until expropriation, the land will develop without rules such as those offered in the “Bill of Law”. As the land develops, the cost of expropriation increases and most likely gets delayed allowing more development. If the borders of the National Park are not settled soon and the development is controlled, The Las Baulas National Marine Park may be lost to all. I believe the “Bill of Law” is more important to begin protecting this sensitive area than an additional 75 meters of land for the Park.

2. Twenty years ago around 2000 leatherbacks per season nested in Playa Grande but during the season ending in March of this year, only 27 arrived. What do you know about the cause of this dramatic decline at Las Baulas National Park and at other beaches of the Pacific Ocean? (In the Atlantic and Caribbean, I understand that the populations are increasing.)

There are two major reasons for the decline seen in the population of nesting leatherbacks in Playa Grande. It has been often reported in the scientific literature that commercial and local fishing efforts account for many thousands of leatherback deaths each year. This is an indirect take as most of the commercial fisheries are not seeking to harvest leatherbacks, the turtles are considered “by-catch” and both live and dead turtles are thrown back into the ocean. Additionally, in many countries in the Pacific region, there are no laws restricting harvest of leatherbacks so there is loss by direct fishing. All leatherback populations throughout the Pacific Ocean are in rapid decline due to fishing interactions, not just at Playa Grande.

The second major reason for leatherback decline at Playa Grande is the nearly 100% poaching of every leatherback nest in Playa Grande from the 1980’s to the early 1990’s. If one accepts that leatherbacks reach maturity in 11 to 17 years, nearly an entire generation of leatherbacks from Playa Grande has been destroyed. Since reliable protection of the eggs has existed since the mid-1990’s, there is the possibility that increases in numbers of nesting females will be seen in the near future.

Another reason for the decline in nesting females is the uncontrolled development of Tamarindo in the past 10 to 20 years. Construction has destroyed all the vegetation in the 50 meter public zone, there is excessive lighting that can negatively impact sea turtles in playa Grande, and poor water quality from insufficient sewage treatment. Certainly Tamarindo was once a nesting beach for leatherbacks; this area is now lost to the turtles. Lighting from the town can negatively impact the turtles by discouraging females from nesting and by disorienting the hatchlings so that many die before even reaching the sea.

3. Do you believe it is possible that the nesting population at Playa Grande and other beaches in Latin America might recover? If so, what measures should be taken to correct the present situation?

I do believe it is possible for the leatherback populations to recover in Costa Rica, but it will not be easy. Many scientists fear that the Pacific leatherback sea turtle will be extinct within the next few decades if the populations continue to decline as they have been (due to reasons discussed in question #2). No single country can help reverse the decline of the leatherbacks. Only an international effort and the cooperation of many countries could possibly be successful at saving the leatherbacks in the Pacific. Major efforts should be focused to reducing or eliminating the losses caused by commercial and local fishing. In the Atlantic Ocean, leatherback populations seem to be increasing as previously unknown nesting sites are discovered in third world nations in the Atlantic. Florida will report a record high number of leatherback nests this year. The reasons for the increase may be that the American long-line fishing fleet has learned to reduce sea turtle by-catch by 90-95% by using different hook types, bait, and setting practices. These techniques are not largely used by the fishing fleets in the Pacific. Countries in the Pacific that do not currently have laws protecting leatherbacks must be encouraged to do so. Such an effort to reduce sea turtle by-catch by International Pacific Ocean Fishing Fleets would require the Government of Costa Rica to work cooperatively with these other governments to reduce the sea turtle by-catch. Perhaps the President, you, or even other Costa Rican environmental organizations such as PRETOMA can meet with these other governments, predominantly along the west coast of Central and South America, to train to use new fishing techniques. The United States has sent representatives to other countries to show how to reduce turtle by-catch by almost 95%. The United States also has expertise in the use of Turtle Excluding Devices (TED's) in shrimp net that drastically reduce turtle by-catch. Such a meeting, or more likely, series of meetings would also possibly look into funding sources to provide turtle-safe fishing equipment to the commercial fleets and the local fleets. By showing how to reduce sea turtle by-catch to local and regional (southeast Pacific), fisherman, the population of leatherback sea turtles in the Pacific stands a better chance of survival.

