Farm A: Overview

• Established in 1999 in upper lower Michigan for captive hunting of white-tailed deer

• 320-acre farm (129.5 hec)
  – 20 acres (8 hec) of handling facilities, small pens, and associated outbuildings
  – 300 acres (121 hec) of natural woodland containing multiple meadows
    • Managed as a single enclosure
    • Tree and shrub species: red and white oaks, yellow birch, red maples, sumac, dogwood, white pine and black spruce
    • Forage in meadows: various native grasses, forbs, and clovers
    • 8 miles of trails through the enclosure

• ~300 deer
  – ~1 deer per acre (~1 deer/2.5 hec)
Farm B: Overview

- Established in 1993 in south central Pennsylvania for breeding and captive hunting of white-tailed deer

- 200-acre farm (81 hec)
  - 50 acres (20 hec) of handling facilities, small pens, and associated outbuildings
  - 150 acres (61 hec) subdivided into 15 managed pastures, some contain clumps of natural woods
    - Deer are rotationally grazed in 3 groups through the pastures
    - Pastures have been planted with a mixture of perennial ryegrass, timothy, fescue, red clover, and lucerne

- ~300 deer
  - ~10 deer per acre (~25 deer/hec) on the pastures being actively grazed at any one time
Personnel

Farm A

• 3 regular employees
  – All are employed full-time
  – 2 are college graduates
    • 1 with BS in animal science
    • 1 with BS in fisheries and wildlife
  – 30 years collective experience in farming livestock
  – 20 years collective experience raising deer

Farm B

• 6 regular employees
  – 4 are employed full-time and 2 are part-time
  – 3 are college graduates
    • 2 with BS in animal science
  – 95 years collective experience in managing livestock
  – 80 years collective experience working with deer
Farm A: Farm Description

• The farm is located 45 miles (72 km) from a major highway
• 10’ (3 m) double fence of high tensile woven wire surrounds the enclosure
• 6 permanent deer blinds are located in the enclosure
  – 1 per 50 acres (20 hec)
Farm B: Farm Description

• The farm is located .5 mile (.8 km) from an interstate highway

• 8.5’ (2.6 m) single fence made of high tensile woven mesh surrounds each pen, pasture, and alley

• 5 deer stands are located in a subset of pastures that are used for captive hunts
Farm A: Animal Handling

- A portable handling facility is set up in an unwooded corner of the enclosure
  - Deer netting is used to create temporary fences around a feeding area
Farm A: Animal Handling

- Animals only handled for medical and identification purposes
  - Two days prior to handling, supplemental feed is provided only in the feed troughs in the handling area
  - Deer are moved quickly into the handling area using 4 wheelers and dogs
  - Humans and dogs move groups of deer into the gathering pen
  - Deer are not presented with water in the handling area

- A drop floor crate is used to restrain deer for ID, vaccination, TB testing, and blood sampling

- Deer are identified with a combination of an ear tattoo and an RFID* tag

*RFID = Radio-frequency identification tag
Farm B: Animal Handling

- The 15 managed pastures are divided into 3 groups of 5 pastures
- For each group of 5 pastures, there is a centrally located handling facility and holding/breeding pens
  - 5 pens; 0.75 acre each (0.3 hec)
  - Pens contain the water and supplemental feed sources for the deer

Adapted from Haigh & Friesen, 1995
Farm B

- Each handling shed uses curved races, sliding doors, and rotundas to move deer forward
- A hydraulic crush is used to restrain deer in the working area
- Sorting doors are located at the exit
- The interior of the handling shed can be dimmed during handling of deer

Adapted from Figure 2. Haigh & Friesen, 1995
Farm B: Animal Handling

- Deer are herded slowly from the pastures to pens using employees on horseback
  - Because water and supplemental feed sources are located in the pens, little herding is needed

- Deer are handled for medical exams, tattooing, and breeding purposes

- Deer are also moved regularly through the alleys in the handling area when they are rotated between pastures
  - Horses and dogs are used to quietly move deer between pastures

- Deer are identified using a visual ID tag in the left ear
Farm A: Nutrition

• Deer are free-range and can forage the 300 acres of the fenced enclosure

• Natural habitat provides forage from a variety of trees, shrubs, and annuals
  – maple, birch, white pine, sumac, dogwood, clovers, grasses, broad-leafed plants, etc.

