



Three Methods for Management of Zoological Bird Populations

Thomas Jensen, Ph.D.
San Diego Zoo Institute for Conservation Research
Reproductive Physiology

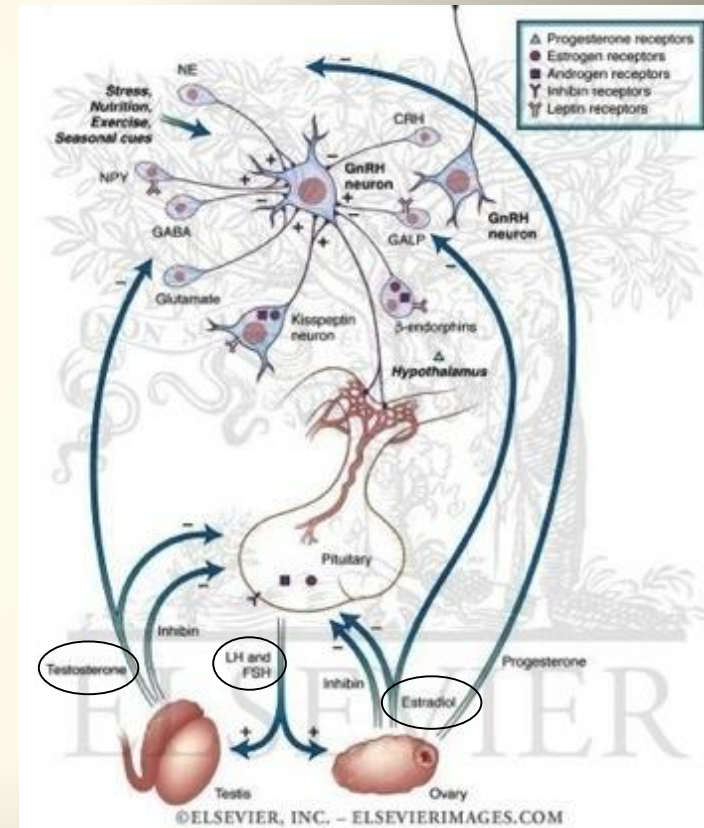
SAN DIEGO ZOO
INSTITUTE FOR
CONSERVATION
RESEARCH.

Development of breeding management techniques

- Reproductive hormone manipulation of birds
 - GnRH administrations
- Evaluating sperm function and egg fertility
 - Oocyte membrane-bound sperm detection
- Population sex ratio manipulations
 - *In ovo* sexing

GnRH study

- Management of non-reproducing pairs/individuals
 - Lack of reproductive behaviors
 - No increase in steroid hormones
- Stimulation of breeding by GnRH
 - Stimulate anterior pituitary release of LH/FSH
 - Increase steroid production
 - Increase breeding

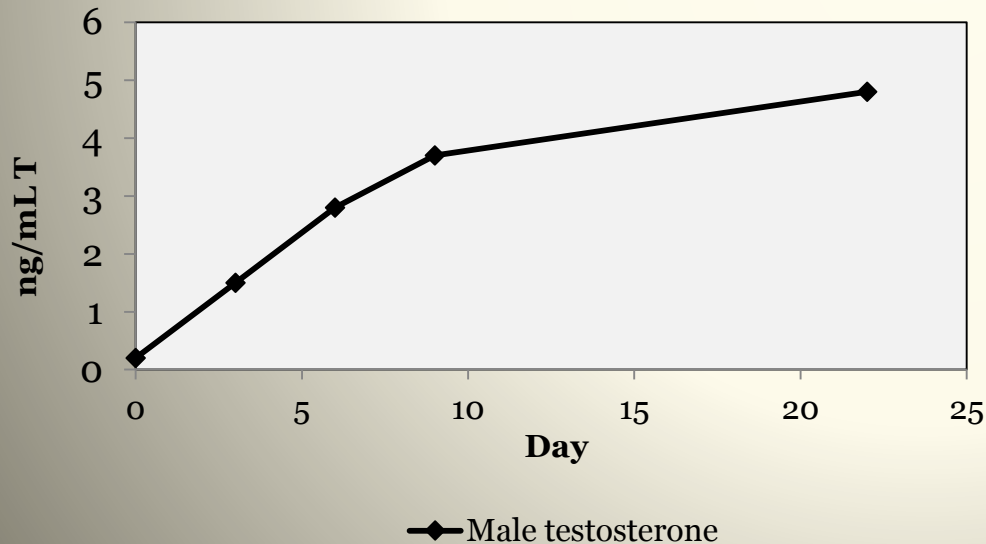


GnRH study

- Preliminary results:
 - Significant increase in T (male)