As mentioned before, because poaching is much less a problem than it was 20 years ago, the possibility exists for local nesting populations of leatherbacks to recover to some extent. This will not be seen in other countries that do not protect sea turtles as well as Costa Rica.

While gaining control of the problems turtles face in the oceans, it is critical that future nesting females have beaches in Costa Rica to return to. Parks must be established to effectively protect the nesting habitat and that controls on development in the areas adjacent to and within the Parks be instituted to prevent a repeat of the present situation in Tamarindo. While development is beneficial to the economy of Costa Rica, if it is not controlled to protect the wildlife, Costa Rica will lose one of its most important resources and source of income- the environment. Development that occurs under well-enforced environmental codes or laws will insure that the environment and the development can co-exist in the future to the benefit of Costa Rica. It is important to maintain large areas of pristine Park for many species of wildlife in Costa Rica; smaller, more fragmented Parks are not effective for many types of wildlife that require large forage areas. In the case of Playa Grande, only a narrow strip of beach is National Park area

which is fine for sea turtles that go to sea to forage. Controlled, low-impact development as described in the “Bill of Law” can insure protection of the nesting beach and protection of the many native species of plants and animals that make use of this dry forest.

4. What measures have been applied at other nesting beaches and oceanic areas that have been successful in the recovery of marine turtle populations?

In the United States sea turtles have been protected by the Endangered Species Act since the late 1970’s. This protection caused the States and municipalities to enact laws that protected the sea turtles nesting beaches. In Florida, the second largest nesting population of loggerhead sea turtles exists with significant nesting demonstrated even in significantly developed areas. The most densely nested developed areas have faced restrictions on development and most importantly, lighting restrictions for beachfront developments. Sea turtles clearly avoid brightly lit beachfronts as can be seen in many areas of Florida which have ineffective or unenforced lighting codes. It is estimated that 20% of all hatchling sea turtles in Florida die each year from lighting violations. Florida also has a strong sea turtle protection program administered by the Florida Fish and Wildlife Conservation Commission which trains and grants permits for people to monitor the beach for sea turtle nesting activity. In many cases, the local nature of these sea turtle permit holders helps effectively educate the public about sea turtle conservation which has a significant impact on the community “protectiveness” of the local sea turtles. The permit holders of the Florida Marine Turtle Program have a uniform set of guidelines to follow for effective sea turtle conservation practices. A copy of these guidelines is available online at: http://www.myfwc.com/WILDLIFEHABITATS/Seaturtle_ConservationGuide.htm

Unfortunately, Florida does not have the 50 meter public zone that Costa Rica has and Florida also has significant old development that was constructed before beachfront management practices were developed. Costa Rica has the opportunity to develop in a manner that is environmentally responsible. Many of the provisions contained in the “Bill of Law” are similar to those in Florida where these codes have effectively protected nesting sea turtles and their hatchlings. Because of such codes restricting development and lighting, nesting of green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles in Florida is increasing in a nearly exponential manner, even in developed areas such as Boca Raton. Beachfront conservation even in areas as developed as Southeast Florida are successful at helping sea turtle populations recover if they do not interact with the fishing industry as is the case for the greens and leatherbacks of southeast Florida whose populations are increasing nearly exponentially.

Sadly, the nesting loggerhead population has been in decline since 1999 due to similar pressures of the commercial and local fishing industries faced in the Pacific Ocean. In response to this decline, the United States has supported successful research to reduce sea turtle by-catch by the long-line fishing industry. Additionally, marine protected areas such as those in Hawaii and in the Keys in Florida, have been set aside in US waters to protect all marine life in the area. Fishing is not allowed in these areas but adequate law enforcement is required to keep these areas clear of fishing activity. Finally, sections of the US Government such as the National Marine Fisheries Service (NMFS) will actually close a fishery if it is determined that excessive by-catch of sea turtles is occurring. Recently, bottom long-lining was suspended in the Gulf of Mexico due to excessive by-catch of loggerhead sea turtles. So far there has not been a recovery

of loggerhead sea turtles in the US due most likely to the fact that many of these events are relatively recent. Additionally, only 4% of the fishing fleet is actually from the US which leaves the other 96% of the fishing boats continuing to kill sea turtles. International effort is required and the US is sending representatives to many other countries to encourage use of modern fishing practices that reduce the by-catch of sea turtles.

