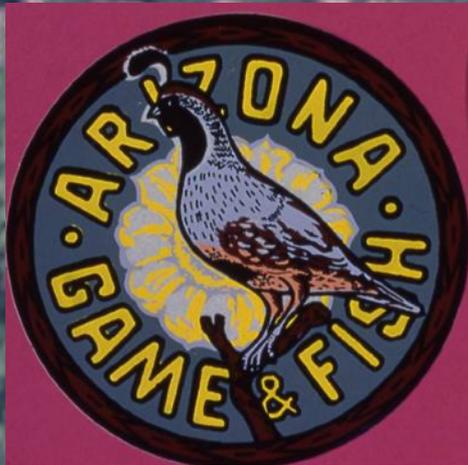


# Management of Mearns' Quail in Arizona



Kirby Bristow,  
Mike Rabe, Johnathan O'Dell  
Arizona Game And Fish Department

# General Characteristics



- Inhabit oak woodlands at 4-6000 ft elevations
- Feed on bulbs and tubers by digging with enlarged claws
- Food (forbs) and cover (bunchgrasses) are dependent on summer precipitation
- Escape predators with “crouch and hide” strategy

# Escape Behavior

- Cryptic coloration increases effectiveness of their primary predator avoidance strategy

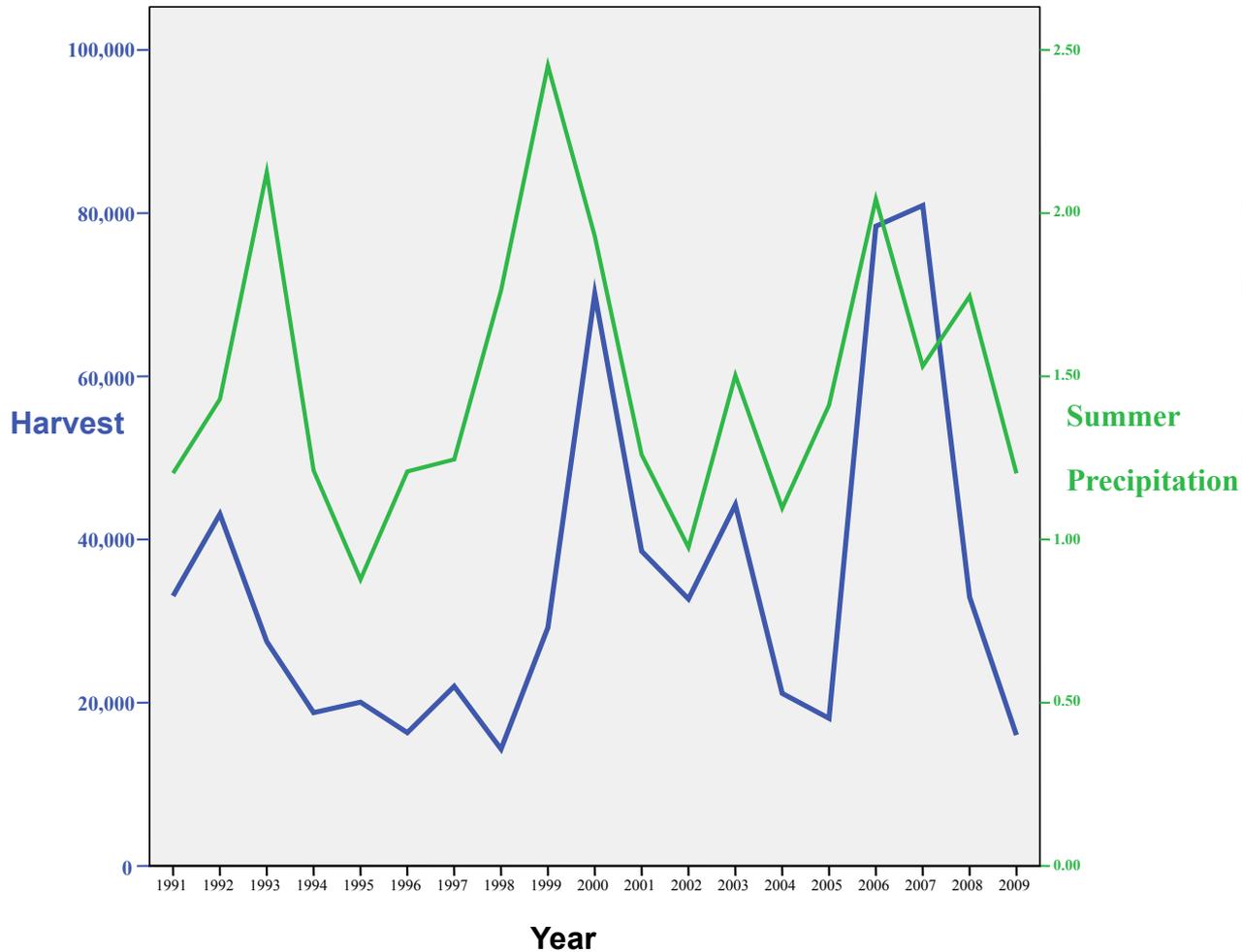


# Behavior and hunting

- Tight holding behavior has made them popular among hunters who use pointing dogs

