



PLLA Grasslands Management

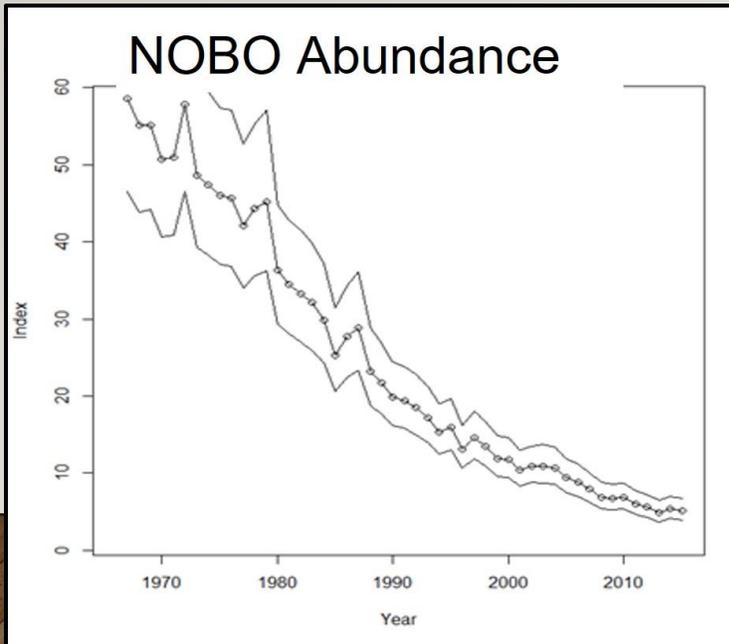
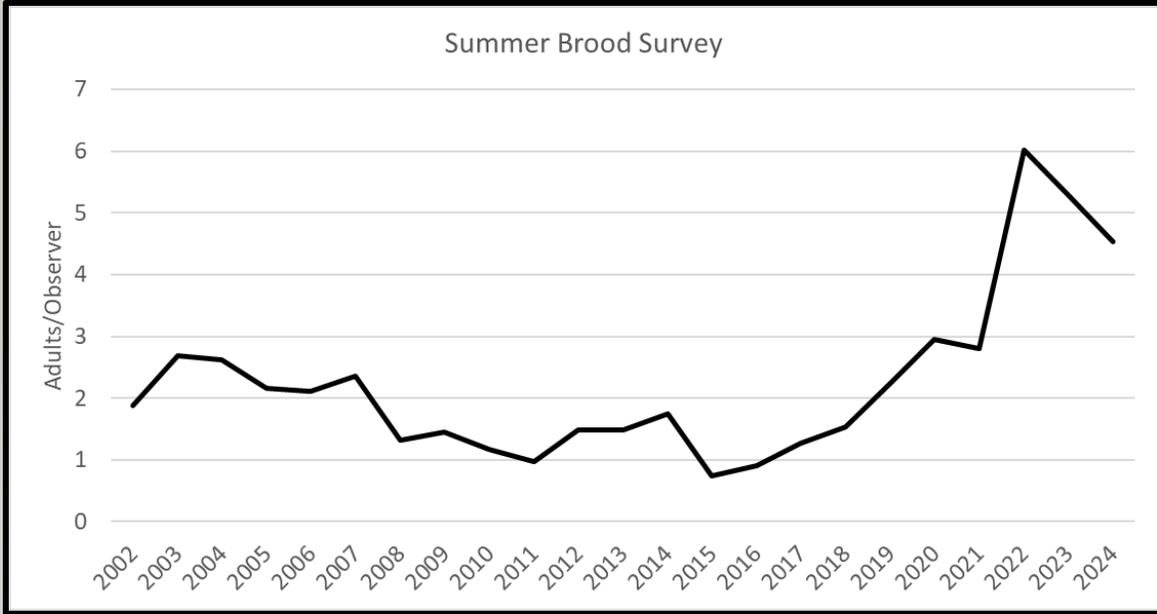
**Clint Johnson
Quail Program Coordinator
Arkansas Game And Fish Commission**

NOBO Abundance



Courtesy of the Cornell Lab of Ornithology. Source: Science, 2019

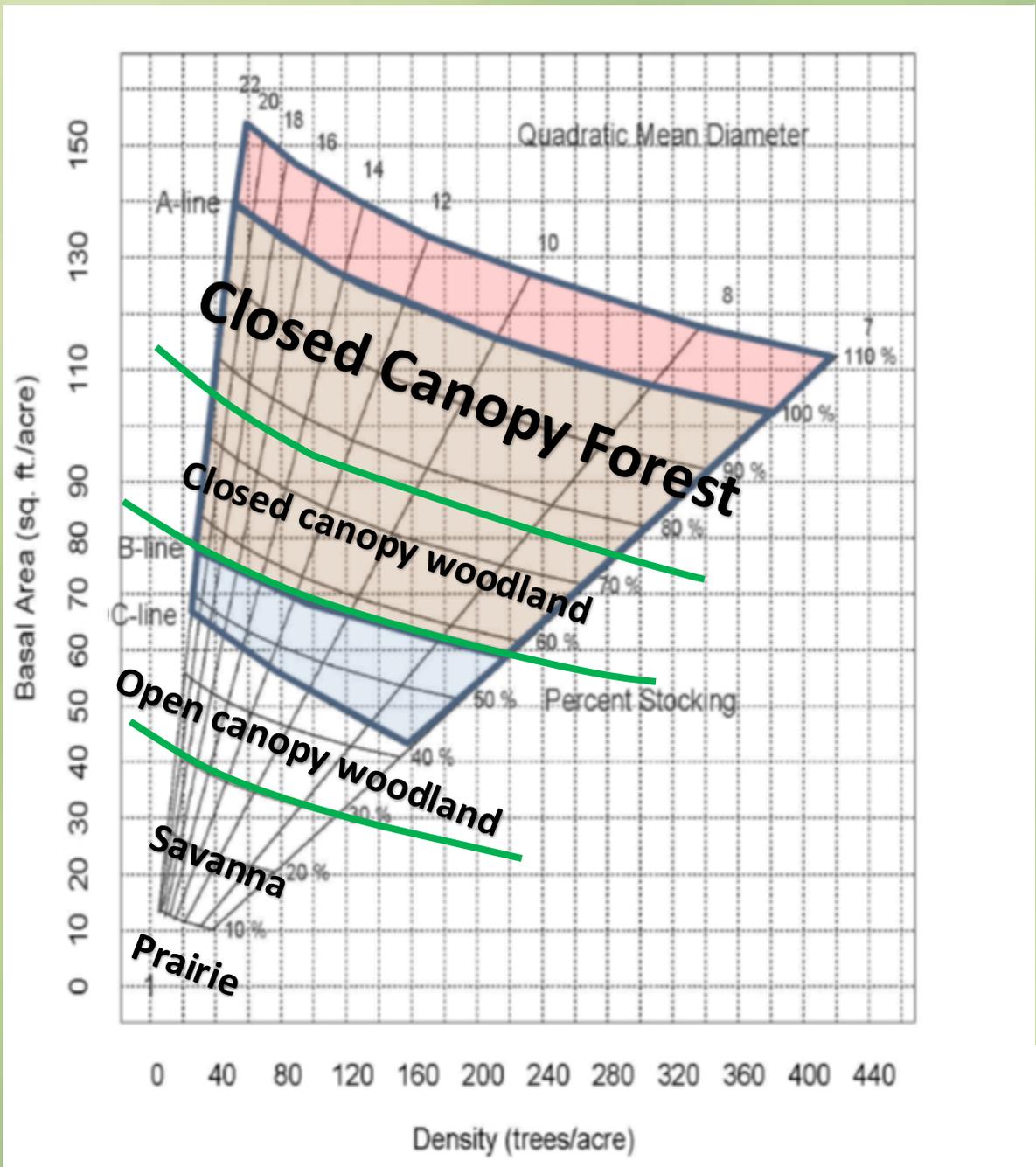
All is not lost for quail!