Finally, a network of volunteers should be trained to record data from stranded dead or injured sea turtles in Costa Rica. Such a program in Florida successfully lets wildlife managers know what is going on with the local populations of sea turtles both in a positive and negative manner. While in Costa Rica I saw a stranded Olive Ridley that had been hit by a boat, people would see it, then go about their business. Learning how stranded turtles die allows wildlife managers to respond to the cause of death and implement laws or restrictions that can protect the sea turtle populations from threats such as boating and fishing pressures. Such a network may help locate unknown nesting hotspots, particularly on the pocket beaches of Guanacaste Province. In my opinion, it is critical that Costa Rica know what resources it has in terms of nesting beaches before those areas are developed. I visited a few small pocket beaches north of Playa Grande that had a high density of crawls and nests from what appeared to be the black turtle, a sub-species of the green turtle.

5. We do not have the resources to purchase the properties that the NGO stationed in the Park considers absolutely necessary for the preservation of leatherbacks. We propose instead to place those properties under the regime of a public/private wildlife refuge. Do you consider this to be a reasonable solution? Do you know of other places in the world where forceful expropriation with the objective of protecting marine turtles has been applied?

Regardless of the actual size of the Las Baulas National Park, uncontrolled development of the lands surrounding the Park will surely have a serious negative impact on the Park's leatherbacks. As I mentioned in Question 1, even if the Park were 125 meters landward of the high tide line and no protective laws restricting development existed, the Park still could be lost to uncontrolled development. In other words, I see the disputed 75 meters of land landward of the 50 meter public zone less important than an enforceable (and enforced) law that restricts development in the area to environmentally sustainable levels. Although refuges in Costa Rica often have poorly-enforced laws, hopefully better success of a refuge near the National Park would be achieved by educating and including the local residents in sea turtle conservation projects in Las Baulas. A successful Wildlife Refuge would require close involvement and cooperation of the residents, MINAET, and environmental groups in the area. Successful programs that clearly involve and benefit the public are found on beaches such as Ostional and Tortugero. Involving and benefiting the public clearly leads to enhanced enforcement through community involvement. I did not find an educational center at Las Baulas National Park that interpreted the remarkable beauty of the area, described the local wildlife, or described the importance and threats to the nesting sea turtles in the area. That there was no Educational Center for people to seek out and learn about the local environment both surprised and saddened me.

I have heard of very few cases of expropriation as a means of protecting sea turtle nesting beaches. Individual cases of expropriation by eminent domain have occurred or been attempted in the US, but nothing as widespread as Playa Grande. In the late 1980's Greece considered expropriation of several properties on the Island of Zakynthos which hosts one of the largest populations of nesting loggerheads in the Mediterranean Sea. Apparently, since 1984 the Greek Government had introduced various legislation to protect the area, which included expropriation. These efforts were not "endorsed by part of the local community and generally were poorly enforced". In 1999, the National Marine Park of Zakynthos was established but poor funding and lack of enforcement caused Park operations to cease in 2004, meanwhile one section called Daphni 14 buildings were constructed illegally. Threatened fines from the European Commission resulted in increased funding for the Park and since 2005, Park Wardens were established along with public education programs, and maritime law enforcement. The Greek Government works with ARCHELON, the Sea Turtle Protection Society of Greece, to implement Park operations and educational programs. Apparently, expropriations never occurred but illegally built buildings on Daphni are expected to be demolished. After years of non-enforcement and illegal building, a coalition of government and private environmental groups are gaining a foothold on the National Park beaches as well as the surrounding waters. Attached is a "Short Report on Sea Turtle Conservation on Zakynthos Island, Greece, during 2008" which details some of the history of this National Marine Park.

6. The Leatherback Trust (NGO stationed at the Park) considers the forceful expropriation of a 75 m wide strip of land behind the 30 m public zone along the beach and the Cerro el Morro the ONLY way to protect the remaining turtles. Are there any alternative conservation measures that might be effective now, and in the future?