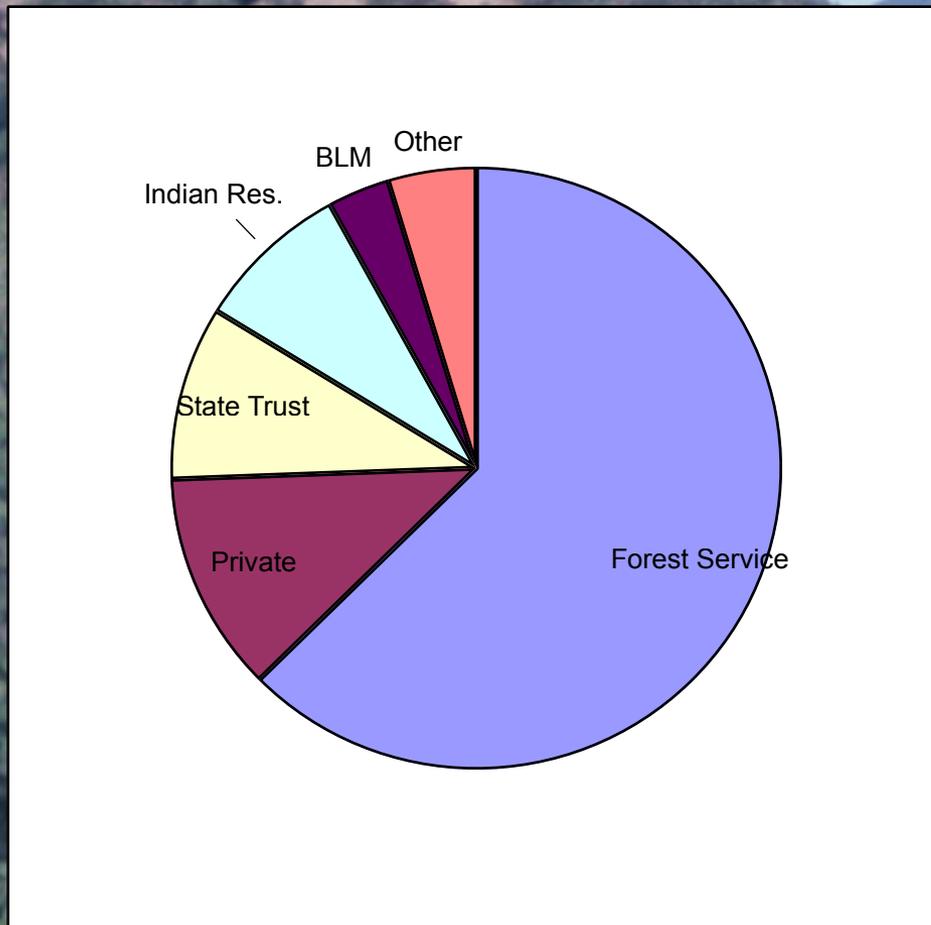


# Harvest Data and Summer Precipitation



- Harvest reflects bird abundance
- Harvest seems to track summer precipitation
- Population fluctuations similar to that seen in other quail species

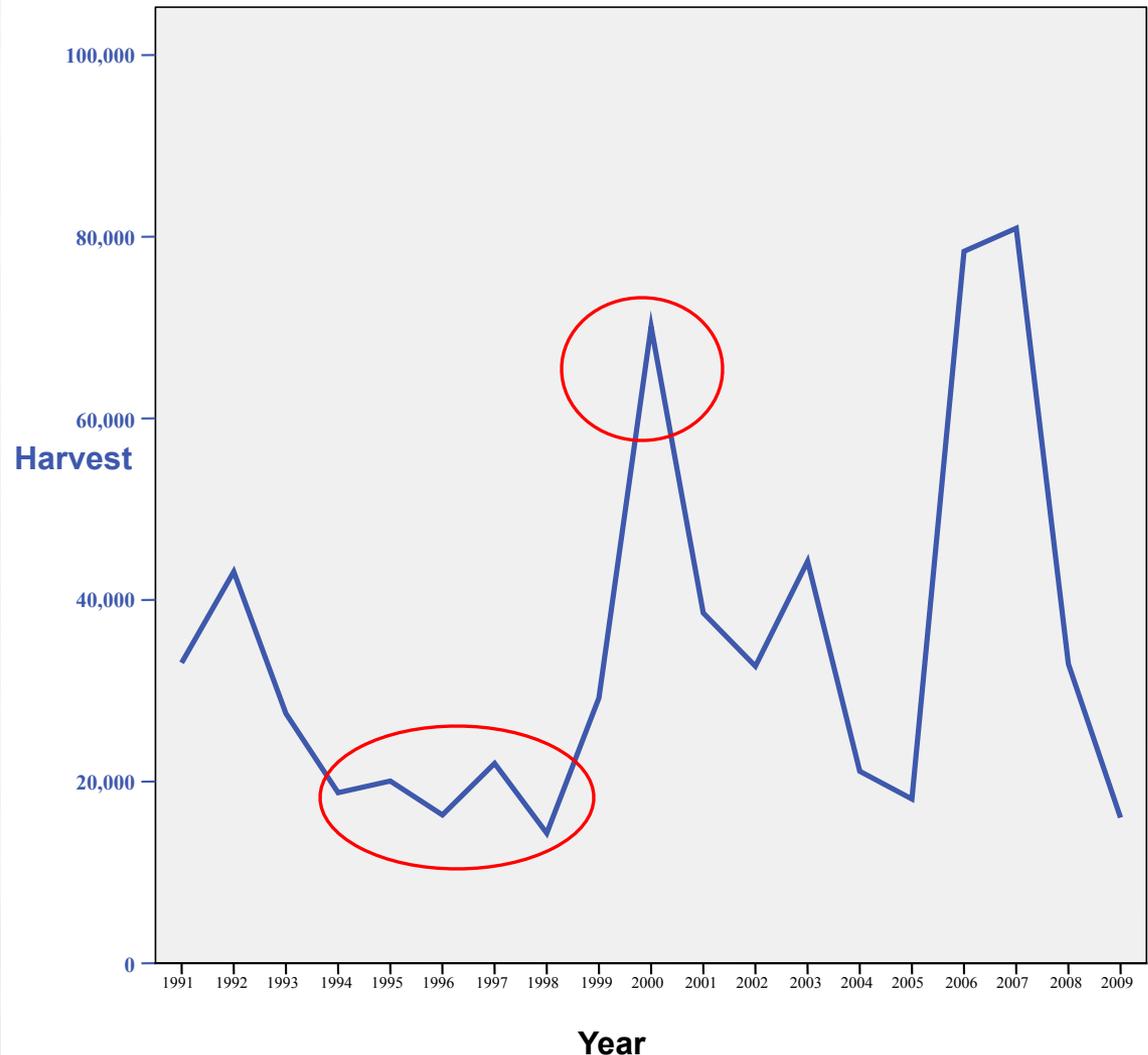
# Land Ownership across Mearns' quail distribution within Arizona



U.S. Forest Service	63%
Private	12%
State Trust	9%
Indian Reservation	8%
B.L.M.	3%
Other	5%

# History of (latest) Mearns' Quail Harvest and Bag Limit Controversy

- Low harvest in mid-1990s raised concerns about over-harvest (limit reduced to 8)
- Research study limit returned to 15 in 2000
- Declining harvest prompted more limit reductions



# Public Information Efforts

Fuel the controversy

- In 2000 AGFD, in the interest of providing information to the hunting public, advertised the fact that Mearns' quail numbers were high
- With the relatively new online outreach media the effort was more successful than anticipated
- Hunter numbers (especially among non-residents) increased along with complaints from many resident hunters

**This Is The Year!**  
**Mearns' Quail Hunting** November 17, 2000–  
February 12, 2001

For information about Mearns' quail hunting, check the Arizona Game and Fish Department's web site at [www.azgfd.com](http://www.azgfd.com).

**Arizona Hunting Licenses Sold Here**

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Your hunting and fishing gear purchases support wildlife management in Arizona.

# 2002 Special Mail Questionnaire

- 900 known Mearns' Quail hunters
- Assess public opinion about the 2001 hunt structure (10/day, 75 day season ending in early February)
- Generally supportive of current hunt structure



**2002 QUAIL HUNTER OPINION SURVEY**  
 Partial Summary of Migratory Bird Stamp Hunter Sample

# of Surveys Mailed: 6000  
 # of Surveys returned: 978 (16.3%)

**Part I: Your Quail Hunting Experience**

1. Indicate which species you hunted in Arizona by placing an estimate of the number of days and the number bagged. Do not count days you hunted on shooting preserves.

