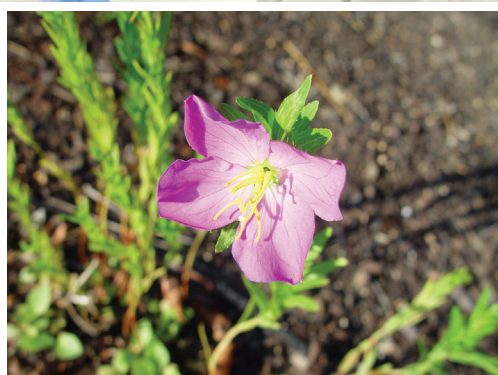


# CREW PROGRESS REPORT

Lindner Center for Conservation and Research of Endangered Wildlife



## Twenty Years is Just the Beginning

Sundews and ferns, willows, black walnut, chestnuts, and goldenrods. Just like Rip Van Winkle, these plants have woken up after more than 20 years of sleep in CREW's Frozen Garden®. All were part of a four-year study, recently completed by CREW's Plant Lab, on the effectiveness of cryopreservation as a tool for the long-term storage of plant tissues. It involved the work of two post-docs, a graduate student, CREW staff, and consultation with four internationally recognized experts in cryopreservation. The final year included time to reflect on the results of the project and look at the overarching question that prompted the study: "How long can samples survive storage in liquid nitrogen?" Projected survival times for cryostorage are so long (decades and even centuries) and the method is so young (20-30 years) that we are only starting to be able to provide real-life evidence to answer that question. CREW's collection is one of the oldest and most diverse cryopreserved collections in the world and funding from the Institute of Museum and Library Services made it possible to evaluate over 1000 samples that had been stored in the collection over the years. And what were the results? Almost everything that came out of storage showed good viability, including seeds that are normally short-lived, fern spores, tiny fern and moss gametophytes, embryos, shoot tips from many rare species, and pollen from the American chestnut tree. Some seeds, spores, embryos, and pollen had also been stored at  $-20^{\circ}\text{C}$ , which is the standard temperature for seed banks, and in many cases those samples did not survive as well as the materials stored in liquid nitrogen (if they survived at all). Taken together, the results of the study strongly support the use of cryopreservation as a safe and effective tool for the conservation of "exceptional" endangered plants, those which cannot be stored using traditional seed banking methods.



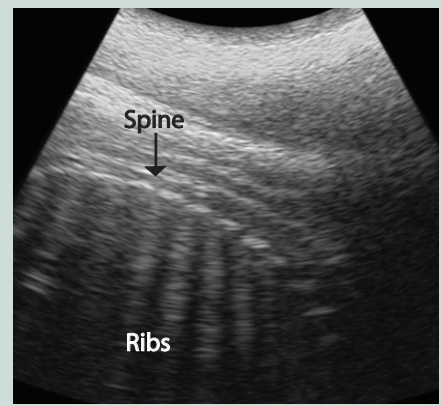
"Using Science to Learn,  
Applying Knowledge to Save,  
A Future for Wildlife"

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## Ocelot Kitten Born Using Improved AI Approach - It's about Time

Artificial insemination (AI) in cats is one of CREW's primary areas of expertise, with the births of multiple kittens in several different felid species over the past ten years. One of our major challenges with AI has been the need to control the ovarian cycle of the female to allow proper synchronization for conception. Earlier research in domestic cats indicated that oral progesterone, fed daily to females, can be used to suppress their natural ovarian activity, and with subsequent hormone treatment, allow precise control of the timing of follicle growth and ovulation. In November 2016, Drs. Bill Swanson and Anneke Moresco from CREW used this 'fixed-time AI' approach with a pair of ocelots housed at the Texas Zoo in Victoria, TX. The 12 year old female (Bonnie) conceived and, 85 days later, gave birth to a healthy female kitten (JoJo). This was the first offspring born to Bonnie and her 17 year old mate, Obidaiah. Importantly, JoJo also is the first ocelot ever produced using this newer 'fixed time AI' method. The approach potentially could increase our AI success in ocelots for improved conservation management within the Ocelot Species Survival Plan. (Supported by a Collection Stewardship grant from the Institute of Museum and Library Services)



## Famous Fiona's First Appearance

A side project taken on by one of CREW's post-doctoral researchers, Dr. Jessye Wojtusik, took an interesting turn in early January when a hippo fetus complete with heart beat was observed during a transabdominal ultrasound exam. Prior to this discovery, nobody knew if ultrasonography could be used to diagnose pregnancy in Nile hippos because they are so large and dense. The outstanding effort by the Africa exhibit keeper staff in training female hippo Bibi for voluntary ultrasound exams, allowed Jessye to monitor Bibi weekly to see if/when the pregnancy could be diagnosed. After months of just seeing unidentifiable "stuff", the fully formed fetus suddenly came into view just after the holiday season. In a normal pregnancy, this would have made diagnosis possible at five months of gestation - or three months before delivery. However, because Bibi delivered so prematurely, only a few weeks of ultrasound data were collected before baby Fiona greeted the world and quickly became a social media phenomenon.

