
**PLEASE TURN YOUR LIGHTS OFF, THE
TURTLES ARE NESTING: ENSURING THAT
FEDERAL, STATE, AND LOCAL LAWS HELP
GUIDE ENDANGERED MARINE TURTLE
HATCHLINGS IN FLORIDA TO THE RIGHT
SOURCE OF LIGHT**

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*You divided the sea before them,
so that they passed through it on dry ground. . .
by night you led with a pillar of fire
to give them light on the way they were to take.¹*

I. INTRODUCTION

Light—a “natural agent that stimulates sight and makes things visible.”² It is a source of illumination in a bedroom at night and a decorative accessory during Christmas time. Signal lights guide vehicles in and through traffic and a light can be found as an expression in someone’s eyes, indicating a particular emotion or mood. Finding the light can be a spiritual illumination by divine truth. The people of Egypt needed a pillar of firelight to pass through the red sea. Harriet Tubman used candlelight to guide slaves through the night to escape the south.³ Thomas Edison worked on at least 3,000 different theories until he invented an efficient incandescent lamp for household use.⁴ Human existence is sustained by the visible spectrum of light—the sun’s hot gas produces light, like an incandescent light bulb.

Late in the night, the light of the moon provides a direct guide for sea turtle hatchlings to the ocean and a sensor for sea turtle mothers to nest on land.⁵ Bearing its full face, the moon alerts baby sea turtles to break out of their shell to begin an epic journey to the sea. Hatchlings possess an inborn tendency to move in the brightest direction, which on a natural beach is an uninterrupted open view of the lunar glow in the dark sky, reflecting over

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1. *Nehemiah* 9:11–13 (New King James).

2. *Light*, OXFORD DICTIONARIES, http://www.oxforddictionaries.com/us/definition/american_english/light (last visited Feb. 15, 2015).

3. See generally *Underground Railroad: A Path to Freedom*, E. ILL. UNIV., http://eiu.edu/eiutps/underground_railroad.php (last visited Mar. 10, 2015).

4. *Edison’s Lightbulb*, THE FRANKLIN INST., <https://www.fi.edu/history-lightbulb> (last visited Feb. 15, 2015).

5. See generally BLAIR E. WITHERINGTON & R. ERIK MARTIN, UNDERSTANDING, ASSESSING, AND RESOLVING LIGHT-POLLUTION PROBLEMS ON SEA TURTLE NESTING BEACHES (1996).

the ocean.⁶ But, on a public beach, thousands of beach vacationers reside, private lots span for miles, and hotel developments line virtually every inch of coastal shoreline. A competing brighter and more alluring form of light emanating from land insolently interrupts what seems like a natural pattern of sea turtle behavior.⁷ Sea turtle hatchlings are unable to distinguish the ocean from land, or the moon's light from an artificial light, and find themselves gravitated to follow the latter.⁸ What ends up happening to many baby sea turtles is an unanticipated trek through dry sand, concrete private lots, porch stairs, and pool decks.⁹ In a few short minutes unforeseen predators may eat up hatchlings, or their tiny marine-bound and newly born bodies dry up and lay lifeless from the lack of oceanic fluid.¹⁰

Additionally, mother sea turtles are in danger of being deterred to nest on beaches that have bright lights directly illuminating the shore. "Sadie," a mother sea turtle found offshore by a local interest group has an unfortunate story to highlight the reality of artificial lighting for nesting females.¹¹ Sadie was brought to a local sea turtle conservation hospital after a woman found her on the beach fallen off an embankment.¹² The sea turtle mother had come onto the beach to nest but failed; therefore, she was carrying eggs when she arrived at a sea turtle hospital.¹³ Doctors speculate that her inability to find a dark and unlit beach to lay her eggs left her wandering for miles off the coast.¹⁴ In the process, Sadie had fractured her plastron.¹⁵ Sadie was x-rayed and kept in a small tank for a short time until it was decided to try to induce labor.¹⁶ She received injections of oxytocin,¹⁷ and over three days' time deposited about seventy-five eggs that

6. See *Keep Sea Turtles in the Dark*, FLA. POWER & LIGHT CO., <https://www.fpl.com/environment/wildlife/turtles-lights.html> (last visited Mar. 10, 2015).

7. See *id.*

8. See generally *General Sea Turtle Information*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/northflorida/SeaTurtles/seaturtle-info.htm> (last visited Apr. 9, 2013).

9. See generally *id.*

10. See generally *id.*

11. See *Sadie*, MARINE LAB. & AQUARIUM, <https://mote.org/hospital/patient/sadie> (last visited Feb. 16, 2015) [hereinafter MOTE].

12. *Id.*

13. *Id.*

14. See *id.*

15. *Id.* See generally Rainer Zangerl, *The Turtle Shell*, in 1 *BIOLOGY OF THE REPTILIA* 311, 312 (Carl Gans et al. eds., 1969). The plastron is the nearly flat part of the shell structure of a turtle, what one would call the belly or ventral surface of the shell. See Zangerl, *supra*. It also includes within its structure the anterior and posterior bridge struts and the bridge of the shell. See *id.*

16. MOTE, *supra* note 11.

17. See generally *Oxytocin Injection*, U.S. NAT'L LIBRARY OF MED.,

were taken out to the local beach and placed in an artificial nest.¹⁸ Unfortunately, none of the eggs hatched.¹⁹

In Florida, artificial lighting is a huge problem for marine turtle hatchlings and nesting mothers like Sadie.²⁰ Hotel and private beachfront property owners display bright lights that jeopardize the habitats of three federally protected marine turtle species: the loggerhead,²¹ leatherback,²² and green turtle.²³ Under federal law, these sea turtles are now endangered,²⁴ and are dangerously close to extinction.²⁵ The Florida Marine Turtle Protection Act (“FMTPA”)²⁶ states that Florida has more endangered sea turtle species than any other continental state.²⁷ Based on this fact, Florida municipalities have enacted lighting ordinances to attempt to decrease the high death toll of sea turtle hatchlings.²⁸ All levels of government protection provide the sphere of sea turtle conservation that should be adequate for the population to be removed from the Endangered

<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a682685.html> (last visited Feb. 16, 2015) (defining oxytocin as a hormone used to help start or strengthen labor and reduce bleeding after delivery).

18. MOTE, *supra* note 11.

19. *Id.*

20. See Kathleen Doyle Yaninek, *Turtle Excluder Device Regulations: Laws Sea Turtles Can Live With*, 21 N.C. CENT. L.J. 256, 259 (1995). See generally *Sea Turtles*, NAT’L. OCEANIC AND ATMOS. ADMIN., <http://www.nmfs.noaa.gov/pr/species/turtles/#conservation> (last visited Feb. 16, 2015). The scope of this article is limited to artificial lighting as a threat of harm to sea turtles; however, sea turtles face other major threats that make them endangered that include: (1) destruction and alteration of nesting and foraging habitats; (2) incidental capture in commercial and recreational fisheries; (3) entanglement in marine debris; and (4) vessel strikes. See NAT’L. OCEANIC AND ATMOS. ADMIN., *supra*. “Shrimpers have also complained that figures regarding sea turtle mortality used by the NMFS are inaccurate because they have been extrapolated.” Yaninek, *supra* at 274.

21. See generally *Loggerhead Turtle*, NAT’L. OCEANIC AND ATMOS. ADMIN., <http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm> (last updated Dec. 15, 2014).

22. See generally *Leatherback Turtle*, NAT’L. OCEANIC AND ATMOS. ADMIN., <http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm> (last updated June 23, 2014).

23. See generally *Green Turtle*, NAT’L. OCEANIC AND ATMOS. ADMIN., <http://www.nmfs.noaa.gov/pr/species/turtles/green.htm> (last updated Oct. 30, 2014).

24. See U.S. FISH & WILDLIFE SERV., *supra* note 8 (“Of the six sea turtle species that are found in U.S. waters or that nest on U.S. beaches, all are designated as either threatened or endangered under the Endangered Species Act.”).

25. WITHERINGTON & MARTIN, *supra* note 5, at 1.

26. FLA. STAT. § 379.2431 (2015).

27. FLA. STAT. § 372.2291(2) (2015).

28. See *Turtle and Beach Law Digest*, SEATURTLEOP.ORG, http://seaturtleop.org/broward/images/stories/docs/Turtle_Beach_Lighting_Laws.pdf (last visited Mar. 12, 2015). See generally *About our Volunteers*, SEA TURTLE OVERSIGHT PROTECTION, http://seaturtleop.org/broward/index.php?option=com_content&view=article&id=5&Itemid=38 (last visited March 29, 2013).

Species list. However, there may be too many parties involved to hold anyone responsible for sea turtle deaths occurring from artificial lighting.

The Endangered Species Act (“ESA”) provides a means to protect and conserve endangered sea turtle species and their ecosystem, as well as to issue penalties if a person harms marine turtles.²⁹ In Florida, the Coastal Zone Protection Act of 1985 (“CZPA”),³⁰ the Marine Turtle Protection Act (“MTPA”),³¹ Florida Statute section 161.163, titled *Coastal Areas Used By Sea Turtles*,³² the Florida Department of Environmental Protection (“DEP”), and the Fish and Wildlife Conservation Commission are jointly authorized to administer programs to protect sea turtle hatchlings from artificial lighting.³³ To implement Florida Statute §161.163, the DEP promulgated 62B-55 of the Florida Administrative Code to guide local governments in developing ordinances and enforcement strategies, and suggests how local governments should assess penalties sufficient to deter violations and promote compliance with the ESA.³⁴ However, the FWS is not authorized to regulate the conservation efforts; it merely collects data and distributes information. Finally, if local governments adopt the above rules, local ordinance laws provide a lower tier of protection for sea turtles against artificial lighting.³⁵ Ordinances may issue discretionary penalties to persons who harm or disturb sea turtle behavioral patterns.³⁶

However, with the growing number of legal frameworks in place for sea turtles, it can be overwhelming to ensure successful sea turtle protection. Perhaps sea turtles hatchlings in Florida, who are unwillingly subjects to increasing disorientation reports, are in need of cohesive and comprehensible laws to oversee and protect their existence. Federal, state,

29. 16 U.S.C. §1531(b) (2015).

30. Fla. Stat. § 161.52. *See generally* Fla. Stat. §§161.021, 161.163, 379.2431(g) (2015)“”. This article will not include a discussion of the CZPA because it primarily delegates authority to the Florida Department of Environmental Protection (“DEP”) to designate and manage sensitive coastal areas, and gives the DEP authority to place conditions on hotel construction lighting that specifically addresses the protection of sea turtles. *See* §161.021, 161.163. However, the CZPA operates in the same way as the Florida Marine Turtle Protection Act in assigning oversight protection to the DEP instead of addressing the issue specifically. *See* § 379.2431(g).