• Water is provided via a river running through the enclosure and small ponds
Farm A: Nutrition

• Deer receive free choice supplemental feed from October-March in covered homemade feeders
  – Pellets and cottonseed mix (11% total protein)

• 12 covered feed troughs
  – 1 per 25 acres (10 hec)
  – Feed is stored in wooden bins with hinged lids near each feeder

• Feeders are:
  – Checked and filled every 2-3 days
  – Cleaned and disinfected monthly throughout the year
Farm B: Nutrition

• Deer are kept in managed 10 acre (4 hec) pastures
  – Perennial ryegrass, timothy, fescue, red clover, and lucerne
  – Deer are rotated between pastures when vegetation gets below 5 inches (13 cm)
Farm B: Nutrition

• Pelleted deer feed is provided October through June using gravity drop tripod feeders
  – Primary ingredients are soybeans and corn (20% total protein)
  – 1 located in the handling/breeding pen associated with each pasture
  – Feed is stored in galvanized steel containers near the handling facilities

• Feeders are:
  – Checked daily and filled as needed
  – Cleaned and disinfected every 2 weeks

• A mineral lick and heated water trough are located in the pens near each feeder
  – Troughs are cleaned weekly
  – Troughs are disinfected every other cleaning
  – Mineral licks are replaced as needed

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Farm A: Veterinary Care

• Health evaluation is performed every spring by farm personnel
  – Physical exam for signs of injury and disease
  – Animals diagnosed with HD are euthanized immediately
  – No routine vaccinations
• Veterinarian is called in case of emergency and for any DNR testing
• Garlic powder is added to supplemental feed throughout the year as a natural dewormer
• Feeders are sprayed monthly with 10% pemethrin July – September
• Certified TB and CWD clear (double fencing system and DNR certification)
• Closed Herd

CWD = Chronic wasting disease, TB = tuberculosis, HD = hemorrhagic disease, DNR = Department of Natural Resources
Farm B: Veterinary Care

- Health evaluation every 6 months by farm personnel and veterinarian
  - Physical exam (including hooves) and tests for worms, CWD, TB, HD, and Necrobacillosis
  - Vaccinated annually with Fusogard™ (inactivated *F. necrophorum* bacterin)

- Pour-on de-worming medication administered during health evaluations
  - Cydectin® (moxidectin) and Ivomec® (ivermectin) are alternated at each deworming

- Feeders, waterers, and handling facilities (and other equipment used during summer) are sprayed every two weeks with 10% pemethrin July – October

- Animals diagnosed with hemorrhagic disease are euthanized immediately
  - Immediate physical exam is made of other deer

- Certified TB and CWD clear (DNR certification)

- New stock are brought in early each spring
  - quarantined for 6 months before introduction into herd

*CWD* = Chronic wasting disease, *TB* = tuberculosis, *HD* = hemorrhagic disease, *DNR* = Department of Natural Resources
Morbidity and Mortality

Farm A

• Average annual mortality
  – Fawns: 31.8%
  – Yearlings: 7.5%
  – Adults: 5.9%

• Average annual morbidity (all age classes)
  – Hemorrhagic disease: 24%
  – Necrobacillosis (lumpy jaw): 3.3%
  – Pneumonia: 0.3%
  – Salmonellosis: 0.7%

• Average # of injuries/handling event
  – Fawns: 3.7%
  – Yearlings: 8.6%
  – Adults: 5.6%

Farm B

• Average annual mortality
  – Fawns: 24.6%
  – Yearlings: 3.1%
  – Adults: 4.0%

• Average annual morbidity (all age classes)
  – Hemorrhagic disease: 11%
  – Necrobacillosis (lumpy jaw): 4.0%
  – Pneumonia: 0.6%
  – Salmonellosis: 1.1%

• Average # of injuries/handling event
  – Fawns: 1.6%
  – Yearlings: 5.2%
  – Adults: 5.1%
Farm A: Breeding

- Closed, natural breeding herd
  - 1 buck per 10 does
  - 88% conception rate
  - Pregnancy is assessed during annual physical examination in the spring

- No human-animal contact is associated with breeding

- Genetics are not controlled
Farm B: Breeding

- A breeding plan selecting for health, vigor, and antler growth determines which does and bucks are mated

- Estrus in does is synchronized using half of a norgestomet (synthetic progestin) ear implant