What is a grassland?

- Biomass and diversity dominated by herbaceous species
 - Can have trees
- Herbivory, abiotic limitations and fire
 - Rocky soil, south slopes, high or low pH, low rainfall, hardpan
 - Grassland plants increase flammability, attract grazers

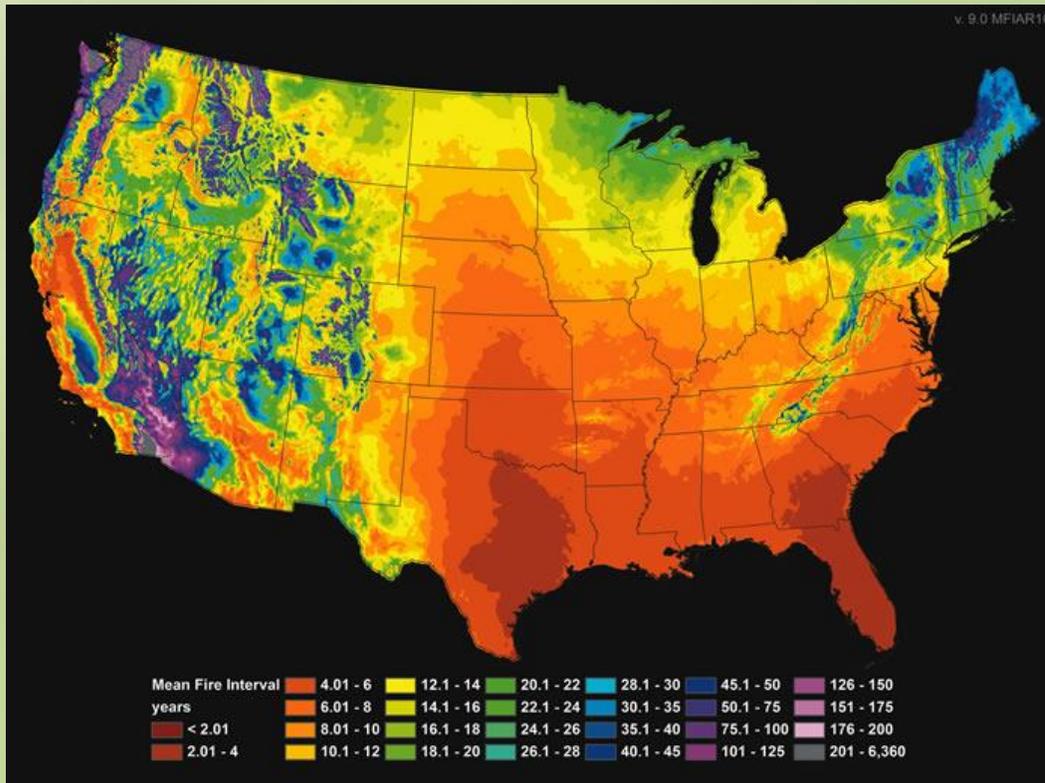




SE Grasslands

- Human influenced- Human caused?
- 470 million years of fire
- Plant change since Pleistocene- desert to aspen forest

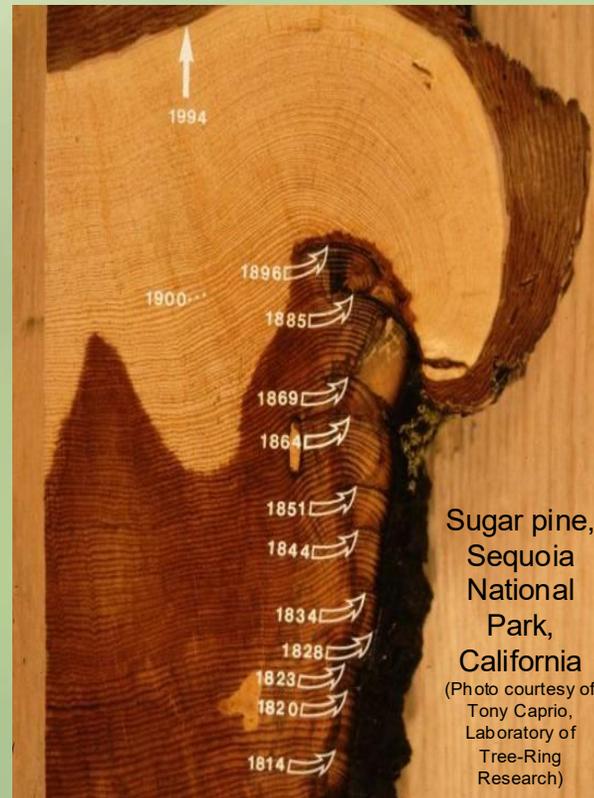
Fire frequency, 1650-1850. Dey et al., 2012





SE Grasslands

- 10-20k years of humans in Arkansas
- “Captured” tallgrass prairie
- Glades- captured desert flora and fauna





What is a grassland?

- On-site grasslands
 - Remnant
 - Recreations
 - Facsimiles



Off-Site Grasslands

- On acres not historically grassland
- Lemonade from lemons
- Do historical conditions matter to a bean field?
- Greatest conservation benefit
- Landowner objectives
- More input than on-site examples



How to read land

- Aerial- winter
- Topo
- GLO notes
- Prairie shapefile
- Glade shapefile
- LIDAR
- AWAP Mapping

Arkansas Game and Fish Commission | AGFC GIS & WMD, MORAP EMS, Arkansas GIS Office, Esri, TomTom, Garmin, Safe Software, Esri, NWS, USGS, EPA, NPS, USDA, USFWS

Powered by Esri

7:08 PM 6/10/2025

AWAP Habitat Class System	
	Cropland
	Crowleys Ridge Mesic Loess Slope Forest
	Cultivated Forest
	Gravel and Sand Bars
	Herbaceous Wetland
	Lakes and Ponds
	Lower Mississippi Alluvial Plain Grand Prairie and Savanna
	Lower Mississippi River Bottomland Depression
	Lower Mississippi River Dune Pond Forest and Woodland
	Lower Mississippi River Flatwoods Forest and Woodland
	Lower Mississippi River High Bottomland Forest
	Lower Mississippi River Low Bottomland Forest
	Native Nonnative Prairie or Pasture
	Ouachita Montane Oak Forest



How to read land

- Cedars
- Terraces
- Old fields





How To Read Land

- Soils
- Indicator plants
- Trees
- Stumps
- Interview the landowner
 - Dry soil
 - Rocks
 - Hardpan
 - Previous owner



