

# Understanding Mule Deer Populations

Rick Danvir, 2006

Weather, topography, vegetation and management determine the availability of dependable cover, protein and energy (P&E) sources through time. **Production limited** populations/areas lack sufficient reproductive habitat (cover, P&E) to maintain fawn production during normal-dry years. Good patches of fawn rearing habitat are limited in average-dry years. Summer maintenance habitat for males and non-lactating does and winter habitat are generally not limited. Above-average growing season precipitation in wetter years can increase amount of reproductive habitat temporarily by improving P&E in normally marginal fawn-rearing habitat.

**Recruitment limited** populations/areas generally have more dependable and widespread Apr-Oct P&E, thus are less limited by suitable reproductive habitat. These populations are limited by available winter habitat (thermal and predator escape cover, P&E for winter maintenance) during *severe winters*. Frequent severe winters in areas lacking winter habitat (i.e. urban Rocky Mountain foothills/valleys) can limit population increase and deer density. Since many northern herds experience both drought and tough winters, both fawn production and recruitment are affected at times.

## Mule deer populations can be either Production or Recruitment limited

Definitions:

- Production = # Fawns alive at 6 months (Fall)
- Recruitment = # Fawns alive to 1 year (Spring)

### Attributes of populations limited by fawn production:

- Poor or highly variable Apr-Oct P&E, often resulting in poor body growth and reproductive rates
- Limited reproductive habitat (suitable forage *quality* and cover) in average-dry years
- Adults can be long-lived (>7yrs)

### Attributes of populations limited by fawn recruitment:

- More dependable Apr-Oct P&E = higher body growth and reproductive rates
- Limited by habitat providing cover and P&E to meet *winter* metabolic needs
- High mortality of adults >6 in severe winters (especially bucks)

### Data Needs:

- Weather data (precip., temp., snow depth)
- Production estimate (Fall F:D)
- Recruitment index (Spring F:Adult; Fall Yearling buck:doe)
- Population index-trend or density (deer/mile of transect, deer/mile<sup>2</sup>)
- Deer condition (age, weight, BCS, fat, lactation, antler mass)
- Number harvested
- Predator abundance (high, med, low)
- Elk, livestock abundance and distribution

### Management Strategies (P&R Limited)

- Increase availability of P&E year-round
- Manage for optimum density, not maximum density

- increases growth rates, condition, production, recruitment, antler mass
- Learn to predict effects of weather and deer density on condition, production, recruitment

### **Management Strategies (Production Limited)**

- Optimum population strategy = maintain deer #'s and body condition during drought
- Avoid over-harvesting does in response to drought (low fawn production) years
- Increase summer P&E, drought tolerant forage species (i.e. palatable deep-rooted legumes)
- May require strategic predator (coyote) reduction
- Reduce buck harvest rates to account for poor fawn production (failed cohorts) in prior years
- Expect to produce fawns only in best reproductive habitats in drought years, thus poor F:D ratios

### **Management strategies (Recruitment Limited)**

- Optimum Population strategy = maintain adult deer #'s and body condition during severe winters
- Avoid over-population, don't exceed 'normal' winter carrying capacity
- Increase taller, palatable shrubs & winter-greening plants on winter range
- May need to increase predators if antlerless hunts ineffective
- Manage deer density & summer forage to maximize fall body fat
- Maintain, improve & expand habitat patches where deer repeatedly congregate in severe winters
- Supplemental feeding in severe, deep snow winters

### **Limiting factors can vary with deer density:**

Low Deer Density:

- Predation
- Hunting
- Summer nutrition (drought)

High Deer Density:

- Overabundance (competition)
- Deep snow

### **Antler Management:** *Manage buck harvest rate*

- Optimum age (4-6 yr. old)
- Maximize body condition (density, habitat)
- Genetics

