

the longer swards. Further research should be undertaken to determine the comparative nutrition of White rhinoceros grazing intake *in situ*, and whether differences in dentition across the order *Perrisodactyla* has a role to play in sward length preference.

TRAINING A WHITE RHINO FOR ARTIFICIAL INSEMINATION

Amber Berndt and Susanne Wyatt, Indianapolis Zoo, aberndt@indyzoo.com, swyatt@indyzoo.com

Indianapolis Zoo has a female southern white rhinoceros (*Ceratotherium simum simum*) from Kruger National Park who isn't cycling on her own. We have partnered with Cincinnati Zoo's Conservation and Research of Endangered Wildlife (CREW) and began hormone therapy to assist with successful cycling. Progesterone has been monitored via blood and urine throughout hormone treatment in order to establish baseline hormone levels for her cycles. Transrectal ultrasounds show successful follicular development, however, our proven bull has not bred her. Training and desensitization occurred in preparation of a hymen rupture and multiple artificial insemination procedures. Attempted artificial insemination continues with this female. Due to our success with this female, we decided to attempt hormone therapy and artificial insemination on our older female who has had nine calves. However, her last calf was a stillbirth and her cycles have since been erratic and the proven bull will only breed her in the warmer months although she's cycling regularly.

THE RHINO RESCUE CENTER: SAVING THE NORTHERN WHITE RHINO

Jill Van Kempen, San Diego Zoo Safari Park, jhampson@sandiegozoo.org

San Diego Zoo Global is committed to saving species from the brink of extinction. No species better fits this description than the northern white rhinoceros. With only three individuals left on the planet, human intervention is needed. Through the international collaboration of scientists and animal care professionals, it was decided that there was enough diverse genetic material banked from the northern white rhino to attempt assisted reproduction techniques. The Rhino Rescue Center was built as a first step. This research facility is home to six, wild-born, southern white rhino females that were imported from Africa in 2015. The center was uniquely constructed with their specific needs, and the needs of our Reproductive Sciences team, in mind. The rhino's training program allows for voluntary participation in their daily care and medical procedures. One of the most important voluntary behaviors is for the rhinos to allow weekly transrectal ultrasounds to be performed. In being able to frequently and reliably view the reproductive anatomy of each female, their cycles can be tracked and invaluable data is gathered. In the short time since the rhinos have arrived from Africa, they have made extensive progress behaviorally and continue to hit their training goals. As an added focus, The Rhino Rescue Center is committed to the highest level of animal welfare, which includes detailed records, scoring systems, specialized diets and an engaging enrichment program. The end goal is for these six females to become surrogate mothers to northern white rhino calves. Geneticists and reproductive physiologists are working to perfect techniques to create viable reproductive cells and eventually perform successful embryo transfer. There are many steps to be taken between now and then but we hope to one day reach our goal of saving the northern white rhinoceros from extinction.

RHINO CONSERVATION: ENFORCEMENT TO EDUCATION

Sarah Metzger, USFWS, Office of Law Enforcement, National Eagle and Wildlife Property Repository, sarah_metzger@fws.gov

The recent spike in rhino poaching and rhino horn trafficking necessitates action to save this iconic species from extinction. U.S. Fish and Wildlife Service's Office of Law Enforcement works on both ends of the spectrum to protect rhinos, effectively enforcing Federal laws and reducing demand through education and awareness campaigns such as Operation Crash and the San Diego Zoo rhino horn burn. Learn what updates are taking place and how zoo professionals can be involved.