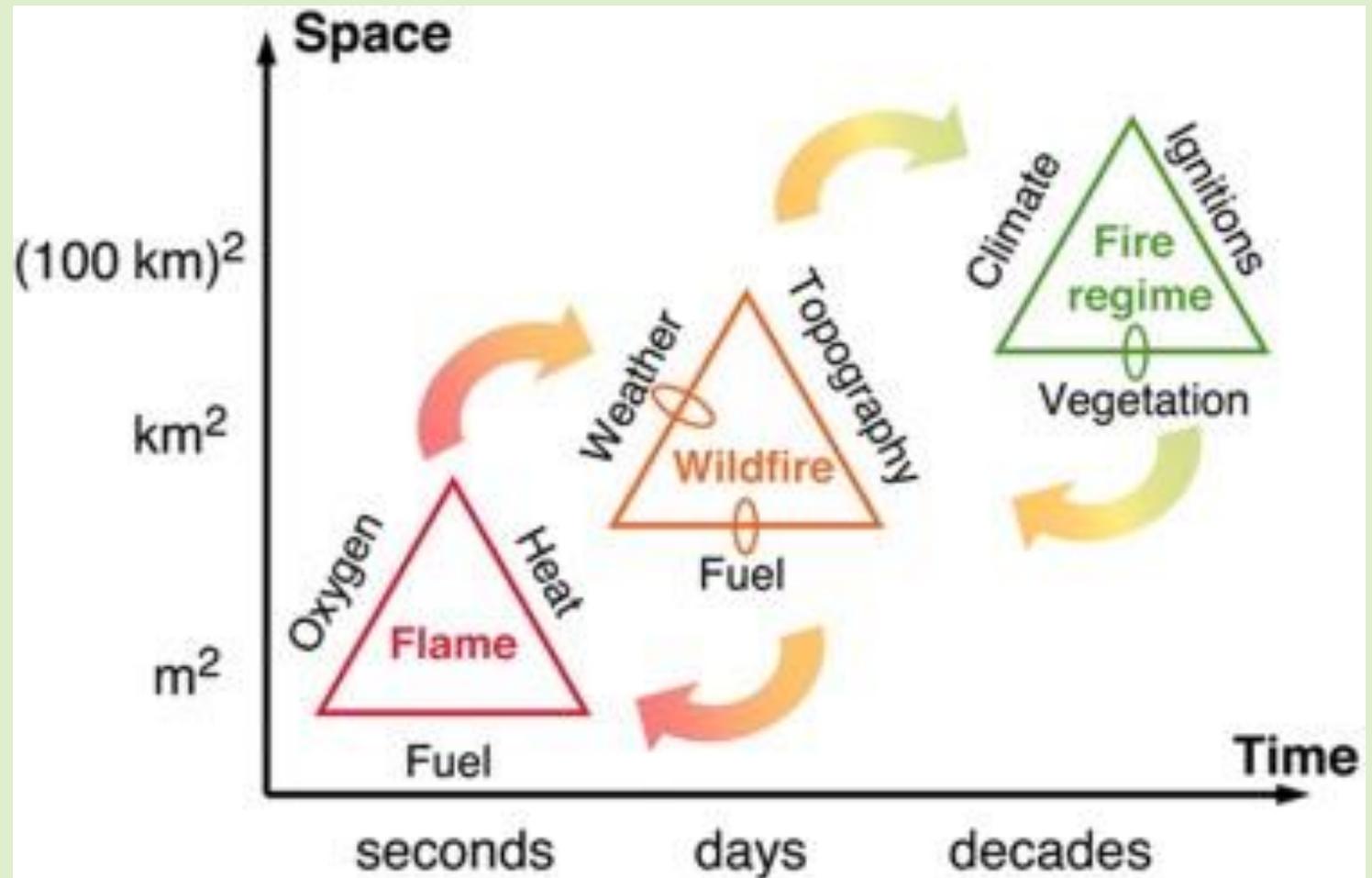


Tools of the Trade

- Fire
- Tree Removal
- Herbicide
- Disking
 - Very seldom the right tool
- Mowing
 - Complementary only

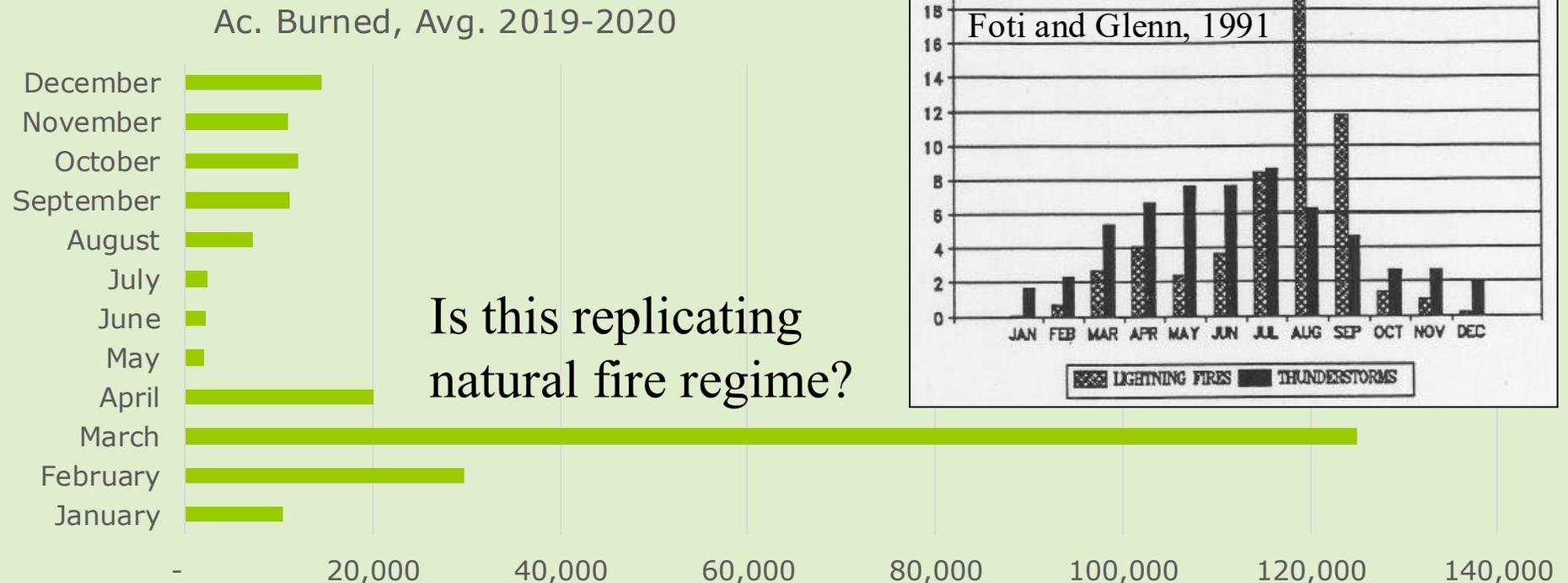
Fire

- Frequency
- Severity
- Seasonality



Fire Season- Why is it important?

- Historical long-term feral fires
- Lightning- late summer
- Native Americans- fall or spring, variable



Intensity and Severity

- Intensity- amount of heat produced by fire, approximated by flame height
 - Theoretically measurable, but practically subjective and relative
- Severity- amount of ecological change imparted by the fire
 - Dependent on intensity, fuel, season, ignition, frequency, and goals (prescription)
 - Manipulated by experienced burners
- Fast, intense fire vs. low and slow fire
- Overstory, midstory, or understory?

Intense? Severe?