**GAMBEL'S OR SCALED QUAIL**  
 (Oct. 12, 2001-Feb. 11, 2002)

# of Hunters: 719  
 # of days hunted: 5,626 +/- 9% ( $\bar{x}$  = 5.8)  
 # Gambel's Quail bagged: 15,479 +/- 42% ( $\bar{x}$  = 15.8)  
 # Scaled Quail bagged: 1,524 +/- 11% ( $\bar{x}$  = 1.6)  
 Average birds per day: 3.02  
 Average days per hunter: 7.82

**MEARNS' QUAIL** (Nov. 23, 2001-Feb. 11, 2002)

# of Hunters: 121  
 # of days hunted: 495 +/- 2% ( $\bar{x}$  = 0.5)  
 # Mearns' Quail bagged: 999 +/- 6% ( $\bar{x}$  = 1.0)  
 # of daily limits: 59 +/- 0.8% ( $\bar{x}$  = 0.06)  
 Average birds per day: 2.02  
 Average days per hunter: 4.09

2. How would you rate your ability to locate a place to hunt during the 2001-2002 quail season in Arizona?

	9% - very difficult		40% - not difficult	
	30% - difficult		22% - no problem	

3. Estimate how many total miles you traveled to hunt quail during the 2001-2002 season, include from your residence to where you hunted, miles driven while hunting and return to your residence for all trips?

$\bar{x}$  = 319.2 Estimated Total Miles Driven to Hunt Gambel's and Scaled Quail  
 $\bar{x}$  = 54.0 Estimated Total Miles Driven to Hunt Mearns' Quail

4. How many hunters, other than those in your hunting party, did you encounter (i.e., see or hear) while quail hunting on average per day during the 2001-2002 quail season? What was the maximum number of hunters you encountered while hunting in a single day?

While Gambel's or Scaled Quail hunting?  
 $\bar{x}$  = 2.3 Average Number of Hunters  
 $\bar{x}$  = 3.9 Maximum Number of Hunters

While Mearns' Quail Hunting?  
 $\bar{x}$  = 0.3 Average Number of Hunters  
 $\bar{x}$  = 0.5 Maximum Number of Hunters

8. What is your opinion about when quail seasons start? For each species, does the current hunting season open: too early, too late, etc?

	Too Early	Too Late	Just Right	No Opinion
Gambel's Quail:	10%	12%	62%	16%
Scaled Quail:	7%	5%	39%	49%
Mearns' Quail:	2%	7%	33%	57%

9. What is your opinion on when the quail season ends? For each species, does the current hunting season close: too early, too late, etc?

	Too Early	Too Late	Just Right	No Opinion
Gambel's Quail:	24%	6%	54%	16%
Scaled Quail:	14%	4%	35%	47%
Mearns' Quail:	11%	3%	31%	56%

Indicate the number of daily bag limits for Mearns' quail you reached during the following months:

	Didn't				
	Hunt	None	1-2	3-4	5+
November:	73%	22%	2%	2%	1%
December:	72%	24%	2%	1%	1%
January:	74%	23%	2%	1%	1%
February:	76%	22%	1%	1%	1%

# 2003 Arizona Quail Symposium

- Arizona Game and Fish Department hosted a “quail symposium” in 2003
- University experts in quail management were invited to review and examine the quail management structure
- Results largely supported current structure



# Bag Limit Reductions

- 2004 AGF Comm. lowered limit to 8 in response to public pressure
- This pattern was a repeat of bag limit decisions in the 1960s and 1970s
- 10/day until 1963, then 15
- Dropped to 10 in 1970, back to 15 in 1973



# Harvest Management

## Management options

- Daily bag limit
- Season length
- Hunter numbers?

## Tools

- Questionnaires
- Wing Barrels
- Research



# Annual Mail Questionnaire

- Post-hunt
- Random sample of 5% of licensed hunters
- Mearns' quail included since 1987

**2001 SMALL GAME HUNTER REPORT**

DID YOU HUNT ANY OF THE **SMALL GAME** SPECIES LISTED BELOW DURING THE 2001-2002 SEASON IN ARIZONA? YES  NO   
(IF YOU HUNTED MORE THAN ONE KIND OF **SMALL GAME** IN A DAY, COUNT IT AS A DAY FOR EACH SPECIES).

<b>MOURNING DOVE</b>	1ST SEASON	2ND SEASON	<b>TREE SQUIRREL (NOT GROUND SQUIRRELS)</b>	
NUMBER OF DAYS HUNTED			NUMBER OF DAYS HUNTED	
NUMBER OF DOVES BAGGED			NUMBER OF SQUIRRELS BAGGED	
<b>WHITEWINGS</b>			<b>PREDATOR &amp; FUR BEARERS (NOT TRAPPING)</b>	
NUMBER OF DAYS HUNTED			NUMBER OF DAYS HUNTED	
NUMBER OF WHITEWINGS BAGGED			NUMBER OF BOBCATS BAGGED	
<b>QUAIL</b>			NUMBER OF COYOTES BAGGED	
NUMBER OF DAYS HUNTED			NUMBER OF FOXES BAGGED	
NUMBER OF GAMBEL QUAIL BAGGED			NUMBER OF RACCOONS BAGGED	
NUMBER OF SCALED QUAIL BAGGED				
<b>COTTONTAIL</b>				
NUMBER OF DAYS HUNTED				
NUMBER OF COTTONTAILS BAGGED				
<b>MEARNS QUAIL</b>				
NUMBER OF DAYS HUNTED				
NUMBER OF MEARNS QUAIL BAGGED				
NUMBER OF DAILY LIMITS				
<b>PRAIRIE DOGS</b>				
NUMBER OF DAYS HUNTED				
NUMBER OF PRAIRIE DOGS BAGGED				

**JUNIOR HUNTER INFORMATION ONLY**  
IF YOU TOOK ANY JUNIOR HUNTERS WITH YOU (UNDER 14 YEARS AND UNLICENSED) ENTER THE TOTAL NUMBERS THEY BAGGED DURING THE ENTIRE SEASON.

<b>SPECIES:</b>	MOURNING DOVE	
	WHITEWINGS	
	QUAIL	
	COTTONTAILS	
	TREE SQUIRRELS	

# Wing Barrels

- Collect wings of harvested birds for harvest surveys
- Hunter effort
- CPUE (birds/day, birds/hr)
- Hunter distribution
- Sex and age ratio of harvest
- Crippling loss



**Quail Wing Envelope**  
Please help the Arizona Game and Fish Department manage your quail by providing the information below. One envelope per hunter please. Thank you!

