Fertility Control in Wild Horses

An Overview

November 2009

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Australian Brumby Alliance

Australian Brumby Alliance Inc.

Assateague Island

Maryland/Virginia, USA

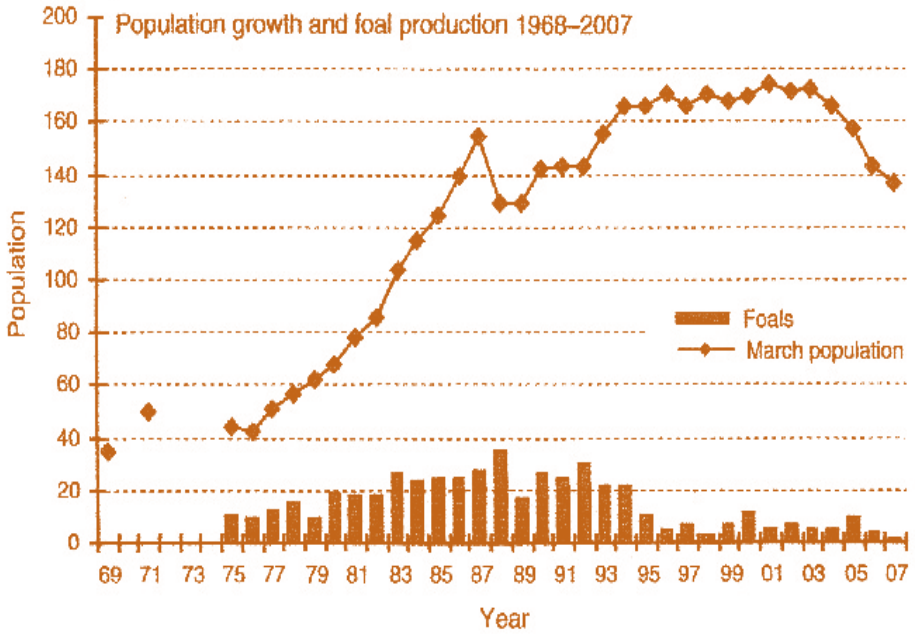
Earliest and longest wild horse fertility control study

Tropical Storm Ida – November 2009 Assateague Island

Assateague Island

Population growth and Foal Production

- **1975-1988**: 11.8% growth with no management
- **1985-1993**: research to evaluate the use of immunocontraception
- **1989-1992**: decline in population due to removal of some horses as well as storms and disease
- **1995**: contraceptive management program fully implemented
- **1997**: population stabilized
- **2002**: population started to decline



Kirkpatrick and Turner, 2008

Assateague Fertility Control Plan

1994-1997 - All mares 2 yrs and older given a primer shot.

This made the herd a “one-shot” herd.

Years 1-3, all mares up to 4 years old treated.

Mares over 4 years not treated

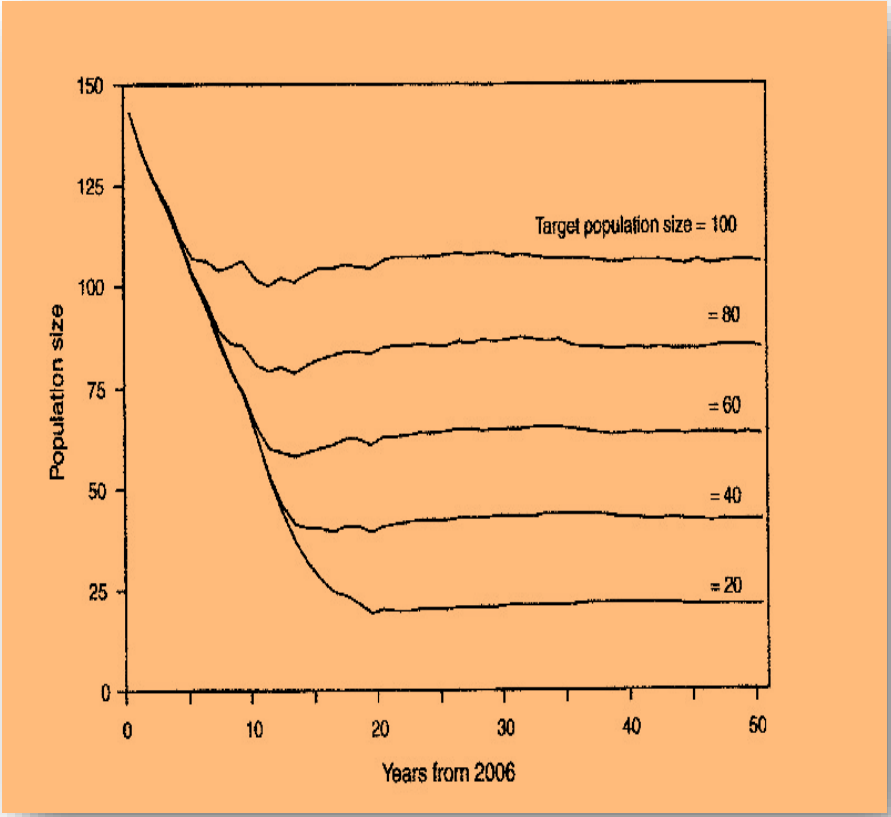
Allowed 3 foals then treated for rest of life