31. FLA. STAT. § 379.2431(g) (2015) (giving the DEP authority to enforce regulations protecting endangered sea turtles in Florida).

32. FLA. STAT. §161.163 (2015) (giving the DEP authority to designate coastal areas for sea turtle nesting, and to create guidelines for local governments to adopt controlled beachfront lighting that protects sea turtle hatchlings. *Id.*

33. 16 U.S.C. § 1451(m) (2015).

34. *See* FLA. ADMIN. CODE r. 62B-55.008 (2015).

35. *See* VOLUSIA COUNTY, FLA., CODE ch. 72, art. 3, div. 12, §72-921 (2015).

36. *See Id.*

and local regulations are lacking the necessary protections that sea turtles are in current need of in Florida. To be effective sea turtle laws can be successful if attainable goals exist, the appropriate authorities are handling their layer of concern, and parties that act in a prohibited manner against sea turtle nesting sites are rightfully held responsible.

Utilizing preexisting and current statistical data of sea turtle habitat populations and their behavioral trends, while analyzing the effectiveness of the local, state, and federal laws to respond to this data, this article will determine if such laws are sufficient for sea turtle protection against fatal artificial lighting in coastal areas in Florida. Furthermore, this article will attempt to determine whether local artificial lighting ordinances are effectively protecting marine turtle behavioral patterns with such discretionary authority to issue penalties without state or federal standards. The depleting population of sea turtles in Florida requires full assurance of the current and future conservation of their unique species.³⁷

Part I of this paper provides background information on sea turtle behavioral patterns in nesting and hatching, while also highlighting the problems of disorientation and nesting deterrence. Part II examines federal and state laws that authorize and delegate sea turtle oversight protections, administer legal and practical protection, and attempt to enforce the laws to prevent sea turtle disturbances or deaths. Part III discusses local ordinance regulations on artificial lighting and comments on the Model Lighting Ordinance in Florida. Part IV analyzes sea turtle law coordination and conservation at the federal, state law, and local ordinance level, while commenting on a local county's efforts and missteps. Finally, Part V proposes practical initiatives and assistance from citizens to facilitate the state of Florida and its local governments in their effort to allow sea turtles the full opportunity to live safely through the low hatchling survival rate.

37. See generally NAT'L. OCEANIC AND ATMOS. ADMIN., *supra* note 21; *Trends in Nesting by Florida Loggerheads*, FLA. FISH AND WILDLIFE CONSERVATION COMM'N, <http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/> (last visited Mar. 15, 2015). In southeast Florida the loggerhead sea turtle population is declining. *Id.* Similarly, long-term nesting data show loggerhead nesting declines in North Carolina, South Carolina, and Georgia.

II. BACKGROUND ON SEA TURTLES AND THE CHALLENGES TO SURVIVE

A. WHY ARE SEA TURTLES IMPORTANT?

Many people ignore the value of sea turtles. Sea turtles are mainly valuable to people for pure enjoyment. The joy of watching hours-old sea turtles scurry into the dark ocean waters, or a mother sea turtle slowly reach land is particularly fascinating for adults and children alike. Florida residents and tourists know that Florida is a major sea turtle habitat state.³⁸ During the summer months, there are approximately 50,000 sea turtles in Florida.³⁹ This makes it the most important nesting area in the United States.⁴⁰

Sea turtles also play important roles in marine ecosystems. They are a keystone species⁴¹ and an emblematic flagship because of the critical functions they serve in marine ecosystems.⁴² For example, sea turtles eat many types of invertebrates, such as mollusks and crustaceans, and can change the seabed by “mining” the ocean grass for their prey.⁴³ They make sea grass beds more productive, cause nutrients to be recycled more

38. *See Fla. Sea Turtle Info.*, SEE FLA. ONLINE, <http://www.seefloridaonline.com/turtles/> (last visited Apr. 4, 2013). *See generally Mission*, GUMBO LIMBO, <http://www.gumbolimbo.org/Mission> (last visited Apr. 9, 2013) (“[Our mission is] to increase public awareness of coastal and marine ecosystems through research, education, preservation and conservation.”).

39. *Fla. Sea Turtle Info.*, *supra* note 38.

40. *Id.* *See generally Leatherback Sea Turtle*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/leatherback-sea-turtle.htm> (last updated Feb. 2012) (“In Florida, nesting varied between 540 and 1,747 nests per year between 2006 and 2010, with the majority of nesting occurring along the southeast Atlantic coast in Brevard through Broward Counties.”).

41. *See generally Keystone Species*, NAT’L GEOGRAPHIC, http://education.nationalgeographic.com/education/encyclopedia/keystone-species/?ar_a=1 (last visited Apr. 8, 2013) (“A keystone species is a plant or animal that plays a unique and crucial role in the way an ecosystem’ functions. Without keystone species, the ecosystem would be dramatically different or cease to exist altogether.”).

42. *See Tundi Agardy, How Sea Turtles Draw us in to the Broader Challenges of Conservation*, WORLD OCEAN OBSERVATORY, <http://worldoceanobservatory.org/events/seaturtles/current2.htm> (last visited Apr. 11, 2013). Marine ecosystems are intricate webs of life, with each species dependent on others for survival. *See id.*

43. *See Loggerhead Turtle*, WWF GLOBAL, http://wwf.panda.org/what_we_do/endangered_species/marine_turtles/loggerhead_turtle/ (last visited Feb. 2, 2013). WWF works to protect marine turtles throughout the world through specialist programs and regional projects devoted to the conservation of marine turtles. *Id.*

quickly, and give grass beds a higher protein content, all of which benefit other sea creatures.⁴⁴ Also, sea turtles carry real animals and plant species on their shell.⁴⁵ On one single sea turtle, as many as 100 species of marine animals and plants have been recorded to live on its shell.⁴⁶

Sea turtles are an ancient and unique part of the world's biological diversity.⁴⁷ They serve as a global resource; they are highly migratory creatures and are often found in international waters.⁴⁸ Sea turtles feed hundreds of miles from their nesting grounds, which serve as an important role in nutrient cycling⁴⁹ by transporting massive quantities of nutrients from their feeding grounds to nutrient-deficient coastal habitats near their nesting beaches.⁵⁰ If sea turtles were extinct it would inevitably harm other sea creatures that rely on the same marine ecosystem, and would result in a less interesting world to enjoy.⁵¹ A decline in sea turtles causes declines in all the species whose survival depends on healthy sea grass beds and coral reefs. That means that many marine species that humans harvest would be lost.⁵²

B. THE FAMILY: CARETTA, CHELONIA AND DERMOCHELYS

In Florida, the loggerhead sea turtle (*Caretta Caretta*) is named for its block-like shaped head.⁵³ Loggerheads are larger sea turtles because on

44. IUCN SSC MARINE TURTLE SPECIALIST GROUP, A GLOBAL STRATEGY FOR THE CONSERVATION OF MARINE TURTLES 3 (1995), available at <https://mtsg.files.wordpress.com/2010/07/global-strategy-for-the-conservation-of-marine-turtles.pdf>.

45. *Loggerhead Sea Turtles*, SAVE THE TURTLES, http://www.costaricaturtles.org/costa_new_loggerhead.html (last visited Apr. 9, 2013).⁷

46. *Id.*

47. *See Saving the Leatherback Sea Turtle*, CENTER FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/species/reptiles/leatherback_sea_turtle/ (last visited Mar. 16, 2015).⁷

48. *Sea Turtles*, AM. MUSEUM OF NATURAL HISTORY, <http://www.amnh.org/our-research/center-for-biodiversity-conservation/research/species-based-research/reptiles-and-amphibians/sea-turtles> (last visited Mar. 16, 2015).

49. *See* WILSON, E.G. ET AL., WHY HEALTHY OCEANS NEED SEA TURTLES: THE IMPORTANCE OF SEA TURTLES TO MARINE ECOSYSTEMS 11 (n.d.), available at http://oceana.org/sites/default/files/reports/Why_Healthy_Oceans_Need_Sea_Turtles.pdf (“[L]oggerheads increase the rate at which the [crustacean] shells disintegrate and increase the rate of nutrient recycling in benthic or ocean bottom ecosystems.”).

50. *See id.*

51. *See id.* at 14.

52. *See id.* at 14–15⁷.

53. *Species of Sea Turtles Found in Florida*, FLA. FISH AND WILDLIFE CONSERVATION COMM’N, <http://myfwc.com/research/wildlife/sea-turtles/fl-sea-turtles/species/> (last visited on

average an adult weighs 275 pounds and has a shell length of about three feet.⁵⁴ “Each of its flippers has two claws.”⁵⁵ As is true for all sea turtles, the adult male has a long tail, and the female’s tail is short.⁵⁶ The Green Turtle (*Chelonia mydas*) is named for its green body fat, which is said to have been valued by European settlers in the New World,⁵⁷ for their meat, hide, eggs, and calipee.⁵⁸ The green turtle weighs an average of 350 pounds and has a small head for its body size.⁵⁹ Adult green turtles are unique among sea turtles in that they are largely vegetarians, consuming primarily sea grasses and algae⁶⁰ Approximately 100 to 1000 green turtles nest on Florida’s beaches each year from June through late September.⁶¹

The Leatherback sea turtle (*Dermochelys coriacea*) is the largest turtle—and the largest living reptile—in the world.⁶² Most leatherbacks average six feet in length and weigh from 500 to 1,500 pounds, but the largest leatherback on record was nearly ten feet long and weighed more than 2,000 pounds.⁶³ The Leatherback looks uniquely different from other sea turtles. Instead of a shell covered with scales or shields, “leatherbacks are covered with a firm, leathery skin and have seven ridges running lengthwise down their backs.”⁶⁴ They are usually black with white, pink, and blue splotches and have no claws on their flippers.⁶⁵ The leatherback is found in Florida’s coastal waters, and a small number (from thirty to sixty per year) nest in the state.⁶⁶ Other species of sea turtles that frequent

Apr. 12, 2013) [hereinafter FFWCC].

54. *Id.*

55. *Id.*

56. *Id.*

57. See Arlene Burnett, *Slow food: Turtle soup is a throwback to an elegant time*, PITTSBURGH POST-GAZETTE (June 26, 2008, 8:00 AM), <http://www.post-gazette.com/life/food/2008/06/26/Slow-food-Turtle-soup-is-a-throwback-to-an-earlier-elegant-time/stories/200806260465>; Stephanie Butler, *The Rise and Fall of the Turtle Soup*, HISTORY, <http://www.history.com/news/hungry-history/the-rise-and-fall-of-turtle-soup> (Aug. 3, 2012). Turtle soup was extremely popular in the U.S. because the species was abundant during the first colonies. Burnett, *supra*. “Abraham Lincoln served it at his 1861 inauguration... [and] [t]wenty-seventh president William Howard Taft hired a special chef to make it during his days in the White House.” Butler, *supra*.