Dormant Season Fire

November 1- April 15

- ❑ Removes leaf litter and fuel, top kills saplings
- ❑ More intense flames- dead fuels
- ❑ Less tree damage
- ❑ Encourages grasses



DS head fire- fast moving, intense, low severity



Dormant Season Fire

Feb. 1 - April 15

- Less smoke, cooler air temps
- Typically more wind, more smoke dispersion
- More spotting potential



Growing Season Fire

April 15 - Oct. 31

- ❑ Removes less fuel (higher fuel moisture)
- ❑ Kills saplings outright- more tree damage
- ❑ Encourages forbs
- ❑ Less flame intensity- live fuels



GS head fire- slow moving, intense, severe



Growing Season Fire

Aug. 1 - Oct. 31

- More smoke, higher air temps
- Typically less wind, less smoke dispersion
- Less spotting potential
- Can leave cover intact
- KDBI 400-600, more important than RH



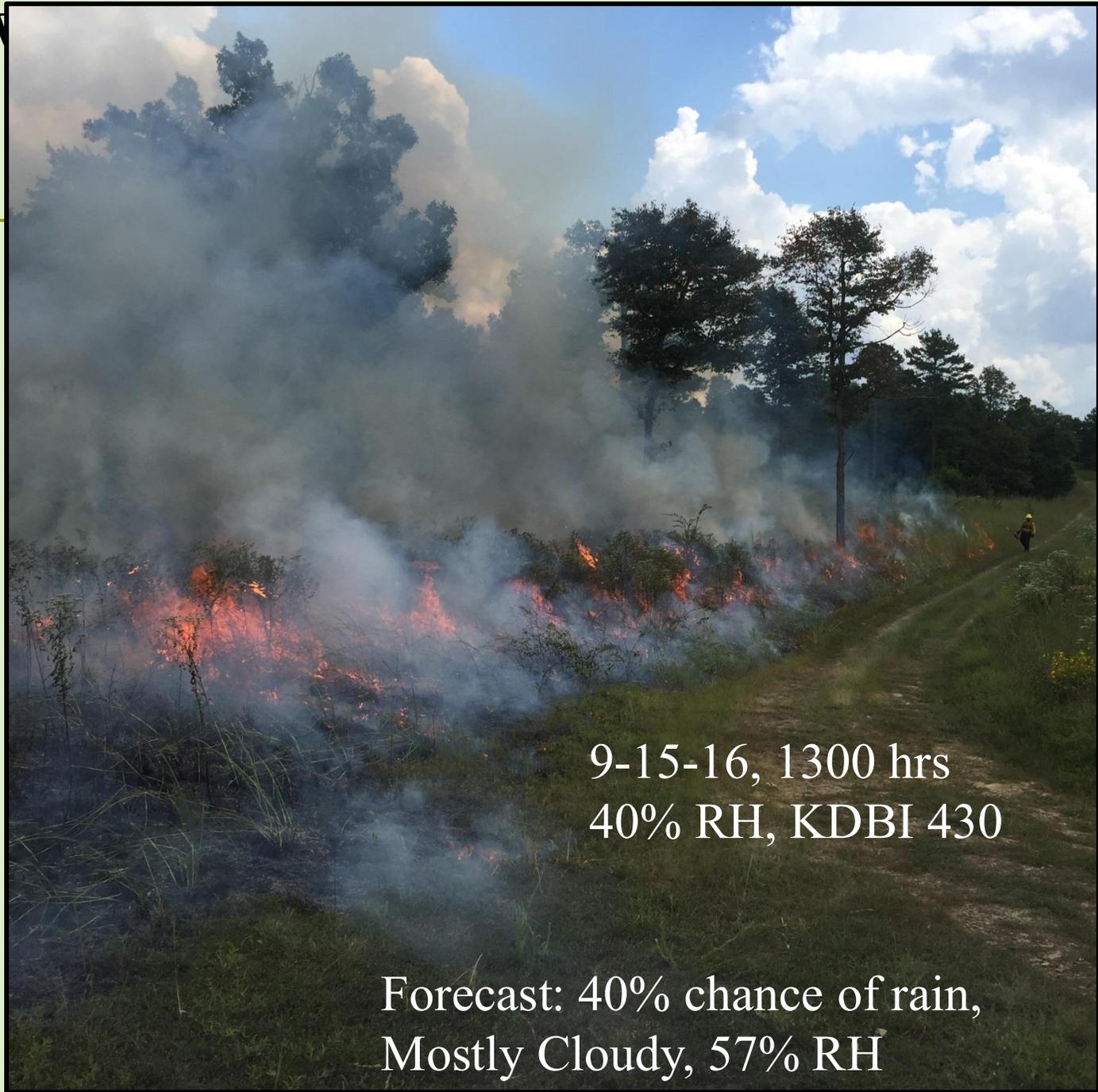
Frequency

- 1.5-2 years in prairie
- 2-3 years in savanna and woodland
- 3+ in forest, up to 100 years in cypress swamp
- “In the school of the woods, there is no graduation day.”
Horace Kephart
- If you have never lit a fire that has gone out, you are missing burn days!
- What kind of fire do you actually need?
- How can we get more burn days?



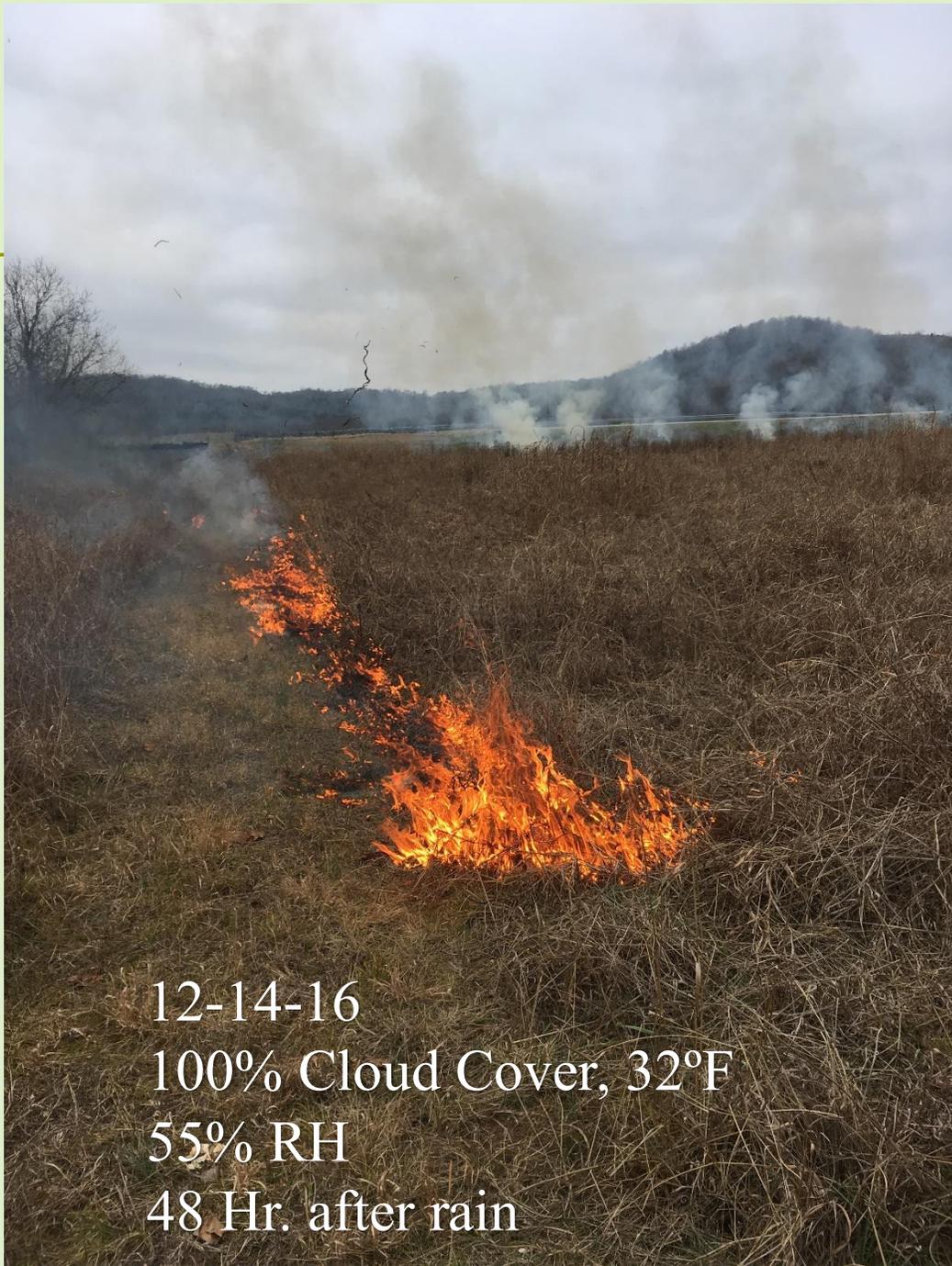
Keep track of weather and fire behavior
to help you learn. Take notes!

