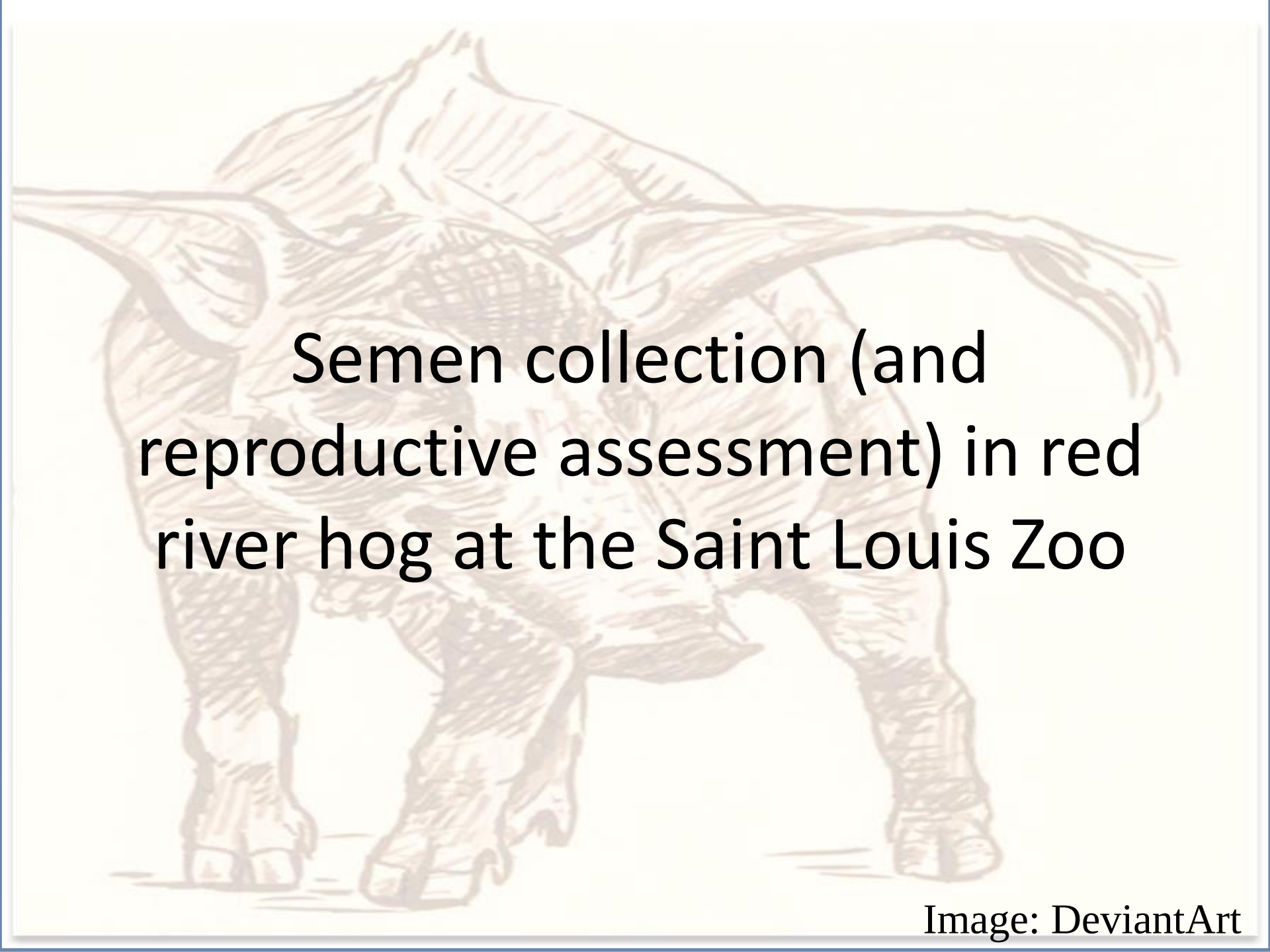


Semen collection (and reproductive assessment) in red river hog at the Saint Louis Zoo

Image: DeviantArt

Background

- RRH was identified a species of concern at the Infertility Workshop (AZA Midyr in Memphis)
- Stl Zoo has had much success breeding suids, but none to date with red river hogs (RRH)

- Our goals:
  - To assist the SSP through extra effort to fulfill our breeding recommendation for this pair
  - To better understand if any aspects of husbandry or our habitat need to be modified to maximize the likelihood of reproductive success for this (and future pairs)