58. FFWCC, *supra* note 53. Calipee is the fat attached to the lower shell that formed the basis of the popular green turtle soup. *Id.*

59. *Id.*

60. *Id.*

61. *Id.*

62. See NAT’L OCEANIC AND ATMOS. ADMIN., *supra* note 22.

63. FFWCC, *supra* note 53.

64. *Id.*

65. *Id.*

66. *Id.*

Florida waters but generally do not nest include the Hawksbill,⁶⁷ and the Kemp's Ridley.⁶⁸

Disorientation and Deterrence: The Moon and Artificial Lighting

At the Archie Carr National Wildlife Refuge in Florida, a woman watched stunned as an adult loggerhead rose from the jet black ocean, guided only by the moon, to lay her eggs, then journeyed back into the sea.⁶⁹ Amazed at this sight, the woman recounts her story for a local magazine interview highlighting Florida's coastal treasures.⁷⁰ Females that nest at the Archie Carr National Wildlife Refuge are free from the harsh effects of artificial light as standard street lights were replaced with low ground lights on the side of the roads—illuminated enough for visitors to see in the night, but not disturb nesting sea turtles.⁷¹ “The community thrives on the logo “sea turtles dig the dark!”⁷²

Female sea turtles that do not nest on protected wildlife lands come onto Florida's beaches at numerous locations, mostly unobserved and near human activity. On average, female sea turtles nest every other year at least twice during the nesting season, producing up to eighty to 120 eggs.⁷³ Female loggerhead and green turtles most often nest at night.⁷⁴ Only females come ashore to nest while males almost never return to land once they leave the sand of their natal beach⁷⁵ After female sea turtles birth, twenty to fifty years later they each experience natal homing—a behavior of returning to where one was born.⁷⁶ “Not only do they appear on the same beach, they often emerge within a few hundred yards of where they

67. *See id.*; *see also Hawksbill Sea Turtle*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/hawksbill-sea-turtle.htm> (last updated Feb. 2012). The Hawksbill Turtle is endangered throughout its range. U.S. FISH & WILDLIFE SERV., *supra*.

68. FFWCC, *supra* note 53.

69. Natalie Hummel, *Sea Turtles Dig the Dark*, IT'S OUR ENVIRONMENT, EPA'S BLOG (Oct. 5, 2012), <http://blog.epa.gov/blog/2012/10/sea-turtles-dig-the-dark/>.

70. *See id.*

71. *See id.*

72. *See id.*

73. *See* Catherine Lohmann & Kenneth Lohmann, *Sea Turtles*, 16 CURRENT BIOLOGY R784, R785 (2006), *available at* http://www.researchgate.net/publication/6813811_Sea_turtles (last visited Apr. 4, 2013).

74. *Information About Sea Turtles: General Behavior*, SEA TURTLE CONSERVANCY, <http://www.conserveturtles.org/seaturtleinformation.php?page=behavior> (last visited Apr. 14, 2013).

75. *Id.*

76. *See id.* Turtles employ an instinctual ability to navigate using the Earth's magnetic field which leads the females back to the beaches where they hatched to make their own nests. *Id.*

last nested.⁷⁷ “The female crawls out of the ocean, pausing frequently as if to carefully scope out her spot.”⁷⁸ “Sometimes female sea turtles will crawl out of the ocean, but for unknown reasons decide not to nest.”⁷⁹ “This is a “false crawl,” and it can happen naturally or be caused by artificial lighting and the presence of people on the beach⁸⁰

In Florida, recently documented false crawls are observed because brightly lit developments deter female sea turtles from nesting, like Sadie from MOTE laboratory.⁸¹ Females avoid nesting on these high-tourist beaches and experience a number of issues like dehydration, exhaustion, confusion, and over incubation of sea turtle eggs.⁸² If a suitable nesting site cannot be found nearby, female turtles may expend valuable energy looking for a site, potentially leading to a decrease in the number of nests she is able to lay that season.⁸³ Like Sadie, sick turtles are being brought to turtle hospitals for treatment more than ever before because of false crawls due to artificial lighting and human activity.⁸⁴ “We can’t ignore that,” the MOTE laboratory scientist explains.⁸⁵

Additionally, during the cool midnight hour, sea turtle hatchlings are ready to emerge as they wait beneath the sand surface.⁸⁶ “Each nest may contain 100 eggs, the size of Ping-Pong balls.”⁸⁷ The hatchlings are buried underneath the beach sand for approximately two months and eventually hatch.⁸⁸ The cool temperature of the night prompts the hatchlings to emerge, although some late-afternoon and early-morning emergences have been documented.⁸⁹ When a sea turtle hatches, it instinctively pushes

77. *Id.*

78. *Id.*

79. *Id.*

80. *Information About Sea Turtles*, *supra* note 74.

81. *See supra* notes 11–16 and accompanying text.

82. *See* Fredrica Lindsay, *Saving Sea Turtles with a Lights-Out Policy in Florida*, NATIONAL GEOGRAPHIC NEWS (Mar. 10, 2003), http://news.nationalgeographic.com/news/2003/03/0310_030310_turtlelight_2.html; *see also* Annette Broderick, *False Crawls U-turn*, SEATURTLE, <http://www.seaturtle.org/glossary/index.shtml?term=False+Crawl+U-turn> (last updated July 27, 2005) (defining false crawl).

83. *See supra* notes 11–16 and accompanying text.

84. *See id.*

85. *See id.*

86. *Artificial Lighting and Sea Turtle Hatchling Behavior*, FLA. FISH AND WILDLIFE CONSERVATION COMM’N, <http://myfwc.com/research/wildlife/sea-turtles/threats/artificial-lighting/> (last visited Apr. 1, 2013).

87. Lindsay, *supra* note 82.

88. *Artificial Lighting and Sea Turtle Hatchling Behavior*, *supra* note 86.

89. *Id.*; *see also* *January 2010 Statewide Sea Turtle Cold-Stunning Event*, FLA. FISH AND

through the sand to move towards the brightest light in view, which naturally would be the moon, leading them toward the ocean horizon and into their new ecosystem.⁹⁰ This visual cue is essential to sea turtle hatchling survival. If sea turtles hatchlings reach the sea, experts say that only one out of one thousand will survive under natural conditions⁹¹ This fact is important because sea turtles have an already-low chance of survival in the ocean, yet it is being exacerbated by the artificial light intrusions. This pattern of sea turtle behavior is documented worldwide and is under attack by artificial lighting throughout the world.⁹²

Nesting female sea turtles, their eggs, and hatchlings face a number of natural dangers on the beach. A single light can cause hundreds of misdirected hatchlings to be killed by automobiles on nearby roads and parking lots, and dehydrate in the morning sun⁹³ Sea turtle eggs could fail to incubate if their mother is wandering for miles searching for an unlit beach. Hatchlings that wander towards the land fall victim to predators such as raccoons, ants, crabs, foxes, feral hogs, crows, herons, coyotes, buzzards, dogs, and armadillos.⁹⁴ Researchers estimate that with the increase of sea turtle populations in Florida, these predators will migrate towards more coastal lands if hatchlings are not protected during their trek to the sea.⁹⁵

In 1999, about a third of the nests laid on a stretch of thirty-six miles of Florida's beaches⁹⁶ have hatched, with an estimated 18,333 hatchlings

WILDLIFE CONSERVATION COMM'N, <http://myfwc.com/research/wildlife/sea-turtles/cold-stunning-event/january-2010/> (last visited Mar. 17, 2015) (explaining how the FWC, working with the Sea Turtle Stranding and Salvage Network, recovered more than 250 cold-stunned sea turtles in Mosquito Lagoon in Brevard County). Sea Turtles die more frequently during Florida cold-stunning weather, which creates a more imminent death for hatchlings if they are disoriented from the moon's light, and spend longer than necessary making figure eights in the sand from confusion. *See January 2010 Statewide Sea Turtle Cold-Stunning Event, supra*.

90. *See* Lohman, *supra* note 73.

91. *See* *Baby Sea Turtles*, SEETURTLES, <http://www.seeturtles.org/1403/baby-sea-turtles.html> (last visited Apr. 8, 2013).

92. *See* Daniel Bateman, *Abbott Government Gives Green Light to Abbot Point*, TOWNSVILLE BULLETIN (Dec. 11, 2013, 12:00 AM), www.townsvillebulletin.com.au/news/abbott-government-gives-green-light-to-abbot-point/story-fnjfzs4b-1226780241020#.

93. *Sea Turtle FAQ's*, AMELIA ISLAND TURTLE WATCH, <http://www.ameliaislandseaturtlewatch.com/faqs.html> (last visited Apr. 9, 2013).

94. *See January 2010 Statewide Sea Turtle Cold-Stunning Event, supra* note 89.

95. *See Information About Sea Turtles: Threats from Invasive Species Predation*, SEA TURTLE CONSERVANCY, www.conserveturtles.org/seaturtleinformation.php?page=invasivespecies (last visited Apr. 9, 2013).

96. *See generally About the LBK Turtle Watch*, LONGBOAT KEY TURTLE WATCH,

making their way to the water.⁹⁷ Another estimated 500 hatchlings lost their way during fifty-eight recorded disorientation events.⁹⁸ A decade later in 2009, 1,937 newly-hatched sea turtles got lost on their way to the sea in Sarasota County alone.⁹⁹ Most often, researchers at Mote Marine Laboratory believe the cause is distraction from artificial lights along Florida county coastlines.¹⁰⁰ In 2011, in four different adjacent counties, volunteers for Sea Turtle Oversight Protection (STOP) documented nearly 14,000 hatchlings that were found to be disoriented from their journey and drawn towards coastal lights in Broward County, FL.¹⁰¹ The organization had only enough volunteers to monitor 40% of the total nests—imagine how many sea turtle hatchlings were missed.¹⁰² In a real time report, STOP has documented 20,656 nighttime sea turtle hatchlings, which were guided back to the sea from wandering towards brightly lit property.¹⁰³

III. KINDLING ACTION: LAWS TO SHIELD SEA TURTLES FROM LIGHTING

A. FEDERAL ENDANGERED SPECIES ACT OF 1973

The Endangered Species Act (“ESA”) protects all sea turtles in U.S. waters and lists marine turtles as endangered or threatened.¹⁰⁴ In 1973,

<http://www.lbkturtlewatch.com/AboutUs.htm> (last visited Mar. 17, 2015). The prevalence of turtle hatchlings in Longboat Key, Florida has led locals to create watch groups that help protect the hatchlings. *Id.*

97. *See Information About Sea Turtles*, *supra* note 95.

98. *See generally* U.S. FISH & WILDLIFE SERV., *supra* note 8 (A “disorientation event” could include one turtle or many turtles).

