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24 August 1989

Dr. Joseph W. Angelovic
Acting Regional Director
Southeast Regional Office
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, FL 33702

Dear Dr. Angelovic:

Enclosed is the report "Blue Ribbon Panel Review of the National Marine Fisheries Service Kemp's Ridley Headstart Program". The panel members unanimously support the conclusions and recommendations in this report. Additionally, the panel considers outside peer reviews of this sort to be of great benefit to the Headstart Program and we strongly encourage such reviews in the future. If you have any questions and/or comments, please contact me at (512) 471-1113.

Sincerely,

Thane Wibbels, Ph.D.
Panel Chairman

Enclosure

xc: Dr. Nat Frazer (Mercer University)
Dr. Mark Grassman (Memphis State University)
Dr. John Hendrickson (University of Arizona)
Dr. Peter Pritchard (Florida Audubon Society)

Report to the National Marine Fisheries Service

Blue Ribbon Panel Review of the National Marine Fisheries Service Kemp's Ridley Headstart Program

Panel Members

Dr. Thane Wibbels (University of Texas)
Dr. Nat Frazer (Mercer University)
Dr. Mark Grassman (Memphis State University)
Dr. John Hendrickson (University of Arizona)
Dr. Peter Pritchard (Florida Audubon Society)

Dates of Review
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National Marine Fisheries Service

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Review Summary

There is presently worldwide interest in the question of whether or not "headstarting" is an effective tool for conserving endangered sea turtle populations. The National Marine Fisheries Service (NMFS) Kemp's Ridley Headstart Program, now functioning for over a decade, represents an unprecedented opportunity to address this question. Additionally, if headstarting works, this program has the potential of contributing significantly to the recovery of the endangered Kemp's ridley. During the past ten years, the Galveston Laboratory has refined first-year captive-rearing of sea turtles into an exact science; there is no better facility or staff in the world for this purpose. Long-term tag return data indicate that headstarted turtles can adapt and grow in the wild, and captive-breeding studies indicate that headstarted turtles can successfully reproduce. However, based on tag return, stranding, trawling, and nesting beach data collected by NMFS, U.S. Fish and Wildlife Service, and Instituto Nacional de Pesca, it is presently impossible to determine if headstarted ridleys are recruited into the natural breeding pool because the shrimp trawl-induced mortality rate of Kemp's ridleys (both wild and headstarted) is so high that few if any headstarted ridleys are expected to reach sexual maturity. To effectively evaluate headstarting, we recommend that the program be continued for a ten year period following the installation of turtle excluder devices (TEDs) on all shrimping vessels in U.S. Gulf and Atlantic waters. This ten year continuation is based in part on current estimates of the time required by Kemp's ridleys to reach sexual maturity in the wild.

The Kemp's Ridley Headstart Program has greatly increased public awareness of the endangered status of sea turtles (particularly due to the efforts of the conservation/education organization "HEART"). Enhanced public awareness is a worthwhile aspect of the Headstart Program. It should be emphasized to the public,

however, that this is an experimental program and should not be viewed as the panacea of sea turtle conservation. If the Headstart Program is viewed as the means of restoring the Kemp's ridley, then the primary element in the Kemp's ridley recovery plan, (i.e. protection of ridleys in their natural habitat) and thus, the survival of this species, could be jeopardized.

Specific Comments and Recommendations

Aquaculture of Kemp's ridleys

The use of headstarting as a method for conserving sea turtles is a controversial issue among scientists. While there is worldwide interest in this subject, there is presently no conclusive evidence indicating that headstarting is an effective conservation strategy for any endangered sea turtle population. The NMFS Kemp's Ridley Headstart Program offers an unprecedented opportunity to evaluate the use of headstarting as technique for conserving sea turtles. Over the past ten years, the Galveston Laboratory has continually refined the art of rearing Kemp's ridleys for approximately 8-12 months in captivity. The headstart facility and staff are unparalleled in this task. There will not be a comparable opportunity to address this issue elsewhere in the foreseeable future.

Recommended Criteria for Assessing Success of Headstarting

1) Provisional Criteria

A) Apparent competence of headstarted turtles at and after release (i.e. Do headstarted turtles survive and grow in the wild, and are they comparable to wild ridleys in body weight, feeding behavior, orientation, and reactions?)

B) Ratio of recoveries (tag returns and strandings) of headstarted turtles to

naturally occurring Kemp's ridleys, taking into consideration the number of hatchlings produced at Rancho Nuevo and the number of headstarted hatchlings (taking into account the possibility of biased sampling due to the presence of tags on headstarted turtles)

C) Comparison of recovery locations of headstarted and nonheadstarted ridleys

2) Ultimate Criterion

If headstarting is successful, the proportion of nesting headstarted females should increase relative to the proportion of nonheadstarted nesting females. We consider that a gradual increase in this proportion over a five year period would be an indicator that headstarting is an effective conservation technique.