9-15-16, 1100 hrs
70% RH, KDBI 430



9-15-16, 1300 hrs
40% RH, KDBI 430

Forecast: 40% chance of rain,
Mostly Cloudy, 57% RH



12-14-16

100% Cloud Cover, 32°F

55% RH

48 Hr. after rain



Resources

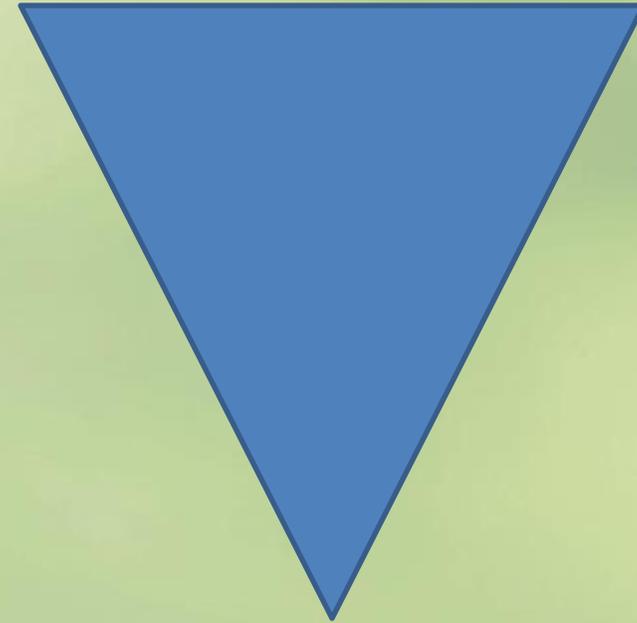
AGFC Habitat Biologists and others

AWAP- Finalized this fall

Joint Venture DFC's- species and system specific



Label = law
MP44
Published literature
Other publications
Random dude on internet
Random dude at workshop



treatment, tall fescue conversion improved the habitat characteristics of grasslands for northern bobwhites.



Remnant

- Surgical
- Fragile Seed Bank
- Single Invasive
- Control justified?
- Polishing a diamond

Degraded Site

- Nuclear?
- Replant
- Multiple invasives, some unknown
- Control critical
- Lemonade from lemons

Plenty of grey area in between



Adjuvants

Surface tension, waxy cuticle- NIS, MSO, oil-silicone blends

Hydrophilic vs. lipophilic active ingredients

Liquid nitrogen

Water softeners

Drift control

Plant injury

Check the label!



Sericea Lespedeza

- Woody, perennial legume, prolific seed after 2nd GS
- Levels of invasion
- LGS Fire
- PastureGard HL- 12-24 oz./ac., (0.5% NIS, 10+ gallons per ac.)
June-July before flowering (add 0.5-1 oz./ac. MSM after)
- MSM alone- 0.5-1 oz./ac.- useful in sensitive sites, flowering
August-Sept.
- Ineffective- glyphosate, imazapic and imazapyr



Sericea Rx Examples

- 100% sericea, unknown seed bank
- August fire- prevents seeding
- PastureGard HL- 24 oz./ac. + 1 oz./ac. MSM next July
- Treat seedlings in September?
- 3rd growing season- should be controlled, clean up with MSM 0.5 oz./ac. if necessary

- Sericea patches in diverse forbs
- August fire
- MSM 0.5 oz./ac. next August



Saplings

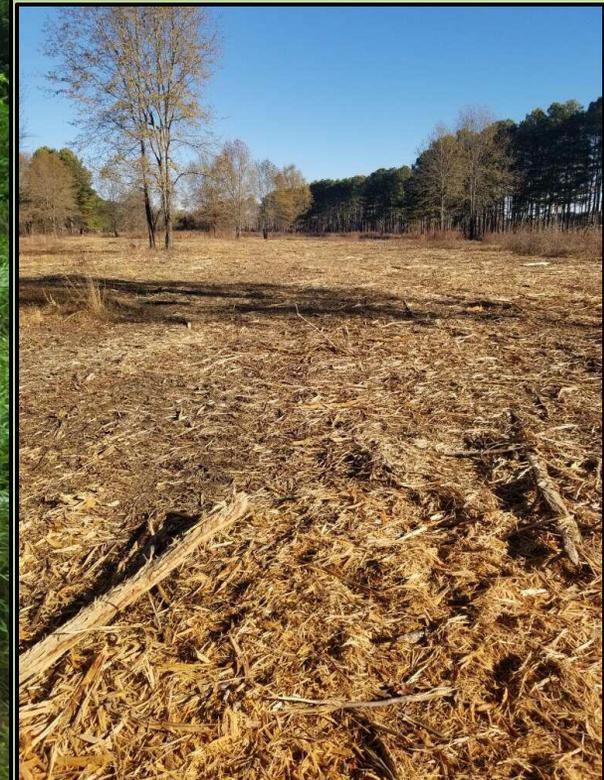
- Kill the momma trees
- Species?
- LGS fire
- Imazapyr- aquatic; soil active; pine, blackberry and legumes tolerant
- Triclopyr- amine and ester; foliar, basal bark and cut surface
 - PastureGard HL- Gold Standard
 - Trycera- acid- do all
- MSM- soil activity, broader efficacy, synergism
- Milestone- soil activity, locust and persimmon, broader efficacy, synergism

Growing Season

Broadcast foliar
Spot foliar

Year Round

Hack and squirt
Cut stump
Basal spray





Sapling Rx Example

6 ft. tall solid sweetgum patches in remnant prairie

Drone spray PG HL 48 oz./ac., oil blend surfactant

Burn in July

Spot spray PG HL 1% next September

6 ft. tall sweetgum sprinkled in remnant prairie

Weed wick PG HL, MSM, Milestone

OR

Cool December burn, then cut stump with triclopyr amine in January



Cool Season Grasses

- Fescue and vasey grass
- Vulnerable February-April and October-November
- December-January- high and low temp > 100
- Fire can do a lot
- Glyphosate 48-64 oz./ac.
- Clethodim 8-16 oz./ac.
- Imazapic 6-12 oz./ac. (soil active)



Fescue Rx example

- 100% fescue, unknown seedbank
- Imazapic?
- Glyphosate 64 oz./ac. in February
- March fire
- Clethodim 12 oz./ac. in April-May as needed
- Monitor for seed bank response over summer
- Clethodim 12 oz./ac. in October as needed
- Plant in winter



Bermuda

Persistent resprouter

Persistent seeds- Dallis and Bahia

Repeated application or soil activity a must- replant?