Assateague Contraceptive Management

- But population remained stable for some time
- 1998- only two foals allowed for each mare
- 2000 – only 1 foal allowed for each mare
- Fertility control lowers mortality rate in mares

Benefits from Assateague

- Better understanding of fertility control on populations
- Refinement of modelling
- Development of software tools
- Better forecasting for management



Ballou, et.al., 2008

Little Bookcliffs Horse Management Area

View from LBC towards Grand Junction Colorado and the Colorado Monument National Park

Little Bookcliffs HMA

Managed by US Bureau of Land Management

One of 3 BLM ranges set aside specifically to protect horses

36,113 acres

Rugged canyon and plateau country

Little Bookcliffs HMA

90-150 horses (AML)

Gatherings every 3-4 years

PZP Fertility Control

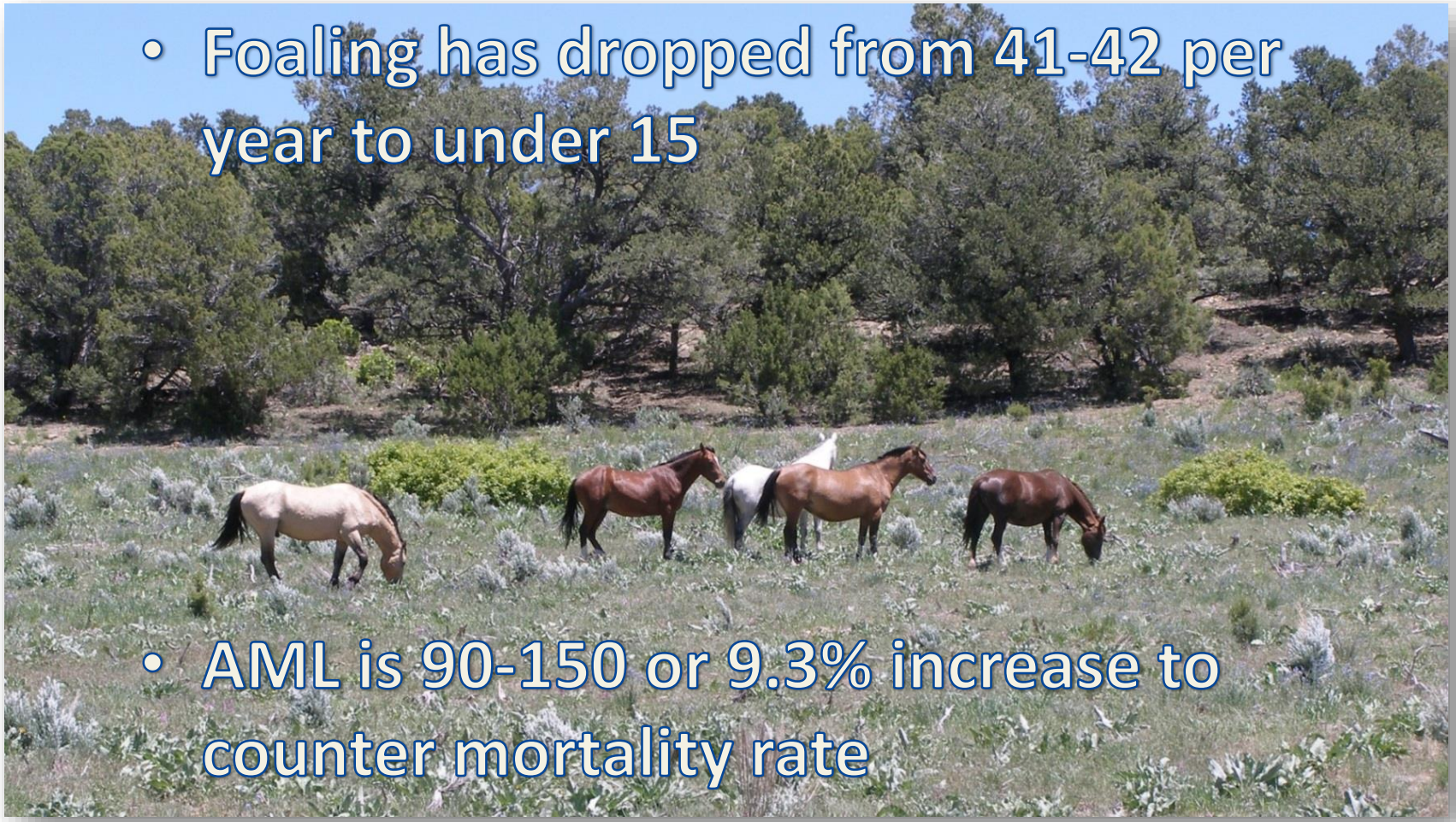
Assisted by Friends of the Mustangs

