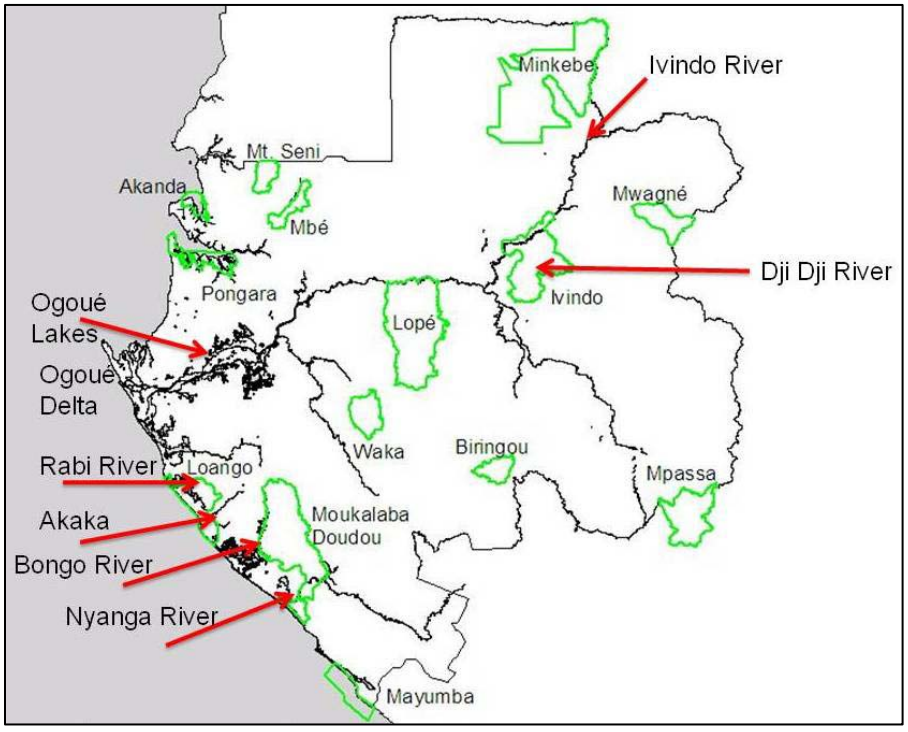
PROGRESS UPDATE

Crocodile Conservation in the Congo Basin

The slender-snouted crocodile (*Mecistops cataphractus*) is the least known crocodilian in the world. All data to date suggests that it is in rapid decline, and regional populations in West Africa seem to be on the brink of extirpation. To date, the limited survey data available for Central Africa has found disparate, but robust, populations in Gabon. To facilitate the long-term conservation and management of this species I have undertook to study the ecology and population status of the slender-snouted crocodile in Loango National Park and throughout Gabon. Specifically, I am examining the following questions: 1) What are the habitat use, dispersal potential, and factors influencing habitat suitability and preference in *Mecistops cataphractus*?; and 2) What is the genetic diversity of *Mecistops cataphractus* in the Congo Basin and how do historical biogeographic and modern anthropogenic factors influence the geographic structuring of that diversity? In answering these questions, I aim to also evaluate the following objectives: 1) Population size of *M. cataphractus* in Gabon; 2) Principle threats to *M. cataphractus* in Gabon and Republic of Congo; 3) Extent and importance of utilization of *M. cataphractus* by local communities in and around protected areas of Gabon and Republic of Congo.



Gabon Map with Selected Study Sites Highlighted

Molecular assessment of population structure (question #2) has yet to begin; however, intensive nationwide sampling has begun as of June 29th. Sampling is carried out alongside survey efforts to assess national population status, distribution, and threats. In addition to the areas detailed above, I have surveyed/sampled the Dji Dji River in Ivindo National Park and am currently working in the lakes region of the Ogoué River downstream from Lambarene. Not

including hatchlings captured, nearly 100 samples have been secured from throughout these survey locations. Additional efforts have been prioritized along the Komo and Mbe Rivers that feed the Gabon estuary, Mpassa River in and around the Plateau Bateke National Park, Ivindo River and its tributaries near Minkebe National Park, Ogoué River and its tributaries near Lope National Park, and the rivers feeding the coastal Mayumba Lagoon. Genetic work will begin upon returning the USA in January 2011. Additionally, funding has been secured for sampling in the Congo Basin. This will be carried out in northern Republic of Congo and or southwestern Central African Republic in the Sangha-Dja system in July 2011.

Ecological assessment (question #1) began with a preliminary visit to Gabon in December 2009 during which I was able to visit Loango National Park to conduct preliminary surveys, as well as, arrange for all research permits and familiarize myself with my government and NGO collaborators. Unfortunately, surveys around the Iguela Lagoon in the northern sector of Loango National Park, including the Rabi River (which drains the famous Shell Rabi oil fields and Lake Divangui), resulted in no slender-snouted crocodile sightings. While I did not expect any in the lagoon proper, surveys conducted by M. Eaton and J. Thorbjarnarson in 2004 revealed few *M. cataphractus* individuals in the Rabi River. The high water level and flooded forest no doubt confounded these attempts. Despite this, surveys in the lagoon were highly successful for detecting Nile crocodile breeding. I found 3 active Nile crocodile nests and 2 old nest sites. This is incredibly positive news for this species as it possibly marks an upward trend in their population after decades of relentless poaching for the illicit skin trade.