Obviously, the more land available for any Park, the better it would be for the wildlife of that Park. Unfortunately, the 75 meter strip has been disputed from the Park's beginnings resulting in confusion and so far, small-scale development in the Playa Grande area. As I mentioned previously, Florida does not have the advantage of the 50 meter public zone that Costa Rica has in Playa Grande. Development so far has largely respected this public zone with small exceptions. Presently, the existing development in Playa Grande does not negatively impact nesting leatherbacks or their hatchlings. I have walked the entire length of beach on a few nights with guides and saw no badly lit houses on the beachfront. With the exception of Tamarindo, the beach at Playa Grande is extremely dark during nesting season. Residents are strictly not allowed on the beach at night. I was asked to leave the beach while photographing the lights of Tamarindo on three separate occasions.

The plans for the Playa Grande Central area are more problematic as there are planned a large number of small lots which will result in a potential high density of people near the beach. This plan is not shown in the "Bill of Law" and many properties already sold are not as large as required in the "Bill of Law". Some of the lot sizes are as small as 300 square meters, such a lot size would destroy all native vegetation on that lot. The proposed "Bill of Law" would restrict lot sizes in Playa Grande Central to 1200 square meters with 40% maximum build for a single story home, 30% maximum build for a 2 story home. These building restrictions should allow healthy area for native vegetation plus keep all buildings in the area at 2 stories or less, no high

risers. Presently, lots are being sold in the Playa Grande Central area even while the area is under dispute. There should be a moratorium on land sales particularly in the Playa Grande Central area until the dispute is settled.

As long as the property in the area of the National Park is disputed, development can continue uncontrolled. I feel it is in the best interest of all parties involved and the people of Costa Rica to settle this dispute, establish rigid National Park boundaries, and enforce new environmental codes such as those in the "Bill of Law".

7. Is it possible to determine sex of hatchling marine turtles without killing them (by decapitation or other lethal procedures)?

Reliable non-lethal gender determination methods were first available in the early 2000's by raising hatchlings in captivity until they were approximately 120 grams then, using a laparoscope through a small surgical incision, the gender can be determined visually. Such studies have taken place at the Gumbo Limbo Nature Center supervised by Dr. Jeanette Wyneken of Florida Atlantic University since 2002. Other techniques such as measuring blood estrogen levels have proven less reliable. Other gender-ratio studies have relied on recovery of dead hatchlings from nests. In Florida there is a high mortality of leatherback hatchlings relative to loggerhead and green sea turtles which supplies a large number of data points without the need to kill healthy hatchlings.

8. During the nesting season, nobody is allowed on the beach between nightfall and sunrise except for the tour guides and tourists that come to watch the turtles. What do you recommend regarding the number of tourists allowed on the beach per night per turtle?

In Boca Raton, Florida the areas with more people on the beach at night have fewer sea turtle nests. This is also true on other beaches throughout the State. In other words, the more people you put on the beach at night, the more negative impact you have on nesting sea turtles. In Florida only 18 beaches are allowed to guide visitors to nesting loggerhead sea turtles. Such events, described in the FWC Marine Turtle Guidelines, allow a maximum of 50 people four nights a week. These events are largely finished before 12 midnight which allows the bulk of the nesting female sea turtles to deposit their eggs without potential interference from tour groups.

I was distressed to see all night tour groups in Playa Grande during my visits, apparently hundreds of visitors are guided to nesting leatherbacks even while the turtle is excavating an egg chamber, a practice that is specifically prohibited by Florida's Sea Turtle Conservation Guidelines for viewing nesting loggerhead sea turtles. During the beach tours I attended, there appeared to be more people on the beach at night than I saw during the day. This certainly cannot be good for the nesting turtles on this beach. Although I found the guides to be extremely knowledgeable, there was a weak educational component to the experience. Groups of people were taken to the beach without prior presentations about these sea turtles, their life history, and the threats they face. The educational component only occurred while a few visitors were around the nesting turtle, the entire experience should be educational. While our group waited more

than an hour for a turtle to show up on one occasion, the guides moved off to talk with themselves and left the group alone. That was an excellent educational opportunity lost.