Little Bookcliffs

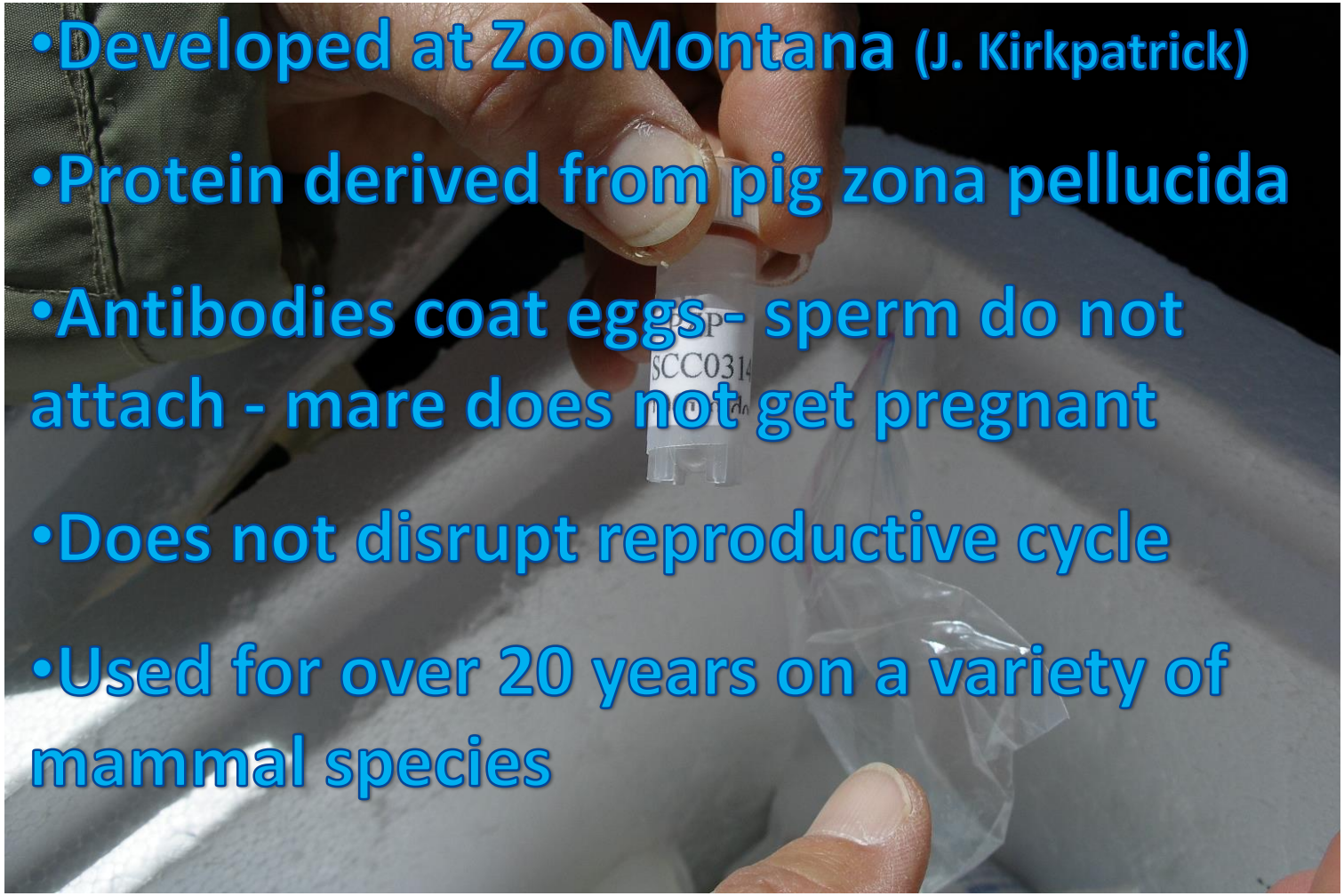
Fertility control program

- 4 year USGS study completed 2008
- Program continued by BLM
- Mares under 4 and over 10 generally treated
- Others contribute to gene pool
- Adjust program according to season and adoption outcomes

Little Bookcliffs Stallion and his PZP mares



Porcine Zona Pellucida - PZP



PZP Delivery

Remote dart delivery

Mixing the adjuvant and PZP

Charging the dart

Remote darting

Checking distance

Set distance for shot

Gonadotrophin-releasing hormone GnRH – an alternative to PZP

- Interrupts reproductive cycle
  - Stimulates production of antibodies that surround endogenous GnRH
  - This in turn suppresses follicle stimulating hormone and lutenizing hormome
- Also used in males to suppress aggressive behaviour
  - Reduces semen quality/quantity but insufficient for contraception

PZP Delivery Improvements

Controlled Release Pellets

- Single shot
- Vaccine mixed with polymers for specified time release
- 1 and 2 year vaccines
- Delay in return to fertility
- Remote darting possible but not reliable

SpayVac

- Single shot
- Vaccine mixed with liposomes (cholesterol and lecitin)
  - lengthens the period of immuno-response.
- Shown effective over 4 years
  - Antibody levels decrease in years 1-3 but increase in year 4
  - Suggests self boosting of immune system
- Some evidence of increased frequency of cycling

Comparative Study multi-year contraception

Killian et al, 2008

Control group Foaling rate	75%	75%	88%	100%
Study Group	Contraception	Rates		
IUD	80%	29%	14%	0%
GonaCon	93%	64%	57%	43%
SpayVac	100%	83%	83%	83%

The Holy Grail - Oral Contraception

Need to distribute widely and repeatedly in environment

Lack of species specific actives

Species-specific tailoring can be through:

