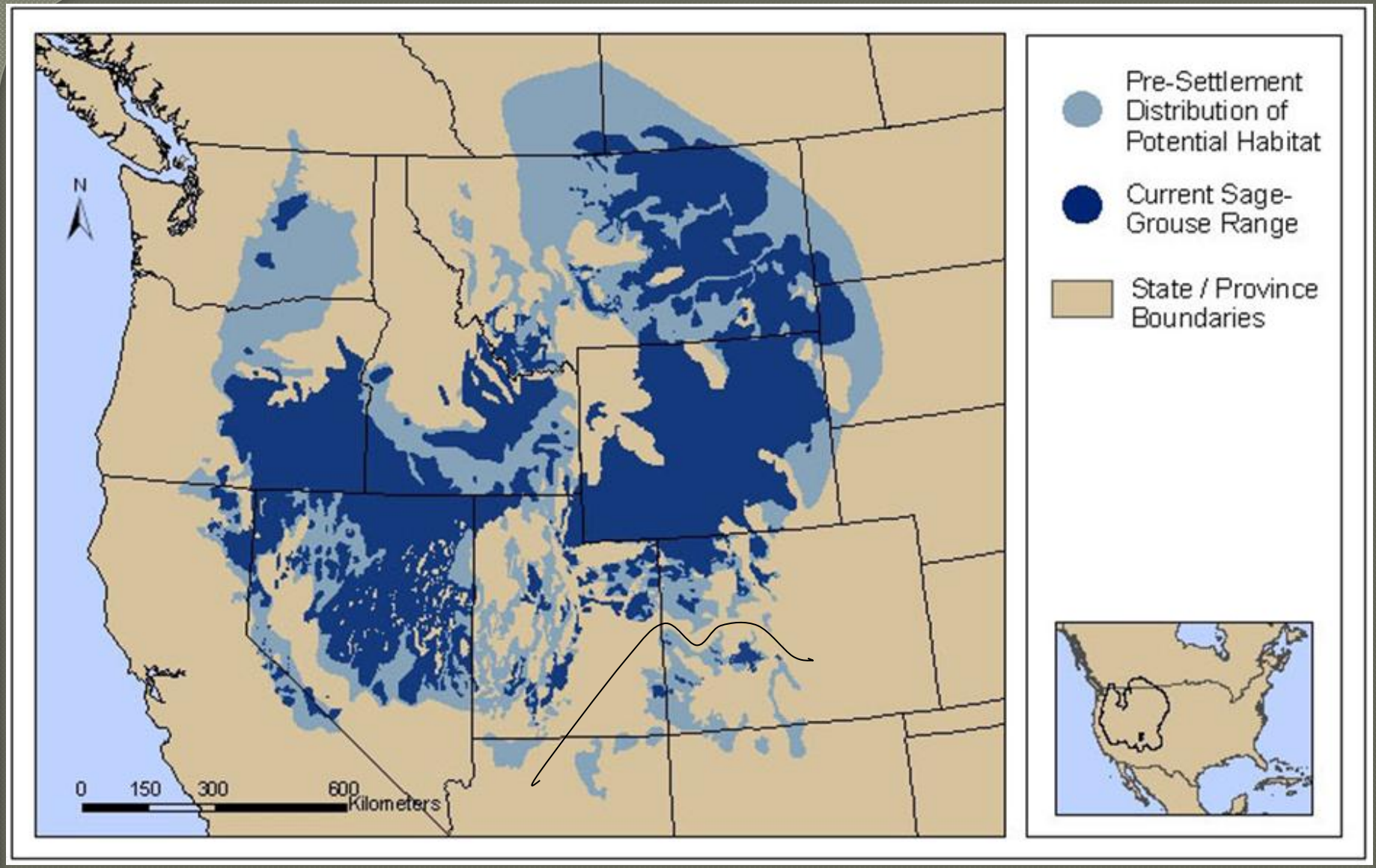
Greater Sage-grouse Ecology

Governor's Sage-grouse Advisory Council

May 22, 2013

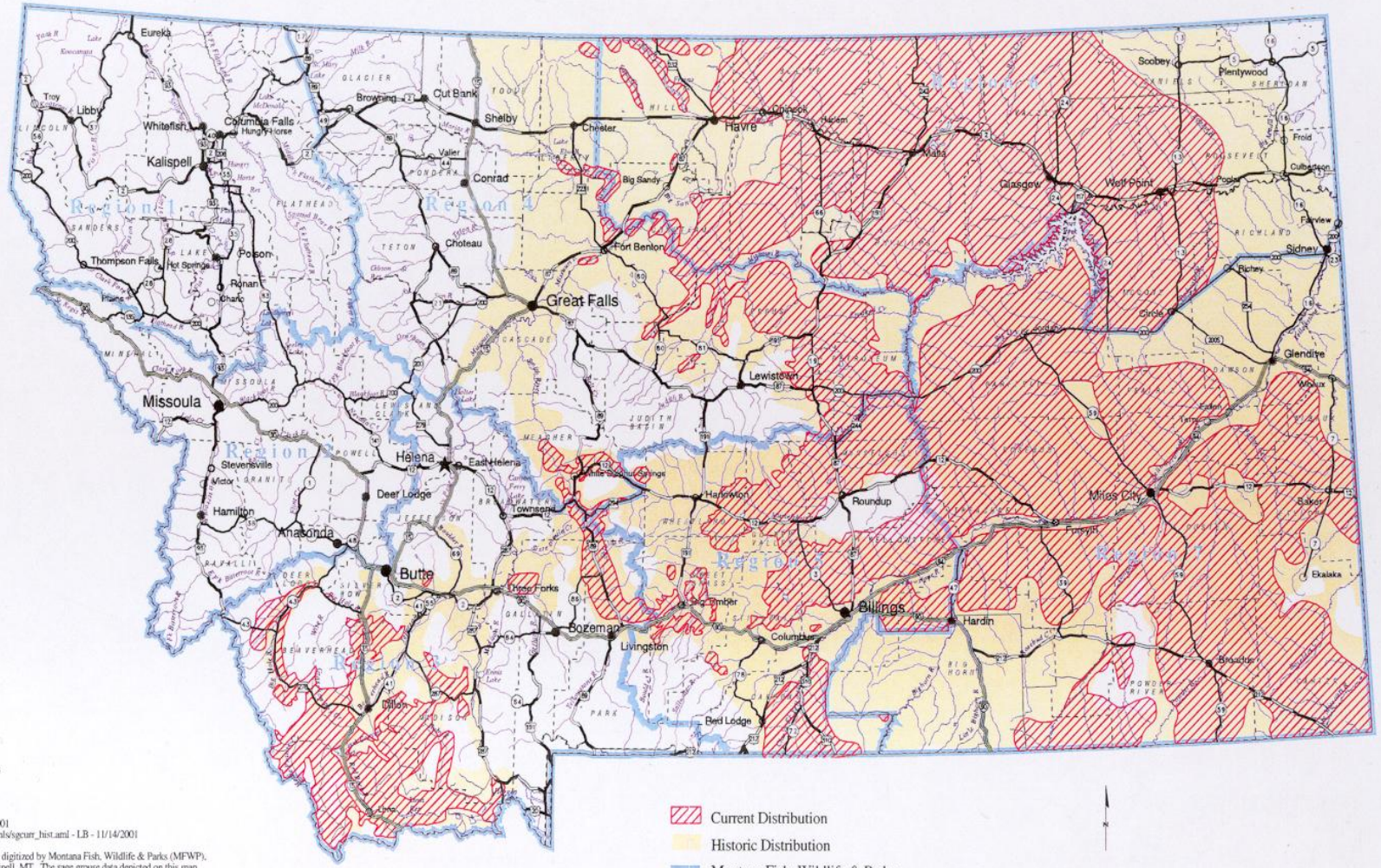
Sage-grouse Ecology

- Overview
- Movements
- Breeding season
- Summer season
- Winter season
- Survival
- Large, intact, interconnected habitat



(USGS image, based on Schroeder et al. 2004)

Current and Historic Sage Grouse Distribution - Montana



Current Distribution
Historic Distribution
Montana Fish, Wildlife & Parks Regional Boundary
County Boundary