Name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Area hunted: \_\_\_\_\_

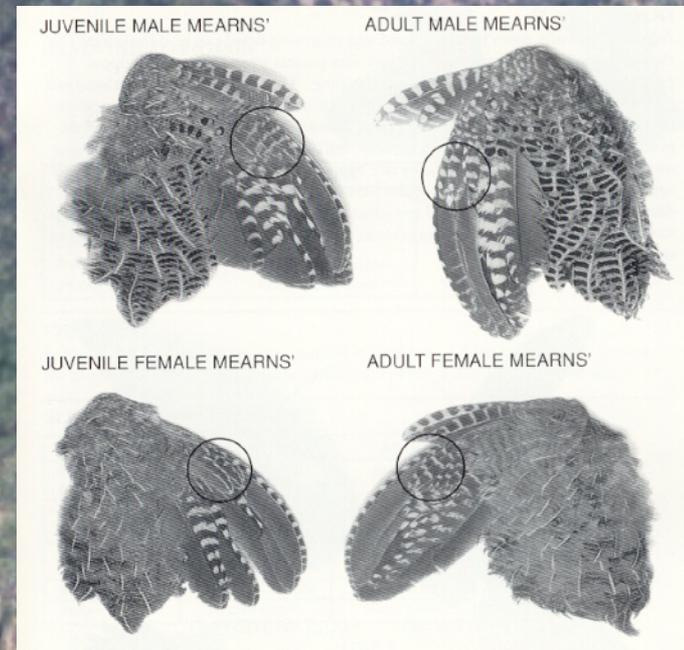
Game Management Unit: \_\_\_\_\_

Did you use a dog? Y N

*Please record the information for each day separately.*

	Date	Number of hours hunted	Number of birds harvested	Number of birds knocked down but not retrieved
Day 1				
Day 2				
Day 3				
Day 4				
	<b>Total</b>			

Instructions:  
 1. Use 1 envelope per hunter.  
 2. Complete questions on this envelope.  
 3. Remove 1 wing from each bird harvested and place in this envelope.  
 4. Place envelope in wing barrel. **Thanks!!**

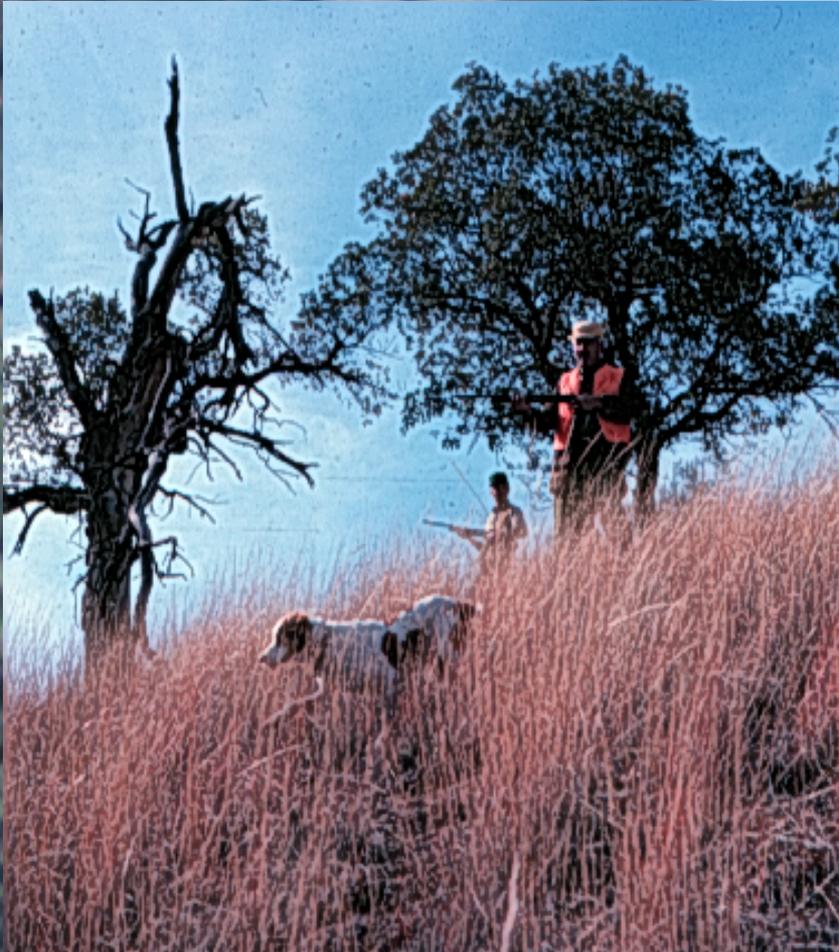



# D.E. Brown. 1979. Factors Influencing Reproductive Success and Population Densities in Montezuma quail.

- Correlation between reproductive success and summer precipitation related to food and cover
- Recruitment rates were relatively high and more constant than in other quail species
- Strong correlation between hunt success and the previous years summer precipitation



# R.A. Brown. 1977. Effects of Hunting on Mearns' quail



- Quail populations fluctuated independent of hunting pressure
- Reduction in bag limit from 15 to 10 birds/day did not reduce the percentage of population removed during the hunt
- Hunter harvest allowed greater survival by relieving stress on available food resources

