

Review of Draft Recovery plan for the Northwest Atlantic population of the Loggerhead Sea Turtle (*Caretta caretta*), second Revision

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General Comments

The authors of this recovery plan have done an excellent job of reviewing the past and current status of the loggerhead turtle in the Northwest Atlantic. The document is well written and takes full advantage of the available data in peer reviewed papers and government reports. The Recovery team has done a superb job on this report.

The Recovery Plan documents an extensive effort to recover the loggerhead turtle over the past two decades. While these efforts have been successful in preventing the extirpation/extinction of this species from US waters, it is obvious that the level of effort exerted to date has been totally inadequate for recovery since in all recovery units for which data are available the populations have declined greatly since the last report. The central questions raised by this report/plan are: 1. What are the major causes for this decline- nesting beaches lost, lighting problems on beaches, fishing bycatch, or something else? and 2. What new or expanded measures should be implemented to reverse this trend and actually move toward recovery? This report appears to recommend business as usual. If we continue in this way, then when the next report is written in 20 years (2028) the goal for recovery in the Northern Recovery Unit will be 5000 nests, about the current number because instead of increasing by 2% the population will continue to decline by 1.6%.

The population in the Northern Recovery Unit has declined. This is especially worrisome because that population is genetically distinct from the other populations. The peninsula Florida population has declined 28% since 1989. That is very serious indeed. That population represents one of the two strongholds for the species and we do not know what is happening to the other population in Oman. Even worse, the Gulf population is declining at 6.3% a year. That is horrendous. I was amazed at the data presented that indicated that the loggerhead was in such serious trouble in the Western Atlantic. However, this document does not raise sufficient alarm at these steep declines. Given the very serious nature of the decline of the loggerhead turtle in the Western Atlantic this Recovery Plan should recommend strong measures that will reverse this trend as quickly as possible. I do not detect a sense of urgency in the Recovery Plan. This is very troubling. Perhaps the urgency is there, but it is hidden in the complex language of the document. The Recovery Plan should be written in plain English and follow the plain language guidelines that were established for the federal government over 8 years ago. Or have they been repealed?

The Recovery Plan should clearly state in the Executive Summary three to five key actions that should be taken to reverse the trends of decline in all Recovery Units. The Plan now has 75 pages of presentation of the recovery action outline and 39 pages of a table of the implementation schedule. Buried in that table are the number 1 priority actions that need to be taken. However, if it took me some hours to find those actions how many policy makers and legislators will take the time to find those actions? How many interested citizens will take the effort to find those items? As a legislator in South Carolina I would want to know what actions I should support now to fix this problem.

Give me a list in the Executive Summary and make it obvious to me what needs to be done.

My review of this document suggests that the following actions are urgently needed to reverse the trend of decline in the loggerhead turtle: 1.) Emergency regulations to reduce fishing bycatch in gillnet, trawl and drag fisheries in US waters, 2.) National and/or state legislation to require that no lights that disturb turtles shine on loggerhead nesting beaches during nesting and hatchling season, 3.) A doubling of the length of protected beaches available for loggerhead nesting, 4.) National and/or state legislation to prevent additional armoring of beaches, 5.) Removal of armoring from historic loggerhead nesting beaches.

In several sections of the document the narrative indicates that it is difficult to address actions that harm loggerheads (e.g., p 69- gillnet fisheries). If it were easy to address these problems it would not be necessary to be doing a revised Recovery Plan. How much of the difficulty is due to the real or potential conflict of interest within the NMFS between its primary purpose of promoting fisheries and its regulatory function to protect endangered species under the ESA? It seems that when a clear case of damage to loggerhead turtles and other endangered species has occurred in the past NMFS has been reluctant to implement emergency actions required under the ESA to protect the endangered species. The agency seems to err on the side of fishing and seeks to avoid action that would inconvenience commercial fishing interests. It seems obvious that if large numbers of loggerhead turtles wash up dead along the coast something is killing them. Past studies and necropsies indicate that these turtles drown or are otherwise killed in fisheries. Usually the agency fails to take action until the fishery has moved on to

another area to fish. Why does it not proactively implement regulations to either close areas to fishing that we know will have loggerheads present off the nesting areas or in the foraging areas. Time area closures can be implemented ahead of time, before loggerheads wash up dead on the beaches.