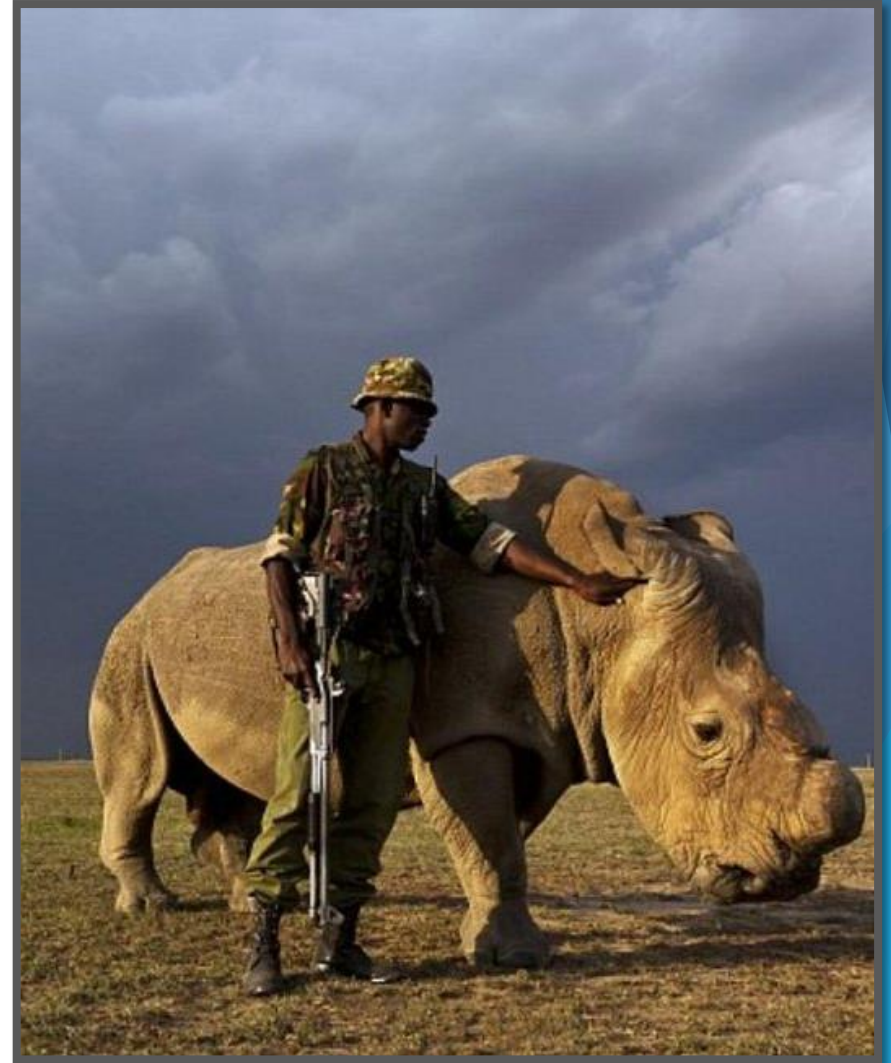
The Rhino Rescue Center

Saving the Northern White Rhinoceros

SAN DIEGO ZOO.
SAFARI PARK

Northern White Rhino History

- ❖ **Early 1900's** - NWR subspecies discovered
- ❖ **1960** - More NWR alive than SWR (pop. 2,000+)
- ❖ **1970** - Only 700 NWR remained
 - ❖ Started captive management
 - ❖ Dvur Kralove Zoo (Czech Republic)
- ❖ **1981** - 350 NWR left
- ❖ **1984** - 15 left in Garamba National Park
- ❖ **1989/90** - 2.2 arrived at SDZSP
- ❖ **2008** - Last wild sighting
- ❖ **2015** - Nola passed away at SDZSP





❖ Today:

- ❖ 3 non-reproductive individuals remain
- ❖ Ol Pejeta Conservancy in Kenya
 - ❖ Sudan (≈ 44), Najin (≈ 28), Fatu (≈ 17)

❖ Captive Breeding:

- ❖ 1980-2000: 1.3 born at Dvur Kralove Zoo (F1/F2)
- ❖ No reproductive success at Ol Pejeta or San Diego Zoo Safari Park

