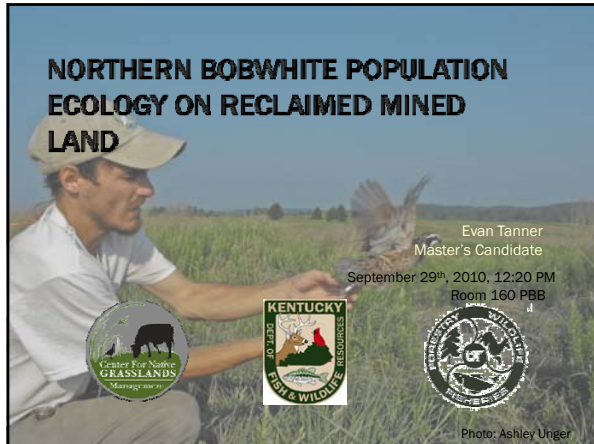


NORTHERN BOBWHITE POPULATION ECOLOGY ON RECLAIMED MINED LAND



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Room 160 PBB


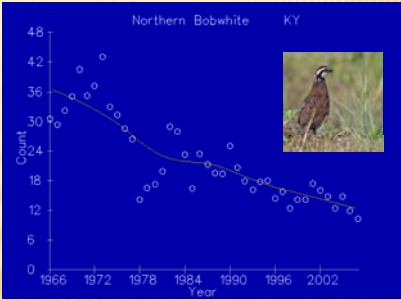


Photo: Ashley Unger

POPULATION DECLINES

• Annual region-wide decline of 3.0%

• 2.6% decline within Kentucky




Year	Count
1966	36
1972	32
1978	28
1984	24
1990	20
1996	16
2002	12


Source: Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007, Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD

CAUSES OF POPULATION DECLINES

- **Habitat Loss**
 - Increase in clean farming practices
 - Successional advancement from lack of prescribed fires
 - Urbanization
- **Habitat Fragmentation**
- **Decline of native grasslands species diversity**



Source: <http://agriculture.sc.gov/>



Source: <http://www.hammelmans.com/>

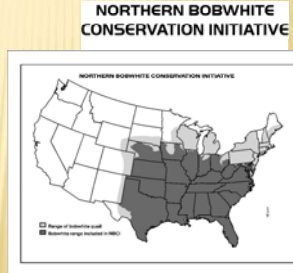
CONSERVATION EFFORTS

- Non-migratory species = no federal responsibility
- Efforts must come from region/state level!

• Northern Bobwhite Conservation Initiative

- Restore populations to the density of 1980 through habitat-oriented plans
- Impact habitat on 81.1 million acres

Dimmick, R.W., M.J. Gustin, and D.F. McKenzie. 2002. The northern bobwhite conservation initiative. Miscellaneous publication of the Southeastern Association of Fish and Wildlife Agencies, South Carolina. 96 pp.



OTHER CONSERVATION EFFORTS

- Conservation and Interest groups
 - National Bobwhite Technical Committee
 - Quail Unlimited
 - Quail Forever
 - State Agency Initiatives



- USDA Farm Bill programs
 - CRP
 - CP-33
 - CP-38
 - CREP
 - GRP
 - EQIP





QUALITY OF RECLAIMED MINES TO BOBWHITE?

• Research is lacking

- No bobwhite studies conducted on reclaimed mines ←
- Few population ecology studies done in Central Hardwood Conservation Region (Stanford 1972), (Roseberry and Klimstra 1984), (Burger 1995)
- Efforts need to be made to assess habitat use and measure population dynamics of bobwhites in these areas

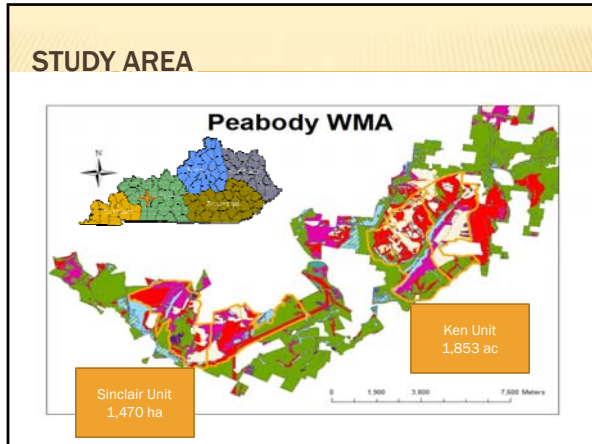
Goal: Evaluate bobwhite population dynamics on a reclaimed surface mine in western Kentucky.