The recovery of the loggerhead turtle and other endangered species would be enhanced if the regulatory function for protection of these species was removed from the NMFS, the agency that promotes the commercial interests that are clearly responsible for a large part of the decline of this species. This is not unlike the action taken many years ago to split the Nuclear Regulatory Agency away from the Atomic Energy Commission so that nuclear power plants were not regulated by the agency that was promoting their use. What would be the effect if the people who had a financial interest in the success of nuclear power plants had a major role in the regulation of those power plants? That is exactly what the situation is today with the NMFS and commercial fishing interests having a major role in regulating the industry that is clearly a main cause for the decline of the loggerhead turtle in US waters. This Recovery plan will not succeed unless this conflict of interest is resolved.

Specific Comments

P viii- Recovery Objectives- These are not specific enough, or do not indicate specific actions that need to be taken to achieve these objectives.

P viii- Recovery Objective 5. What is meant by minimize legal harvest? Is there a legal harvest in the US? Or do you mean in other countries? Why isn't the goal to eliminate legal harvest?

P ix- Recovery Criteria- round off numbers. For example, change 14,012 nests to 14,000 nests. The implied precision of the numbers obscures the accuracy in the estimates of present day numbers of nests and the error in today's numbers is compounded when the increase is extrapolated into the future.

P ix- Recovery criteria- the low estimates for number of nests needed for recovery in the Northern Recovery unit is an underestimate of the actual number needed to achieve recovery. What was the estimated number of nests in this unit in 1980? Or even 1970? You should make a best estimate based on length of beaches and numbers of nests on beaches for which data were available. Going from the average of 5,206 nests for the last 20 years to 14,000 nests would bring the population from about 1,300 females to about 3,400. That is undoubtedly below the number nesting in that unit even 50 years ago, let alone historically. So how can that indicate recovery? In the face of global warming we should expect loggerheads to shift their nesting from south to north. That means there will be even more turtles nesting in the Northern recovery unit. That will cause an apparent increase in the population, which may actually be a shift in turtles from the Florida population to the north.

P x- Listing Factor Recovery Criteria- (1) It is insufficient to have a strategy for beach barriers that ensures that the percentage of nesting beach free of barriers to nesting is stable. The loggerhead population is in serious decline. Part of that decline must be due to a lack of nesting areas. Therefore, the criteria should be to reduce the amount of beach barriers by an amount sufficient to ensure increased nesting success. Given the nature of the decline I recommend a target of reduction by 50%.

P x- Listing Factor Recovery Criteria- (3) There are currently 1581.7 km of loggerhead nesting beaches and adjacent uplands protected as conservation lands. The Recovery criteria proposed is that the total be 1,581. That is no improvement. Given that loggerhead populations continue to decline it is logical to determine that there are not enough nesting beaches protected for this species to nest successfully. Therefore, more land needs to be conserved and managed in a manner compatible with sea turtle nesting. A conservative estimate would be an additional 30%.

P x- Listing Factor Recovery Criteria- b. marine- This criterion should include another item- a reduction in loggerhead strandings to $\frac{1}{2}$ the number annually for the last 20 years. This is one of the few measurable criteria for success of management efforts in the marine areas. Of course this criteria has to be considered in light of the numbers of nesting loggerheads. If the populations decline considerably the number of stranding will also decline, although the percentage of turtles being killed at sea could be a larger proportion of the population. I do not agree that if the population increases, the number of stranding or the impact of a particular industry can be allowed to increase since an increase in take of turtles will negate positive efforts on the nesting beaches. So if a power plant takes 8 turtles in a year and its permit allows a take of 4 it is not logical or scientific to increase the allowed take to 8. That simply undermines conservation efforts that succeed in increasing the number of turtles in the ocean and defeats the attempt of recovery of the species.

P x- Listing Factor Recovery Criteria- Over utilization- last line- minimize legal harvest should be changed to eliminate legal harvest. Minimize is a non-quantifiable term and

means different things to different people. Minimize means reduce to a level that is convenient to the user, not to the turtle.

P xi- 4. Inadequacy of Existing Regulatory mechanisms- the target of 10% of nests with hatchlings disoriented by lights is too high. That level of take will insure the decline of the population (Santidrian et al, Conservation Biology 2008, In Press). See Figure 1 below. A take of 10% of hatchlings in a population above natural levels will cause a long-term decline in a sea turtle population. The level should be 5%.