Decision to Save a Species

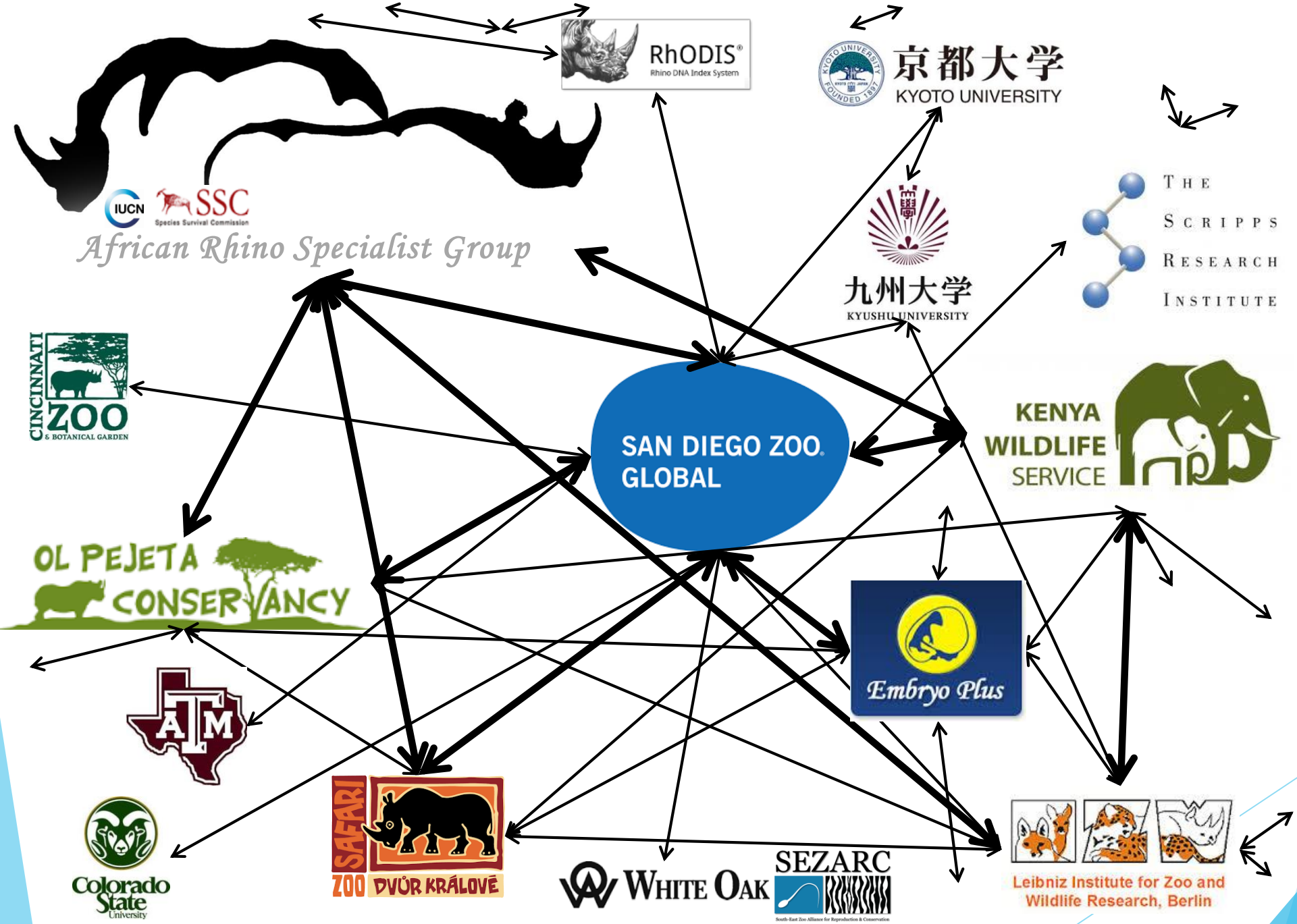
“If not us, who? If not now, when?” -Douglas Myers, SDZG President/CEO

❖ Northern White Rhino Initiative

❖ Goals:

- ❖ Increase AI repeatability in SWR
- ❖ AI SWR female with NWR sperm - hybrid (possibility)
- ❖ Perfect technique to create viable NWR embryos in a lab
- ❖ Embryo transfer
 - ❖ Use SWR females as surrogates for NWR offspring
- ❖ Create a self sustaining NWR herd
- ❖ Re-introduce to native range

❖ Global collaborators:



Why the NWR?

- ❖ **Threat of Extinction**