Demoiselle crane GnRH response

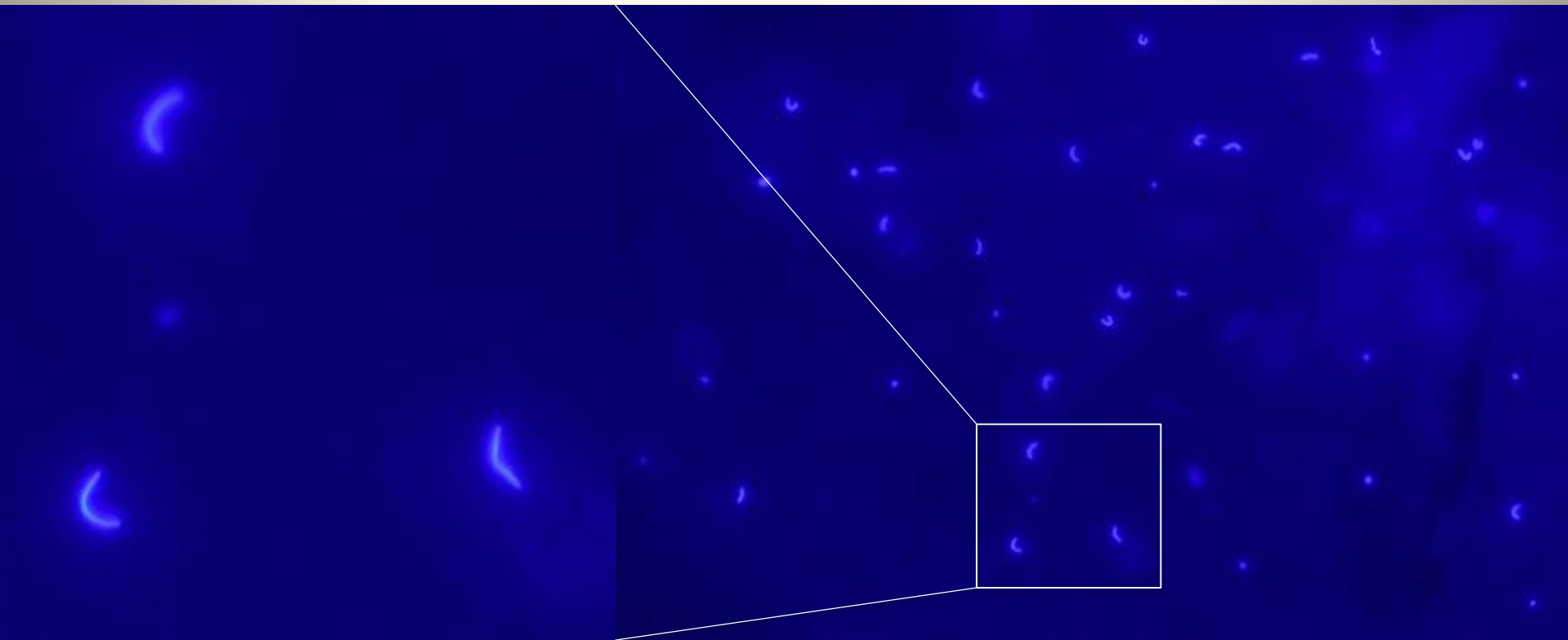
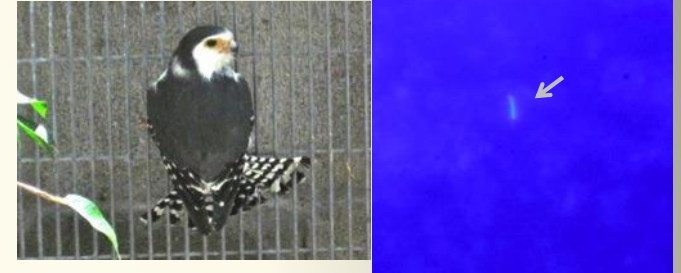


Oocyte perivitelline membrane sperm detection

- Detection of sperm on oocyte perivitelline membrane
 - Eggs with no visible embryonic development
 - Fertile (early death) vs. infertile
 - Indirect determination of egg fertility
 - Sperm functionality
 - Physiological compatibility between male and female
 - Verify AI



Oocyte perivitelline membrane sperm detection



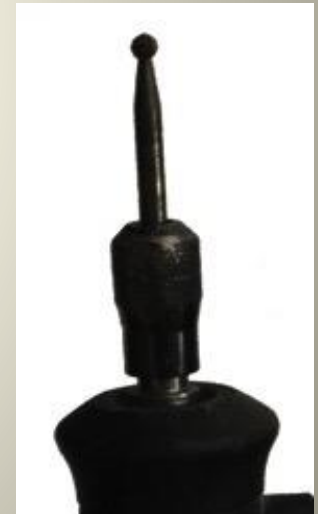
In Ovo Embryo Sexing

- Gender determination of avian embryos prior to hatch
- Sex skewed populations
 - Resource drain
 - Eggs not incubated
 - Embryo sexing allow incubation of specific sex