Our RRHs

Female "Tulia" Sbk 95

- ~13.5 yrs
- Never contracepted
- 3 litters previous to arrival at Stl Zoo (06, 07 & 08)
- Arrived Stl Zoo Oct 08
- Paired with diff male from 08-12;Intro to "Flint" Apr 13
- Mounting and intromission seen in 2014, mounting seen in 15 & 16
- Endocrine monitoring in 14 found no evidence of pregnancy

Male "Flint" Sbk 320

- 6.5 yrs
- Never contracepted
- No previous reproductive experience
- Arrived at Stl Zoo Dec 12
- Intro to "Tulia" Apr 13
- Smaller physically than typical male
- Possible preputial diverticulitis in past

Our RRH habitat

- Mixed species habitat – bat eared fox (0.4) & Egyptian geese (1.1) from 2013-15
- Outdoor habitat 5500sq ft; 4 stalls ~70sq ft ea.
- Share space at all times currently, except for 2 grain feeding times
  - However in past they have had times when they were separated at night

Our Approach

- Research
  - Breeding & Transfer Plan
    - Background
    - Life Tables
  - Husbandry and reproductive information
    - Internal (Animal Care Staff)
    - External from the zoo community
  - Literature search
- Operationalize
  - On-going

RRH Reproductive Information

- Seasonally polyestrous (~Dec – summer)
- Estrous length:
  - 34-37d: Berger, Ani Repro Sci 2006
  - 23 d (16-30d range): Bryant, JZAR 2016
- Successful reproduction (AZA)
  - 1-18yrs males
  - 1-13yrs females
- Semen collection has been attempted, but not successful (per Newell-Fugate & Penfold)

Relevant Reproductive Information – suids in general

- Boars have a preputial diverticulum which accumulates urine, sloughed cells and secretions which leads to mature boar odor

- Evidence in the literature that sexual interest is increased after a time of separation

Male

- Decision to relocate the male to a different habitat to create pair reunion scenario
  - Gone from 1/30 to 3/10/17
- Fertility Evaluation
  - Recommendation from the Infertility Workshop and AZA RMC 2016 meeting
    - AZA Animal Health Committee is working on a process for this to be done during routine exams, e.g. quarantine, intra-zoo moves, etc.

Semen collection

- Anesthetized with combination of: ketamine, butorphanol, midazolam & medetomidine for transport to different habitat
- Due to reproductive anatomy, we utilized a combination of: catheterization (and flush) of the preputial diverticulum, manual massage, and electro-ejaculation