- ❖ **Saving NWR will help SWR**
- ❖ **SDZG's Breeding Success**
- ❖ **Genetically Distinct**
- ❖ **Available Resources**
 - ❖ **Frozen zoo**
 - ❖ 12 NWR cell lines (6 more in S. Africa)
 - ❖ More genetic diversity than all $\approx 20,000$ SWR
 - ❖ Institute for Conservation Research
- ❖ **Public Appeal**



Genetics

BIG STEP 1

LITTLE STEPS

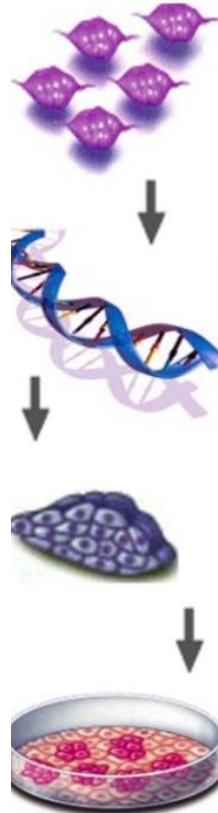
BIG STEP 2

LITTLE STEPS

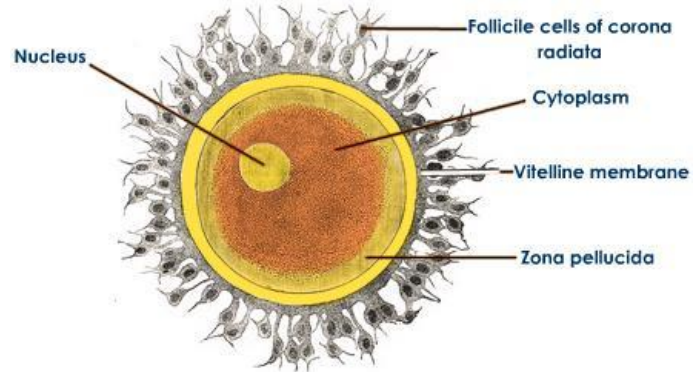
BIG STEP 3



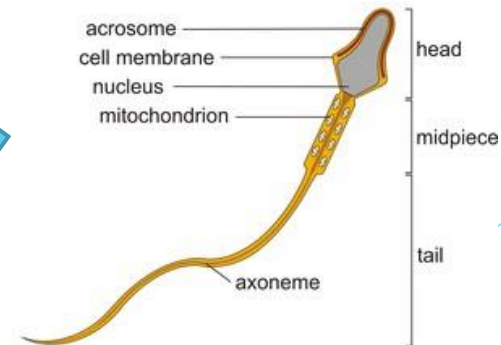
Skin cell culture from the SDZG Frozen Zoo



