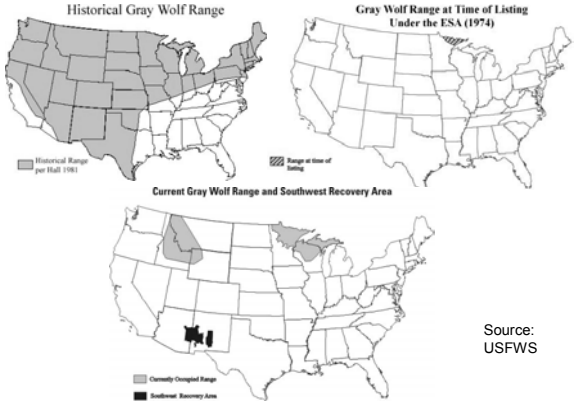
Predator Conservation

Predators Pose Special Issues

- **"Charismatic" yet "sinister"**
- **Missing – Large predators have been extirpated from much of their original range**
- **Big & mobile – require large home ranges, difficult to contain**
- **Sparse populations – require large tracts of habitat to maintain viable populations**
- **Dangerous – to livestock, game species, and (rarely) people**

Predators Pose Special Issues

- **Dangerous?**
  - **1991 to 2003: about 6 people attacked by cougars per year in U.S. & Canada (about 1 death / year)**
  - **Compare to: about 500,000 car/deer collisions per year in U.S. (>100 deaths / year)**



Source: USFWS

Big predators are scarce

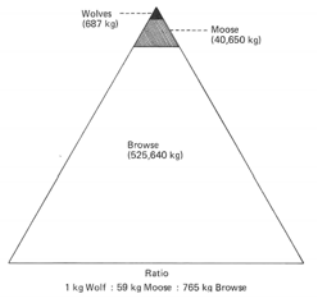


Figure 4–3. A pyramid of biomass on Isle Royale, based on browse consumed by moose and moose consumed by wolves. (From Mech 1966.)

Predators Require Large Home Ranges

- **Gray wolf: 1,000 km^2 (pack)**
- **Mountain lion: up to 800 km^2 (solitary)**
- **Grizzly bear: up to 2,000 km^2 (solitary)**
- **Coyote: up to 143 km^2 (pack)**
- **Golden eagle: up to 500 km^2 (pair)**

Predators Move Long Distances

- 2004: Cougar collared in South Dakota killed by a train in Oklahoma (>650 miles away)
- 2004: GPS collared wolverine travels over 500 miles
- 2003: Gray wolf collared in Michigan found dead in western Indiana
- 2000: Cougar hit by train in southern Illinois – genetics & body condition indicative of a wild animal (not an escaped pet)

Issues with Movements

- **Predator populations on public lands (parks, etc.) spill over into surrounding private lands**
  - **Economic & psychological impact on residents**
  - **Predators poached or killed in response to attacks on livestock are deducted from protected population**

Issues with Movements

- **Example:**
  - **Wolves reintroduced to Yellowstone National Park are designated "experimental and nonessential"**
  - **Wolves caught in the act of attacking livestock can be killed**

Fragmentation

- Large areas of habitat are necessary for population viability
- But, large unbroken tracts of habitat are rare
- Therefore, maintaining connectivity among subpopulations is key

Yellowstone-to-Yukon (Y2Y)

- Initiative to create large-scale network of habitat reserves along Rocky Mts., linking
  - Greater Yellowstone Ecosystem
  - Glacier National Park
  - Banff National Park (Alberta)
- Grizzly bears as an **<u>umbrella species</u>**
  - Premise: if grizzly bears have enough habitat, then virtually everything else will too.

Most public lands in the Y2Y corridor contain good bear habitat.

But, private lands in between are critical for connectivity.

Predator Control

- Responsible for extirpation of many predators
- Rationale:
  - increase populations of game or endangered species
  - reduce attacks on livestock

Predator Control

- Crucial questions:
  - Is it necessary?
  - Is it effective?
  - Is it acceptable?
  - Are there alternatives?

Predator Control: Necessary & Effective?

- Introduced predators (especially on islands) have devastated native fauna
  - Mongooses on Hawaii ravage native birds
  - Arctic Foxes on Kiska Island, AK nearly eliminated Aleutian Canada geese
  - Red foxes (from Europe) threaten piping plovers along Atlantic Coast
- Predators may reduce game populations
  - Kie et al. (1979) (in Bolen & Robinson p 163)
    - Coyote exclusion caused short term increase in fawn survival & deer density
    - But, deer density later declined due to food limitation
  - Duebbert and Lokemoen (1980) (B&R pp 163-164)
    - Predator control approximately doubled nesting success of ducks
    - However, amount and arrangement of cover was perhaps more important
  - Gasaway et al. (1983) (B&R pp 166-167)
    - Killing wolves in Alaska allowed moose populations to recover from decline
- Predators kill livestock
  - USF&WS (1979) (B&R p 170)
    - Coyote attacks on sheep are patchy
    - Some ranches have heavy losses (>20% of lambs)
    - Losses to industry ~$20 million / year
    - Much of sheep grazing occurs on public lands

Predator Control

- Evidence for predator impact & effectiveness of control:
  - Introduced predators can be especially problematic
  - Brown tree snake
    - Venomous, preys on virtually everything
    - Has stowed away on ships, invaded several Pacific islands
    - Got to Guam in 1950s
    - Has caused extinction or near extinction of virtually all native birds

Predator Control

- Evidence about effectiveness of control:
  - Gasaway et al. (1983)
    - Wolf reproduction did not increase due to control
  - Coyote control (B&R pp. 172-174)
    - 70,000-85,000 coyotes killed by government annually
    - Coyote per capita recruitment appeared to increase due to increased adult mortality
    - Coyote control did not decrease total sheep losses on a large scale (other mortality factors increased)
    - Control reduced losses on a small scale

Predator Control: Acceptable?

- Acceptability & Nontarget impacts:
  - Methods matter
    - Humaneness
      - Slow poisons, shooting from aircraft less acceptable
    - Potential for nontarget impacts
      - Poisons & traps are major concerns
      - Compound 1080
        - » short lived, fast acting poison
        - » Highly toxic to canids & rodents, much less to other predators
        - » Does not bioaccumulate
        - » Can be used to poison collars on sheep (no nontarget impacts)

Brown Tree Snake Control

- Problem: Brown tree snakes (BTS) live in remote forests
- Solution:
  - It turns out, acetaminophen (Tylenol) is toxic to BTS
  - BTS will eat dead mice
  - So: stick acetaminophen tablets in dead mice, attach the mice to streamers and drop them from planes
    - streamers get tangled in trees, where snakes hunt
    - No joke, this is really being tried.
- Trapping and trained dogs also being used near populated areas

Things To Remember

- Predator conservation is challenging because of:
  - Strong emotions
  - Low densities: lots of land needed
  - Extensive movements
- Yellowstone to Yukon initiative
- Predator control has had a mixed history
  - Effective & necessary in some instances
  - Ineffective (compensatory reproduction) or unnecessary (not reducing prey) in others
- Coyote & BTS case studies