Current Assessment of Headstarting Success

The data presented to us by the Galveston Laboratory indicate that headstarted turtles fulfil the first provisional criterion; tag return data indicate that headstarted turtles can adapt and grow in the wild. To-date, tag return/stranding data from both headstarted and nonheadstarted turtles has not been critically compared and we recommend that NMFS complete such analyses in the future. These analyses should provide insight as to the competence of headstarted ridleys in the wild compared to their natural counterpart. However, it may not be easy to interpret whether recovery of a tagged turtle is "good" news or "bad"; that it survived and grew is positive; that it was caught or died may indicate that it was less adequately adapted for the wild than its natural counterpart.

Captive breeding studies at the Cayman Turtle Farm, LTD, indicate that headstarted turtles can successfully reproduce, but there have been no documented nestings of headstarted Kemp's ridleys in the wild. It is possible that the time

required to reach maturity in the wild is greater than the ten year period that the Headstart Program has been in operation, although current NMFS estimates suggest that ridleys may reach sexual maturity in five to seven years. It is also possible that mature headstarted turtles are not distinguishable from nonheadstarted turtles due to the gradual loss of flipper tags as well as the gradual fading of "live tags". However, tag return, stranding, trawling, and nesting beach data recorded by NMFS, U.S. Fish and Wildlife Service, and Instituto Nacional de Pesca, collectively indicate that the mortality rate of Kemp's ridleys in the wild (both headstarted and nonheadstarted) is so high that few if any headstarted ridleys are likely to reach sexual maturity. Based on NMFS tag return, stranding and trawling data, the majority of this mortality is attributable to shrimp trawling. Thus, all available evidence indicates that shrimp trawl-induced mortality of Kemp's ridleys negates any possible benefits of the Headstart Program and prevents the accurate evaluation of whether headstarted ridleys can be incorporated into the natural breeding pool. To evaluate the effectiveness of headstarting properly, we recommend that the NMFS Kemp's Ridley Headstart Program be continued for a ten year period following the installation of TEDs on all shrimping vessels. The ten year period takes into consideration the NMFS estimate of the time required by Kemp's ridleys to reach sexual maturity in the wild. If, after ten years, there is not an increasing proportion of headstarted nesting females compared to the proportion of nonheadstarted nesting females after the ten year period, then the program should be discontinued.

"Artificial Imprinting"

We concur with the recent move away from artificial imprinting at Padre Island National Seashore, TX. At present, "imprinting" is simply one (unproven) hypothesis to explain how sea turtles choose nesting beaches. " Artificial imprinting" to Padre Island

adds many extra variables to the headstart experiment, all with the potential of interfering with the effectiveness of the program.

Fitness of Headstarted Turtles

We recommend that the headstart staff continue to develop "practical" means of assessing the fitness of headstarted turtles. In recent years the policy has been to control feeding so that turtles do not become "fat". We intuitively agree on this point, but we would prefer to have physical and/or physiological data on which to base this decision. Additionally, if it takes a while for a headstarted ridley to start feeding in the wild, a fat reserve may be a benefit.

Public Awareness

Public awareness of the Kemp's ridley's plight has greatly increased during recent years. In particular, we would like to commend the efforts of the conservation/education organization "Heart" directed by Carole Allen of Houston, TX. We consider the heightened public awareness generated by the Headstart Program a healthy influence on the public's attitude toward conservation. However, headstarting is an <u>experiment</u> and it should not be viewed as <u>the</u> means of saving the Kemp's ridley. Placing too much emphasis on the Headstart Program could jeopardize the primary element of the Kemp's ridley recovery plan (i.e. protection of Kemp's ridleys in their natural habitat). Therefore, we recommend that the entire headstart staff emphasize this point to the public. We noticed TEDs in one of the turtle-rearing facilities, and are pleased that the staff has already begun to stress the importance of protecting ridleys in their natural habitat.

Cost Justification

There is presently worldwide interest in the effectiveness of headstarting as a conservation technique for sea turtles. The NMFS Headstart Program offers an unprecedented opportunity to address this issue. For that reason, we consider the cost of the Headstart Program to be justified. Additionally, peripheral research associated with this program has the potential of providing technologies and data that can enhance sea turtle conservation in general (e.g. development of permanent tags, accumulation of data on the life history of Kemp's ridleys, etc.).

Should the Program be Expanded?