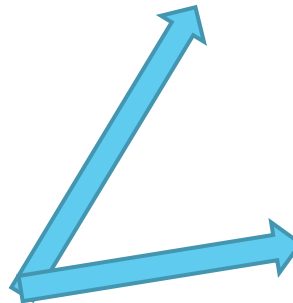
Induced Pluripotent Stem Cells

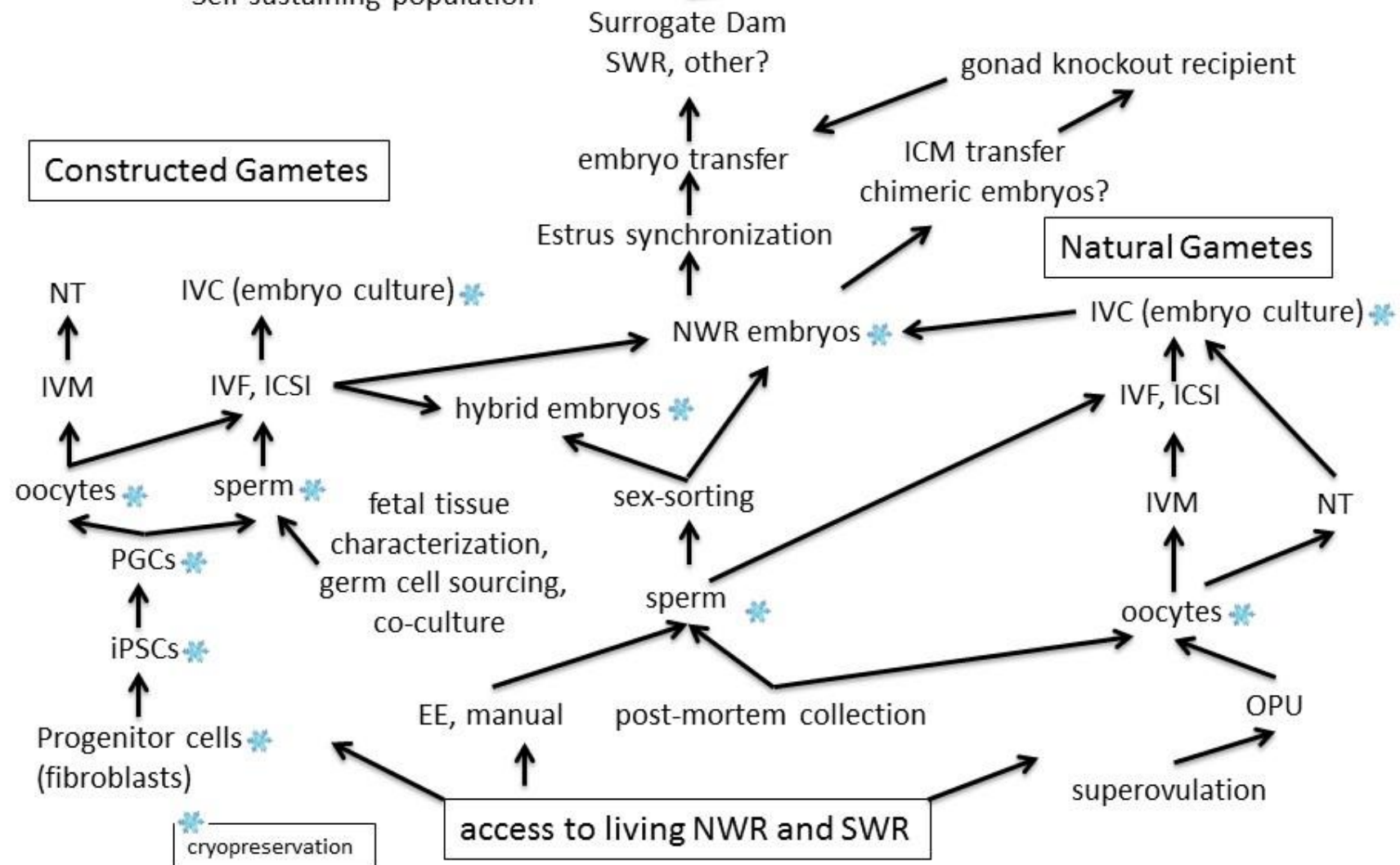
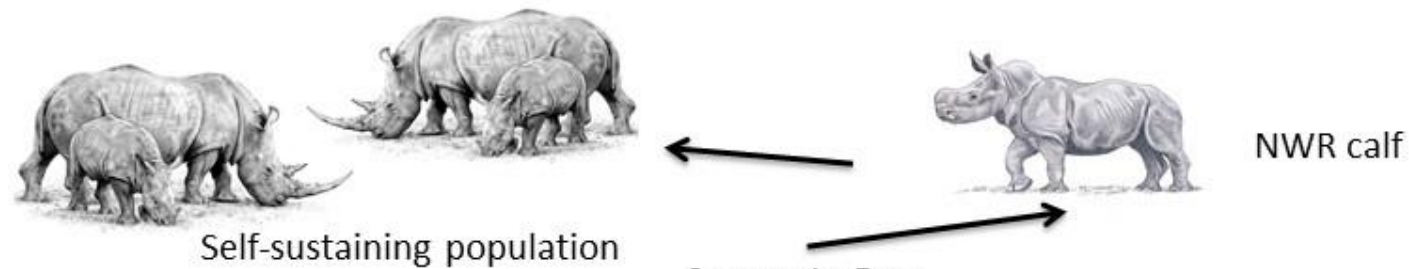