I believe setting times during which visitors are invited to view nesting leatherbacks between sunset and 11:00 PM would benefit the nesting turtles. As visitors are guided from two sites in Playa Grande, I would limit the number of visitors from each site to 50 with two guides minimum with each group. Each program should be preceded by a half-hour or so educational presentation describing the Pacific leatherback sea turtle, its life history, and its present predicament.

These restrictions that I recommend do not apply to the qualified biologists that monitor the beach each night for nesting leatherback sea turtles. It is important to not disrupt a scientific investigation that has provided reliable and consistent data for nearly two decades.

9. What measures have you applied in your densely populated city that has made your protection program such a success?

The City of Boca Raton has monitored its 8 kilometers of beaches for nesting sea turtles since 1976, a date which is two years earlier than the US Endangered Species Act protection granted in 1978. In the early years, monitoring and marking nests in a developed environment protected the nests from beachraking activity by bulldozers and later, heavy tractors. Nests were also caged to protect the eggs from mammalian predators such as raccoons and foxes until it was determined that the routine caging actually attracted the predators. Presently nests are protected by ad lib screening, habenero pepper powder for deterrence, and by removing sources of garbage that feed the predators to expand their populations. These methods have reduced predation in Boca Raton from an average of 15% of nests to 5% of nests. Recently, residents of beachfront condominiums began feeding mammalian predators which lead to an increase in predation around these condominium complexes. Additional educational materials and programs were begun to teach these residents to leave the wildlife alone. The education of these residents has been nearly as successful as the habenero pepper powder.

The most important measure to protect Boca Raton's sea turtles was the adoption of a beachfront lighting ordinance in 1986. This ordinance (copy attached) restricted all lights that were visible from the beach during sea turtle nesting season. In an urban area such as Boca Raton, lighting is one of the worst impacts to sea turtles and their hatchlings. In one area of Boca Raton, a beach renourishment project exposed 28 150 watt high pressure sodium streetlights to the beach. The first year after this project, more than 1600 hatchlings were disoriented by the streetlights and 74% of them died as a result of the disorientations. Because of this carnage, a project from the Florida Department of Transportation installed an experimental embedded roadway lighting project in the area. This project embedded pavement marker lights in the road surface illuminated by light-emitting diodes (LED's) which delineated, but did not light the roadway. This new form of lighting allowed the streetlights in the area to be turned off which eliminated all hatchling disorientations in the area since 2001. In 2007, the lighting project was expanded to 2.4 kilometers which has had a dramatic positive impact on the nesting sea turtles and their hatchlings in the area. The City of Boca Raton has also employed Environmental Officers who

can respond to environmental violations at my request or public request and levy a fine on the spot if the violation is not resolved in a timely manner. It is important that a local representative of MINEAT have the power to levy fines when environmental codes are violated. In the 14 years I have worked for the City of Boca Raton, I have never had to ask for a fine. The educational programs offered by the Gumbo Limbo Nature Center in Boca Raton have effectively taught the residents the importance of protecting our nesting sea turtles and their hatchlings. When I point out violations and solutions to residents, they quickly comply because the majority of them want to do the right thing for the sea turtles and other local wildlife. In most cases, I find that people want to do the right thing; they simply need to be educated about the problems and what they can do to help. I believe this demonstrates how effective local nature centers can be to educate and involve the local residents in important conservation measures. Such an educational center is clearly lacking in Playa Grande even though MINEAT has an office building in Playa Grande, encouraging public involvement in conservation is a highly effective way to protect local endangered species.

Finally, the City of Boca Raton includes my position (Marine Conservationist) in the decisions for planned beachfront construction and new or replacement beachfront lighting. My position is involved in the planning stages of beachfront construction projects by evaluating the environmental needs of a project before our local Environmental Advisory Board and finally, our City Council. Including a biologist in these construction projects avoids beachfront development that rises uncontrolled. In this manner, problems are resolved before they are built. Such a program in Costa Rica could have harnessed many beachfront developments that arose in an uncontrolled manner such as Tamarindo.