- Clethodim 8-16 oz./ac. (0.25% NIS)- 4-5 applications
- Glyphosate 48-64 oz./ac.- 4-5 applications
- Imazapic 6-12 oz./ac. (soil active) with glyph
OR
- Imazapyr 12-20 oz./ac. (soil active) with glyph- may require some glyph follow up



Johnson Grass

- Rhizomes-huge root reserves
- Disking
- Glyphosate 48-64 oz./ac.- 4-5 applications, June-September
- Imazapyr ineffective
- Wicks
- Sulfosulfuron 0.75-2 oz./ac. in July- soil active
 - Very selective- gamma grass
 - Finish off seedlings with glyph or clethodim in September



Native Grasses

- Incorrect fire regime or grass-heavy seed mix
- Goal- increasing forb diversity, not total control
- Disking (not on remnants)- 50% dirt: brace for invasives
- Clethodim- 12 oz./ac., spray sloppy
- Drone?
- Alternate fire seasonality, NO EGS!



Planting

- Minimize soil disturbance and non-target herbicide damage
- Match seeds to site
- Genotype- as local as possible
- Seeds/ft² (~25), not PLS lb/ac.
- Don't plant too deep
- Social reasons to plant- annuals in mix



Tree Removal

- Commercial
 - Pros and Cons
 - What's a tree worth?
 - Timber theft
 - Mark trees
 - Bid the sale
 - Consulting forester
 - Contract with logger
 - Check references



Tree Removal

- Injection
 - Slower understory response- shade- worse the more open
 - Labels are conservative
 - Always girdle trees
 - Multiple modes of action
 - Soil active
 - Se habla Espanol? Stay. With. Contractor.
 - Sub-contractor
 - Rx- Diameter? Species?



Tree Removal

- Cut and drop
 - Same contractor issues as injection
 - More cut and dry
 - Faster understory response and final product
 - Fire- risk of overstory mortality, soil sterilization
 - BEHAVE critical

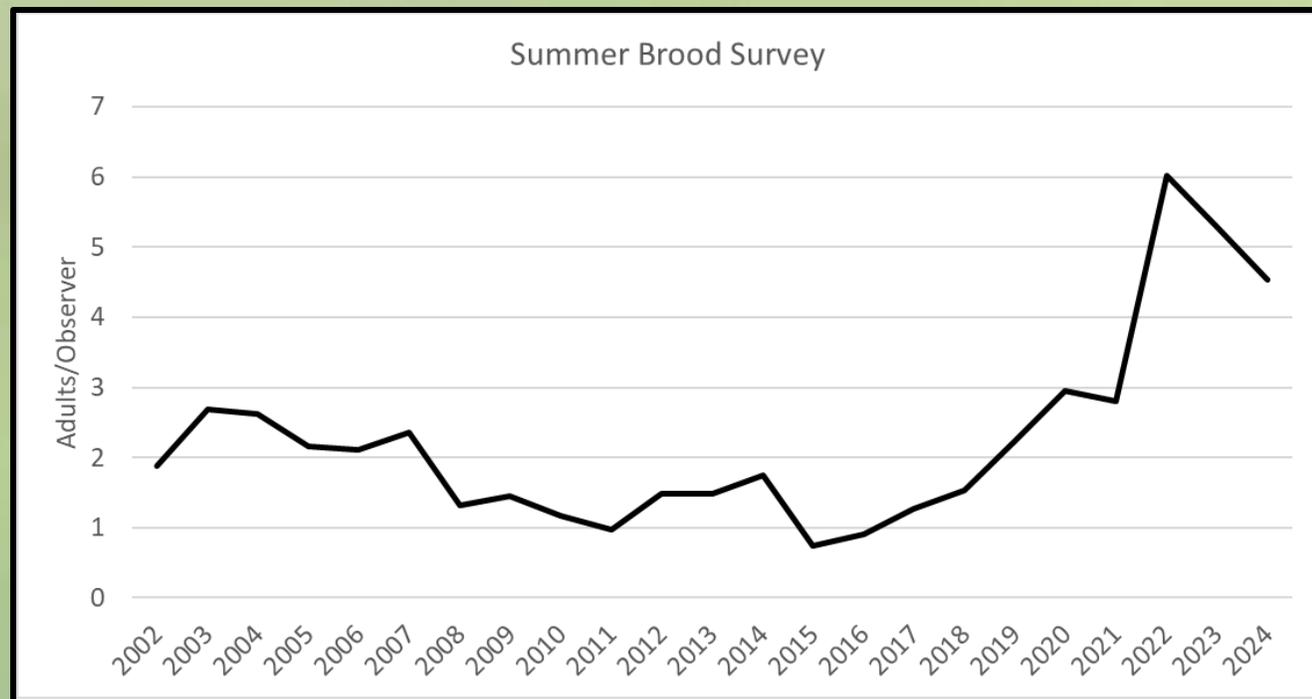


Tree Removal

- Mulching
 - Bigger is cheaper
 - Skid steer
 - Not a magic bullet- resprouting
 - Burning mulch
 - 2 weeks, 6-12 months
 - Slow burn
 - Overstory mortality, root systems, soil sterilization