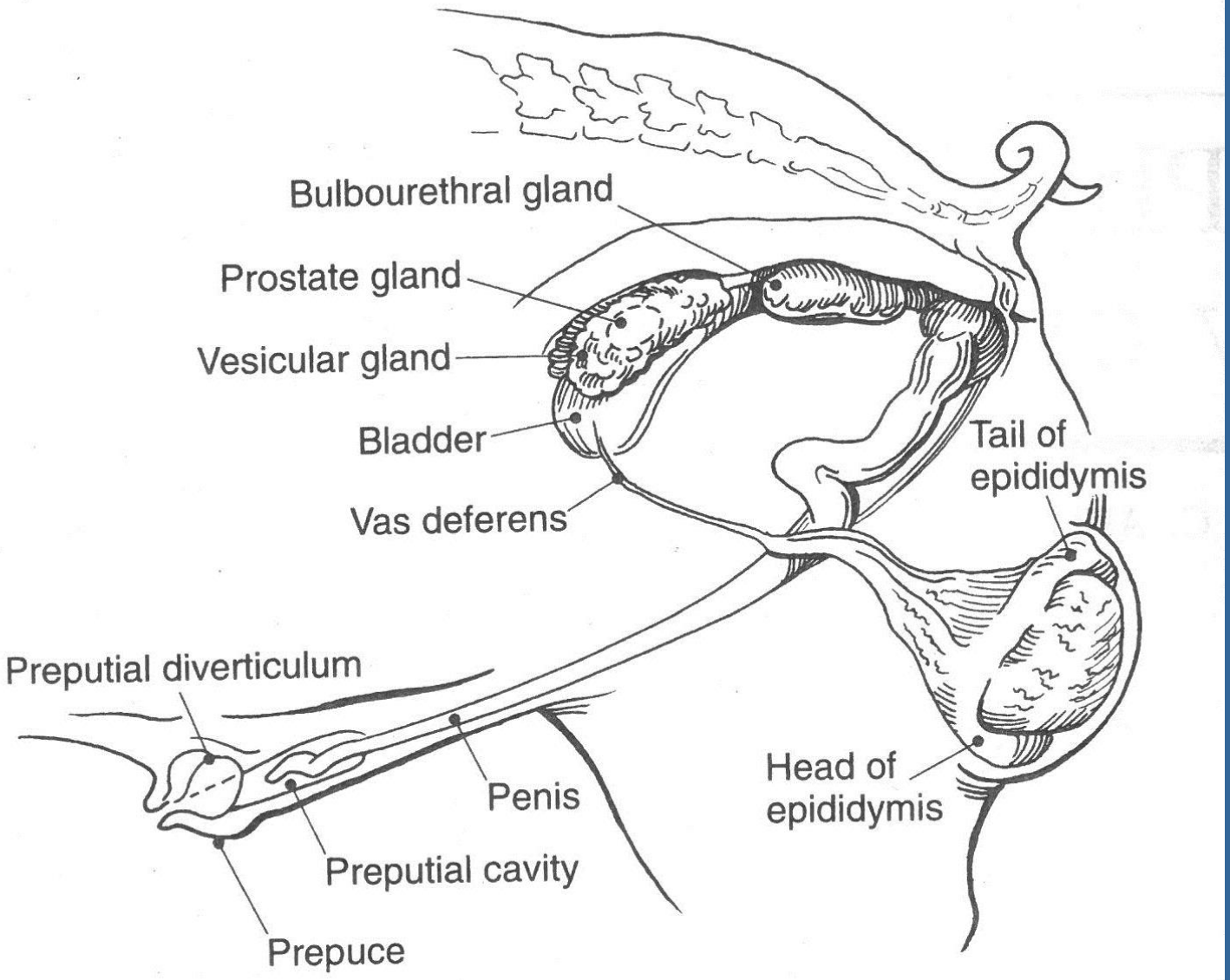


Fig. 94-1 Boar reproductive tract in situ.

Photo: Current Therapy in Large Animal Theriogenology 2007, Youngquist and Threslfall, Eds

Semen collection

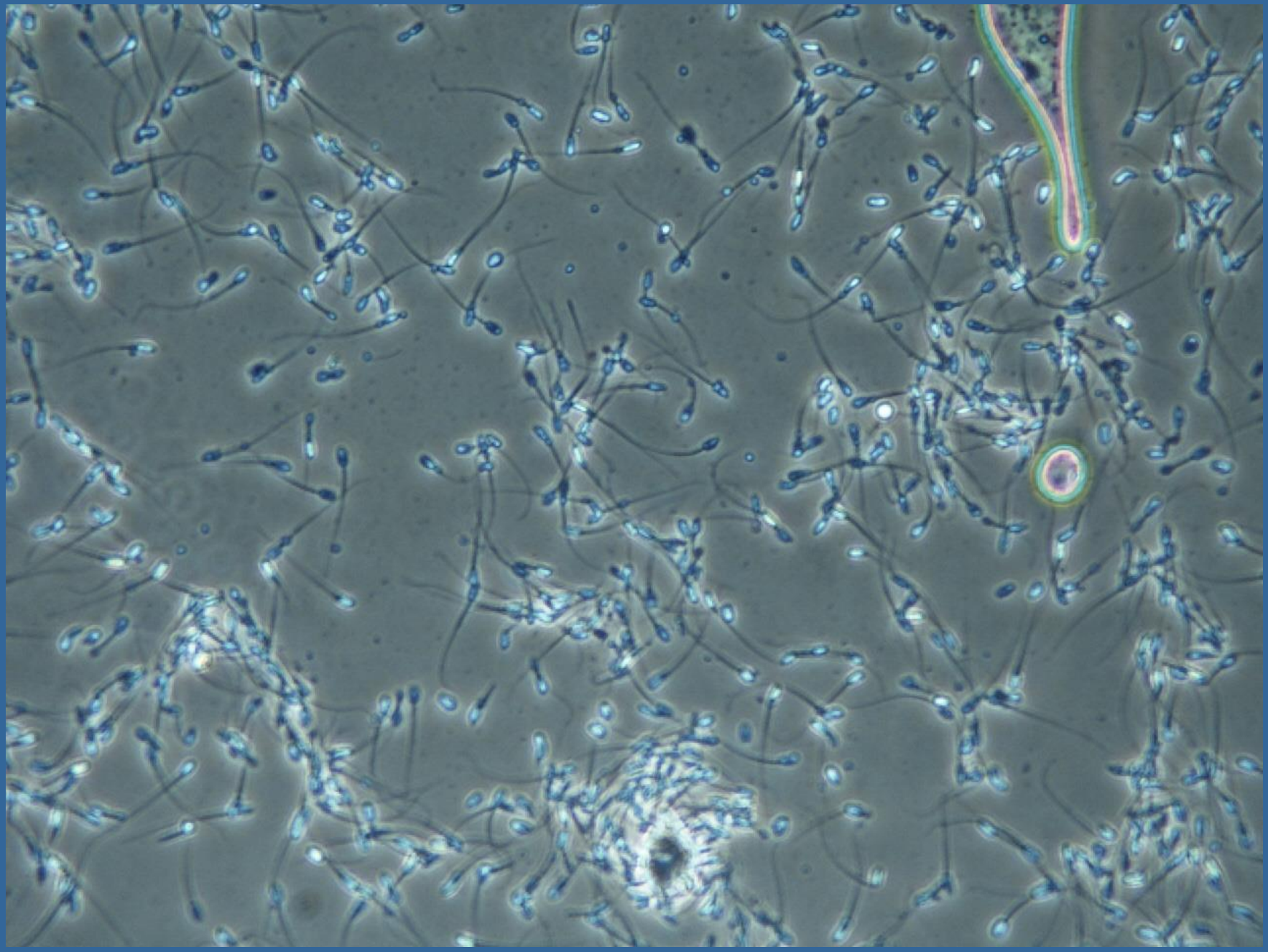
- Flushed 12ml of saline into the diverticulum using a cattle embryo transfer pipette
  - Retrieved 11.5ml of fluid back – sample was cloudy with a slight yellow coloration; no sperm
- Electro-ejaculation (EEJ) conducted
  - Using Platz #6 probe and Seager EEJ unit
  - Penis was not exteriorized despite attempts to do so manually; sigmoid flexure makes this challenging
  - Collected 7.5ml of cloudy fluid that was more yellow via; no sperm

