

# CREW Progress Report

Lindner Center for Conservation and Research of Endangered Wildlife • Cincinnati Zoo &amp; Botanical Garden

## First Sand Cat Kittens Born Following In Vitro Fertilization and Embryo Transfer

Scientists from CREW and the University of Illinois, working with colleagues at the Al Ain Wildlife Park & Resort (AWPR) in the United Arab Emirates, have used in vitro fertilization and embryo transfer to produce sand cats for the first time. Two healthy female sand cat kittens (*Felis margarita*) were born on December 13th, 2009 to a five-year old female sand cat housed at the AWPR following a 66 day gestation. This success is the culmination of several years of CREW research in North American



zoos, first characterizing the basic reproductive biology of sand cats and then developing semen collection, freezing and in vitro fertilization protocols for this species. For the procedures at the AWPR, a total of 70 oocytes was recovered from five hormonally-treated females using a minimally-invasive laparoscopic technique and inseminated in vitro to produce 50 embryos. Twenty-one embryos were transferred laparoscopically into the oviducts of four synchronized recipients, resulting in the single pregnancy. The remaining embryos were frozen and imported to the U.S. for use with embryo transfer procedures in other zoological institutions.

Sand cats are a small-sized (2-3 kg body weight) desert-adapted species native to the Middle East and Northern Africa. Little is known about the conservation status of wild sand cats but the populations are thought to be declining throughout their range. Sand cats are managed in North American zoos by the Sand Cat Species Survival Plan (SSP) based at the Living Desert Zoo in California. The SSP population consists of just 28 cats housed in 11 U.S. institutions, whereas globally, ~200 sand cats are maintained in captivity. However, there is little coordination in management of sand cat populations in different geographic regions. CREW and the Sand Cat SSP are working with the AWPR to develop a global management program that may include periodic genetic exchange between North American and Middle Eastern zoological parks. Our recent success with in vitro fertilization and embryo transfer in sand cats could allow frozen embryos and semen to be moved between countries as an alternative to transporting living sand cats internationally.



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“Using Science to Learn,  
Applying Knowledge to Save,  
A Future for Wildlife”



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## Surviving in the Scrub

It's a small plant, but it's tough. Growing in the inhospitable habitat of the central Florida scrub, the Avon Park harebells (*Crotalaria avonensis*) can survive in the hot, dry sandy soil of the Lake Wales Ridge. But, that habitat is also good habitat for agriculture and housing, and the competition has forced the Avon Park harebells into only three remaining populations. Fortunately, two of these populations are in protected areas: the Nature Conservancy's Saddle Blanket Lakes Preserve and Carter Creek, a tract of the Lake Wales Ridge National Wildlife Refuge (NWR). The Lake Wales Ridge NWR was the first NWR created for the protection of plants, and it contains 31 rare plant species, including the Avon Park harebells. The third population is not protected and is found in the scrub patches of a housing development.



CREW's Plant Division has been collaborating with others to increase the number of plants of this species and return them to the wild. CREW scientists first developed effective tissue culture and cryopreservation protocols for this species. Now, CREW is producing plants to augment the population at Carter Creek. Plants are propagated in tissue culture and then sent to Archbold Biological Station, where they are acclimated to conditions in Florida and planted back into the scrub. Because of the unique adaptations of this species, research has been required to discover the conditions needed for acclimatizing the plants. In order to alleviate some of the shock of outplanting, portable camping showers are used to keep the soil moist when the plants are first put in the ground of their natural habitat. In the past year, significant progress has been made and 4 plants have been successfully returned to the scrub habitat, with more to follow during the 2010 season.

In addition to producing young specimens for outplanting, CREW scientists are cryopreserving the many tissue culture lines maintained at CREW. Each line has a unique genetic make-up, and before the tissue is banked in CREW's CryoBioBank, the DNA is analyzed to provide a genetic "fingerprint" of the line. This species does not produce prolific seeds in the wild, making seed banking difficult, and thus, this tissue banking will preserve the lines and provide a valuable resource for the future of this species.

*(This project is being conducted in collaboration with Bok Tower Gardens, Lake Wales, FL, and Archbold Biological Station, Lake Placid, FL, and has been supported in part by the Institute of Museum and Library Services and the U.S. Fish & Wildlife Service.)*

### **Saving Species with Science<sup>®</sup>**

CREW's plant and animal scientists and conservationists share their expertise around the globe touching most of the world's continents.

#### **Africa**

**African Violet**  
**Black-Footed Cat**  
**Black Rhinoceros**  
**Cheetah**  
**Guenon and Mangabey**  
**Lowland Gorilla**  
**Okapi**  
**Spotted-Neck Otter**  
**White Rhinoceros**

#### **Central/South America**

**Blue and Gold Macaw**  
**Brazilian Ocelot and Tigrina**  
**Giant Otter**  
**Scarlett Macaw**

#### **North America**

**Autumn Buttercup**  
**Black Warrior Waterdog**  
**Cumberland Sandwort**  
**Florida Manatee**  
**Florida Rare Plants**  
**Local Flora**  
**Northern Wild Monkshood**  
**Polar Bear**  
**River Otter**

#### **Asia**

**Asian Small Clawed Otter**  
**Fishing Cat**  
**Indian Rhino**  
**Pallas' Cat**  
**Sand Cat**  
**Sumatran Elephant**  
**Sumatran Rhino**

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