- Vaccine compound
- Delivery method

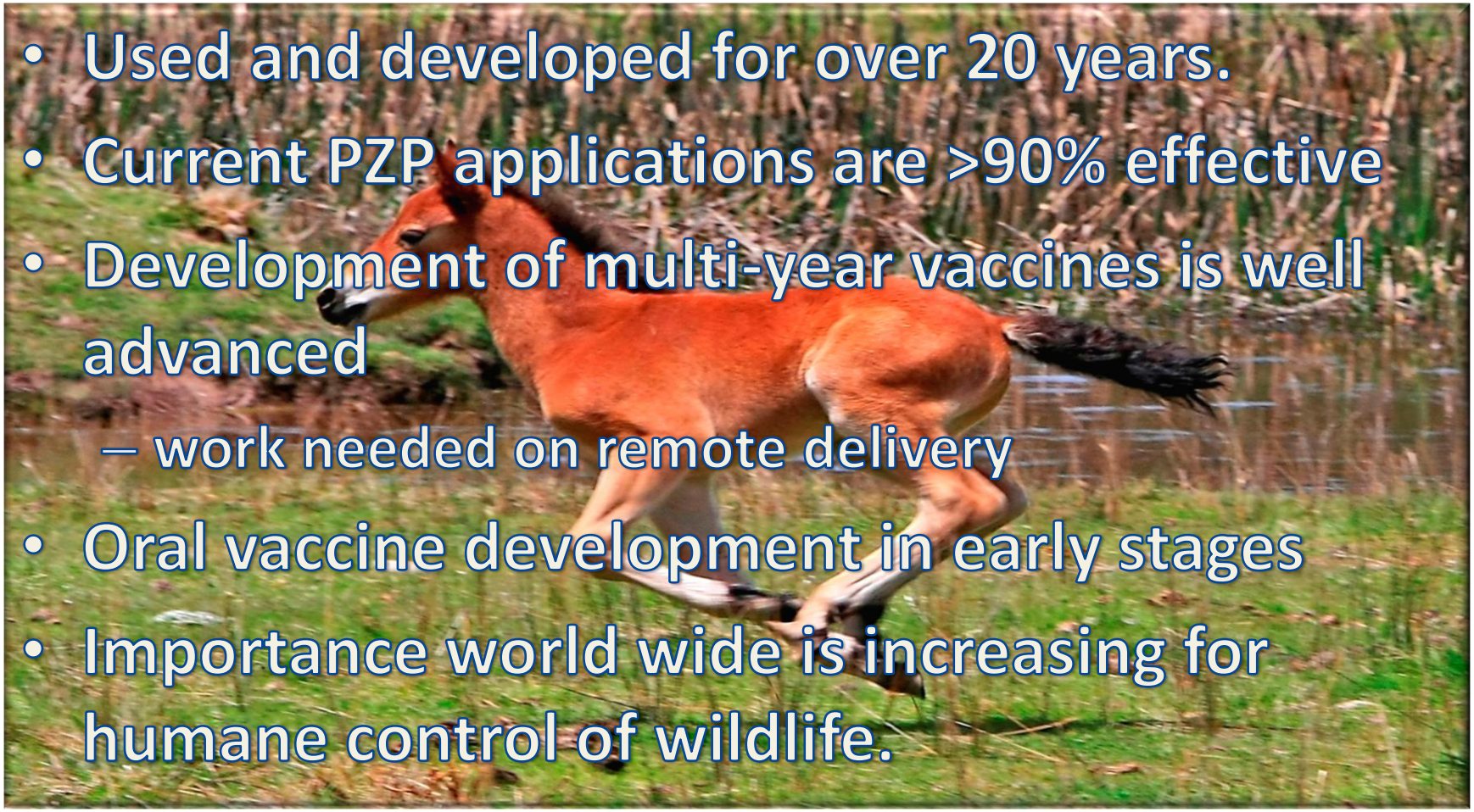
Research on:

- Synthetic chemistry
- Immunocontraception
- Sterilisation actives

To date, viral vector research in Australia for foxes, rabbits and house mice has cost over $15M over 12 years.

It will be a while.....

Wildlife Fertility Control -Summary



- Used and developed for over 20 years.
- Current PZP applications are >90% effective
- Development of multi-year vaccines is well advanced
  - work needed on remote delivery
- Oral vaccine development in early stages
- Importance world wide is increasing for humane control of wildlife.

References

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Butch Roelle (USGS), Jason Ransom (USGS), Allan Sheppard (US Bureau of Land Management), meeting at USGS Fort Collins Colorado Science Centre, June 2008,

Websites

ZooMontana Science and Conservation Centre: http://www.zoomontana.org/conservation_center/index.html

Wildlife Fertility Control
http://www.pzpinfo.org/pzp.html

USGS Fort Collins Science Centre
http://www.fort.usgs.gov/WildHorsePopulations/Resources.asp

SpayVac for Wildlife Org – www.terramar.bc.ca/