Typical *M. cataphractus* habitat in Gabon: Bongo River, Akaka Swamp, Akaka River Oxbow (left to right)

After a short stint in Uganda during the month of January, the project resumed with surveys and sampling of the N'Dougou Lagoon including the Bongo and Nyanga Rivers in and around Moukalaba-Doudou National Park south of Loango National Park. The only available data for this area are preliminary surveys conducted by Olivier Behra (1987), though these did not include the aforementioned rivers. The water level was incredibly high, flooding the forest around the Bongo River up to several kilometers making surveys difficult, however, efforts concentrated in the N'Dougou Lagoon at the mouth of the Bongo River revealed significant numbers of *M. cataphractus* and the first real evidence that they utilize any part of the coastal lagoon system. Similarly, the Nyanga River and the channel to Lac Cachimba were both equally

productive for *M. cataphractus*. The results of these surveys have yet to be fully analyzed, but slender-snouted crocodiles were encountered at rates ranging from 0.45 – 2.6/km. Of note was the relative lack of sightings for adult individuals (those over 2.0m). One hypothesis is that the juveniles disperse into the lagoon as a nursery but the adults remain in the river for breeding. A second, and equally likely hypothesis, is that adults are more wary in this area as they are under high hunting pressure. Local informants revealed the presence of several well known crocodile hunters in the area who focus on slender-snouted crocodiles. This was confirmed upon our arrival in Mayonnami, the base village for surveys of the Nyanga River, when we saw the smoked remains of an adult *M. cataphractus* being sold as bushmeat by the riverside. This work was conducted in collaboration with Mark Merchant, who is currently analyzing the immune capacity of all three African crocodile species from samples taken during this period.



Smoked Remains of a ±2.2m *M. cataphractus*



Adult *M. cataphractus* Being Butchered for Sale

Telemetry work began in Loango National Park, in the region of Akaka, as of early March. My original intent was to utilize acoustic telemetry, however, insufficient funds were secured for this method and I changed to standard radio telemetry. Preliminary surveys were conducted March 7 – 8 and individuals captured for radio attachment beginning March 9. Surveys revealed that slender-snouted crocodiles are present at 1.5 crocodiles/km in this region, though they often occur in pockets of higher density. Further, the population is incredibly heterogeneous in size structure with all size classes observed from 0.8 – 3.0 meters. The lack of hatchling and yearling detections is to be expected as I hypothesize this species disperses into the flooded swamps during the rainy season away from the main river bed to breed, where the smaller individuals likely remain. This hypothesis is supported by adult animals vocalizing from significant distances away from the river in response to the distress call of captured individuals. As the water level came down throughout April, the forest fringes of these swamps were accessed and searched for evidence of nesting. In total, 4 nests were found with females guarding recently hatched young ranging in number from 12 – 18 individuals. Hatchlings and, if possible, females were captured for sampling with the intent of genetically assessing the breeding ecology of this species through analysis of paternal contribution and other parameters. Among the more significant finds was a female of 2.06 m guarding a nest site. The only other information available on minimum size to sexual maturity is from Waitkuwait (1985, 1989) who

found a freshly killed female of 2.25 m with eggs. More precise estimates of breeding size are critical for analysis of survey data.



***M. cataphractus* Nest**



***M. cataphractus* Hatchling Pod**

Radios were deployed until May 5th at which time the 30th individual was tagged. Study animals range in size from 0.99 – 2.75 meters. Individuals are demographically split in every way possible (i.e., 50:50 sex ration, 33:33:33 juvenile, subadult, adult) and are split evenly between the three major habitat areas in the region. Among the individuals is one female in attendance of a hatchling crèche. Telemetry data collection commenced with the deployment of the first radio and continued through June 20th. This data has yet to be analyzed in any way, however, informal assessments of the data suggest that home ranges in this species are likely commensurate with other riverine crocodiles and is largely influenced by water level. Additionally, this area is accessible to fishermen during the dry season and at least one of the tagged crocodiles left the study area at the arrival of the first fishing activity suggesting a relative intolerance to this potential threat.



Adult male *M. cataphractus* with nuchal radio.

Capacity-building efforts have been slow to start due to the work schedule to date, however, we have made progress in training technicians for WWF, WCS, the Agence National des Parcs Nationaux, and the Iguela community. From the end of March until the end of June, I fully supported the internship of a student at the Ecole National des Eau et Forets (the vocational school for the Ministry of Water and Forests, where the Département de Faune et Chasse is housed). Angel Emile Andoung Ebome was trained in crocodile survey techniques and telemetry. He completed an independent project assessing the habitat use and emergence behavior of juvenile slender-snouted crocodiles (0.99 – 1.3 m) over this three month period. He is currently in the process of analyzing his data and preparing his internship report for ENEF.



Gabonese student Angel Emile Andoung Ebome (Right), and local Tchongorowe villager, with adult male *M. cataphractus* being deployed for radio telemetry

From a national perspective, future conservation and management of crocodiles is being well grounded in Gabon. My efforts will provide the baseline data needed to move forward with management activities. We are working with the Agence National des Parcs Nationaux to establish a Crocodile Management Unit with funding from the US Fish and Wildlife Service. This unit will consist of 8 members that will receive extensive training in crocodile ecology and management. The early work of this unit will focus on assessing and monitoring threats to crocodiles from the forestry, mining, and freshwater fisheries sectors, as well as, bushmeat hunting. They will receive training in threat mitigation techniques ranging from fisheries planning to translocation/repopulation and protected area development. Hopefully these funds will be available as of October at which time we will inaugurate the Unit with an intensive training period in Loango National Park and preliminarily assess Wonga Wongue Presidential Reserve as a site for Nile crocodile repopulation.