

## Rangeland and Wildlife

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## Rangeland Management

- **Where the deer and the antelope play...**
- **Rangeland** = plant community dominated by grasses, forbs and/or shrubs.
- grasslands, tundra, shrublands, savannas, marshes
- Often more arid than arable cropland or forest
- Occupy 1/3 of the U.S., 47% of the worlds lands.
  - 1% of original high quality prairie survives
    - McLean county once had 669,800 acres, now 5 acres
    - Champaign County once had 592,300, now 1 acre.

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## Wildlife, Grazing, and Overgrazing

- Livestock grazing can be both beneficial and detrimental to wildlife
  - quail & mule deer respond positively to moderate cattle grazing
  - prairie dogs establish colonies ("towns") in heavily grazed areas
  - elk sometimes compete with cattle for forage (Stewart et al. 2002)
  - domestic sheep & goats carry diseases highly virulent to wild bighorn sheep

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## Growth in grasses vs nongrasses

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## Grasses Are Adapted to Grazing

- Grazing pressure has been an important force in evolution of grasses
- Grazing stimulates regrowth
- Grazing can actually increase primary productivity

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## Warm-season vs. Cool-season Grasses

- **Warm-season: most growth in summer**
  - Bluestem, Indian grass, switchgrass, etc.
  - Generally bunch grasses with rigid stems rather than soft turf
    - Forbs grow in openings between bunches
    - Room for animals to move & forage
    - Stems provide overhead cover
    - Great for nesting songbirds, quail, pheasants, etc.

**Switchgrass**

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## Warm-season vs. Cool-season Grasses

- **Cool-season:** most growth from fall to early spring
  - Fescue, brome, bluegrass
  - Much poorer wildlife habitat
  - Mowing/grazing in spring can disrupt nesting

Tall fescue

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## How many animals can graze?

- **Animal Unit** = the live weight of a cow and calf (454 kg.)
  - assumes constant forage consumption per kg
  - average weight of all other grazers are converted to these units.
    - E.g. 1 AU = 9.6 pronghorns, 5.6 mule deer, 1.9 elk, 0.05 elephants

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## How many animals can graze?

- **Problem** - not all animals feed alike
  - grazers vs. browsers
  - pronghorn eat more browse, less grass
    - by grass consumed, 105 pronghorns = 1 cow + calf

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## Management of Rangelands

- **Undergrazing** can lead to poor forage quality due to grasses “going rank”
  - grass energy reserves go to reproduction
  - C:N ratio in vegetation increases
- **Overgrazing** = continued grazing that results in long-term degradation of plants and soils.
  - favors growth of unpalatable, thorny, nutritionally poor plants & brush

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## Grazing Systems

- **Continuous** – livestock remain in same tract of land for long period of time
- **Deferred-rotation** – livestock allows to graze most the land in an area, some portion left to rest
- **Short-duration** – livestock intensively graze a small portion of the land for a short period, then move on to another portion
  - Tends to give highest benefit to wildlife

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## Grazing For Wildlife

- **Anderson & Scherzinger (1975)**
- Cattle allowed to graze on elk wintering ground in spring & early summer, then removed
- Grass regrew through summer, providing high-quality forage in winter
- If no grazing, grass would finish growing too early and become rank (low quality) before winter
- Elk herd under this regimen increased almost 4X over 10 years

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## Management of Rangelands

- **The problem of “brush”**
  - competes with grasses
  - poorer forage for cattle
  - physical barrier
  - Mesquite (*Prosopis* spp.)
    - nitrogen-fixing legume
    - hydraulic lift (brings H<sub>2</sub>O from deep soil to surface)
    - facilitates growth of other woody species
  - Leaving some brush benefits deer & other wildlife

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## Tools of Range Management

- **Mechanical disturbance**
  - chaining, crushing, root plowing, mowing
  - mowing / chaining can stimulate regrowth of palatable browse
    - higher protein content
    - fewer defenses
    - at accessible height
- **Herbicides**
- **Fire**
  - Opens tree canopy
  - favors grass regrowth
  - if low intensity, leaves irregular mosaic
  - increases palatability of grasses

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## Livestock And Riparian Zones

- **Trampling** widens stream banks, compacts soil
- Overgrazing/browsing strips bank vegetation
  - habitat for many bird species
- Less shade → higher water temperatures → lower oxygen content
- Contamination with droppings & urine
- Siltation → increased turbidity, impaired fish spawning

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## Things to Remember

- Rangeland: what is it?
- Response of grasses vs. nongrasses to grazing
- Warm- vs. Cool-season grasses
- What is an animal unit?
- Effects of overgrazing, esp. in riparian
- Issues associated with brush
- Range management tools
- Grazing systems

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