Suggestions to Assist Captive Breeding Efforts at the Huidong Gangkou Sea Turtle National Nature Reserve Submitted by

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Based on an Informal Visit to the Reserve 16-18 March 2017.

We have divided our suggestions into three categories- Urgent Immediate; In The Near Future; and Longer Term.

The following suggestions are considered URGENT IMMEDIATE because it is now April and the mating and nesting season should occur very soon:

1) Remove the large female loggerhead from the tank with the female green turtles to prevent any possibility of hybrids being produced.

2) Separate the male green turtles into a different tank away from the female green turtles so they can not see one another nor sense the females via in-water smell/ olfaction. Keep the males separated for 3-4 weeks- until early May- then put them into the tank with the females with the objective of stimulating copulation.

3) In the process of removing the loggerhead and temporarily relocating the males, take the opportunity to mark each turtle's carapace (e.g., 1, 2, 3 or A, B, C etc) on each side for easy visual recognition. Epoxy paint could be used to make the identifying marks. This will allow individual turtles to be identified when they are seen copulating, resting out of the water at the beach edge, and when they are on the beach nesting. The assumption is that, in removing the loggerhead and relocating the males, the tank will need to be drained of sea water, hence the carapace marks can be made when the turtles are dry.

4) When the tank is drained, also take the opportunity to collect small biopsy skin samples preserved in alcohol for eventual DNA genetic testing. Record existing flipper tag numbers and carapace numbers for each turtle to use in labeling the skin sample vials. The purpose DNA genetics analysis would be to identify the source nesting stock of the turtles.

5) Ensure that the female turtles can easily crawl from the water onto the beach without slippage by manipulating the appropriate water level and/or putting more sand on the concrete slope.

IN THE NEAR FUTURE:

6) Several times a week use fresh water to moisten deeply into the sand of the nesting beach- especially in the area where natural rainfall is blocked from the beach by the plastic sheet roof. A lawn soaker hose would be suitable- Please see this link for an example:

https://www.amazon.com/s/?ie=UTF8&keywords=water+hose+soaker&tag=googhydr20&index=lawngarden&hvadid=181944605236&hvpos=1t2&hvnetw=g&hvrand=4643202297993079204&hvpone=&hvptwo=&hvqmt=b&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9032817&hvtargid=kwd-6065807187&ref=pd_sl_27lb0kzqd0_b_p20

It's very important that the nesting beach sand not be too dry. Moisture of the sand is needed for a female to successfully excavate the egg chamber using her hind flippers. If the sand is too dry slippage will occur and the egg chamber can't easily be dug.

7) Plant natural vegetation along the back concrete wall of the nesting beach. This will help to hold moisture in the sand. Also, green turtles often like to nest under natural vegetation. The native plant, Scaevola, that occurs at the reserve would be ideal for this purpose. Please see this link:

https://en.wikipedia.org/wiki/Scaevola_(plant)

LONGER TERM:

8) Obtain more large green turtles- both females and males- to add to the breeding stock tank. The tank is large and excellent. Ten females and 8 males were present during our visit. We estimate that the tank could easily, safely and humanely hold five times that number- i.e., 50 females and 40 males.

9) Undertake a search of as many aquariums in China as possible to locate large adult green turtles for possible transport for loan to the Reserve's captive breeding effort.

10) Collaborate with a world authority on laparoscopy, such as Dr. David Owens, to determine the internal reproductive status the Reserve's breeding stock.

11) Convene a small workshop on captive breeding at the Reserve. Invite several experts with experience in captive breeding of green turtles. The goal would be to

discuss and share information leading to collaborations with sea turtle scientists that support the Reserve in it's efforts, and to obtain additional recommendations for future actions.

If you have questions about any of the above suggestions, please feel free to ask and we will explain in greater detail.

Closing Statement: We were highly favorably impressed with the facilities and efforts devoted to the Reserve's captive breeding project. We are appreciative for the professionalism shown to us during our three-day visit. The improvements recently made to the Reserve's landscape and buildings are absolutely beautiful. The Reserve is clearly a national pride for all the people of China. We sincerely extend our thanks to everyone for their friendship and hospitality.

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Representing the non-governmental non-profit entity:
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