99. *See* Kate Spinner, *Rough Year for Turtle Hatchlings*, HERALD TRIBUNE (Aug. 3, 2009), <http://www.heraldtribune.com/article/20090804/ARTICLE/908041044?p=1&tc=pg>.

100. *See* Stacy Alexander, *Sarasota Police Help MOTE Release Sea Turtle Hatchlings*, MARINE LABORATORY AND AQUARIUM (Nov. 5, 2014), <https://mote.org/news/article/sarasota-police-help-mote-release-sea-turtle-hatchlings>.

101. *See About Our Volunteers*, SEA TURTLE OVERSIGHT PROTECTION, http://seaturtleop.org/broward/index.php?option=com_content&view=article&id=5&Itemid=38 (last visited Mar. 29, 2013).

102. *Id.*

103. *Id.*

104. *See* 16 U.S.C. § 1531 (2014). *See generally* *Endangered Species Act (ESA)*, NOAA FISHERIES, <http://www.nmfs.noaa.gov/pr/laws/esa/> (last updated Oct. 10, 2014); *Endangered Species Act: Overview*, U.S. FISH AND WILDLIFE SERVICE, <http://www.fws.gov/endangered/laws-policies/> (last updated July 15, 2013). The Secretary of Interior under the U.S. Fish and Wildlife Service (“FWS”), and the Secretary of Commerce under the U.S. National Oceanic and Atmospheric Administration (“NOAA”) Fisheries Service administer the ESA. *See Endangered Species Act (ESA)*, *supra*; *Endangered Species Act: Overview*, *supra*. Both agencies jointly provide for the conservation of sea turtle ecosystem. *See Endangered Species Act (ESA)*, *supra*;

President Richard Nixon signed the ESA, which provides for (1) the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and (2) the conservation of the ecosystems on which they depend.¹⁰⁵ Congress enacted the ESA as a means for “safeguarding, for the benefit of all citizens, the Nation’s heritage in fish, wildlife, and plants.”¹⁰⁶ The ESA focuses on endangered species, which are “any species which is in danger of extinction throughout all or a significant portion of its range”¹⁰⁷ and threatened species, “any species which is *likely to become* an endangered species within the foreseeable future throughout all or a significant portion of its range.”¹⁰⁸ All sea turtles except the flatback¹⁰⁹ are listed as threatened or endangered.

To be listed as an endangered or threatened species the species must meet one of five criteria under Section 4(a)(1):

[1. There is] the present or threatened destruction, modification, or curtailment of its habitat or range, [2. An] overutilization for commercial, recreational, scientific, or educational purposes, [3. The species is declining due to] disease or predation, [4. There is an] inadequacy of existing regulatory mechanisms, or [5. There are] other natural or manmade factors affecting its continued existence.¹¹⁰

In 1978, “FWS listed the loggerhead sea turtle as a threatened species and the green sea turtle as an endangered species because of manmade factors that affect its continued existence.¹¹¹ Twenty-nine years later, on November 16, 2007, the National Oceanic and Atmospheric Administration and the FWS received a petition from Oceana¹¹² and the Center for Biological Diversity¹¹³ requesting that the loggerhead sea turtles in the western North Atlantic Ocean be reclassified on the ESA list as an

Endangered Species Act: Overview, supra. “”“”

105. 16 U.S.C. § 1531.

106. 16 U.S.C. § 1531(a)(5) (stating congressional findings and declaration of purposes and policy).

107. 16 U.S.C. § 1532(6) (2014).

108. 16 U.S.C. § 1532(20) (2014) (emphasis added).

109. *See generally Information About Sea Turtles: Flatback Sea Turtle*, SEA TURTLE CONSERVATIVE, <http://www.conserveturtles.org/seaturtleinformation.php?page=flatback> (last visited Mar. 5, 2013).

110. 16 U.S.C. § 1533(a)(1) (2014).

111. 16 U.S.C. §§ 1531–44.

112. *See generally* OCEANA, <http://oceana.org/en> (last visited Mar. 1, 2013).

113. *See generally* THE CENTER FOR BIOLOGICAL DIVERSITY, <http://www.biologicaldiversity.org/> (last visited Mar. 1, 2013).

endangered status and that critical habitat be designated for the species.¹¹⁴ The petitioners asserted that the western North Atlantic loggerhead nesting population has undergone a marked decline in recent decades, and cited coastal development as primary threats to the population.¹¹⁵ Based on the above information on the petitions presented, the Secretary of Commerce under the National Oceanic and Atmospheric Administration found that sea turtles in the North Atlantic region nesting off the coastal areas of Florida are substantially endangered, which warrants listing under the Endangered Species List.¹¹⁶

Since the loggerhead, green, and leatherback sea turtles are listed as endangered and threatened, § 9 of the ESA gives each species a range of protections. Hailed as the “pit bull”¹¹⁷ of environmental jurisprudence, § 9 requires that “all persons, including all private and public entities are subject to federal jurisdiction and penalties if found to ‘take’” sea turtle habitats.¹¹⁸ “Take” is broadly defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”¹¹⁹ Section 9 explains that the “take” prohibition includes “significant habitat modification or degradation where it actually kills or injures a sea turtle.”¹²⁰ The ESA does not distinguish between whether the whole species or one member of the species is harmed because “[a]ny taking and every taking—even of a single individual of protected species—is prohibited by the [ESA] . . . [and, thus], the future threat of even a single taking is sufficient to invoke the authority of the [ESA].”¹²¹

Furthermore, harming a federally protected species comes with serious penalties. Section 11 of the ESA includes a comprehensive and severe suite of preventative and punitive measures.¹²² Such penalties

114. Listing Endangered and Threatened Wildlife and Designating Critical Habitat, 73 Fed. Reg. 11849–51 (Mar. 5, 2008) available at <http://www.gpo.gov/fdsys/pkg/FR-2008-03-05/pdf/E8-4231.pdf#page=1>.

115. *Id.* at 11850.

116. *Id.*; see 50 C.F.R. § 424.14(b)(2) (2015) (authorizing the Secretary of the Interior or the Secretary of Commerce, as appropriate, or their authorized representatives to consider petitions for marine species to be placed on the ESA list).

117. J. B. Ruhl, *Harmonizing Commercial Wind Power and Endangered Species Act Through Administrative Reform*, 65 Vand. L. Rev. 1769, 1776 (2012). (discussing the origins of the ESA’s “pit bull” nickname).

118. See generally 16 U.S.C. § 1532(19) (defining the term “take”).

119. *Id.* See 16 U.S.C. § 1538(a) (2014).

120. See *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687, 690 (1995) (emphasis added) (quoting 50 C.F.R. § 17.3 (1994)).

121. *Loggerhead Turtle v. County Council*, 896 F.Supp. 1170, 1180 (M.D. Fla. 1995).

122. TONY A. SULLINS, BASIC PRACTICE SERIES: ENDANGERED SPECIES ACT 54 (2001). See

include civil penalties, criminal fines, injunctions, forfeiture, attorney's fees, and license/permit revocation.¹²³ Civil penalties for persons who harm an endangered species are subject to a fine up to \$25,000, a criminal penalty of up to \$100,000, and up to one year of imprisonment.¹²⁴ In *U.S. v. Nguyen*,¹²⁵ the Fifth Circuit concluded that Nguyen violated the ESA by possessing [at that time] a threatened loggerhead sea turtle. The court held that even if defendant did not know it was illegal to keep the turtle he was still subject to penalties under the ESA.¹²⁶ The court held that to "knowingly" violate the Act's takings prohibitions "the person does not have to know that their actions are harming sea turtle nesting populations." Several courts have held that a person only has to act with a "general intent" to violate the Act's prohibitions on takings.¹²⁷ Thus, it is possible for a coastal resident who is either knowingly or completely unaware of artificial lighting harm to be found to have impacted the sea turtle hatchling nesting behaviors, or the nesting sea turtle mothers, or both, and may be subject to federal penalties for a violation of section 9 of the ESA.¹²⁸

FLORIDA MARINE TURTLE PROTECTION ACT

Six species of endangered sea turtles are protected under the Florida Marine Turtle Protection Act ("FMTPA").¹²⁹ Similar to the Federal Endangered Species Act, the FMTPA¹³⁰ assigns the responsibility for marine turtle species in Florida to the Fish and Wildlife Conservation Commission ("FWCC") to conserve species' habitat and population.¹³¹ Under Florida Statute 161.163, the Florida legislature delegated to the DEP¹³² authority that requires (1) habitat designation and (2) adopting of rules guiding local governments to "control beachfront lighting to protect

16 U.S.C. § 1540 (2014).

123. SULLINS, *supra* note 120.

124. 16 U.S.C. § 1540 (2014).

125. *See* *United States v. Nguyen*, 916 F.2d 1016 (5th Cir. 1990).

126. *Id.* at 1020 (requiring the district court to impose a ten dollar special assessment for each class B misdemeanor of which defendant was convicted under Endangered Species Act, regardless of defendant's indigency).

127. *See* *United States v. Billie*, 667 F. Supp. 1485, 1493 (S.D. Fla. 1987); *United States v. St. Onge*, 676 F. Supp. 1044, 1045 (D. Mont. 1988).

128. *See* Steve G. Davison, *Alteration of Wildlife Habitat as a Prohibited Taking Under The Endangered Species Act*, 10 J. LAND USE & ENVTL. L. 155, 171 (1995); Eileen Sobeck, *Enforcement of the Endangered Species Act*, 8 NAT. RESOURCES & ENV'T, 30, 31 (1993).

129. FLA. STAT. § 379.2431(b)(1)–(5) (2014).

130. FLA. STAT. § 379.2431(b).

131. *Id.*

132. FLA. STAT. § 161.021(7) (2014) (defining "Department" as the Department of Environmental Protection).

hatchling sea turtles.”¹³³ Since the DEP and the FWCC are under the state mandated responsibility to protect sea turtles, determining what activities harm the sea turtles is a critical component of fulfilling their duties.

Under the FMTPA, “Take” means an act that actually kills or injures marine turtles, and includes *significant habitat modification* or degradation that kills or injures marine turtles by *significantly impairing essential behavioral patterns*, such as breeding, feeding, or sheltering.”¹³⁴ Subsection (b) of the rule states that significant adverse impacts are, “adverse impacts of such magnitude that they may cause a take, as defined in Section 379.2431(1).”¹³⁵ A plain reading of the FMTPA is circular in that the definition of “take” means significant adverse impact, whereas significant adverse impact means a “large take” of the sea turtle species. The language should be rewritten to reflect a clear measure of harm to sea turtles to merit a violation of the FMTPA.