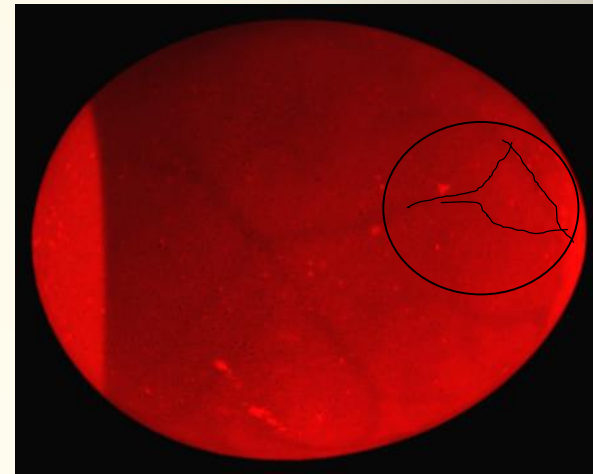
In Ovo Embryo Sexing

- Belt sander
 - Larger/dark eggs
 - Incubator
 - Large area for finding vessels
- Dremel tool
 - Small hole
 - Easy to repair
 - Hard to hit vessel in thick shelled eggs
- Emory board
 - Good for very small thin shelled eggs

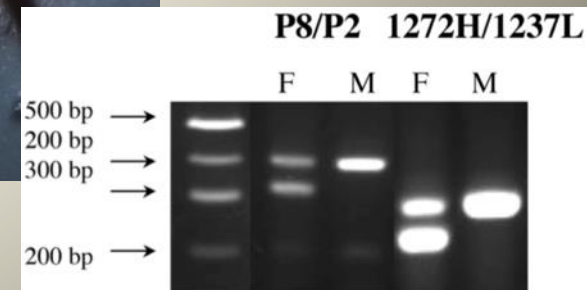
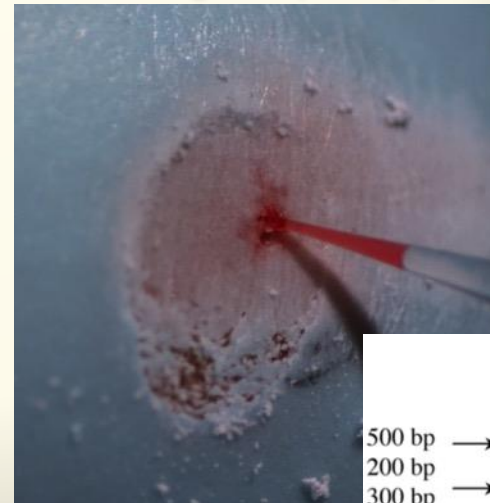


In Ovo Embryo Sexing

- Blood draw
- Insulin needle
 - 27g
 - Good for large egg
 - Requires hand dexterity and practice
- Pulled glass capillary needle
 - Very small
 - Essential for small eggs
 - Requires hand dexterity and practice
- DNA sexing using blood



Stage 36 (10days)