Miles
0 20 40

Albers Equal Area Projection

Map produced by:

Montana Fish, Wildlife & Parks
Information Services Unit
490 N. Meridian Rd
Kalispell, MT 59901

sghist_curr.cmp - LB - 11/14/2001
s:/wildlife/game/sage_grouse/arcls/sgcurr_hist.aml - LB - 11/14/2001

Current sage grouse distribution digitized by Montana Fish, Wildlife & Parks (MFWP), Information Services Unit, Kalispell, MT. The sage grouse data depicted on this map were quality checked in May, 2001 by Bureau of Land Management (BLM) and MFWP wildlife biologists.

Historic sage grouse distribution is based on the following four sources:
1. Information from the Upland Game Bird Section of the Biennial Report, Montana Fish and Game Commission, 1941-1942.
2. Locations of known sage grouse habitat from literature search.
3. Counties with at least one season for sage grouse from Fish and Game Commission Meeting notes dated May 13, 1926 - August 13, 1956.
4. Schroeder, M.A. April 1999. Sage Grouse of North America. Unpublished GIS Layer. Scale 1:2,000,000. Washington Department of Fish and Wildlife.

All other layers from the Natural Resource Information System, Montana State Library, Helena, MT. All other layers digitized at 1:100,000.

Information Services

Montana Fish Wildlife & Parks

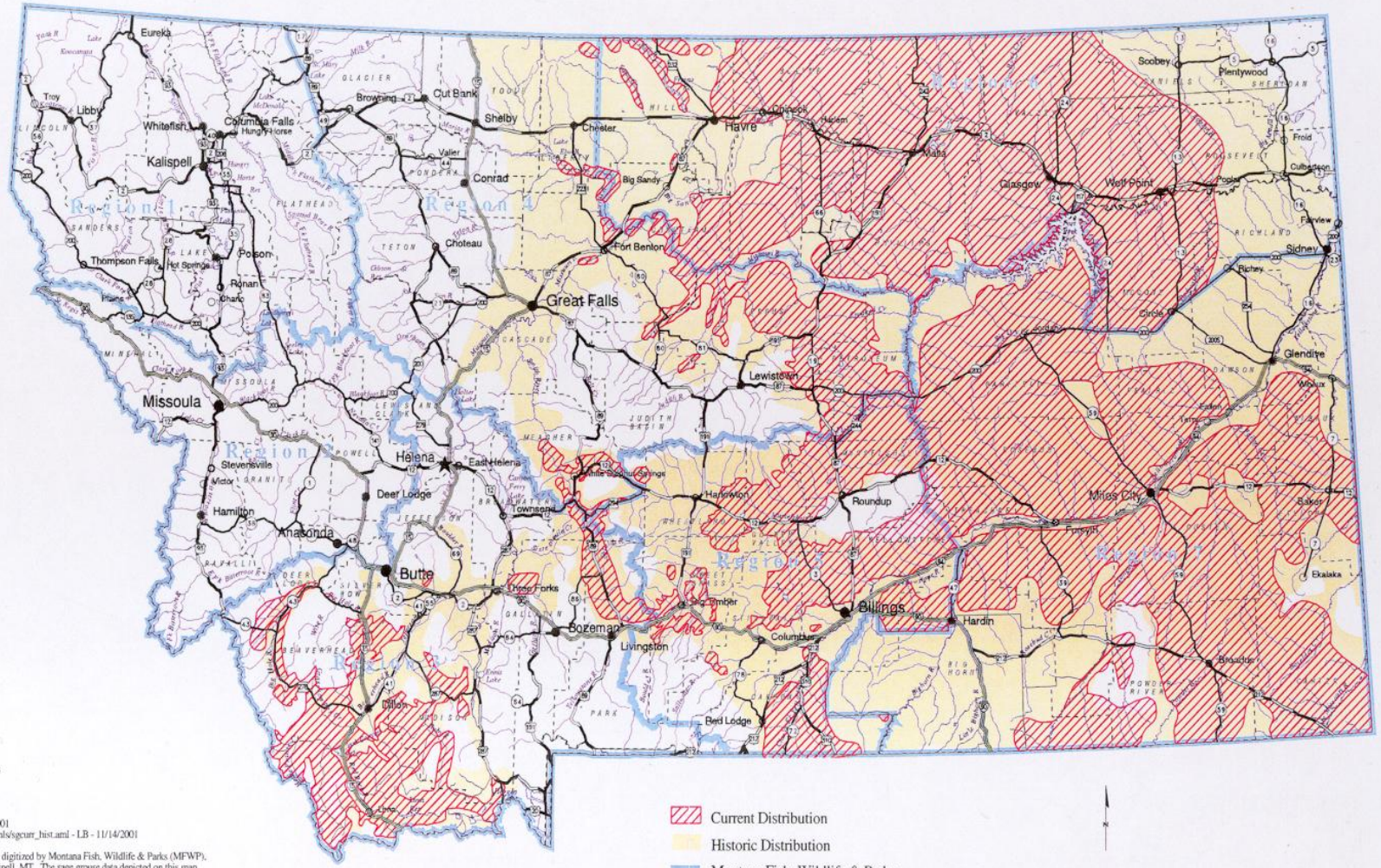
Movements

- Dispersal
  - Place of hatch to place of breeding
  - ~4 – 5.5 miles average
- Within season movements
  - Varies, sometimes discrete, sometimes intermixed
  - Greater than other game birds

Movements

- Migration
  - Non-migratory
    - Move less than 6.2 mi (10 km)
  - One and two-stage migration
    - Move greater than 6.2 mi among two or all three seasonal habitats
  - Decisions effected by habitat conditions, weather, etc.

Current and Historic Sage Grouse Distribution - Montana



Current Distribution
Historic Distribution
Montana Fish, Wildlife & Parks Regional Boundary
County Boundary

Miles
0 20 40

Albers Equal Area Projection

Map produced by:

Montana Fish, Wildlife & Parks