Additionally, the FMTPA provides penalties and consequences if sea turtles are harmed. Section 379.2431 states that, “Any person, firm, or corporation that illegally takes commits a third degree felony.”¹³⁶ To date, the FWCC has only issued warnings for sea turtle lighting in violation of the ESA and FMTPA, and no felony penalties for artificial lighting violations occurring on known sea turtle nesting sites.¹³⁷ Nine cases are centered on the interpretation of the FMTPA with only one district court case holding actually focusing, negatively, on sea turtle protection.¹³⁸

In 2012, a nonprofit corporation called Sea Turtle Oversight Protection (STOP) filed an administrative petition with the DEP challenging a construction permit by a beach resort to completely remove a

133. FLA. STAT. § 161.163 (2014). The department that is authorized to implement guidelines and rules for people to follow is the Department of Environmental Protection. *Id.*

134. FLA. STAT. § 379.2431(1)(c)(2) (2014) (emphasis added); *see also* Hildreth v. Florida Fish and Wildlife Conservation Comm’n, 2008 WL 4974681 (Fla. Div. Admin. Hrgs. 2008) (“ “[A]ny armoring structures sited more than 20 feet seaward of the habitable structure could be considered a take of threatened, endangered marine turtles.”).

135. Hildreth v. Florida Fish and Wildlife Conservation Comm’n, 2008 WL 4974729 (Fla. Div. Admin. Hrgs. 2008).

136. FLA. STAT. § 379.2431(1)(e)(5) (2014).

137. *See* Lois Swoboda, *\$5,000 Fines*, THE TIMES: APALACHICOLA & CARRABELLE (Sept. 21, 2012, 1:48 PM), <http://www.apalachtimes.com/news/law-enforcement/fish-and-wildlife-threatens-island-fines-1.13647>.

138. *See generally* Bivens v. State, 586 So. 2d 442, 445 (Fla. 4th DCA 1991) (holding that the legislature’s failure to distinguish between fertile or not fertile marine turtle eggs was enough to violate Mr. Bivens’ procedural due process rights and resulted in a clear miscarriage of justice). Mr. Bivens “was arrested “with a bagful of turtle eggs . . . covered in sand . . . [with] the smell of a skunk.” *Id.* at 443. The record indicated that he possessed 1,088 turtle eggs. *Id.*

large sand mound near the beach.¹³⁹ The sand mound¹⁴⁰ was significant to STOP because the construction site was a frequent nesting site for sea turtle activities.¹⁴¹ Removal of the sand mound would impact the nesting activities of protected sea turtles by creating “night glow” or allowing added artificial lighting on the coastal shore and disorienting sea turtle behavioral patterns.¹⁴² In its challenge to the permit, STOP asserted that complete removal or modification of the beach sand mound would amount to a take¹⁴³ under Fla. Stat. 379.2431, the FMTPA.¹⁴⁴ STOP presented evidence that removal of the sand mound would create “significant adverse impacts”¹⁴⁵ to marine turtles, specifically the two current green turtle nests in the area, and those that nest in the future.¹⁴⁶ Conversely, the beach club presented data to assert “no impact to the nesting of marine turtles” if the sand mound would be removed.¹⁴⁷ The division of administrative appeals found that STOP’s prediction that a marineturtle”take” would occur in the future, *after* the removal of the Sand Mound, was not a significant adverse impact on sea turtle hatchlings.¹⁴⁸ The Administrative Law Judge found the beach club’s evidence more persuasive and, on October 16, 2012, the beach club was granted a permit to completely remove the sand mound notwithstanding the threat to sea turtle survival from artificial lighting.¹⁴⁹ The department decision to issue the permit is still a shock to the

139. *See* *Sea Turtle Oversight Protection v. Mayan Beach Club*, 2012 WL 5210741 (Fla. Div. Admin. Hrgs. 2012). *See generally* Kristen N. King, *Sea Turtles Lose Their Fort Lauderdale Beach Sand "Dune"*, EARTHBLAWG (Sept. 1, 2001), <http://earthblawg.com/2012/09/01/sea-turtles-lose-their-fort-lauderdale-beach-sand-dune/>. Sand Mound is not a dune. King, *supra*. “[A mound] bears similarity to a dune in that is a mound of loose, sand-sized sediment deposited by natural or artificial mechanism which is bare or covered with vegetation and is subject to fluctuations in configuration and location.” *Sea Turtle Oversight Protection*, 2012 WL 5210741 at *23.

140. *See* *Sea Turtle Oversight Protection*, 2012 WL 5210741 at *18. A Sand Mound is “a sand feature that is not a dune on a stretch of beach that is without dunes.” *Id.*

141. *Id.* at *28.

142. *See id.* at *14.

143. *See id.* at *7 (“The Department interprets its rule defining ‘significant adverse impacts’ to include a ‘take’ of marine turtles regardless of whether marine turtles are part of the coastal system as the Department defines it in rule and regardless of whether adverse impacts includes impacts to turtles.”).

144. *See id.*

145. *See* *Sea Turtle Oversight Protection*, 2012 WL 5210741 at *7 “”

146. *Id.* at *28.

147. *Id.* at *2.

148. *Id.* at *34.

149. *Id.* at *9 (“[T]he Applicants’ data and analysis is more persuasive than Petitioners’ prediction based on general knowledge of marine turtle behavior in coastal systems that include dunes.”).

challengers STOP and other organizations that vow to protect sea turtles from artificial lighting occurrences because evidence was presented that showed present and future harm to sea turtles, yet a permit was issued. If the FMTPA provided measurable guidelines on when construction permits near sea turtle nesting grounds can be issued based on the present and prospective harm that could occur, sea turtle nesting sites in Ft. Lauderdale and in other cities may have a better chance to survive.

Sea turtles deserve federal and state oversight protection that enables sea turtle nesting and a chance of getting a petition to be taken off the endangered species list. The legitimacy of the FMTPA depends on the DEP and FWCC fulfilling the purpose of the FMTPA to its full potential based on adequate enforcement for permit issuance when sea turtle survival is threatened.

IV. LOCAL ORDINANCE REGULATIONS ON ARTIFICIAL LIGHTING IN FLORIDA

A. THE RULE INTENDED TO GUIDE: THE MODEL LIGHTING ORDINANCE IN FLORIDA

In 1993, in an effort to implement Section 161.163 of the Florida Statutes, the DEP promulgate a final rule to help local counties protect sea turtle hatchlings from artificial lighting, the Model Lighting Ordinance (MLO).¹⁵⁰ The rule makers wrote with great detail on what DEP believed to be the minimum standards that all Florida counties with sea turtle nesting populations should adopt.¹⁵¹ The rule addresses: (1) definitions, (2) designation of nesting areas, (3) general guidance (4) prohibited activities that will disrupt marine turtles, (5) minimum model standards for new and existing beach front lighting ordinances, (6) proposed enforcement and penalties, and (7) monitoring and reporting guidance.¹⁵² The MLO appears to be a step in the right direction for species protection. After ten years of applying the MLO, the state of Florida might be leading in the fight to save sea turtle hatchlings.¹⁵³ Nevertheless, according to a report data from

150. FLA. ADMIN. CODE r. 62B-55.001.

151. FLA. ADMIN. CODE r. 62B-55.004.

152. FLA. ADMIN. CODE r. 62B-55.

153. *See generally* SOUTH CAROLINA ORDINANCES, *available at* <http://www.dnr.sc.gov/seaturtle/volres/ordinances.pdf>. It seems that South Carolina has lighting ordinances in place but no date is indicated as to when the ordinance was enacted. *See id.*

eyewitness nighttime survey volunteers,¹⁵⁴ sea turtle disorientation from artificial lighting is up 67% in 2012 from 2011.¹⁵⁵ This data was compiled in one county that has modeled almost exactly the same words as the DEP's MLO rule.¹⁵⁶ Additionally, to date, four counties with major sea turtle nesting populations have not adopted an artificial lighting ordinance.¹⁵⁷

First, to try to make sense of the disparate sea turtle disorientation data, understanding the MLO's purpose and goals may help identify the problem. The MLO is intended to guide local governments *in developing* ordinances which will (1) protect hatchling marine turtles from the adverse effects of artificial lighting, (2) provide overall improvement in nesting habitat degraded by light pollution, and (3) increase successful nesting activity and production of hatchlings.¹⁵⁸ The three focus areas are important because they essentially provide measurable goals. Providing "improvement" to nesting habits is an indication that Florida acknowledges the presumably "bad" state of habitat protections. This language is helpful to utilize if, over a period of time, improvements to nesting sea turtles conservation are still operating in areas that are being threatened by human activities. Also, because this law is designed to protect sea turtles from the "adverse affects of artificial lighting," the law promotes the Florida Marine

154. *See generally About Sea Turtle Oversight Protection*, SEA TURTLE OVERSIGHT PROTECTION,

http://seaturtleop.org/broward/index.php?option=com_content&view=article&id=2&Itemid=27 (last visited Mar. 6, 2015). Sea Turtle Oversight Protection is a local interest group that is managing a Florida county with an active artificial lighting ordinance. *Id.*

155. *See* SEA TURTLE OVERSIGHT PROTECTION, SEA TURTLE OVERSIGHT PROTECTION 2011 REPORT (2011), *available at* http://seaturtleop.org/broward/images/stories/docs/2011_STOP_PresentationReport.pdf; *see also* NICHOLAS BARSHEL ET AL., SEA TURTLE FRIENDLY LIGHTING 5 (2014), *available at* http://www.law.ufl.edu/_pdf/academics/clinics/conservation-clinic/SeaTurtleFriendlyWholeReport.pdf. STOP has generated this data by eyewitness volunteers who have counted sea turtles that are misguided by light emanating from the land. *See* SEA TURTLE OVERSIGHT PROTECTION, *supra*. In 2011, STOP counted 13,955 sea turtle hatchlings that were disoriented from their trek to the ocean. *Id.* In 2012 STOP counted 20,656 sea turtle hatchlings that were disoriented. NICHOLAS BARSHEL ET AL., *supra*. The data revealed a trend and noted that 1 in 3 hatchlings will be disoriented. *See* SEA TURTLE OVERSIGHT PROTECTION, *supra*.

156. *See generally* SEA TURTLE OVERSIGHT PROTECTION, *supra* note 154.

157. *Sea Turtle Protection Ordinances*, FLORIDA FISH AND WILDLIFE CONSERVATION COMM'N, <http://myfwc.com/conservation/you-serve/lighting/ordinances/> (last visited Apr. 3, 2013). The four counties that have not adopted an artificial lighting ordinance are Okaloosa County (near the Panhandle), Pinellas County (over eight known sea turtle nesting sites), Manatee County (near the Gulf of Mexico), and Miami-Dade County. *Id.*

158. FLA. ADMIN. CODE ANN. r. 62B-55.001.

Turtle Protection Act's intent and the Federal Endangered Species Act stated purpose¹⁵⁹ to conserve threatened and endangered sea turtles in Florida. Overall, the stated purpose and intent seem to be broad enough to affirmatively promote greater sea turtle protection.