Objectives:

1. Estimate hunting/non-hunting survival rates (by sex and age classes if sample size permits)
2. Document fecundity
 - Nest success
 - Nest productivity
 - Brood survival
3. Analyze survival rates as a function of habitat
4. Estimate population densities
5. Develop a population model that includes hunting effects

HYPOTHESES:

1. H_0 : There will be no change in population density as a function of habitat condition (proportion of land in major habitat types – open herbaceous, NWSG, deciduous forest, coniferous forest, cool season grasses, & scrub-shrub);
2. H_0 : There will be no difference in hunting survival as a function of habitat condition;
3. H_0 : There will be no difference in non-hunting survival as a function of habitat condition;
4. H_0 : There will be no difference in fecundity and recruitment as a function of habitat condition.



METHODS

- **Trapping**
 - Use of Stoddard funnel traps (Stoddard 1931)
 - Birds double banded
 - Fitted with necklace-style collars (<6.5 grams)
 - Goal of .100 birds per unit
 - Sex, age, condition, and weight noted

The block contains two photographs. The left photograph shows a person's hands holding a bird, likely a sparrow, which has been captured in a trap. The right photograph shows a person in a white shirt and dark pants crouching in a field, setting or checking a trap.


METHODS

- **Telemetry Efforts to monitor movement, habitat use, and survival**
 - Birds located 3 times/week
 - Homing in on birds (~50m)
 - Time, activity, and vegetation type noted

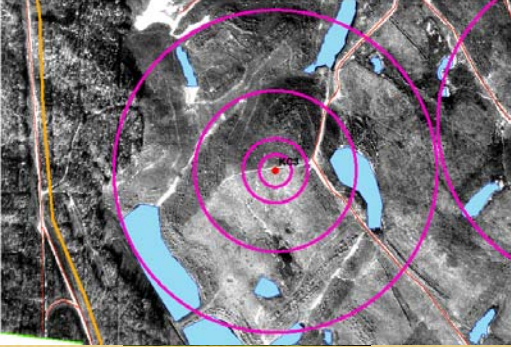
The photograph shows a person standing in a vast field of tall, dry grass under a clear blue sky. The person is wearing a dark jacket and a hat, and appears to be holding a device, possibly a radio or a GPS, used for bird telemetry.

METHODS

- **Survival Estimates**
 - Assessed through telemetry
 - Radio collars on 48 hour mortality
 - If mortality occurs, determine cause of death (if possible)
 - By units, sex, and age (if sample size permits)
 - Relate survival to vegetation
- **Seasonal Estimates**
 - Winter (October 1st-March 31st)
 - Summer (April 1st-September 30th)




METHODS




METHODS

- **Estimate of hunting mortality**
 - Quota hunt regulated by KDFWR
 - Hunters allowed on only designated areas
 - Band recovery (at least 10%) by KDFWR used to estimate hunting mortality
 - Hunting pressure kept equal among both units



METHODS

- Fecundity and recruitment
 - Estimated by nest success, nest productivity, and brood survival
- Nest success and productivity
 - Nest located through telemetry
 - Nest monitored daily (eggs checked if adult is away from nest)
 - Fate of nest recorded (Abandoned, Destroyed, Hatched)



METHODS

- Brood survival
 - Initial brood size is assumed through # of eggs hatched
 - Broods located every day after hatch through telemetry (collared adult)
 - Broods flushed on days 14-20, flushed weekly after 21st day to obtain survival estimates



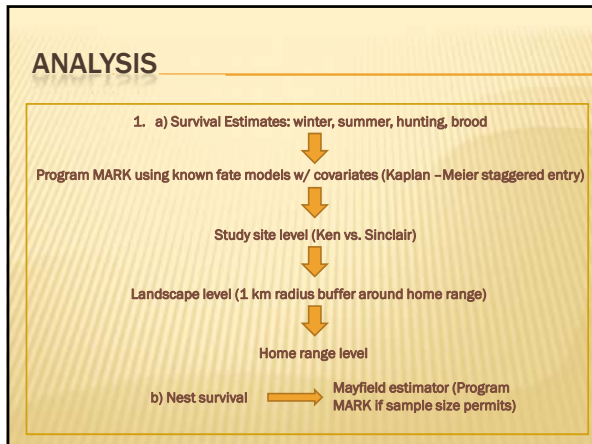
Source: <http://americanwildlifeenterprises.com/>

METHODS

•Vegetation Parameters

Parameter	Summer	Winter
Woody density	x	x
Distance from woody cover		x
Visual Obstruction	x	x
Litter Presence/Absence		x
Litter Depth	x	
Species Richness	x	
Ground Sighting Distance	x	

Nesting Vegetation Parameters
Distance to bare ground
Substrate
Distance to edge
Overall Strata



ANALYSIS

2. Home range:

- ArcGIS with Animal Movement Extension
- 95% fixed-kernel method
- Only birds with ≥30 locations


3. Covariates: entered into survival models

- Vegetation parameters (winter/summer/nest)
- Landscape (1km):
 - *% core area
 - *Contrast Weighted Edge Density
 - *Interspersion

4. Nest survival by vegetation type: ANOVA

5. Density:

- Covey census



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