Semen collection

- Due to presence of urine in the sample, we again used a cattle embryo transfer pipette to collect the fluid in the diverticulum from the EEJ; 53ml collected.
  - sperm present, but immotile
- Second EEJ attempt combined with manual massage of penis moved to the cranial prepuce
  - Yielded uncontaminated amount of coagulum containing motile sperm
  - First amps 100mA, last amps 300 mA

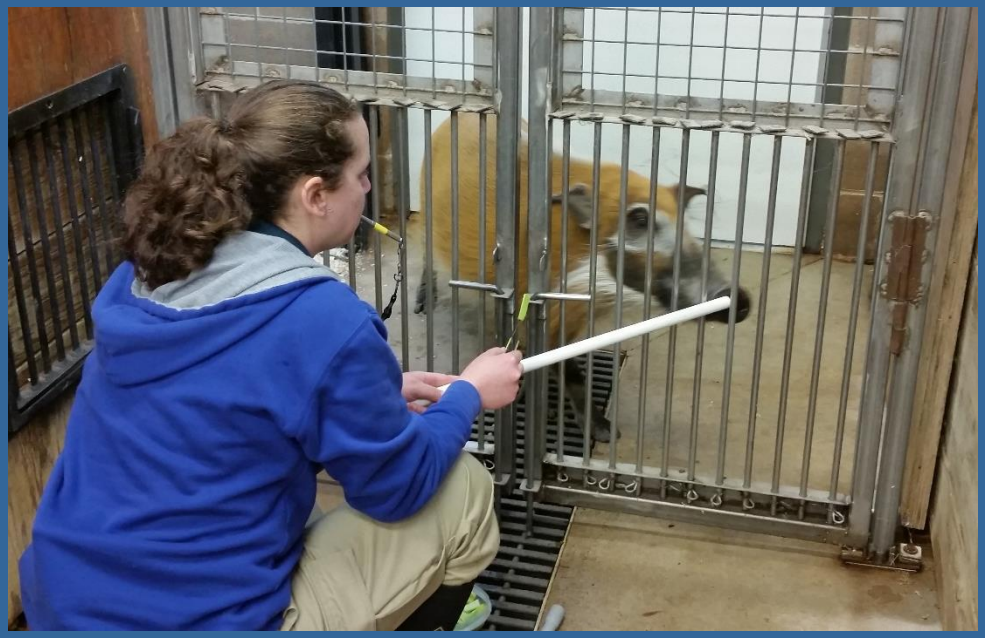
Sample details

- ~1ml of coagulated semen
- Cloudy in color with a pH of 8.1
- Initial total motility was 50%; with 40% progressive and status 4
- Stained with Eosin/nigrosin for morphology assessment. 60% normal; 95% live
- Sample brought back to Lab
  - Photos taken
  - Placed in 37° dry oven hoping to dissolve coagulum (didn't work)



Female

- Endocrine monitoring of ovulatory cycle
- Train female for reproductive ultrasound



Breeding behavior

- Video cameras used to monitor interest ‘howdy’, introduction, and once the pair was reunited
- Live observations conducted when the pair was in the habitat until 2 days post copulation
  - Mounting and intromission observed in habitat 10 days following reunion

The future??

Photo: San Diego Zoo