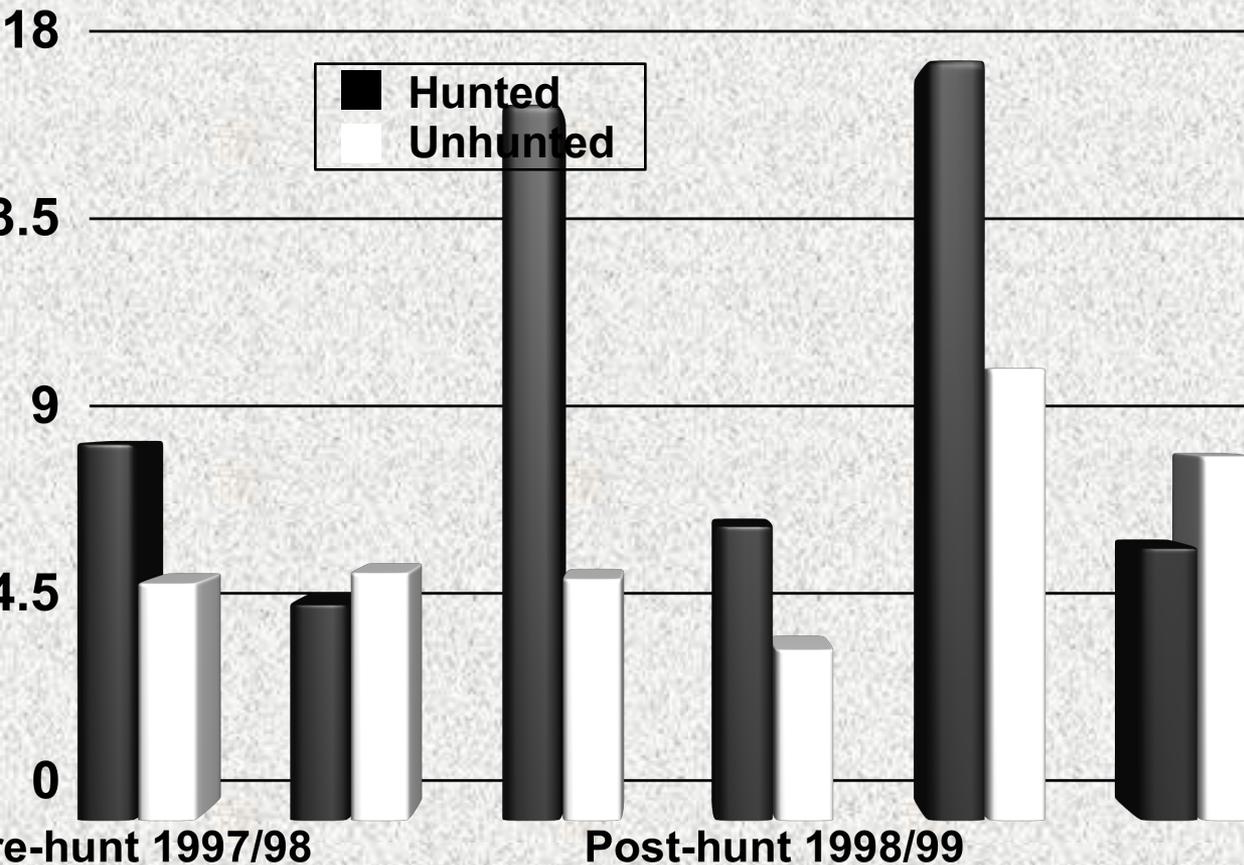
# Bristow K.D. and R.A. Ockenfels. 2000. Effects of Human Activity and Habitat conditions on Mearns Quail Populations



- Un-hunted areas had a greater potential to maintain birds
- Hunted areas had a greater potential to produce birds
- Quail populations not significantly impacted by hunting

# Birds/Route

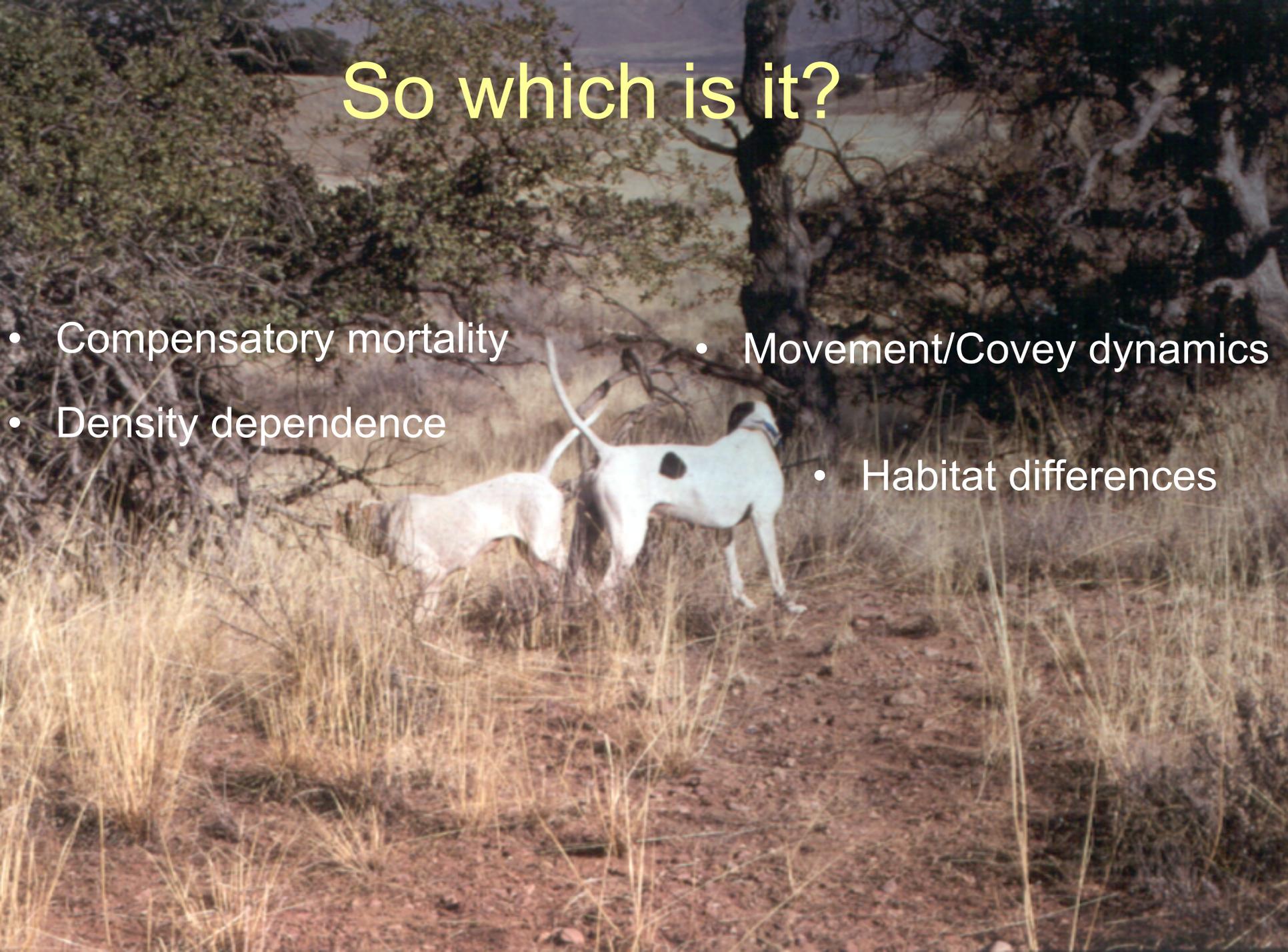
(Bristow and Ockenfels 2000)



- Hunted areas contained more birds during pre-hunt seasons
- Post-hunt bird numbers were more similar
- Great increase in bird numbers between years in hunted areas