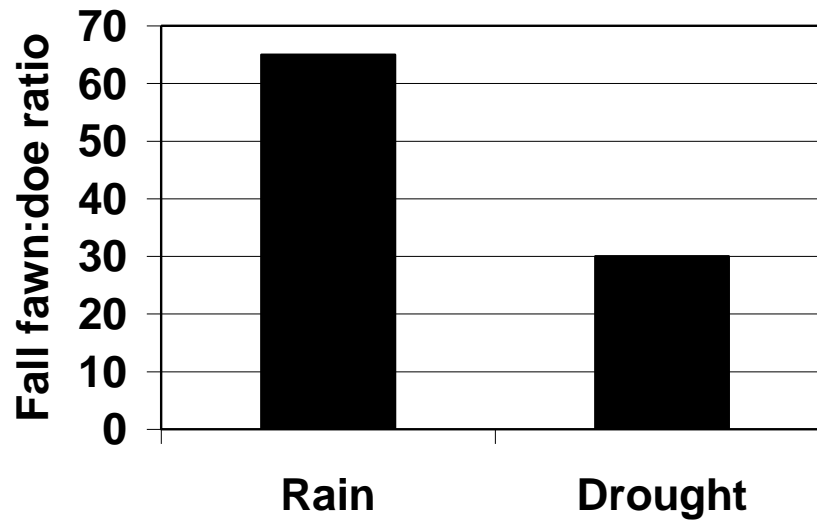
### **Manage Plant Community Composition**

Desired Condition: Maximize availability of digestible protein and energy

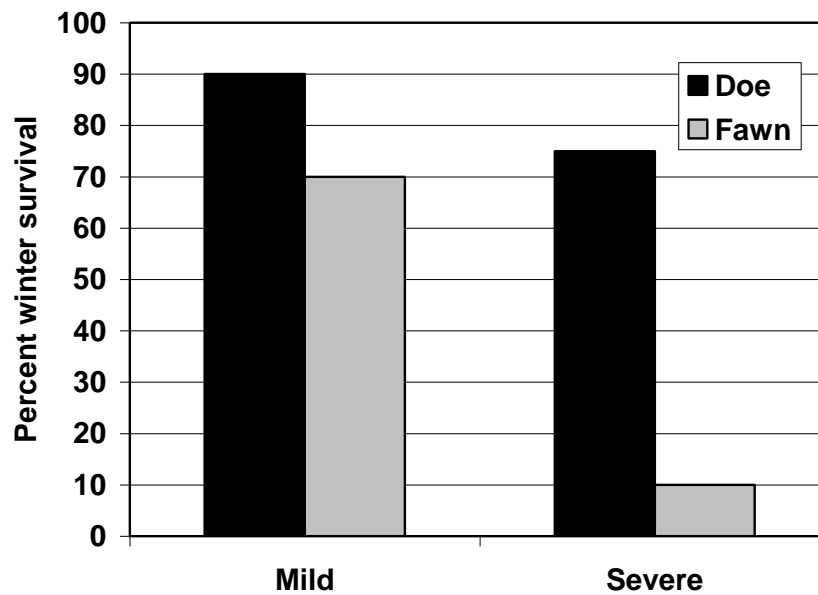
- Mixture grass, forbs, shrubs
- Diversity of plant species, height, age
- Cycle nutrients

**Tools:** Grazing, rest, fire, chemical, logging, mechanical brush thinning, planting

**Fawn production varies with growing season precipitation  
(production limited)**



**Winter survival (fawn recruitment) varies with winter severity (recruitment limited)**



<b>Factor</b>	<b>Production Limited</b>	<b>Recruitment Limited</b>
Location	Southern latitudes/ lower elevations	Northern latitudes/ higher elevations
Habitat*	SW deserts, canyons and grasslands	Northern mountains and foothills
<b>Weather Patterns:</b>		
Summer	low or unpredictable summer rains	higher, more dependable summer rains
Winter	deep or prolonged snow uncommon	deep or prolonged snow common
Fawn Production	Fall F:D ratio generally < 65	Fall F:D ratio generally > 65
Fawn Recruitment	Fall F:D nearly = Spring F:D	Fall F:D > Spring F:D
Primary Limiting Factor	Summer Nutrition	Winter nutrition
<b>Deer Condition:</b>		
Growth rate	Slower	Faster
Maturation age	Older (i.e females breed at 2 yrs old)	Younger (females breed at 1 yr old)
Body weight (by age)	Smaller (male dressed wts. <150 lbs.)	Larger (male dressed wts. >160 lbs.)
Fall body fat	Low	High

\* Some areas (i.e. N. Great Plains and Intermountain Basins) can be equally P&R limited.