Egg



Sperm





The Rhino Rescue Center

0.6 SWR Imported from S. Africa in November 2015



Rhino Training

- ❖ Rectal ultrasounds
- ❖ Transabdominal ultrasounds & milk collection
- ❖ Vaginal swabs
- ❖ Blood draw - ears and legs
- ❖ IM injection - neck
- ❖ Foot care
- ❖ Reliable shifting & recall
- ❖ Training at night
- ❖ New behaviors



Unique Door Design

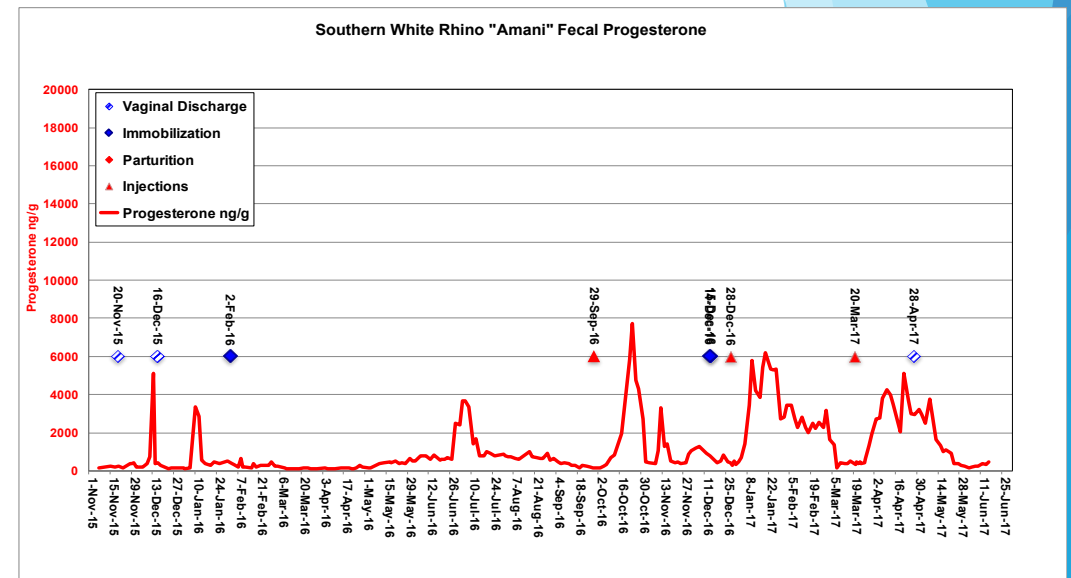
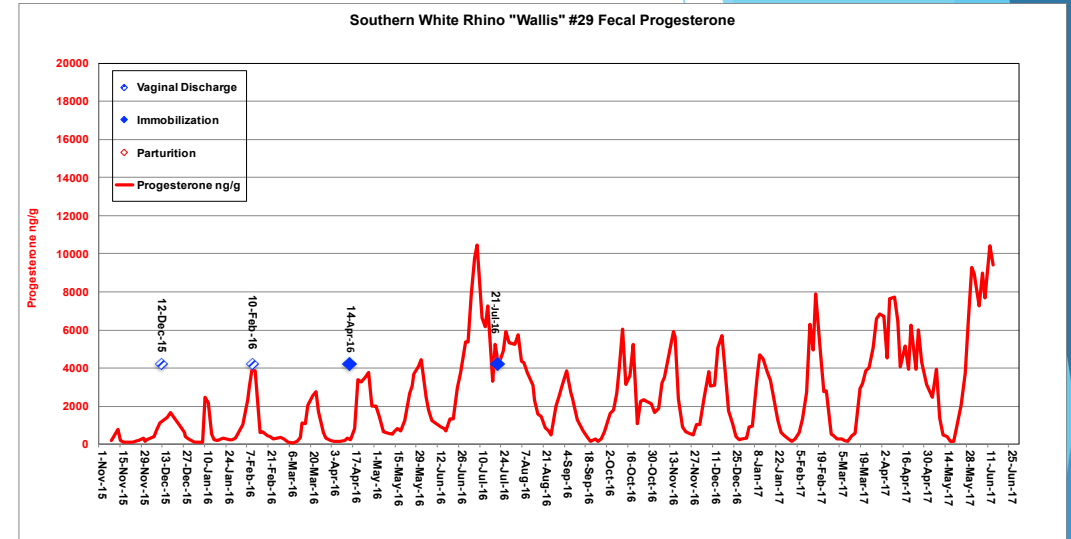