Under section 55.008, the DEP promulgated enforcement and penalties to guide local counties which states,¹⁶⁰

Enforcement, appeal, and remedy of matters related to this chapter should be regulated pursuant to procedures established under local ordinances. Penalties for non-compliance should be established and should be sufficient to discourage violations. Enforcement capability should be adequate to respond to possible violations within the timeframe necessary to prevent continued and prolonged impacts to marine turtles and hatchlings.¹⁶¹

The provision is unnecessarily broad in that it delegates to a county the responsibility to punish violators of the ordinance. However, counties may not find sea turtle deaths from artificial beachfront lighting to be a problem, and may simply issue a warning. Also, money may influence the decision to limit penalties under the MLO because disturbing businesses that bring in revenue for the city can outweigh the serious plight of sea turtles deaths. Conversely, the four counties that have no lighting ordinance have the freedom to disregard beachfront lighting penalties. The vagueness of this provision and the inherent freedom for counties to voluntarily participate in the enforcement process should be mandatory because this small change could make a significant difference for the thousands of sea turtles hatchlings struggling to make it to sea.

B. THE CITY INTENDED TO PROTECT: VOLUSIA COUNTY

Volusia County's residents and visitors share the county's beaches with endangered and threatened sea turtles.¹⁶² The residents and visitors use the beaches for living and recreational purposes while the sea turtles

159. See 16 U.S.C. §1531(b) (2015) ("The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section.").

160. FLA. ADMIN. CODE ANN. r. 62B-55.008.

161. *Id.*

162. See *Shining the Spotlight on Volusia County's Failure to Adequately Protect Sea Turtles*, SEA TURTLE CONSERVANCY, http://www.conserveturtles.org/actionalerts.php?page=a_light (last visited Apr. 9, 2013). Volusia County is home to threatened and endangered sea turtles. *Id.*

use the beaches as seasonal nesting ground. These competing interests have created a somewhat inharmonious relationship between the humans and turtles.

On June 8, 1995, Volusia county became a defendant to the federal suit, *Loggerhead Sea Turtle v. County Council of Volusia County, Florida*, where Plaintiffs, Shirley Reynolds¹⁶³ and Rita Alexander,¹⁶⁴ sued on behalf of the loggerhead sea turtle and green sea turtles.¹⁶⁵ Both sea turtle species frequently nest on Volusia County's beaches.¹⁶⁶ Plaintiff turtles filed the lawsuit in the United States District Court for the Middle District of Florida under the citizen-suit provision of the ESA.¹⁶⁷ The turtles were seeking declaratory and injunctive relief by alleging that Volusia County refused to ban night time beach driving during sea turtle nesting season, and that the county failed to ban beachfront artificial light sources that adversely impact sea turtles, which violates the ESA's "take" prohibition 16 U.S.C. § 1538(a)(1)(B).¹⁶⁸ Prior to the lawsuit, and in an effort to mitigate the harm to sea turtles, Volusia County enacted a light pollution ordinance,¹⁶⁹ but the ordinance had no provision for banning the nighttime beach drivers during the high months of sea turtle nesting, March through October. On July 16, 1995, Volusia County applied to the FWS for an incidental take permit and on November 21, 1996, the FWS granted the permit. The District court dismissed the case, concluding that "the permit mooted further

163. See Derek Catron, *A Fight for the Sea*, ORLANDO SENTINEL (Jan. 9, 2000), http://articles.orlandosentinel.com/2000-01-09/news/0001050380_1_volusia-county-sea-turtles-reynolds/2. Shirley Reynolds is a 62-year-old retired hospital administrator who has dedicated her retirement life to documenting Volusia County's violations of sea turtle regulations. *Id.* When asked about her thoughts on her fight to change county, state and federal bureaucracy, she stated, "I'm not unaware of the giant I'm taking on When it began, I guess I was naive enough to think that in the hearts of people they want to do the right thing for all of the inhabitants in the world. I found it absolutely mind-boggling that our recreation had to include killing protected species, any species." *Id.*

164. See Derek Catron, *Baby Steps*, SUN SENTINEL (Apr. 23, 2000), http://articles.sun-sentinel.com/2000-04-23/features/0004200471_1_reynolds-and-alexander-shirley-reynolds-sea-turtle-nests/2 (describing Rita Alexander as a sea turtle advocate who is most known in Volusia County for her sea turtle monitoring during nesting season and her love for community gardens, as a way to provide fresh produce to her needy neighbors). See generally Cameryn Rivera, *A Fresher Law: Amending the Florida Right to Farm Act*, 8 FLA. A&M L. REV. 385 (2013).

165. *Loggerhead Turtle v. County Council of Volusia County*, 896 F. Supp. 1170 (M.D. Fla. 1995).

166. See *Sea Turtle Monitoring*, FLA. FISH AND WILDLIFE CONSERVATION COMM'N, <http://myfwc.com/research/wildlife/sea-turtles/nesting/sea-turtle-monitoring> (last visited Mar. 24, 2015).

167. See generally 16 U.S.C. §1540(g)(1)(A) (2014).

168. See generally *id.*

169. VOLUSIA CNTY., FLA. CODE ch. 72, § 921 (2014).

proceedings” and that no causal connection existed between Volusia County regulation and the harm to sea turtles.¹⁷⁰

On appeal, the turtles asserted two main contentions: (1) Volusia County has a duty to impose a restriction and provide mitigation for impacts on sea turtles resulting from beachfront lighting and nighttime driving, and (2) sea turtles were harmed from humans driving on the beach at night.¹⁷¹ The court held that under the incidental take permit, Volusia County had a duty to “not [likely jeopardize the continued existence of any protected species or result in the destruction or adverse modification of its critical habitat . . .].”¹⁷²

The court noted that “[T]he language, history, and structure of the . . . [Endangered Species Act] indicates beyond doubt that Congress intended endangered species to be afforded the highest of priorities.”¹⁷³ It agreed with the Plaintiff-Turtles that they have shown a sufficient causal connection to seek to hold Volusia County liable for “harmfully” inadequate regulation of artificial beachfront lighting.¹⁷⁴ Using data obtained from the FWS, evidence indicated that artificial lighting from cars, streets and homes can cause sea turtle hatchlings to become disoriented and crawl inland instead of out to sea, and “the mother turtles often abort nesting attempts because of the artificial lighting.”¹⁷⁵ Thus, the U.S. District Court for the Middle District of Florida held that under the ESA, Volusia County was liable for “taking” the loggerhead, green, and leatherback turtle and that for “the last seventeen years it [Volusia County] has continuously placed at risk the welfare of these federally protected sea turtles.”¹⁷⁶

What the *Loggerhead* case stands for is that even a county, who for seventeen years had a lighting ordinance in place, could abdicate their

170. *Loggerhead Turtle v. County Council of Volusia County*, 148 F.3d 1231, 1236 (11th Cir. 1998). See 16 U.S.C. § 1532(13) (2014). The ESA states that any “person[s]” subject to the “take” prohibition include “any . . . agent . . . of the Federal Government . . . and any . . . political subdivision of a State” §1532. “Volusia County contend[ed] that, unlike the EPA, it is not directly responsible for protecting endangered species.” *Loggerhead* 148 F.3d at 1252. “Volusia County, however, is subject to the ESA’s ‘take’ prohibition in the exact same manner as the EPA.” *Id.*

171. See *Loggerhead*, 148 F.3d at 1236–37.

172. *Id.* at 1244–45, 1258.

173. *Strahan v. Linnon*, 967 F. Supp. 581, 601 (D. Mass. 1997) (quoting *Tennessee Valley Authority v. Hill*, 437 US 153, 173–74 (1978)).

174. *Loggerhead*, 148 F.3d at 1249.

175. *Id.* at 1235.

176. *Loggerhead Turtle v. County Council of Volusia County*, 896 F. Supp. 1170, 1178 (M.D. Fla. 1995).

responsibility to protect sea turtles and improperly claim that “unlike the EPA, [the county] is not directly responsible for . . . [endangered sea turtles on county waters].”¹⁷⁷ It is shocking to think of the harm that nesting sea turtles in the five counties in Florida with no lighting ordinance are experiencing. Volusia County had every reason to stand up for sea turtle conservation efforts by prohibiting driving on beaches, but it seems to suggest there is another competing matter that favors the wrong light over dark nesting conditions—money. The seventeen years Volusia County allowed beachfront nighttime driving was most likely due to a unique beachfront experience incentive it gave to local tourist, spring breakers, and bike week visitors.¹⁷⁸ Driving on the beach, at night, could bring in revenue to nightclubs, bars, and hotels on the beach.¹⁷⁹ The more people that come, the better, even at the hands of nesting mothers and baby sea turtle hatchlings. It may appear illogical and unnecessary for a county to act in a drastic manner for such a small species, but as the U.S. Supreme Court held in *Tennessee Valley Authority v. Hill*, “protecting troubled wildlife is serious business” and the “relatively small number of three-inch fish among the countless millions of species extant would require the permanent halting of a virtually completed dam of which Congress has expended more than \$100 million.”¹⁸⁰ Whether or not people see it now, sea turtles have an undeniable purpose on earth and are rightly protected by a federal mandate to oversee their continued existence by conservation efforts at the local level.

V. ANALYSING COORDINATION AND CONSERVATION EFFORTS IN SEA TURTLE LAW

Perhaps sea turtles do not need more laws, but rather, more enforcement of the laws already in place. In order to mandate sea turtle protections, the federal, state, and local rules include language that is

177. *Loggerhead Turtle v. County Council of Volusia County*, 148 F.3d 1231, 1252 (11th Cir. 1998).

178. See Liz Hochstedler, *Undeniable Pocketbook Power*, POWER SPORTS BUSINESS (Apr. 2, 2012), <http://www.powersportsbusiness.com/top-stories/2012/04/02/undeniable-pocketbook-power-rallies-bring-600-million-to-daytona-beach/> (stating that bike week brings in around \$600 million dollars to Daytona Beach, Florida (Volusia County)).

179. See Chris Lamb, *Merchants Organize to Save Spring Break*, THE NEWS-JOURNAL, March 28, 1991, at 1A, 15A, (explaining that Volusia County beach merchants are worried about losing business and closing down if the county cannot save spring break and the money it brings in).

180. *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 172 (1978); *Loggerhead*, 148 F.3d 1231, 1246 (11th Cir. 1998).

effective: conserving, authorizing, implementing, protecting, prohibiting, overseeing, managing, listing, and conducting. A significant limitation is that these laws are unable to be properly enforced without more support for sea turtle protections centered on successful coordination between government entities and the local community.

