

CREW PROGRESS REPORT

An Unexpected Clue to Rhino Pregnancy Health



Dehydroepiandrosterone (DHEA) is a hormone linked to stress and health in many species, but it had never been measured in rhinos until recently. Drew Arbogast, a PhD student at George Mason University, spent a summer training at CREW, and one of his projects under the Wellbeing Pillar of the American Institute of Rhinoceros Science (AIRS v1.0) involved measuring DHEA in over 1,000 serum samples from 40 black and 71 white rhinos across 37 North American facilities. Although DHEA is one of several useful biomarkers of psychological wellbeing, the study revealed that it also may be valuable for monitoring rhino pregnancies. Notably, pregnant females of both species had markedly elevated DHEA concentrations, with levels rising progressively throughout gestation, and preliminary evidence suggested patterns differ between successful and unsuccessful pregnancies. In the next phase of AIRS (v1.5), we will expand on this work by exploring if DHEA can be measured non-invasively in fecal samples, thereby providing a practical tool for pregnancy health monitoring in all rhinos under human care.

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Monkshood Momentum Paving the Way for Recovery

CREW's work with the federally threatened northern wild monkshood (*Aconitum noveboracense*) over the past two decades has resulted in a major conservation breakthrough. Found in Akron Ohio, this species has survived habitat loss, roadway salt runoff, and even poaching, but no one had been able to successfully propagate the species for restoration—until now. CREW has been growing the species in tissue culture for many years, and when Summit County Metroparks learned that one of the tissue culture plants had been successfully established in our garden, they were quick to request CREW plants for transplantation into natural habitat. To scale up from our initial success, we first streamlined our acclimatization process (transitioning plants from test tubes to soil) to increase the number of plants we could provide. We then partnered with the Zoo's Horticulture team at Bowyer Farm to grow the plantlets and overwinter them to strengthen their root system in preparation for transplantation. Although only 1 of 21 plants survived the first winter at Bowyer, after modifying the growing conditions the next year, over 50% of the plants survived. With further adjustments, we anticipate even better survival this year. By merging CREW's expertise in propagating exceptional plants via tissue culture with the Horticulture team's excellence in native plant cultivation, we have created the first successful template for ex situ conservation of this threatened species! After nearly 50 years on the endangered species list, the northern wild monkshood finally has a path forward for restoration and recovery.



Aconitum from tissue culture growing at Bowyer Farm.

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Lindner Center for Conservation and Research of Endangered Wildlife

Dr. Bill Swanson, Small Cat Conservation/ Science Champion, Retires from CREW

Dr. Bill Swanson
with a Pallas'
cat in Mongolia.



Since the early 1990s, Bill Swanson (DVM, PhD) has led the charge for small cat conservation and science. His early research targeted his favorite wild cat species, Pallas' cats, and revealed that artificial lighting in zoos during the winter months was disrupting their reproduction, a problem easily remedied. His work in U.S. zoos and the wilds of Mongolia also led to our improved understanding of their susceptibility to toxoplasmosis, a parasite prevalent in the U.S. and lethal to many Pallas' cats. However, the bulk of Bill's research efforts focused on broadening our knowledge of small felid reproductive biology and using that new information to develop and implement assisted reproductive technologies (ART) to improve their reproduction, genetic health, and sustainability and explore creating genetic linkage between wild and zoo-managed populations. Today, Bill's cat ART success is unrivaled, encompassing 22 pregnancies produced by artificial insemination and in vitro fertilization/embryo transfer across an impressive list of felid species: Pallas' cat, ocelot, fishing cat, sand cat, oncilla, tiger, and cheetah (yes, Bill occasionally stooped to working with large cats). Many of the resulting 19 surviving offspring proceeded to reproduce successfully themselves, thereby solidifying Bill's impact on their species' survival. Bill's work spanned the globe leading to collaborative projects in Mongolia, Egypt, UAE, Thailand, Scotland, England, Canada, South Africa, Mexico, Brazil and ten other Latin American countries. His local work was equally important, with CREW serving as the base for his scientific achievements (Bill never stopped working in the lab) and for training the next generation of scientists (eight post-doctoral researchers and numerous U.S. and foreign graduate students) to carry on with his important work. Enjoy your well-deserved retirement, Bill!



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

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Ocelot kitten produced by IVF/embryo transfer—Brazil.



Sand cat kittens produced by IVF/embryo transfer—United Arab Emirates.