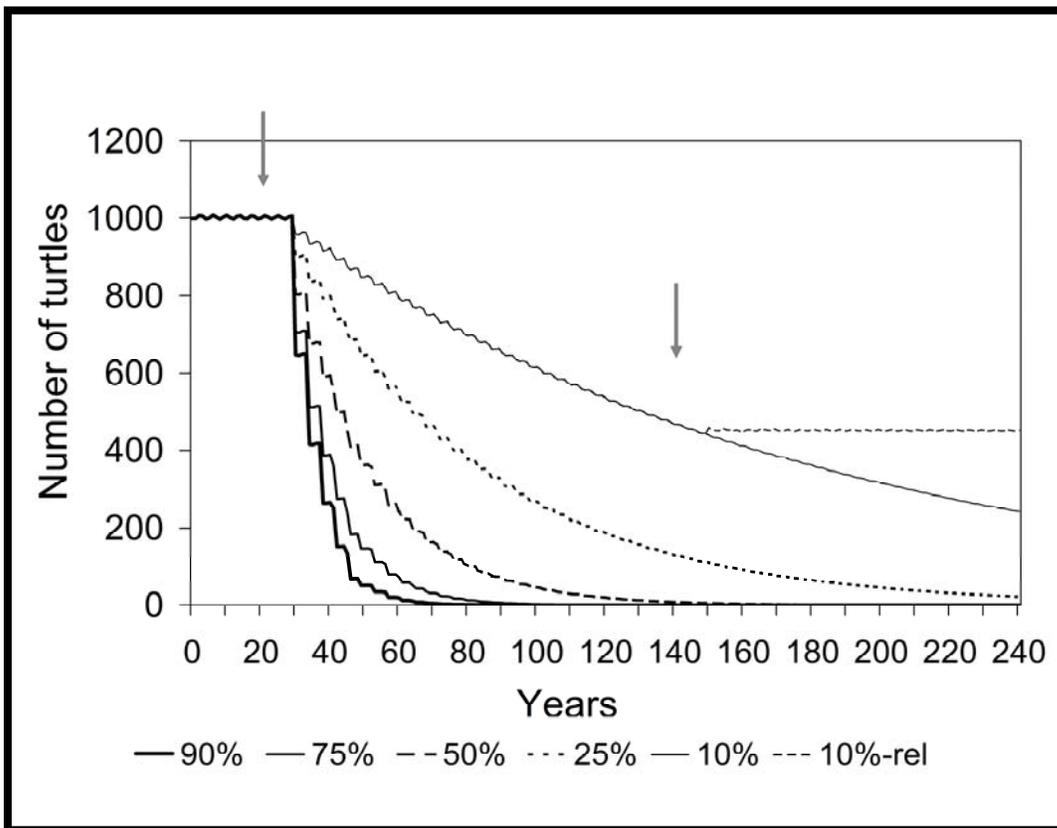


Figure 1. Number of sea turtles declines with the removal of eggs or hatchlings. A 90% harvest causes a rapid decline in number of nesting turtles with a delay from the start of the poaching or harvest/reduction in hatchlings produced to the time when those turtles would be expected to return to nest. This example is for a species with an 11-year maturation time. The effect would be delayed longer for loggerheads. The first arrow indicates the start of the reduction in eggs hatched or hatchlings successfully reaching the water and the second arrow indicates the effect of relocation of nests that are in danger. (from Santidrian, unpublished).

P 2, last para, line 11- weight should be changed to mass. Mass is the correct SI unit.

P3, lines 4 and 6- change beaches to areas.

P 3, 2nd para, line7 and 8- Plotkin and Spotila reported long distance migration of loggerheads from the Northern Recovery unit. (Plotkin, P. T. and J. R. Spotila. 2002. Post-nesting migrations of loggerhead sea turtles *Caretta caretta* from Georgia, U.S.A.: Conservation implications for a genetically distinct subpopulation. *Oryx* 36: 396-399)

P 5, last line- change evidence to data. Data are the currency of science and evidence the currency of the courtroom.

P 6, last para- give equation for line in Figure 3- or put it in the figure legend. r value?

P 7, - give equation for line in Figure 4- or put it in the figure legend. r value?

P 8, last para- give equation for line in Figure 5- or put it in the figure legend. r value?

P 11, line 2- change stastically to statistically

P 14, para 2, line 5- change stock structure to population structure. In population biology and genetics books a group of animals is called a population. In fisheries biology books a population of fish that is exploited in a fishery is called a stock. For example, “In fisheries science an exploited fish population is termed a ‘stock’; as far as we can see this is synonymous with ‘population’ as precisely defined by other ecologists- that is ‘a group with unimpeded gene flow’ - so we use the standard fisheries term in this book.” P 77 in Pitcher, T. J. and P. J. B. Hart, 1982, Fisheries Ecology, AVI Publ. Co, Westport, CN. Sea turtles are not supposed to be exploited in a fishery. They are not a stock to be exploited.

