

Slide 1: NATURAL HISTORY of WHITE-TAILED DEER

CLASSIFICATION

Class: Mammal

Order: *Artiodactyla*. Even-toed ungulate, referred to as ruminant (chews cud & has four-chambered stomach)

Family: *Cervidae*. Along with elk, moose, caribou & mule deer; no incisor teeth on upper jaw.

Genus: *Odocoileus*.

Species: *virginianus*.

Subspecies: 30 total; Florida Keys Deer is smallest, Virginia White-Tail is found in south & much of east; Northern Woodland White-Tail is largest & thought to be the subspecies found in much of PA.

RANGE

- Southern Canada to Panama
- Absent from Northern Canada, Utah, and Nevada

SIZE

- Weight: average buck is 140 pounds live. Weights vary with age, sex, diet, and time of year. A buck can lose 25 percent of weight during breeding season.
- Height: average buck is 32-34 inches at shoulder and 70 inches long (not including tail).

COLOR

- Varies with season; grayish brown insulating coat in winter & reddish brown summer coat
- Melanistic: black; extremely rare.
- Albino: rare; piebald (or calico); more common.

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ANTLERS

- Size depends on diet, age, and genetics.
- Growth starts when longer days of March and April cause secretions from pituitary gland.
- Velvet: covering of skin to nourish antlers while growing.
- Soft & susceptible to injury and insect damage while growing.
- Growth stops with shorter days of late August & September when testosterone levels increase.
- Antlers are shed from mid December to February as testosterone levels decrease after breeding season.
- Older, healthier bucks tend to have larger, heavier antlers. After maximum growth has been achieved, extra nutrition goes into antler growth.

REPRODUCTION

- Mating season: ranges from September through late January, peaks in mid November in PA; most adult doe have been bred by late December.
- Female fawns of that year are capable of breeding their first season & most will breed a month or two later than adult doe.
- Reproductive capacity: Age & health have a major influence. Female fawns of that year (7–8 months old when bred) usually only have one offspring and have slightly more male than female offspring.
- Doe of 2.5 years or older usually have twins; triplets are possible; deer in good range have more fawns.

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FOOD HABITS

- Wide variety of herbaceous & woody plants.
- Depends on season:
 - Spring & summer: green leaves, herbaceous plants, & new growth on woody plants.
 - Late summer, fall, & early winter: Hard & soft fruits such as acorns, beechnuts, black cherries & apples.
 - Winter: hard browse, dry leaves, & evergreen leaves.

HABITAT

- Seedling: sapling forest is best, provides two basic needs: (1) concealment, (2) food in form of buds, stems, leaves of shrubs, & young trees. This type of habitat grows following clearcutting operations.
- Coniferous tree groves: provide shelter during severe weather but minimal nourishing food: used as "deer yards" (areas where large groups of deer congregate).

MANAGEMENT

- To control deer populations with emphasis on health of individual deer; consumptive uses (hunters concerned with more deer verses bigger antlers); nonconsumptive uses (nature watchers & photographers); urban areas; agriculture; forests; and ecological relationships.
- Typically, wildlife management includes habitat manipulation for the species; restoring habitat to original conditions; minimizing human/wildlife conflicts; reducing populations of problem species; protection of threatened and endangered species; and public awareness programs.

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HISTORY OF DEER IN PA

- Current population is higher than before European settlement.
- Native Americans and later: first European settlers were dependent on deer for subsistence, hides & meat, and population of deer were under control; natural predation was also occurring.
- By the late 1800s increased populations of settlers and market hunting had reduced deer numbers to dangerously low levels.
- Concern for conservation became political issue. Agencies, such as PA Game Commission, took on responsibility of protecting & restoring wildlife.
- Major clearcutting campaigns of late 1800s and early 1900s left ideal deer habitat in its wake.
- Deer numbers had been so low that populations were slow to increase even with ideal habitat.
- By 1930s & 1940s: large herds were starting to show up in the northwestern and north central part of the state.
- By late 1900s: large populations were becoming visible throughout the rest of the state, including the larger urban and suburban locations.
- Harvest figures in the early 1900s were usually near 200 per year. Harvest figures for the late 1900s were between 350,000 and 400,000 per year.
- The deer population continues to increase.
- Deer have always been hunted in PA, except for closed doe (antlerless) seasons for several years.

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A VALUABLE RESOURCE

Nonconsumptive:

Aesthetics: a joy to watch, the only value for millions (nature watchers, photographers, tourists).

Consumptive:

Sport hunting: recreation & consumption of venison.

Economics:

- Over \$665 million annually enters PA economy from deer hunting.
- Most of hunting license revenue comes from hunter interest in deer. Much of this money is used to buy land that will be kept open to the public (even nonhunters) and to support other wildlife, including nonhunted species.

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CONFLICTS WITH HUMANS

Second only to humans in impacts on environment.

Urban conflicts:

- Deer-car collisions: \$80+ million annual damage; injuries & death result of both high human and deer populations.
- Damage to parks, gardens, and landscaping.
- Lyme Disease: greater incidence in areas with high deer populations; ticks are carriers.