Information Services Unit
490 N. Meridian Rd
Kalispell, MT 59901

sghist_curr.cmp - LB - 11/14/2001
s:/wildlife/game/sage_grouse/arcls/sgcurr_hist.aml - LB - 11/14/2001

Current sage grouse distribution digitized by Montana Fish, Wildlife & Parks (MFWP), Information Services Unit, Kalispell, MT. The sage grouse data depicted on this map were quality checked in May, 2001 by Bureau of Land Management (BLM) and MFWP wildlife biologists.

Historic sage grouse distribution is based on the following four sources:
1. Information from the Upland Game Bird Section of the Biennial Report, Montana Fish and Game Commission, 1941-1942.
2. Locations of known sage grouse habitat from literature search.
3. Counties with at least one season for sage grouse from Fish and Game Commission Meeting notes dated May 13, 1926 - August 13, 1956.
4. Schroeder, M.A. April 1999. Sage Grouse of North America. Unpublished GIS Layer. Scale 1:2,000,000. Washington Department of Fish and Wildlife.

All other layers from the Natural Resource Information System, Montana State Library, Helena, MT. All other layers digitized at 1:100,000.

Information Services

Montana Fish Wildlife & Parks

Movements

- Site fidelity
  - Generally strong fidelity to leks
- Home range
  - 1.5 – 237 mi^2
  - Breeding and summer, <0.4 – 11 mi^2
  - Winter, <0.4 – 75 mi^2

Breeding Season

- Leks
  - Habitat
    - Open areas
    - Proximity to nesting sites
  - Traditional use
    - Up to 80+ years
    - Satellite leks
  - Patterns of use
    - Adult males
      - MT long-term average = 29 males/lek
    - Females
      - Attendance peaks early – mid April
    - Yearling males
      - Attendance peaks 3 weeks later

Breeding Season

- Nesting
  - Habitat
    - Sagebrush & other shrubs; residual grass
    - Usually nest within 3 mi of active lek (97% in central MT, Sika)
  - Diet
    - Changes from sagebrush to forbs
  - Nesting likelihood
    - 82% (71-93% in MT)
    - ~25% re-nesting attempts
  - Clutch and incubation
    - 8 eggs (6-9); 27 days incubation