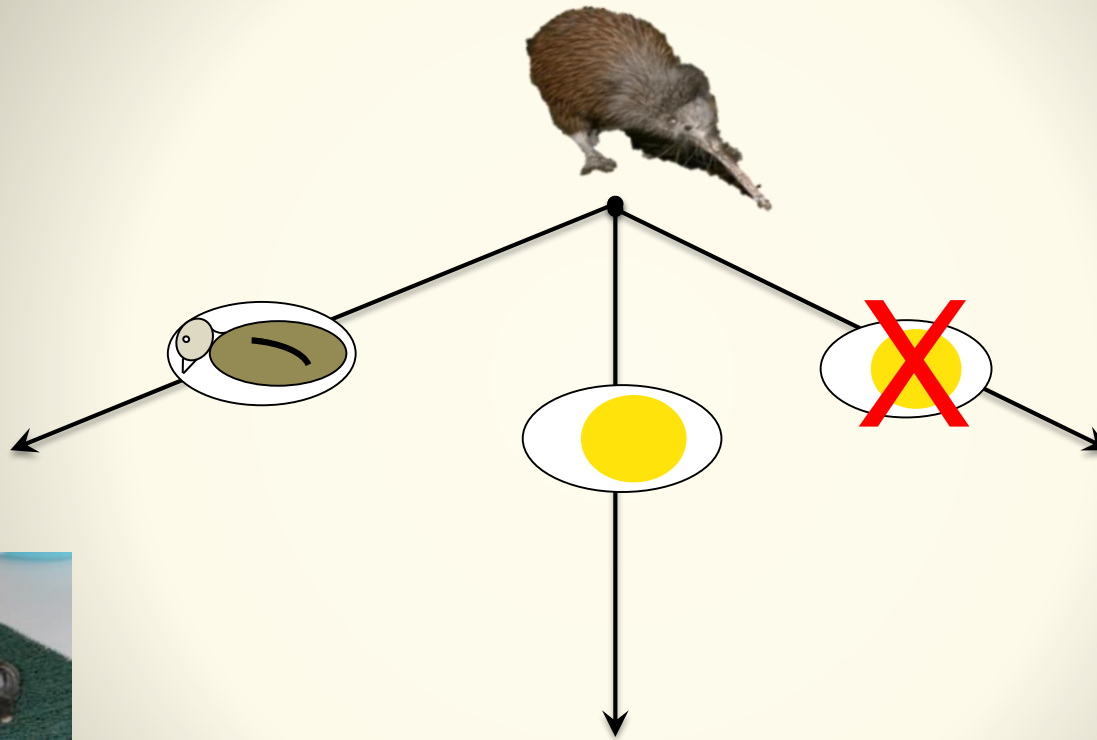
In Ovo Embryo Sexing

This technique is used on several species in the SDZG bird collection

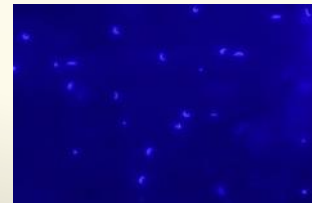
- Elegant crested tinamou
- Storm's stork
- Africa pygmy goose
- Mandarin duck
- Helmeted guinea fowl
- Red-crowned crane
- Madagascar buttonquail
- White-throated ground dove
- Mindanao/Bartlett's bleeding-heart dove
- Greater roadrunner
- Abyssinian ground-hornbill
- Oriole warbler
- Red-billed malkoha
- Barbary dove
- Scarlet ibis
- Sacred ibis
- Chinese monal
- Himalayan monal



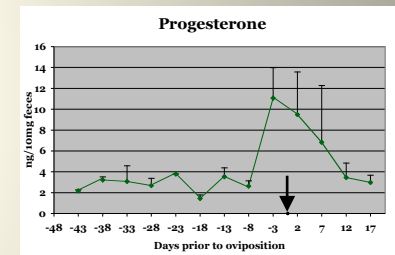
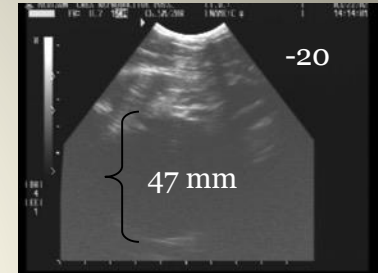
Avian Reproduction Program



In ovo sex determination
for management



Perivitelline membrane
sperm detection



Hormone analysis
Ovarian ultrasound



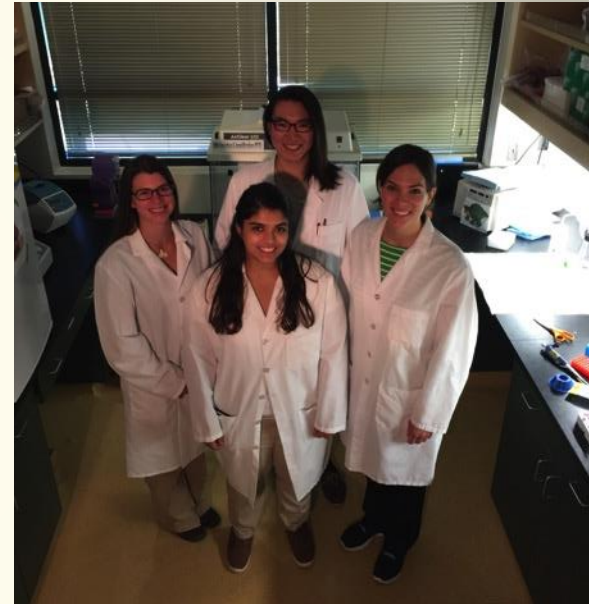
GnRH hormone
treatment



Acknowledgements

- Reproductive Physiology

- Dr. Barbara Durrant
- Chelsea Mannie
- Kaitlin Croyle
- Madhawi Alohalo
- Kyle Hatashita
- Mandi Roe
- Nastassja McDonald/Imus
- Brian Sodeman
- Zerlina Clementsmith
- Matt Poling
- Volunteers



- Collaborators

- Suellen Charter (Genetics Division)
- Wildlife Diseases Lab (Pathology)
- Dr. Thomas Spady CSUSM
- Dr. John Parks Cornell
- Dr. Isabel Castro Massey University New Zealand

Corners Limited
is the proud sponsor of the
2015 ASAG Workshops



Avian Scientific Advisory Group

Questions?