First, federal and state government agencies should give more regulatory power to local counties so authorities closer to sea turtle deaths have the opportunity to conserve sea turtle species. The DEP, with the advice of the FWCC, should establish a cooperation agreement with county municipalities and specialized commission panel overseeing coastal species protections. The commission should consist of at least two members of local sea turtle interest groups like Sea Turtle Protection oversight and MOTE Marine Laboratory, so that scientists, sea turtle disorientation volunteers, and night watch staff, environmental lobbyists, and city attorneys can put the pens down and communicate with each other on how to implement the redevelopment and conservation plans for sea turtles. At commission meetings with FWCC and DEP staff, a time frame should be established to address the current state of sea turtle protections.

Second, since Congress enacted a provision in the ESA that delegates shared responsibility between federal and state governments to conserve sea turtle species, cooperative agreements ought to maintain fair assumptions and goals towards allowing local counties oversight.¹⁸¹ ESA states that, "Such cooperative agreements shall provide for . . . the share of such costs to be borne by the Federal Government and by the States."¹⁸² The key word is "share," and the policy backing this responsibility should be that sea turtle oversight is best carried out in the hands of counties, with financial and administrative support from federal and state government.

A clear example of this type of cooperation is shown in floodwater legislation from the Federal Emergency Management Agency.¹⁸³ In this situation, both federal and state agencies are working together on more direct and effective ways to save sea turtle habitats from storm water

181. See 16 U.S.C. § 1535 (2014).

182. *Id.* ("Such cooperative agreements shall provide for (A) the actions to be taken by the Secretary and the States; (B) the benefits that are expected to be derived in connection with the conservation of endangered or threatened species; (C) the estimated cost of these actions; and (D) the share of such costs to be borne by the Federal Government and by the States.").

183. See *Interior Dep't Issues Guidance on Corporate Statement of Compliance*, U.S. DEP'T OF INTERIOR (Nov. 8, 2010), <http://www.doi.gov/news/pressreleases/Interior-Department-Issues-Guidance-on-Corporate-Statement-of-Compliance.cfm>.

flooding.¹⁸⁴ Both the federal government and state agencies poured funds into the project and called on local county support to have the authority to implement the legislation. This type of cooperation could substantially benefit sea turtles.

Third, the Secretary of Interior and the Secretary of Commerce, operating under the FWS and NOAA, should draft agency guidance letters on how the ESA, in regard to sea turtles and artificial lighting threats, can be implemented in local counties. Although an agency guidance letter is not specifically found in the ESA or MTPA, NOAA and FWS should more plainly define what responsibility for oversight protection looks like in a county and how to measure the success of that responsibility. Information gathered from continued discussions with industry representatives—the DEP and the FWCC to local interest groups like the Sea Turtle Oversight Protection and the Center for Biological Diversity—should be included to ensure sea turtle conservation is a team effort and no longer an isolated issue.

For example, when the BP oil spill occurred, the Secretary of Interior announced a Deepwater Horizon Response & Restoration plan.¹⁸⁵ Upon conducting response activities, the Secretary identified that sea turtle habitats were impaired by the spill response equipment operation, creating light pollution at night off the Gulf Coast of Florida and Alabama.¹⁸⁶ In an effort to guide local counties to protect nesting sea turtles, the secretary issued a cooperation and guidance letter to bring all affected parties together for the one purpose of conserving sea turtle hatchlings located near spill response equipment lights.¹⁸⁷ The letter called for local counties to assess the conduct of existing lights on beaches known to be inhabited by loggerhead sea turtles. It described how site managers or the state agency governing species protection should develop plans to eliminate the existing

184. See Keith Rizzardi, *FEMA Settlement May Enhance Sea Turtle Protections*, ESA BLAWG (Feb. 7, 2011), <http://www.esablwg.com/esalaw/ESBlawg.nsf/d6plinks/KRII-8DV728> (discussing that threatened and endangered sea turtles that nest along Florida's coast are set to benefit from a court approved agreement between conservation organizations and the Federal Emergency Management Agency (FEMA) regarding its National Flood Insurance Program (NFIP)). According to the settlement, FEMA must consult with the U.S. Fish and Wildlife Service and National Marine Fisheries Service under the Endangered Species Act regarding the impacts of the NFIP, which currently subsidizes development in vital sea turtle habitat). *Id.*

185. See *Deepwater Horizon Response & Restoration*, U.S. DEP'T OF INTERIOR, <http://www.doi.gov/deepwaterhorizon/index.cfm> (last visited Apr. 10, 2013).

186. See NAT'L. OCEANIC AND ATMOS. ADMIN., *IMPROVING HABITAT INJURED BY SPILL RESPONSE* (Dec. 2012), available at http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/ImprovedHabitat_12-21-12.pdf.

187. See generally *Deepwater Horizon Response & Restoration*, *supra* note 184.

fixtures on the property. It identified site managers, or local interest groups, to hold campaigns to bring awareness of the issue and offer the best available technology for alternative lighting fixtures.¹⁸⁸ All this information concisely and effectively laid a foundation of practical responsibility to be delegated and carried out over a four year-time beginning in 2012. The agency guidance response letter is a clear example and relevant model to follow in federal, state, and local coordination efforts to accelerate the conservation of sea turtle hatchlings throughout Florida.

Finally, the authority that the ESA has to support awareness and enforce species protection laws on private and corporate actors should be awakened by the local interest groups in the recent opening of public comment period for the loggerhead sea turtle designation on the ESA. To explain, the ESA was enacted in 1973 but it was not until March 25, 2013 that the U.S. Fish and Wildlife Service identified the most endangered sea turtle habitats off the coast of the Northwest Atlantic in an effort to conserve the sea turtle species.¹⁸⁹ Title 50 of the Code of Federal Regulations part 17 states in pertinent part, “We, the U.S. Fish and Wildlife Service, propose to designate specific areas in the terrestrial environment as critical habitat for the Northwest Atlantic Ocean Distinct Population Segment of the loggerhead sea turtle (*Caretta caretta*) under the Endangered Species Act.”¹⁹⁰ In identifying mainland coastal beaches in six states including Florida, the commission is now seeking public comment on the proposed rule.¹⁹¹ This federal regulation is an important first step for adequate sea turtle protections. Designation means placing bad actors on notice of the seriousness of turning their lights off, or replacing current lights with turtle friendly lights during turtle nesting season. Since the FWS found that “coastal development” is a primary threat to the population,¹⁹² the most apparent harm affecting sea turtles appears to be

188. *See generally id.*

189. *See generally General Sea Turtle Information*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/northflorida/SeaTurtles/seaturtle-info.htm> (last updated Mar. 23, 2015).

190. 79 Fed. Reg. 39756 (July 10, 2014).

191. *See id.*

192. *See id.* *See generally Coastal Development & Sea Turtles*, SEE TURTLES, <http://www.seeturtles.org/1131/coastal-development.html> (last visited Apr. 9, 2013).

Coastal development is a broad category which includes an array of human activities including beachfront construction of homes, hotels, restaurants, and roads, often for tourism The human alteration of coastlines forces nesting females to use other beaches, changes the properties of nesting beaches, and contributes to the pollution of sea turtle habitat from runoff and wastewater discharge. Increased coastal populations result in increased recreation and beach going vehicles.

Coastal Development & Sea Turtles, supra.

artificial light emanating from the development of coastal lands.

What would be interesting during this comment period is for citizens and organizations, to collectively voice a concern for what current and future goals “designation” will actually achieve. Federal oversight protection for sea turtles *after* the designation will only work if there is a measurable goal that will keep accountability high in the hands that so strongly advocate for species protection. The federal government and all of its subsidiaries working to further sea turtle conservation should avoid the temptation to affirmatively state it has made full efforts to aid sea turtle hatchlings if no one can accurately measure and monitor the efforts proposed. Keeping a goal oriented and prospective point of view will ultimately give the proposed measure under the ESA the force it needs to put a historical lack of awareness of endangered sea turtles into current conversational practice.

VI. PROPOSED SOLUTIONS: A GUIDING L.I.G.H.T. FOR SEA TURTLE PROTECTION

In most cases, people are simply unaware rather than uncaring in the context of sea turtle nesting protection. If more individuals were given shared information about the negative affects artificial lighting on sea turtles there would be a greater chance for an abundant sea-bound life for baby sea turtles. The amount of effort it takes for people to share information about artificial lighting as a major threat to make sea turtles endangered is no more than a one minute conversation, a sign posted, or a twenty second commercial to put beach residents on notice. It should really be that simple.

Nonetheless, sea turtles are still being harmed with hundreds of volunteers working throughout the nighttime hours,¹⁹³ permits are still being issued amidst a threat of sea turtle life disturbance, disorientation reports are increasing, and there is a lack of enforcement of penalties for violations. What may help guide sea turtle hatchlings to the right source of light is communication and action. First, coastal residents should have accurate information about artificial lighting and sea turtle nests during nesting season. Second, construction permits near nesting locations should

193. See *What does STOP do?*, SEA TURTLE OVERSIGHT PROTECTION, <http://seaturtleop.org/broward/> (last visited Apr. 3, 2013). “Sea Turtle Oversight Protection (STOP) nighttime survey volunteers monitor sea turtle nests . . . [by counting] the number of hatchlings that emerge from each nest in real-time on the beach as it happens. This requires many months of long nights on the beach.” *Id.*

only be permitted if evidence of sea turtle disturbance is minimal. Third, every county that has a history of sea turtle nesting populations should adopt the minimum standards in the Model Lighting Ordinance. Fourth, stricter penalties are in need so that state and local efforts can be taken seriously. If teamwork rules the day, more sea turtles will certainly survive.

A. LIMIT ARTIFICIAL LIGHTS: EDUCATE COASTAL RESIDENTS ABOUT LIMITING BEACHFRONT LIGHTING

Experts have concluded that “[t]he principal component of the sea-finding behavior of emergent hatchlings is a visual response to light.”¹⁹⁴ If light is the principal component, then artificial light producing actors should know to control and limit their use of light during nesting season. However, “[m]any homeowners and businesses are in fact victims of misinformation, poor code education, lack of code enforcement and years of misdirection from their municipalities and code departments.”¹⁹⁵ What may help is if the FWS contracts with sea turtle interest groups to collect accurate data information. Creating a partnership with local non-governmental interest groups, Florida will provide greater information dissemination and awareness.

Also, there needs to be more emphasis on community-based conservation. Because no simple measure of light intensity can reveal whether a light source will be a problem, the most reliable tool to use when making judgments about artificial lighting degradation may be the eyes of a human observer on the nesting beach. This type of ground patrol canvassing could be valid and educational program. Local sea turtle interest groups can explain the benefits of darkening outside beachfront lights during nesting beaches for sea turtles as one of the least expensive ways residents can benefit the environment and save money in electricity costs.¹⁹⁶ Night-glow is already a problem in Florida as light pollution is said to harm not only sea turtles but humans.¹⁹⁷

194. See *Recovery Plan for U.S. Population of Atlantic Green Turtle*, NAT'L. OCEANIC AND ATMOS. ADMIN. 4 (1991), available at http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf.