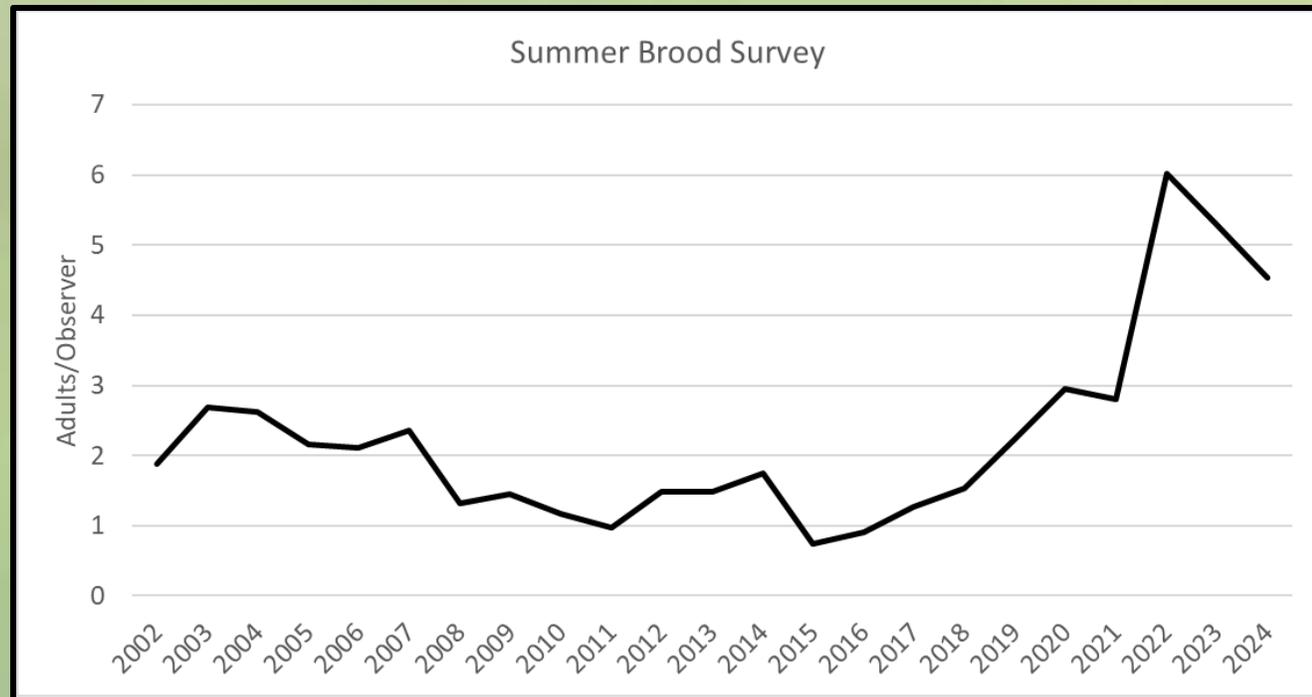
People Actually Quail Hunt!?





People Actually Quail Hunt!?

	AR Statewide
Quail Bagged Per Hour	0.3
Coveys Flushed per Hour	0.3
Quail Bagged per Hunt	0.9

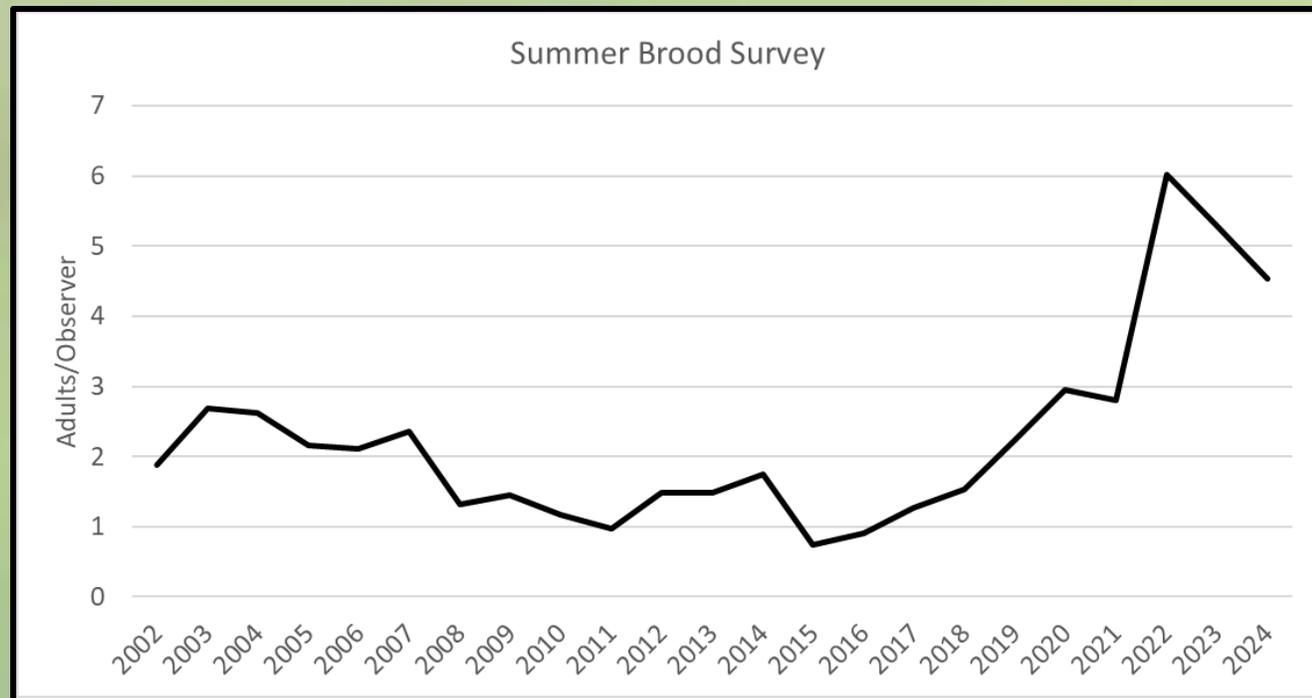




People Actually Quail Hunt!?

	AR Statewide	AR Ft. Chaffee
Quail Bagged Per Hour	0.3	0.4
Coveys Flushed per Hour	0.3	0.5
Quail Bagged per Hunt	0.9	1.3

Average Hunt Satisfaction | **3.7/5**

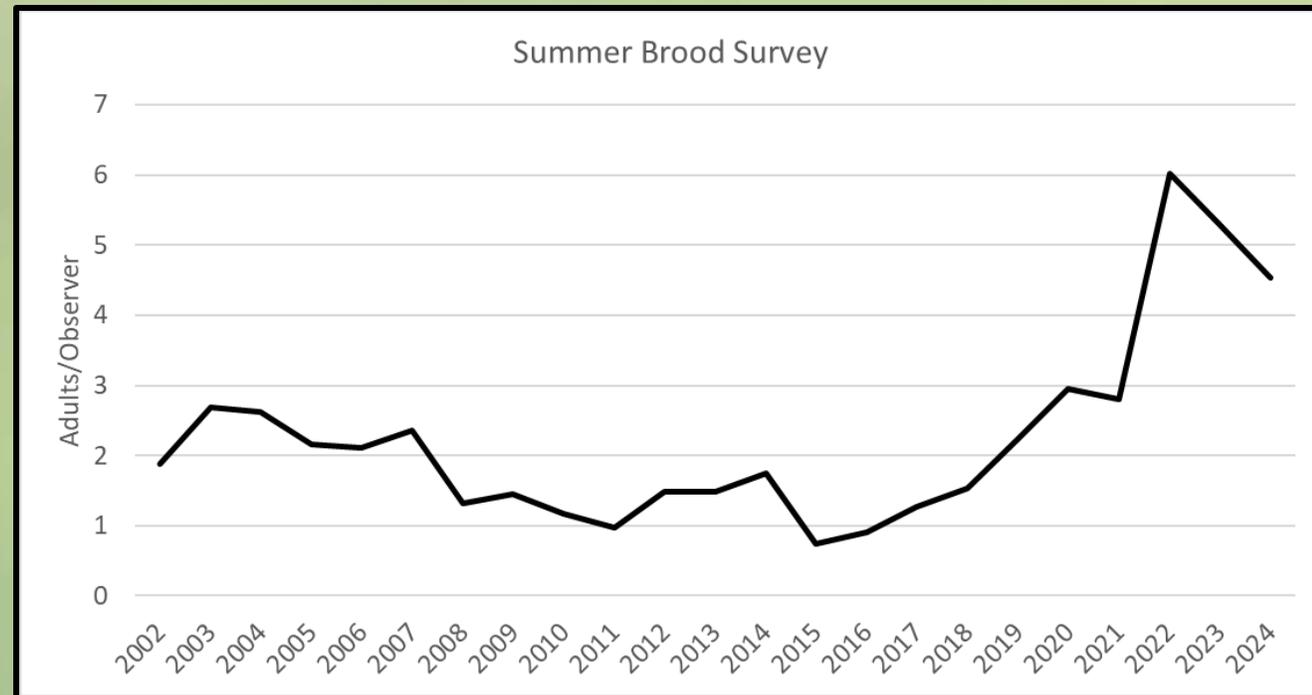




People Actually Quail Hunt!?