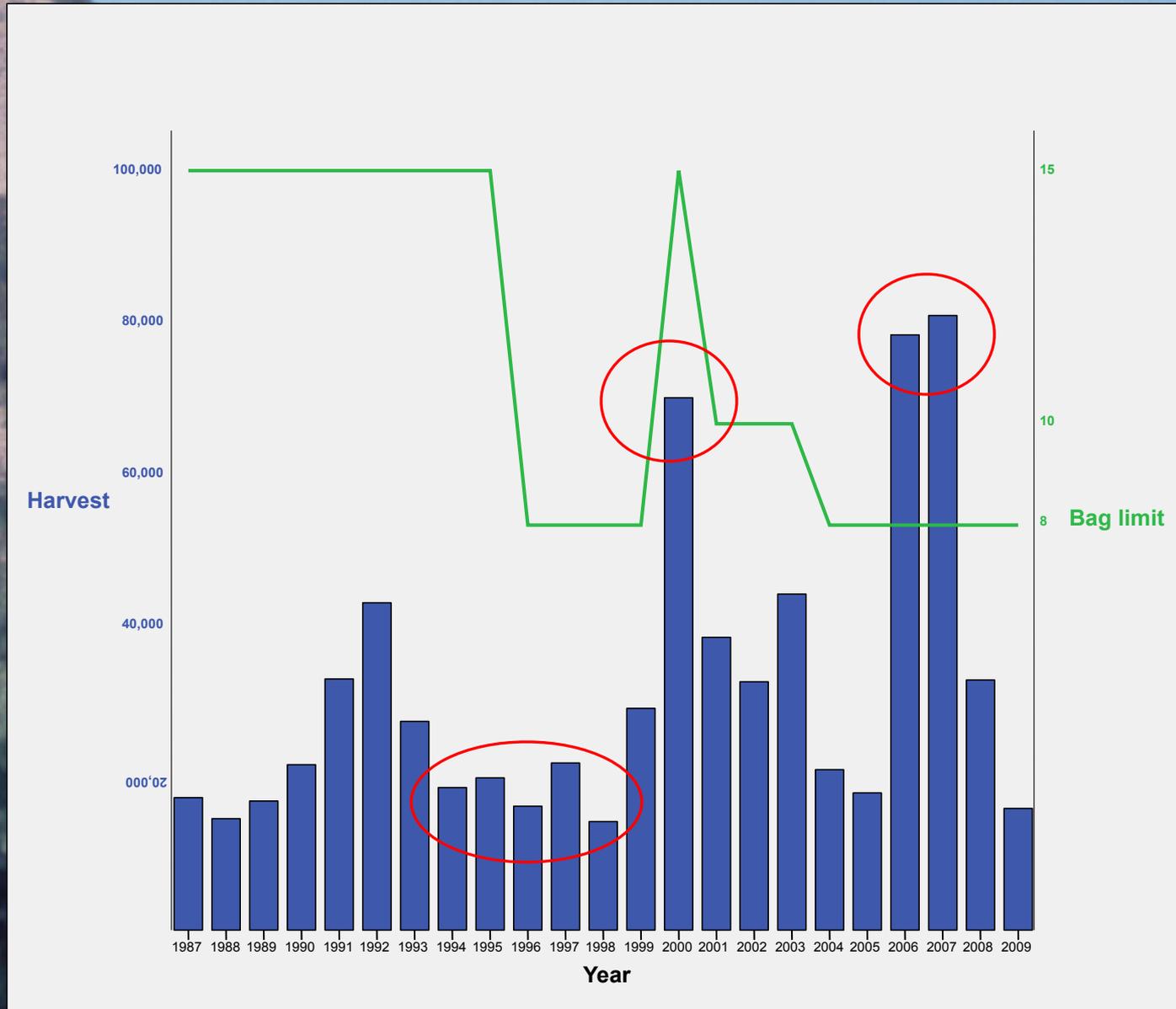
# So which is it?

- Compensatory mortality
- Density dependence
- Movement/Covey dynamics
- Habitat differences



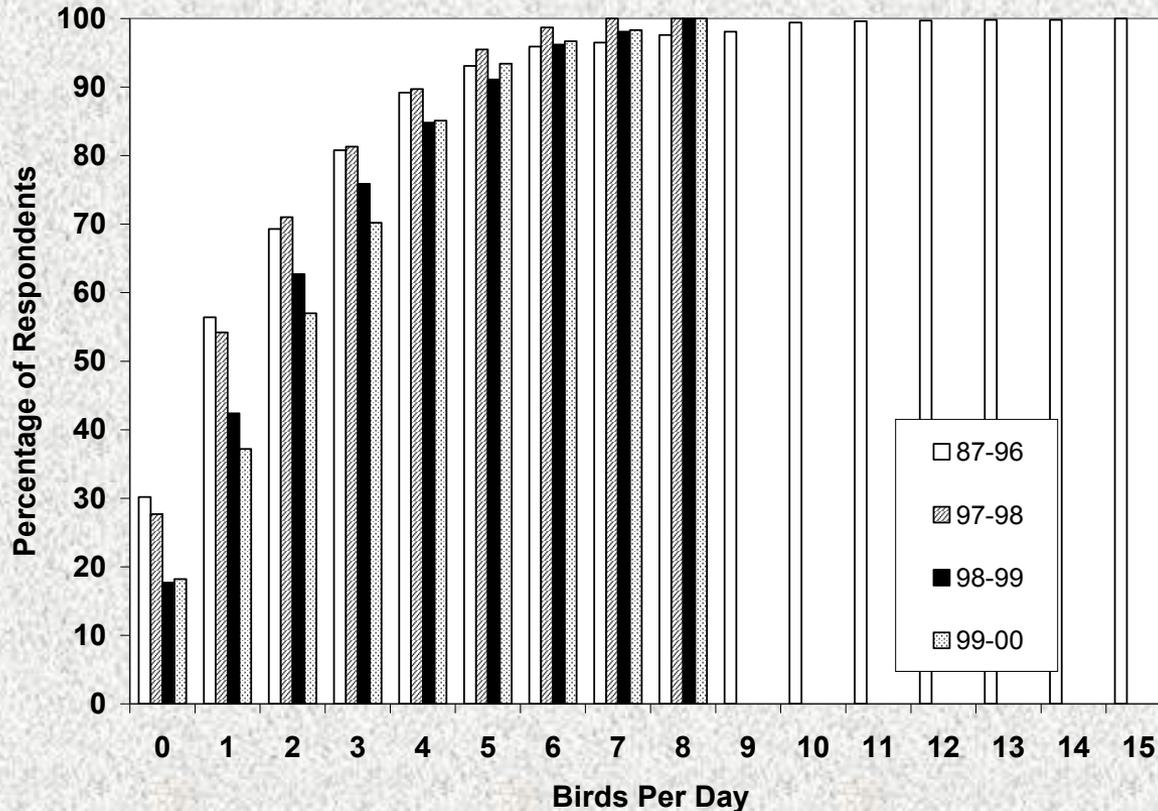
# History of Mearns' Quail Harvest and Bag Limits