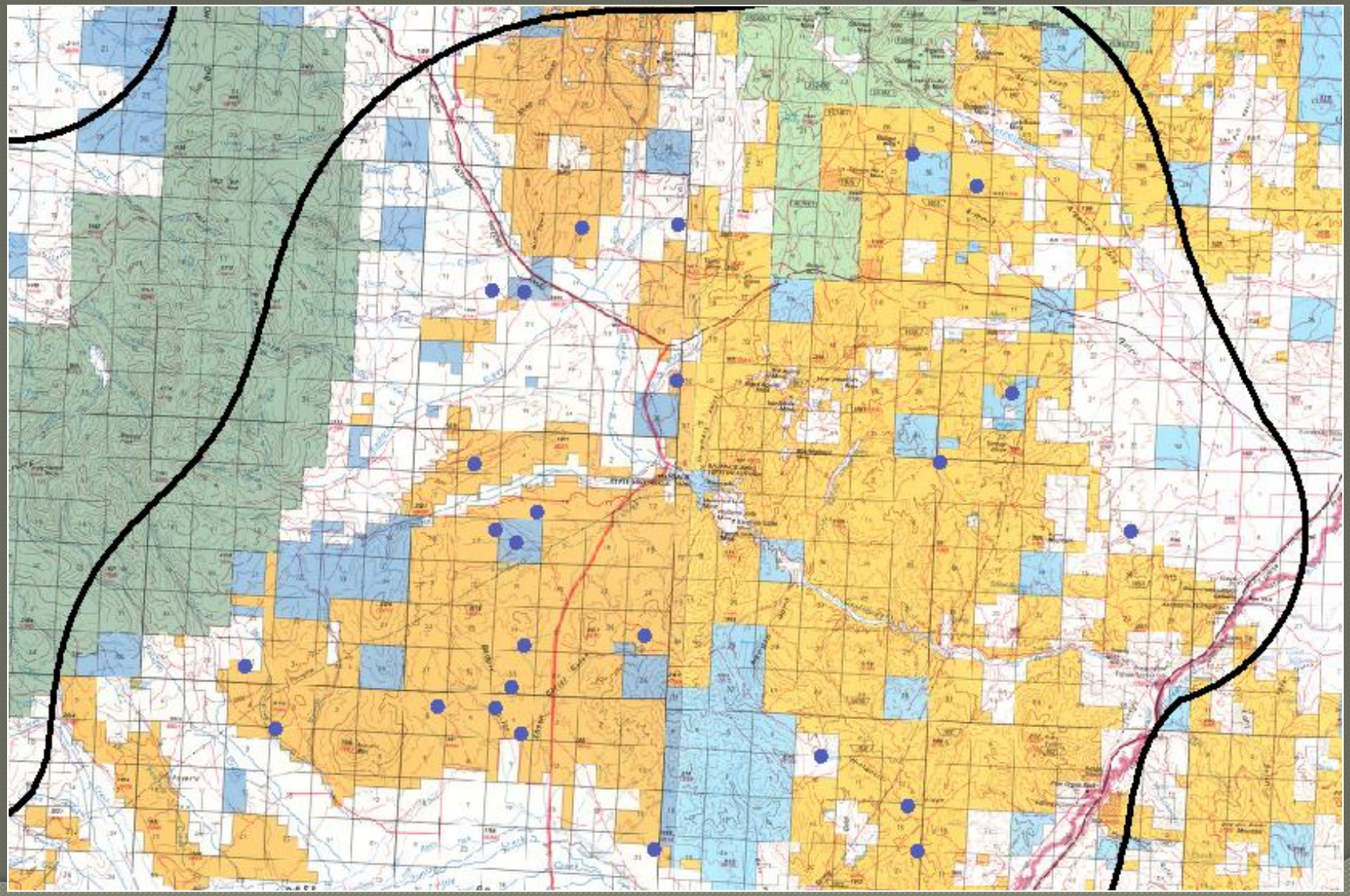
Breeding Season

- Nesting (cont.)
  - Peak hatch
    - end of May – early June
  - Nest success
    - Variable (46-70%) but comparable to other grouse
    - Higher in unaltered landscapes
    - Live & residual grass, forb cover and visual obstruction