10. Do you consider the involvement of communities in the protection of marine turtles a positive element in promoting marine turtle recovery?

In Florida, communities that have no educational nature centers have little awareness of the conservation measures needed to protect sea turtles. Educational Nature Centers such as Gumbo Limbo Nature Center in Boca Raton and the Marinelife Center of Juno Beach engage and teach the local community at all age levels on sea turtle conservation and what they can do to help. I am fortunate enough to have residents of beachfront condominiums go their managers when they note a light that is in violation of the City's lighting ordinance. Residents who visit the beach are aware of sea turtle conservation measures and will let tourist know if they are endangering a nest or interfering with a nesting female sea turtle. We also have trained many residents to monitor nests at night in cities that have no lighting ordinances. These people await the emerging hatchlings and when they emerge and disorient because of the lights, they collect the hatchlings and take them to a dark area to release them. Finally, they fill out a disorientation report for our Florida Fish and Wildlife Conservation Commission to document the bad lighting. This encourages cities with bad beachfront lighting to adopt a lighting ordinance or to enforce existing ordinances.

Community support and involvement is critical for successful sea turtle conservation. I have learned that without community education, there can be no conservation. One thing I noted in Playa Grande is that there seems to be no community involvement or community education

regarding the huge importance of this beach to leatherback sea turtles. I am saddened to see such a high level of hostility between residents of Playa Grande and the Leatherback Trust, this hostility seems equally mutual on both sides. Had the Leatherback Trust involved the community with a strong educational program, there may have been a more constructive level of cooperation between the residents and the Leatherback Trust. It truly bothered me to see an armed guard in front of the Leatherback Trust complex in Playa Grande. Local environmental groups should not be so isolated from the local community. I hope to see more communication between these groups in the future. Hostility must end and community education and support must begin. I am struck with how similar the requests of members of the Leatherback Trust are to the requests of the community and developers. Both sides want stronger environmental laws, both sides want restraints on development. The “Bill of Law” has a management plan that addresses density, building height, lighting restrictions, and setbacks that seem to meet much of what the Leatherback Trust is asking for. The only difference between the parties is the 75 meter strip of land inside the 50 meter public zone. Surely intelligent people can get together and settle this situation to the benefit of the turtles in the area and protect a well-defined National Park. A shining example of community involvement in a Costa Rican National Park can be seen at Tortugero National Park where the Caribbean Conservation Corporation helps by performing research on the local sea turtles as well as providing public education (see- <http://www.cccturtle.org/volunteer-research-programs.php?page=tortnp> for more details). I believe this example shows what can happen when the local community is included in protecting the local sea turtles.

11. What do you recommend be done regarding the neighboring town of Tamarindo, where the lights are clearly seen from the nesting beaches of the Baulas National Park?

Tamarindo and nearby Towns must be part of the management plan for the area around the National Park. The bad lighting that clearly affects surrounding nesting beaches must be controlled so the remaining turtles can have dark beaches to nest on. If lighting restrictions such as those described in the attached City of Boca Raton Code were applied to Tamarindo, the situation for nesting sea turtles in Playa Grande would certainly improve. Efforts to begin educating the citizens of Tamarindo about lighting should begin as soon as possible. Offending lights owned by the Municipality should be removed as soon as possible and be left off or be replaced or shielded in such a manner that it is not visible from the beach. Lighting problems cannot be corrected overnight, or perhaps even in a couple of years but with proper education, inducements, and enforcement the problems should be resolved. If lighting can be effectively controlled in South Florida, it should be possible to fix Tamarindo.

Sewage outflow from Tamarindo must be eliminated before it does significant damage to the estuary as well as the nesting beaches in the area. The type of uncontrolled development that happened in Tamarindo must not spread. I believe the “Bill of Law” will prevent this spread if properly implemented and enforced. If Tamarindo is left to grow without restrictions, no amount of land in the National Park area will be able to protect the nesting sea turtles and other wildlife of the area. I think it would be possible to return Tamarindo’s beach to nesting sea turtles by reinstating the 50 meter public zone, restricting lighting, and eliminating sewage outflow and storm water runoff.