- Low harvest in mid-1990s prompted concerns about over-harvest
- Harvest peak in 2000 (15?)
- Record harvest in 2007 (8?)
- Harvest fluctuates independent of limit 8-15



# Cumulative Harvest

(Bristow and Ockenfels 2000)



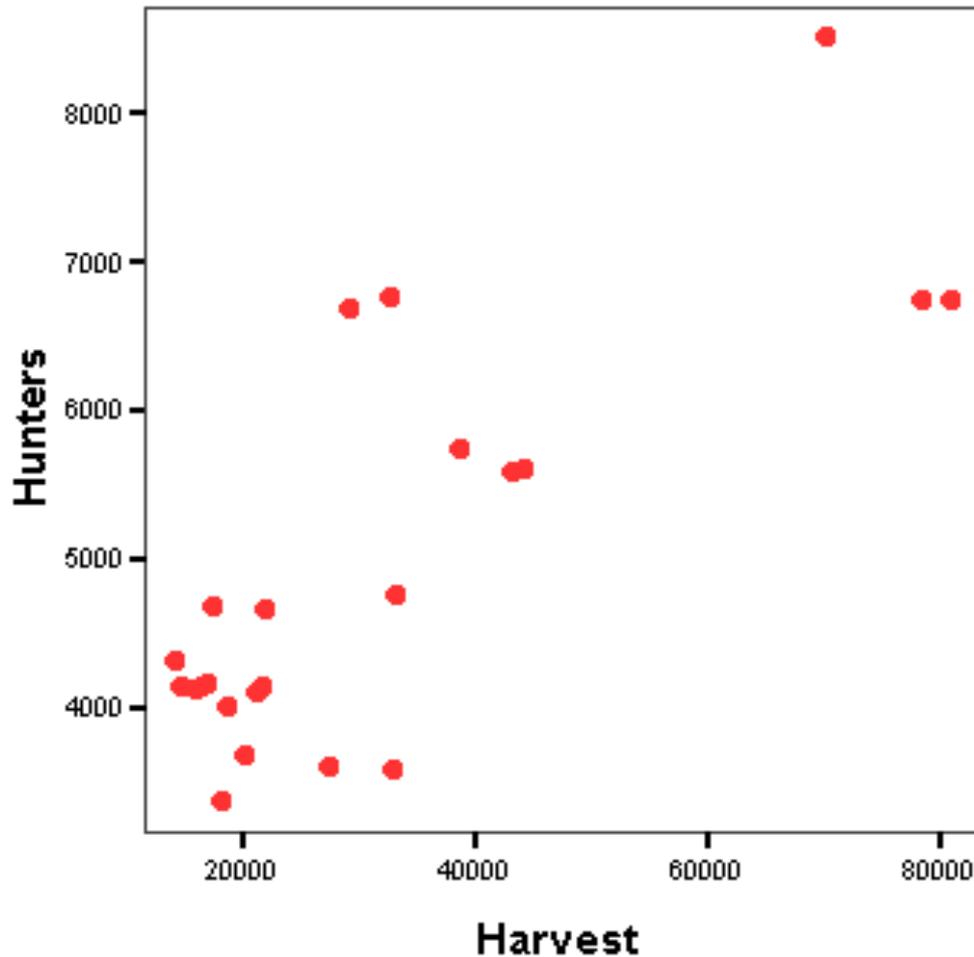
- Average hunter harvests <2 quail/day
- Harvests <6 quail/season
- Bags a limit <0.5 times/season
- Hunts <4 days/season
- Small changes in bag limit will have no effect on harvest

# Season Length History

- 2-day in 1960 in Santa Rita Mtns.
- 9-day in 1961
- Today (75), mid-Nov to early Feb
- Harvest later in the year is more likely to affect breeding pairs
- Mearns' quail breed later than any other quail although pairing begins in Feb.



# Hunter Questionnaire (1987-2009) Harvest Data



- Hunter numbers influence ( $r^2 = 0.62$ ) annual harvest greater than either
- Days/hunter ( $r^2 = 0.23$ )
- Birds/day ( $r^2 = 0.47$ )
- Controlling hunter numbers will affect harvest more than bag limit or season length

# Hunter Characteristics

(Bristow and Ockenfels 2000)

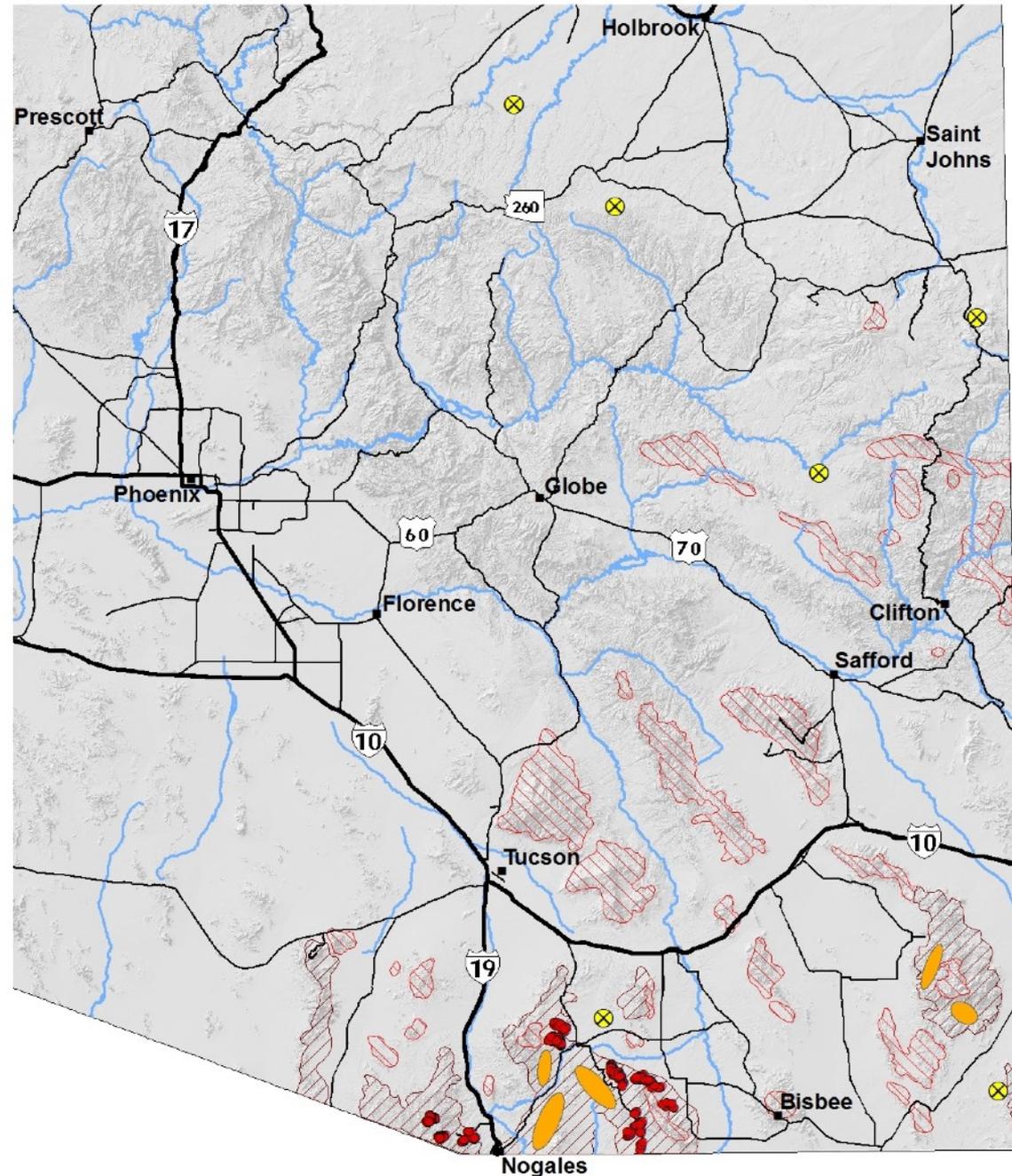
- 98% Male
- Average age = 52.6
- Hunted Montezuma quail for an average of 10-14 years
- Most (86%) use pointing dogs
- Self regulate?