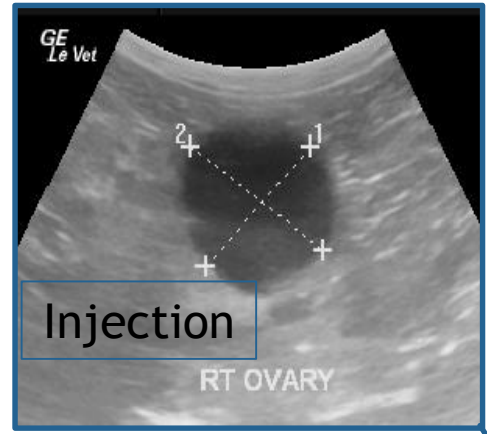
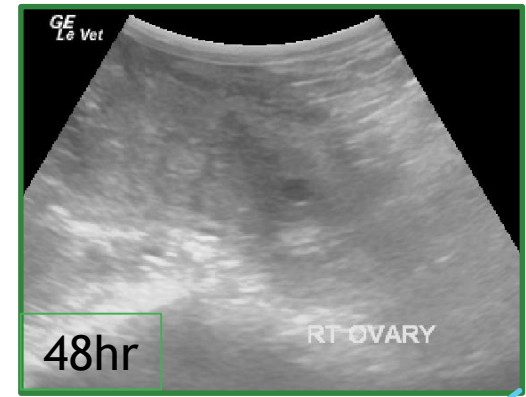
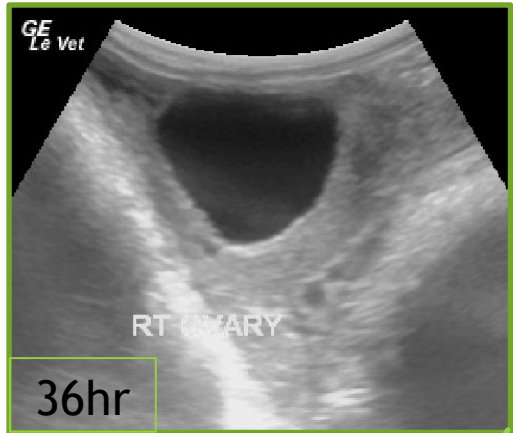
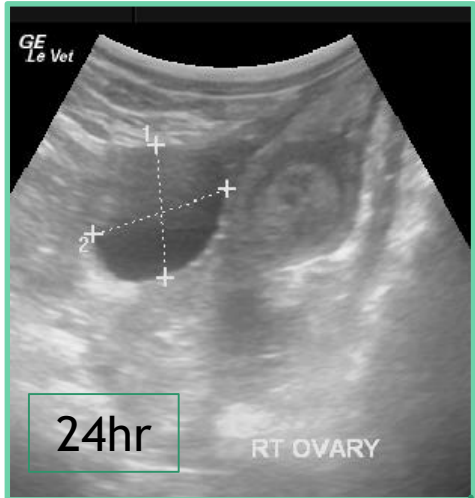
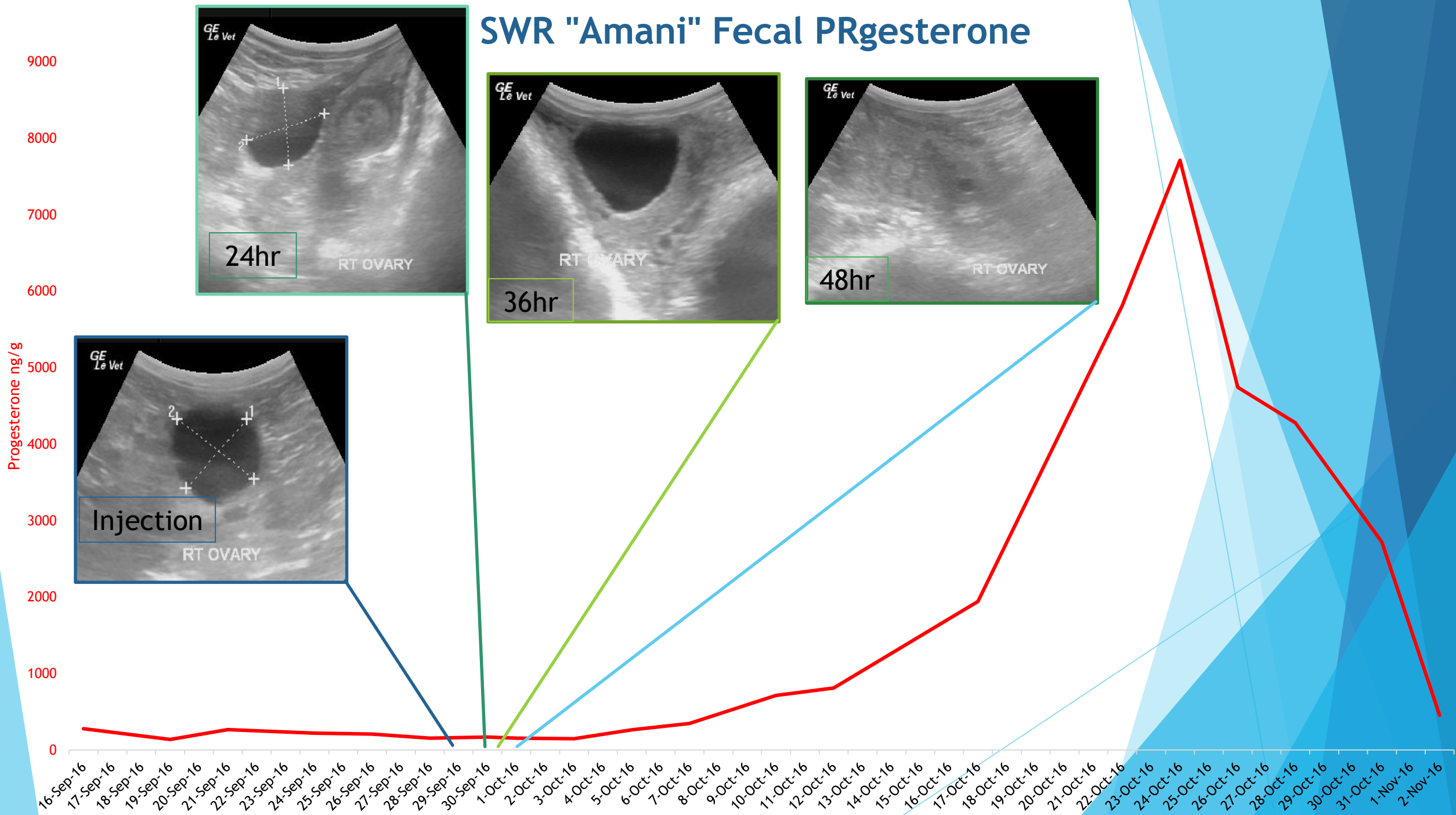
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Reproductive Results