195. *Copyright and Legal Notice*, SEA TURTLE OVERSIGHT PROTECTION, http://seaturtleop.org/broward/index.php?option=com_content&view=article&id=77&Itemid=293 (last visited Feb. 16, 2015).

196. See Lindsay, *supra* note 82.

197. See *About IDA*, INTERNATIONAL DARK-SKY ASSOCIATION, <http://www.darksky.org/about-ida> (last visited Apr. 10, 2013).
Once a source of wonder—and one half of the entire planet's natural environment—the star-filled

B. ISSUE HOTEL CONSTRUCTION PERMITS ONLY UPON A
SHOWING OF “MINIMAL DISTURBANCE” TO SEA TURTLE
NESTING

Another way to ensure that sea turtles are guided to the right source of light is for the DEP to consider the harm to sea turtles when issuing a building or construction permit while there may be harm to sea turtles nesting site. If a significant disturbance to sea turtles from artificial light is present and there is evidence that construction will cause harm in the future, the DEP should refrain from issuing construction permits on coastal lands as shown in *STOP v. Mayan Beach Club*. In that case, the hearing officer mistakenly held that the future effect of sea turtle harm from artificial lights was not clear evidence of a violation of the FMTPA to warrant denial of the permit issuance. During the month of the hearing, March, the beginning of turtle nesting season, the challengers to the permit did not have enough facts to show that sea turtles were presently harmed. The problem to find for *present* harm to sea turtles may be due to the low nesting population in the initial first months of marine turtle nesting season. The hearing commissioners could have overlooked the subsequent data collected to show significant harm.

The DEP can issue a policy that grants an initial presumption in favor of sea turtles when evaluating the evidence. This presumption can then place the burden of proof on the permit proponents, requiring them to provide sufficient facts and data to overcome the presumption of harm to sea turtles. The evidence necessary to rebut this presumption should show that that the hotel construction and land use will cause only a minimal disturbance to sea turtles, as opposed to a significant disturbance that Florida Marine Turtle Protection Act requires.

C. GATHER SEA TURTLE NESTING AND OBSERVATION DATA
BY PROVIDING STATE GRANTS TO MARINE TURTLE RESEARCH
AND STUDY

When prioritizing projects that will receive approximately seventy percent of state funding, the state of Florida should consider the impact of projects for sea turtle nesting and the extent of sea turtle data and research

nights of just a few years ago are vanishing in a yellow haze. Human-produced light pollution not only mars our view of the stars; poor lighting threatens astronomy, disrupts ecosystems, affects human circadian rhythms, and wastes energy to the tune of \$2.2 billion per year in the U.S. alone.

Id.

collection that local community interest groups undertake.¹⁹⁸ MOTE Marine Laboratory is an example of the necessity for state revenue to be put towards state of the art scientific data and research to monitor the sea turtle species habitat and population trends. Since 1995, MOTE has been a leader in marine turtle research,¹⁹⁹ and has aided in the data collection for the Florida government to determine sea turtle nesting deaths due to coastal developments. MOTE is funded from the sale of “Protect Our Reefs” license plates. The revenue from the license plates provides the best source of funding for MOTE however, considering the increase of sea turtles on Florida’s shoreline, the funds may not be enough to insure adequate sea turtle data and monitoring. Funds from the license plate vary from month to month, and sometimes the inconsistency of support cannot guarantee continued and sufficient research efforts.²⁰⁰ As an independent non-profit organization, more state funding should be allocated into interest and community based groups so that sea turtle protections are current and handled by people who first hand observers.²⁰¹

D. HABITAT PROTECTIONS: DECLARE MANDATORY
LIGHTING LAW STANDARDS TO MITIGATE THE HIGH LEVELS
OF ARTIFICIAL LIGHT EXPLOITATION OCCURRING ON NESTING
BEACHES.

Traditionally, the word “should” indicates a suggested action to denote a non-discretionary duty, whereas “may” generally indicates a discretionary duty. Regarding the Model Lighting Ordinance, a non-discretionary duty is place by the DEP use of the word “should.” This means that all that is required of local municipalities throughout the Florida with sea turtles nesting on their beaches is to *consider* enacting a similar ordinance. For sea turtles that are dazed and confused by coastal artificial lighting, adoption of the DEP’s Model Lighting Ordinance should be mandatory, not a suggestion. In the Model Lighting Ordinance, the DEP

198. See Katherin R. Butler, *Coastal Protection of Sea Turtles in Florida*, 13 J. LAND USE & ENVTL. L. 399, 419 (1998).

199. See *generally Research*, MARINE LAB. & AQUARIUM, <https://mote.org/research> (last visited Mar. 9, 2015).

200. See *generally Monthly Revenue Collection Report*, FLORIDA HIGHWAY AND MOTOR VEHICLES, <http://services.flhsmv.gov/specialtyplates/Revenue.aspx> (last visited Apr. 13, 2013).

201. See *About Us*, MOTE MARINE LAB., <http://www.seatrek.org/contact/index.html> (last visited Feb. 17, 2015) (“MOTE is an independent nonprofit organization and has seven centers for marine research, the public Mote Aquarium and an Education Division specializing in public programs for all ages.”).

has issued minimum guidelines for counties to follow.²⁰² Nevertheless, four counties have not adopted the list, and the counties that do have an ordinance in place do not seem to be enforcing the minimum standards.

As a mandatory framework, local counties should identify and map jurisdictional boundaries along the County coast in their ordinance, determine the adequacy of related enforcement programs in protecting nesting and hatchling sea turtles from beachfront lighting and, develop an approach for addressing lighting issues for each coastal lighting category with the State agencies. Where the modifications to the existing model lighting ordinances are impractical, Florida counties should develop a mitigation guideline that will produce greater cost/benefit ratios for both the county and endangered sea turtles they vow to protect.²⁰³ Also, the state of Florida should provide tax credits for citizens who comply with artificial lighting ordinance regulations, which is similar to the tax incentives provided to farmers in the 2008 farm bill.²⁰⁴ By providing financial incentives, local counties may have better resident compliance with the ordinances, and thus spend more time on sea turtle conservation efforts than enforcement problems.

E. THREATEN THE RIGHT SPECIES: ENACT AND ENFORCE STRICTER PENALTIES FOR NONCOMPLIANT HOTEL AND PRIVATE LOT LAWBREAKER

Finally, to have full assurance of the sufficiency of sea turtles protections in Florida, the DEP and FWS should look to enforce sea turtle protections laws by requiring mandatory code enforcement officers in local counties to oversee compliance with the lighting ordinance. For instance, in a local Florida county, code enforcement officers oversee a varying range of ordinance compliance issues such as graffiti control, hand sanitizer ordinances, and building address requirements.²⁰⁵ The county intends that with police powers of the state—health, safety, and welfare—code enforcement officers are assigned the task to execute these important

202. FLA. ADMIN. CODE r. 62B-55.004(2).

203. *See* *Loggerhead Turtle v. County Council of Volusia County*, 148 F. 3d 1231, 1241 (11th Cir. 1998) (“Categories will consider type and extent of upland development, amount and intensity of beachfront lighting, sea turtle nesting densities, and relative effort and expense required to meet appropriate lighting standards.”).

204. *See* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110–246, 122 Stat. 1651 (2008) (describing that compliance with ESA recovery plan allows farmers to capitalize on expenditures incurred for the purpose of achieving species protection).

205. *See Code Enforcement Related Ordinances*, HILLSBOROUGH COUNTY, <http://www.hillsboroughcounty.org/index.aspx?NID=267> (last visited Apr. 12, 2013).

responsibilities. Graffiti control is undeniably an important area to monitor because of the aesthetic well-being of the community. However, graffiti can be painted over; sea turtle deaths cannot be redone. Sea turtle ordinance compliance should be considered as important to merit code enforcement protection because federally protected endangered species are nesting on the county beaches. This type of protection is vital to carry out adequate sea turtle protection that is now necessary due to the growing sea turtle population in Florida. Once hotels are put on notice of sea turtle nesting season, turtle friendly light options²⁰⁶ and the effects of artificial lighting, they cannot continue to disregard the federal and state mandate laws with code enforcement officers observing their conduct. Also, once a code enforcement officer discovers that hotels' developments and private residents are in violation of the county artificial lighting ordinance, penalties²⁰⁷ can be properly assessed.

VII. CONCLUSION

Some people may contend that any inconvenience to protect endangered sea turtles is too much and that the concerns of humans should always outweigh those of creation. However, sea turtles are vital to our earth's ecosystem and are in desperate need of adequate protections that not only sustain their current population but protections that also increase their chance of survival. A significant limitation to species survival ironically occurs in the legal framework. Sea Turtle protection laws are unable to be properly enforced without more support centered on successful coordination between government entities and the local community. Where federal and state government agencies give more regulatory power and financial support to local counties, sea turtle oversight can be shared responsibility. Also, since sea turtle conservation is a team effort and no longer an isolated issue, information gathered to produce current statistical data should be a utilized from continued discussions with the DEP, FWCC, local interest groups like the Sea Turtle Oversight Protection and the Center for Biological Diversity. Also, the 'agencies involved should produce a guidance response letter because this is a clear guide to follow in federal, state, and local coordination efforts to accelerate the conservation of sea

206. See *Sea Turtle Friendly Light Bulbs*, SEA TURTLE LIGHTING, <http://seaturtlelighting.net/lighting/sea-turtle-light-bulbs-fwc-approved/> (last visited Feb. 16, 2015).

207. See Butler, *supra* note 197 at 431–32. Penalties can range from two warnings, depending on minor violations when hotels fail to shield artificial lighting, to civil fines, \$300 per dead sea turtle hatchling, for the most egregious disregard to lighting ordinance violations. *Id.*

turtle hatchlings throughout Florida.

Moreover, more individuals need to be aware of the negative affects artificial lighting on sea turtles. This would produce a greater chance for a long sea-bound life for baby sea turtles. Coastal residents should have accurate information about artificial lighting and sea turtle nests during nesting season. Additionally, construction permits near nesting locations should only be permitted if evidence of sea turtle disturbance is minimal not significant. Also every county that has a history of sea turtle nesting populations should adopt the minimum standards in the Model Lighting Ordinance. Finally, stricter penalties are in need for violators so that state and local efforts can be taken seriously. If teamwork rules the day, more sea turtles will certainly survive.

The time has come to protect sea turtles from artificial light and rebuild their populations to healthy levels. Aldo Leopold wrote in his Sand County Almanac, “The last word in ignorance is the man who says of an animal or plant: ‘What good is it?’ If . . . something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.”²⁰⁸

208. *The Outlook e-Newsletter*, THE ALDO LEOPOLD FOUND., <http://www.aldoleopold.org/About/eneews/04-12.html> (last visited Feb. 17, 2015).