P 14, para 2, line 5- add reference to Rankin-Baransky, K., C. J. Williams, Anna L. Bass, B. W. Bowen, and J. R. Spotila. 2001 (Origin of loggerhead turtles stranded in the Northeastern United States as determined by mitochondrial DNA analysis. *Journal of Herpetology*: 35:638-646) for information on population structure of loggerheads stranded in the Northeastern US.

P 17, Table 2- Age of sexual maturity- According to the book on loggerhead turtles edited by Bolten and Witherington the age of sexual maturity for loggerhead turtles (pages 69-74 and figure 4.3) is between 25 and 32 years in the Atlantic ocean based on 6.5-11.5 years in the ocean stage and 19 years in the neritic stage (from Figure 4.3). This is a better estimate than the personal communication cited for the 32-35 years in the table.

P 17, Table 2- Pivotal temperature- pivotal temperature for loggerhead turtles in the Southeastern US is 29.5 C.

P 19- reference to Lalli and Parsons (1997)- This is an obscure text for US readers. How about *Oceanography: An Invitation to Marine Science* (Paperback) by Tom S. Garrison (2007) or *Essentials of Oceanography* (9th Edition) by Alan P. Trujillo and Harold V. Thurman (2007).

P 21- 3rd para, line 2- change sediment to sand.

P 26, para 2- habitat Description. Delaware Bay should be added to the list of important inshore habitats. The density of loggerheads in Delaware Bay is as great as in the Chesapeake Bay- see report to NMFS (Spotila, J. R., P. T. Plotkin, and J. A. Keineth. 1997. In water population survey of sea turtles of Delaware Bay. Final report to NMFS Office of Protected Resources, contract #43AANF600211).

P 27, line 7- change stocks to populations.

P 31, bottom of second para- note font size change.

P 33- military activities- are there any mitigation efforts by military?

P 36- beach armoring- this is a major detriment to loggerhead nesting and needs to be removed from any current or past nesting beach. For example see conditions on Hilton Head Island.

P 41- lighting pollution- light pollution is well known to kill and disorient hatchling sea turtles. There is no good scientific reason why a major effort should not be undertaken to enact legislation to eliminate light pollution from sea turtle nesting beaches in the US.

P 51, para 3, line 7- Ridgeway et al 1960 is 1969 in Literature Cited

P 51, para 3, line 11- Moein et al 1993 is 1994 in Literature Cited.

P 65, 1.1 Terrestrial Zone- The statement is made that major efforts are underway for most significant nesting areas. Progress has been made in reducing mortality from human related impacts on nesting beaches. If so then why does the population of loggerheads continue to decline in all Recovery units for which data are available? Clearly efforts to date have been inadequate and need to be redoubled.

P 66- Efforts to reduce light pollution- Numerous efforts have been undertaken to reduce light pollution. These are complex and have met with mixed success. Many loggerhead hatchlings continue to be harmed by lights on many beaches. Education, sea turtle lighting certification programs and workshops will not work to solve this problem in the absence of legislation. This is true for stop signs, traffic lights and speeding regulations for humans driving vehicles and is true for humans using light5sd as well. There is a need for state and/ or federal legislation to solve this problem.

P 68- Efforts to reduce bycatch- Efforts to reduce bycatch to date have been inadequate. Fishery bycatch can be reduced by putting video cameras on all commercial fishing boats and requiring captains to log their take. If it is feasible to put cameras on fishing boats in the Bering Sea for a television program (Deadliest Catch), it should be feasible to do so to protect an endangered species.

P 69, second para- Trawl fisheries- TEDS should be required in all trawl fisheries in areas where loggerheads are present.

P 69, last para- Addressing bycatch in gillnet fisheries has been difficult. This is not a very good explanation for the continued bycatch. NMFS should enact emergency closure regulations to eliminate bycatch in gillnet fisheries until the industry can demonstrate that bycatch can be eliminated by a change in fishing practice. Emergency regulations should be implemented before turtle bycatch occurs. Regulations don't bring back dead turtles.

P 74- are any of the efforts at education and to improve communication funded by the federal government?

P 77-84- Recovery units are reasonable and based on best available science

P 168-169- Dredging- Requirements for channel dredging activities need to be extended to the Delaware Bay. Large numbers of sea turtles, especially loggerheads use the shipping channel in Delaware Bay and appear to sit on the bottom in the channel. Dredging of that channel will kill loggerhead turtles if appropriate actions are not taken to avoid that impact.

This was reported to NMFS in a report on Delaware Bay sea turtles by Plotkin, Spotila and Keinath (Spotila, J. R., P. T. Plotkin, and J. A. Keinath. 1997. In water population survey of sea turtles of Delaware Bay. Final report to NMFS Office of Protected Resources, contract #43AANF600211).