# Mearns' quail distribution in Arizona

- Survey locations (97-2000)
- Popular hunting areas
- ▽ Confirmed incidental sightings (2000-09)

- Popular hunting areas and survey sites (based on survey of WMs, hunters, and websites) represent a small portion of Mearns' distribution
- Locations outside of distribution suggests potential for range expansion
- Global warming?
- Wildfires?



# Harvest Management Options

- Reduced Bag
  - Ineffective to reduce harvest
- Reduced season length
  - Unpopular with public
- Hunter numbers

Self regulating

No evidence to show that reducing harvest will prevent fluctuations in bird numbers



# Public Information Efforts

- Public information efforts need to include forecasts of low quail abundance and increased efforts to inform the public about:
- Natural population fluctuations
- Influence of harvest on quail abundance
- Influence of minor regulation changes on harvest

**This is not the Year!**

**Mearns' Quail Hunting**

November 17, 2000–  
February 12, 2001

For information about Mearns' quail hunting, check the Arizona Game and Fish Department's web site at [www.azgfd.com](http://www.azgfd.com).

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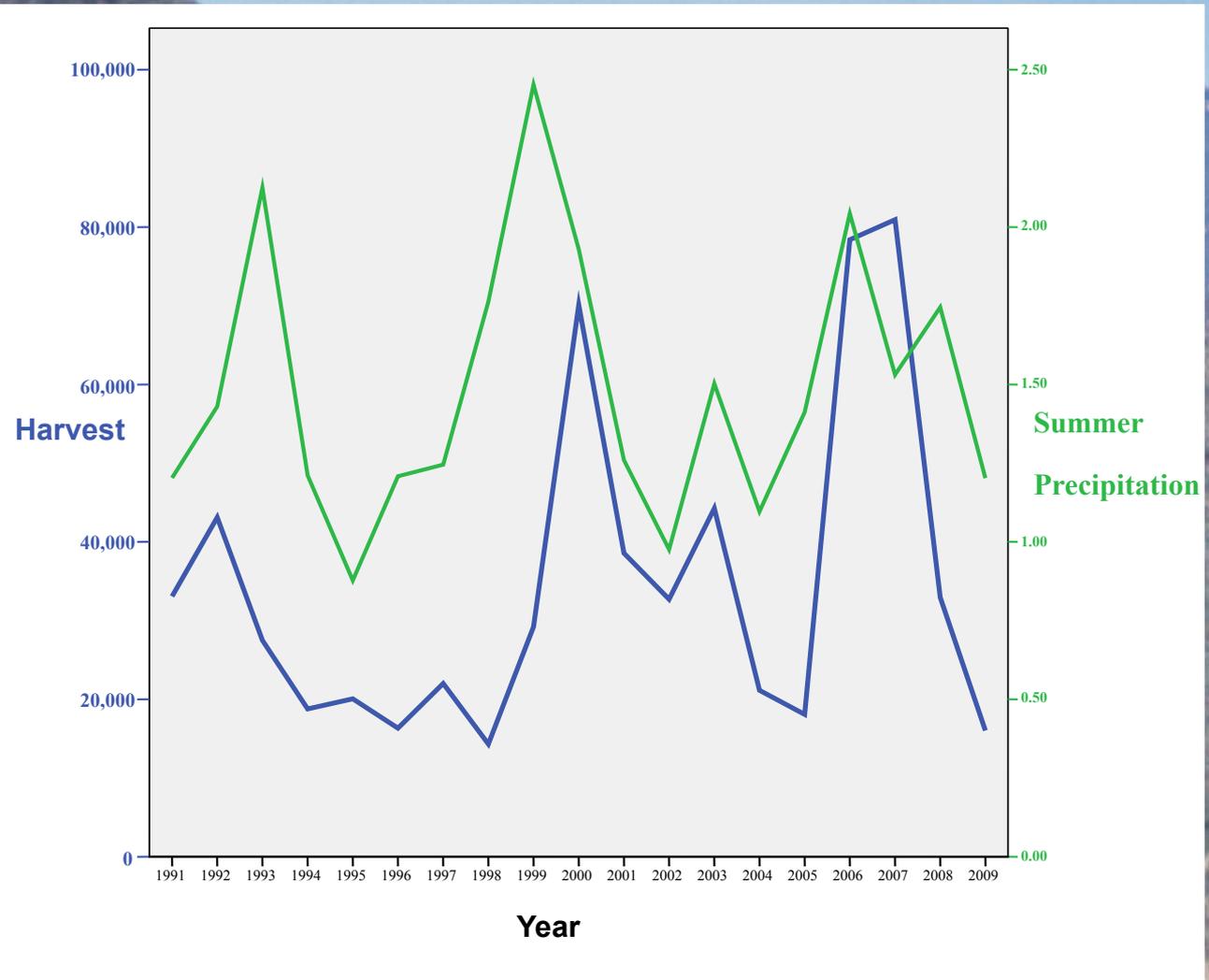
Arizona Game and Fish Department  
[www.azgfd.com](http://www.azgfd.com)

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# Mearns' Quail Abundance

- Natural fluctuations in Mearns' quail numbers
- Limited influence of harvest
- Self regulating nature of hunter harvest



# Public Information Efforts

But Boss, even we can't design harvest regulations to produce this!!

Mearns' Quail Abundance on Fantasy Island