We recommend that the Headstart Program not be expanded, but instead be limited to 2000 hatchlings/year (i.e. approximately 2% or less of the eggs laid at Rancho Nuevo). Expansion should only be considered if future data indicate that headstarting is an effective conservation technique (as described under "Ultimate Criterion"). With the exception of ridleys used in TED testing, all healthy and normally developed (i.e. without genetic defects) ridleys should be released after their approximate 8-12 months of captive-rearing. Considering the experimental nature of headstarting, we do not recommend rearing turtles for longer than one year. There are presently enough adult or near-adult Kemp's ridleys held in public aquaria in the U.S. to facilitate a captive-breeding program should the need arise. However, at this time we see no need to resort to captive-breeding; the major conservation emphasis should be on protection of ridleys in their natural habitat. If additional funds become available for the Headstart Program, we recommend that those funds support peripheral research programs that would enhance headstarting as well as sea turtle conservation in general (e.g. development of permanent tags, development of a sexing technique,

etc.).

TED Testing

We concur with the present policy of rearing a minimal number of ridleys for more than one year for use in TED tests. Based on an NMFS video of TED testing, small ridleys represent a more rigorous test for TEDS than do large ridleys, so we recommend that ridleys should not be captively reared for more than approximately two years.

Headstart Staff

We heartily commend the efforts of the headstart staff. During the past ten years, they have refined first-year captive-rearing into a precise science. The peripheral research programs assigned to individuals are of conservational significance and are an effective means of maintaining a motivated staff at a time when the captive-rearing aspects of the program may lack their former challenge and seem routine. We consider the vigorous and dynamic exchange among the staff a healthy situation and feel that all members should be encouraged to voice their opinions concerning headstart-related research. The merits, techniques, and justifications of ideas should be evaluated by scientific debate and experiment, and not be overruled by authority.

Outside Peer Review of Proposals

We recommend that both internal and external research proposals concerning the Headstart Program should be subject to external peer review. It would be advantageous to develop a specific protocol for submitting research proposals regarding the headstarted ridleys.

Peripheral Research Areas

In addition to the rearing of turtles, the headstart staff have initiated many peripheral research programs that augment headstarting. We strongly recommend that these research programs be continued and intensified. Regardless of whether or not headstarting proves to be an effective conservation technique, the peripheral research programs can provide technologies and information that may enhance sea turtle conservation programs worldwide.

1) Tagging

We commend the previous tagging research conducted by the headstart staff and we recommend that studies of conventional tags (Monel, Inconel, and titanium) as well as high tech tags (such as live tags, coded wire tags and passive integrative transponder tags) be continued. If high tech tags prove practical, then all headstarted turtles (not simply a small subset) should receive these tags. If headstarted turtles cannot be identified on the nesting beach, then it is difficult if not impossible to evaluate the ultimate effectiveness of headstarting.

2) Sex Ratios

We recommend that sexing technique/sex ratio research continue. Ultimately, an accurate yet practical method of monitoring yearly sex ratios in the Headstart Program is desired. Development of a practical and nonlethal sexing technique for young sea turtles (particularly hatchlings) would be a major advance for sea turtle conservation. Although eggs are currently being incubated on the beach at Rancho Nuevo, the sex ratio of turtles in the program could be "adjusted" by changing nest locations or by utilizing eggs from early season and/or late season nests. The effect of sex ratio on

the reproductive output of the Kemp's ridley population is presently unknown. However, we intuitively feel that a male bias could decrease the effectiveness of the Headstart Program. Therefore, we recommend a 50:50 sex ratio or even a slight female bias, but certainly not more than approximately 70% female.

3) Population Genetics

The current molecular study of population genetics of the Kemp's ridley appears to have limited management potential (i.e. all Kemp's ridleys need to be protected). Moreover, it seems probable that there is only one breeding population of Kemp's ridleys, even though some nesters may emerge hundreds of kilometers from Rancho Nuevo. A more extensive study that includes a variety of olive ridley populations could have greater management and scientific usefulness.

4) Turtle Tracking

The development of radio-tracking and sonic-tracking technology should be continued. Satellite-tracking methodology is currently limited to larger turtles and is quite expensive. Therefore, it is of limited value to the Headstart Program, but it could be useful for tracking adult ridleys. Radio-tracking and sonic-tracking of both headstarted and nonheadstarted Kemp's ridleys is encouraged. These studies will generate baseline data on the ecology and behavior of both headstarted and nonheadstarted Kemp's ridleys, thus increasing our ability to judge the competence of headstarted ridleys after their release into the wild.

5) Stranding/Sighting Data

We recommend the continued recording and compilation of stranding and sighting data for both headstarted and nonheadstarted ridleys. These data contribute to our

basic understanding of the distribution and ecology of Kemp's ridleys. The public sea turtle identification signs represent an effective interface between NMFS and the public. The signs facilitate the accumulation of sighting data and they increase the public's knowledge and awareness of sea turtles.

Panel Member Addresses

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