- ❖ 406 ultrasounds as of Aug 6, 2017
- ❖ Cycle Length - 30 or 70 days
- ❖ Only 0.1 spontaneously ovulates
- ❖ 11 inductions on 4 individuals
 - ❖ Use about 2.5mls Deslorelin IM to induce ovulation when a follicle grows to \approx 34-36mm
 - ❖ Amani - 4 ovulations (*1 was AI attempt on July 6*)
 - ❖ Helene - 2 ovulations, 2 HAF's
 - ❖ Nikita - 1 ovulation
 - ❖ Victoria - 2 ovulations
 - ❖ All ovulated between 36-48hrs post induction
- ❖ Monitor hormones through feces

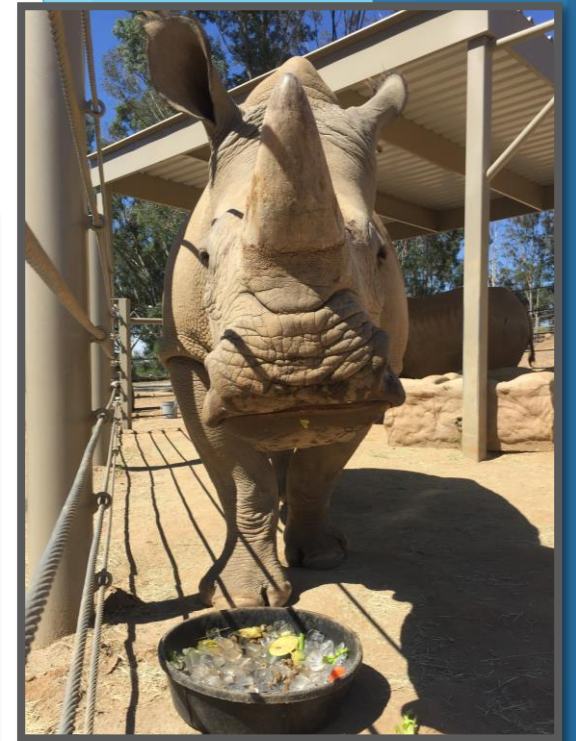


SWR "Amani" Fecal Progesterone



Research Project = Animal Welfare

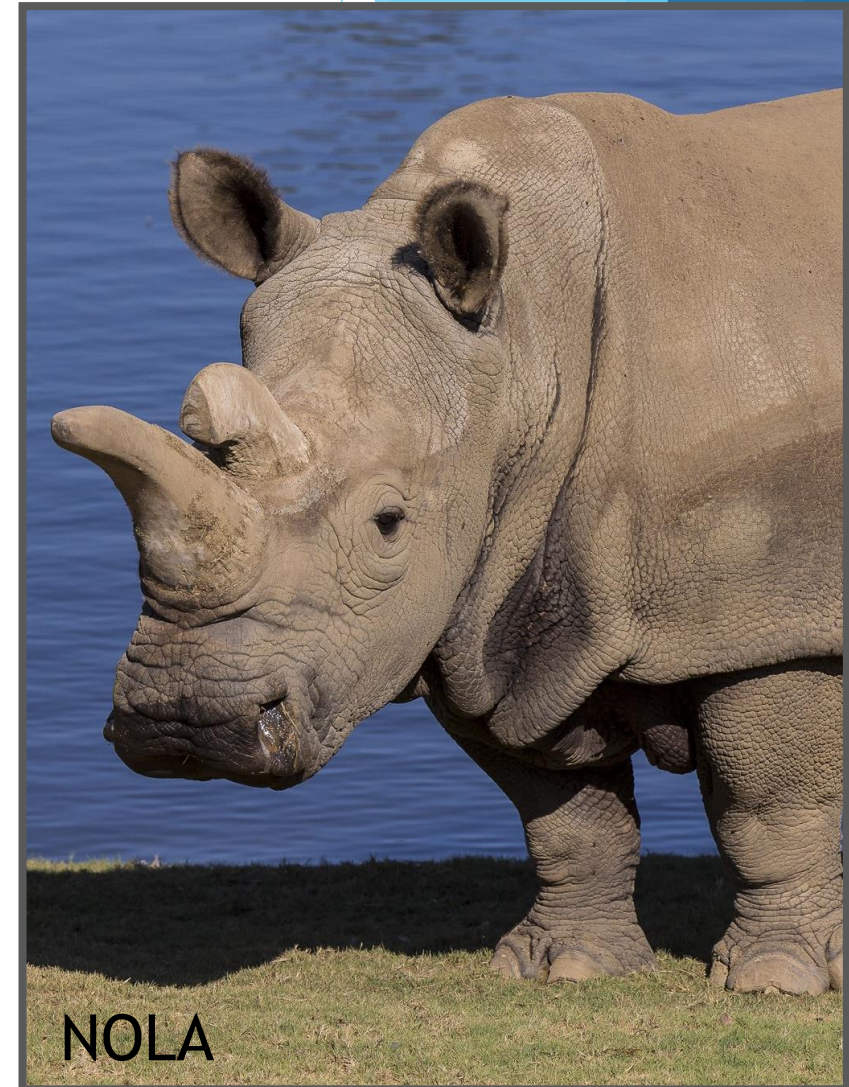
- ❖ **Weekly welfare assessment**
 - ❖ Critiqued in 12 diff categories
 - ❖ Created by our vet staff
- ❖ **Full time research associate**
 - ❖ Hiring soon - 2yr temp position
 - ❖ develop and maintain a comprehensive animal welfare behavioral monitoring system
- ❖ **Enrichment focused**
 - ❖ Automatic feeders (Feedpod)
 - ❖ Once a week “enrichment day”



Overview

- ❖ The Rhino Rescue Center was built in response to goals made by the Northern White Rhino Initiative.
- ❖ New cell technology will hopefully allow for SWR to be surrogates for NWR calves.
- ❖ We hope to hit all our reproductive goals over the years while exceeding animal welfare standards.
- ❖ This project truly represents San Diego Zoo Global's mission...

“bringing species back from the brink of extinction.”





THE END