Damage to natural ecosystems:

- Decline in biodiversity with increase in deer populations. Continuous eating of wildflowers and herbs (will not grow back).
Overconsumption of plants: causes ecosystem changes that affect animals, insects, amphibians, reptiles, birds, & other mammals; removal of native plants allows nonnative, undesirable plants to move in & take over.
- Deer will experience starvation, and diseases and stunting will occur when populations become too high.

Damage to forests:

- \$75 million annual damage to PA's 4th largest industry; prevents regeneration of forests by eating new growth of more valuable trees and by eating most of seeds such as acorns and black cherries.
- Observable "browse line" with all edible plant material consumed to a height that adult deer could reach.
- "Deer exclosures": areas where deer are kept out by fencing show a remarkably contrasting increased growth of plant life.

Agricultural damage:

- \$70 million annual damage by wildlife to PA's largest industry with 75–80 percent of damage by deer.
- Provides supplemental food to deer: allows higher densities in surrounding wooded areas.

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POPULATION BIOLOGY FOR DEER

BIOLOGICAL CARRYING CAPACITY (BCC)

- Defined as the number of deer that a given parcel of habitat can support in good physical condition over an extended period of time.
- When BCC is exceeded, habitat quality decreases and herd physical condition declines.
- When habitat is destroyed, populations of deer will eventually decline, providing that supplemental food is not available.
- Deer reproductive potential causes populations to exceed BCC, unless productivity is balanced by mortality.

CULTURAL CARRYING CAPACITY (CCC)

- Defined as the maximum number of deer that can coexist compatibly with local human population.
- Based on land-use practices and deer populations.
- Is a function of the sensitivity of local human populations to the presence of deer that is how people feel about deer. This attitude toward deer can change.
- Excessive deer/vehicle collisions, agricultural and forest damage, and home/gardener complaints all suggest CCC has been exceeded.
- Low densities can exceed CCC. For example, a single deer on an airport landing strip.
- There are cases where BCC is higher than CCC if excellent habitat is available.

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POPULATION DENSITY

- Measured in deer per square mile of forested area.
- PA recommended maximum sustainable density depends on the habitat and is based on effects of tree generation: Seedling-sapling stage: 60 deer/sq. mi. Pole timber stage: 5 deer/sq. mi. (some say zero is better). Saw timber (mature) stage: 20 deer/sq. mi.
- "Maximum sustainable yield": Can be met by maintaining populations by hunting to 50 percent of the area's biological carrying capacity.

WHY ARE DEER POPULATIONS INCREASING IN SPITE OF INCREASING HARVEST?

- Man has altered ecosystems.
- Natural predators are absent or too few to control deer.
- Land use changes have allowed more deer by supplementing food supply with greater quantities and with preferred foods: agriculture, landscaped shrubs, and different trees in forests.

MANAGEMENT OF THE RESOURCE

OPTION #1. No management; let natural systems function.

- Is management of deer necessary?
- Some say let the herd limit itself.
- In natural ecosystems, when the herd exceeds BCC, mortality increases due to starvation and disease, reproductive rates drop, population decreases, habitat recovers, and the cycle is completed as the population increases again.
- In human-altered ecosystems, predators are nearly nonexistent and increases and decreases in populations are too abrupt.
- In human-altered ecosystems, CCC will not allow populations to reach high levels before natural collapse.
- In human-altered ecosystems, habitat will take too long to recover or may never recover.
- Humans caused the problem and must solve it!

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OPTION #2. Nonhunting control methods.

- Trap & Transfer: expensive, stressful; can't always catch them all; influx of new individuals from outside.
- Fencing: reasonably effective for small areas, but is expensive and must be maintained; can't fence the entire state; if deer can't get in then they will visit your neighbor; \$150-\$200 per acre.
- Repellents: chemicals, human hair, etc.; expensive, impractical, ineffective.
- Sterilization & Birth Control: expensive, impractical, ineffective; mandated in some urban/suburban areas; must give initial injection, followed by a booster in several months, and then one injection annually. \$20 per shot, administered with dart gun. Must monitor entire population and repeatedly find & treat each individual.
- Would have to isolate & confine the entire population; some chemicals would render the meat unfit for human consumption, so each animal must be tagged.
- Some have proposed putting birth control into food put out for the deer. What would prevent other animals from eating it?
- Cultural methods: limited success for homeowners, planting shrubs that deer do not like, fencing individual shrubs.
- Contractors/Sharpshooters: effective but expensive, becoming more common for urban/suburban areas.

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OPTION #3. Regulated Sport Hunting

Positive Factors

- Most effective.
- Generates money into state & local economies.
- Can be adjusted by controlling number of permits, season lengths, & bag limits.
- Man fills role of predator.
- Working systems present in all states.
- Doe harvests are most effective control.

Negative Factors

- Socially unacceptable in areas.
- Traditional and cultural limitations; some are against shooting of does.
- Unacceptable in some urban/suburban settings; archery only method (safer but less effective).
- Archaic management systems and political influence make it difficult to change regulations, which need continual fine tuning to be effective.
- Huntible population is not total population; many deer are protected within parks, preserves, city limits, or behind "no trespassing" signs.