Breeding Season

Generally high nest success

Breeding Season



Breeding Season

- Early brood-rearing
  - Diet
    - Primarily insects
  - Habitat
    - Taller grass, increased forb and grass cover
    - Less sagebrush cover
  - Precocial young
    - Weak flight – 10 days
    - Strong flight – 5 weeks

Summer Season

- Late brood-rearing
  - Diet
    - Change to forbs
  - Habitat
    - Riparian, wet meadow, alfalfa fields
  - Movements
    - Elevation
    - Micro-site
    - Mesic years

Winter Season

- Autumn
  - Diet transitions to sagebrush
- Winter
  - Diet
    - Exclusively sagebrush
  - Habitat
    - Primarily found in big sagebrush
    - Height of sagebrush important
    - Use influenced by snow depth and hardness, topography, vegetation height and cover

Survival

- Chick
  - 9-16% survival through brood-rearing
- Hen
  - 50-75% survival annually
- Seasonal patterns
  - Mortality greater in breeding & summer
  - Adult survival relatively high over winter (85-100%)
- Sex ratio
  - Tends to favor females
- Vital rates effecting population dynamics
  - Hen survival, nest success, chick survival

Survival

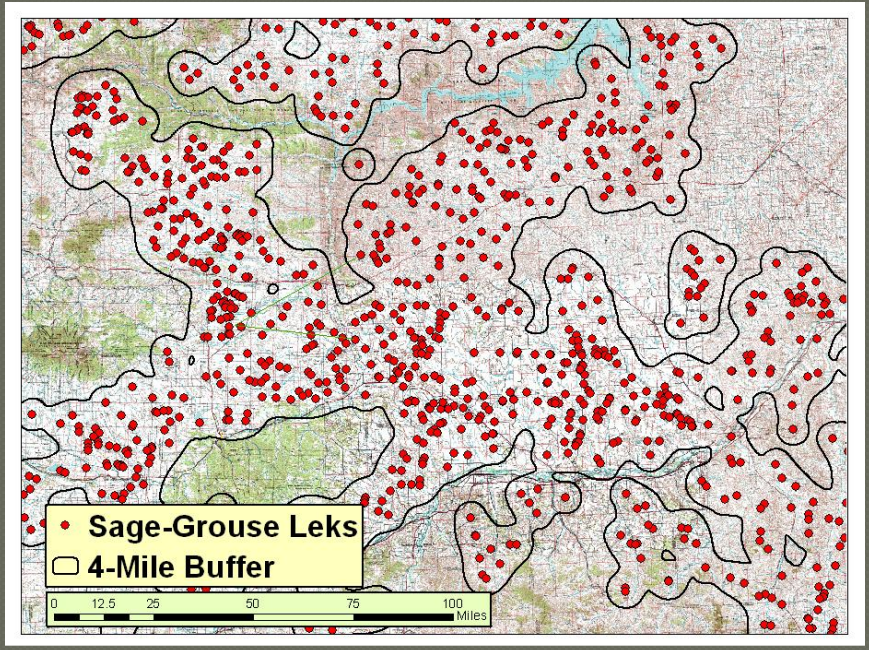
- Leading causes of mortality
  - Predation (eggs, chicks, adults)
    - Rates vary by habitat, location, weather
  - Collisions (vehicles, fences, power lines)
    - 33% of mortalities in ID were with power lines
    - Population response to fence collisions found in other grouse
  - Diseases
    - 2003-2007 WNV outbreaks

Summary

- Relative to other game birds:
  - Generally long-lived
  - Generally high over-winter survival
  - Generally lower reproductive rates
  - May move greater distances within and among seasons
  - Life history traits indicate populations may be influenced by survival more than reproduction
- May be slow to respond to changing habitat conditions

Summary

- Seasonal habitat:
  - Require sagebrush habitat with tall residual grass for breeding sites
  - Use riparian, wet meadows, alfalfa fields during the summer, late brood-rearing period
  - Require big sagebrush in winter for cover and food resources

Summary

- Require large, intact, interconnected expanses of sagebrush habitat