- Semen is collected from selected bucks
  - Bucks are sedated and electroejaculated
  - Semen is also sold to outside farms

- Does are artificially inseminated in mid November using a transcervical method
  - Does are not bred until they are ~ 1.5 yrs old
  - Does are restrained in the crush, but not anesthetized during insemination
  - 75% conception rate

- Pregnancy is detected using a blood test 25 days after AI

- Open does are placed with a clean up buck in a breeding pen
  - 1 buck per 5 open does
  - Does are exposed for 10 days
  - 82% conception rate among remaining open does
Farm A: Pregnancy and Parturition

• Does remain in the main enclosure to give birth and typically choose a spot of herbaceous vegetation to deliver
  – Average of 1.5 fawns per doe
  – Average annual rate of dystocia: 5.6% (91% of dystocias result in death of doe and/or fawn)

• Employees on 4 wheelers drive through the enclosure 1x/day during the birthing season
  – Looking for does having difficulty giving birth
  – Document new fawns

• Human interaction during parturition/delivery is minimal
  – Difficult to capture or handle the doe in the extensive enclosure
Farm B: Pregnancy and Parturition

• All deer in a group remained housed together during pregnancy

• Pregnant does are moved into separate pens two weeks before parturition
  – 5 fawn-rearing pens; 4 acres each (1.6 hec)
  – Average of 1.8 fawns per doe
  – Average annual rate of dystocia: 5.1% (39% result in death of doe and/or fawn)

• Employees check on does in the pens 3x/day

• The veterinarian is called if a doe has been in active labor for more than 24 h
  – Employees will sometimes assist with delivery prior to the vet’s arrival
Farm A: Fawn Rearing

• Does naturally raise their fawns
  – Fawns begin consuming small amounts of vegetation when they are 3-4 weeks old
  – Fawns are typically weaned from milk by 10 weeks of age
  – Fawns continue to remain with does (males for ~1 yr and females for ~2 yrs)
  – < 1% of fawns develop scours

• Orphaned fawns are euthanized using a rifle at close range
Farm B: Fawn Rearing

• Does and fawns remain together in fawn-rearing pens for 1 week
  – Does are then moved as a group to a distant pasture
  – Fawns remain in the pen and are bottle fed using a rack system with multiple bottles
  – Fawns have free choice access to solid food (pasture and supplemental pellets)
  – ~5% of fawns develop scours and must be treated with antibiotics

• At 12 weeks of age, fawns are moved in groups to new pastures that contain wooded areas (for natural cover and browse)

• Orphaned fawns are housed in straw-bedded, enclosed calf hutches within the fawn-rearing pen for 1 week
  – Orphans are individually bottle fed for 1 week (colostrum for the 1st 24 h)
  – Orphans are introduced to other fawns dam removal
Farm A: Hunting

• Hunts are available October – December
  – Management or trophy hunts are available
  – Hunts are 2 days long and all are guide-led
  – Maximum of 3 active hunters at one time
  – License required

• Rifle, or shotgun allowed
  – Guns must be tested for accuracy on the gun range upon arrival
  – Hunter safety talk is given by guide prior to start of hunt

• Permanent blinds are located near 6 of the feeders in the enclosure
  – Brush blind construction is possible at other locations with guide permission

• 12% of deer hit are wounded, not killed, by the first shot
  – Animals that are wounded are tracked by the guide and hunter
  – If the deer is not dead when found, the guide will shoot the deer to ensure death as quickly as possible
  – Typically < 2 h between wounding and death

• Killing an ineligible deer ends the hunt and results in payment of twice the deer’s value
Farm B: Hunting

- Hunts are available September – November
  - Management or trophy hunts are available
  - Hunts are 3 days long, and a guide is optional
  - Maximum of 4 active hunters at one time
  - No license is required

- Rifle, shotgun, muzzle loader, or bow hunting is permitted

- Permanent blinds are located in selected pastures at the edge of woodland patches

- 18% of deer hit are wounded, not killed, by the first shot
  - Animals that are wounded are tracked by the hunter or reported to the guide
  - Hunter has the option of finishing the hunt when the wounded deer is found
  - If the hunter declines or cannot find the animal, the guide will shoot the deer
  - Typically < 4 h between wounding and death

- Killing an ineligible animal results in payment of twice the killed animal’s value, but the hunt can continue