	AR Statewide	AR Ft. Chaffee
Quail Bagged Per Hour	0.3	0.4
Coveys Flushed per Hour	0.3	0.5
Quail Bagged per Hunt	0.9	1.3

Average Hunt Satisfaction	3.7/5
Satisfaction 0 Harvest	3/5

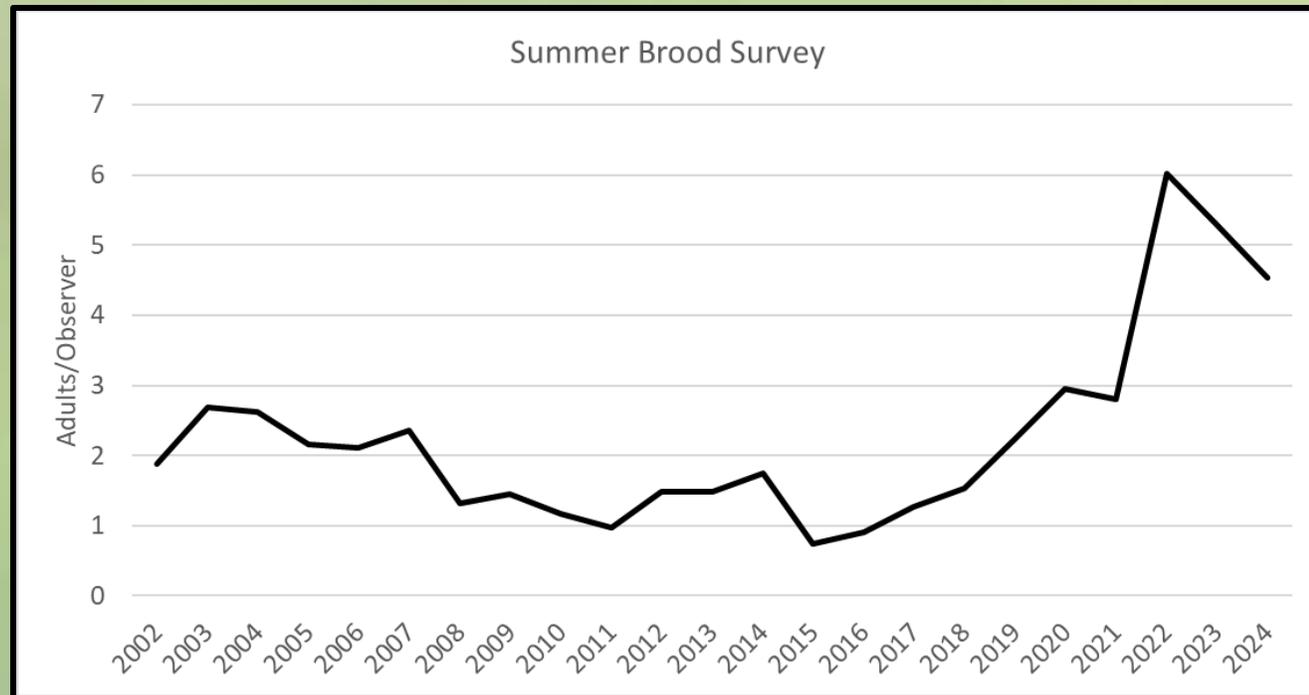




People Actually Quail Hunt!?

	AR Statewide	AR Ft. Chaffee
Quail Bagged Per Hour	0.3	0.4
Coveys Flushed per Hour	0.3	0.5
Quail Bagged per Hunt	0.9	1.3

Average Hunt Satisfaction	3.7/5
Satisfaction 0 Harvest	3/5
Satisfaction 1 Bird	4.2/5

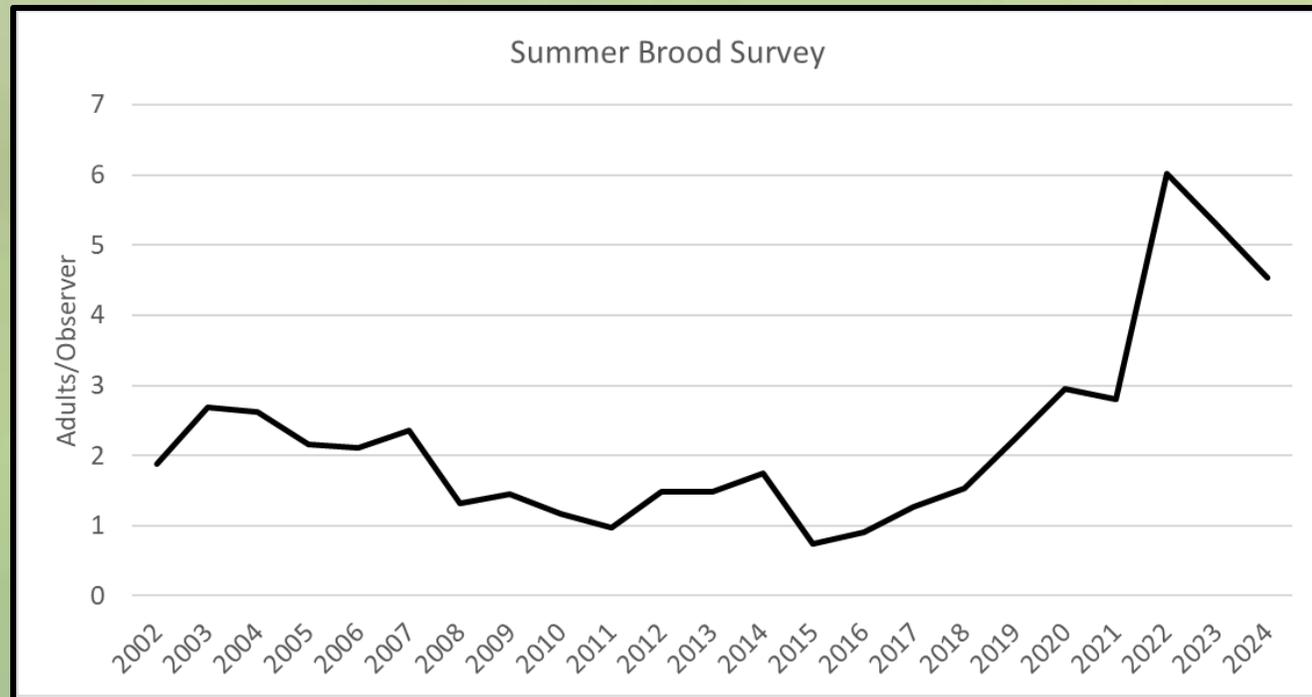




People Actually Quail Hunt!?

	AR Statewide	AR Ft. Chaffee
Quail Bagged Per Hour	0.3	0.4
Coveys Flushed per Hour	0.3	0.5
Quail Bagged per Hunt	0.9	1.3

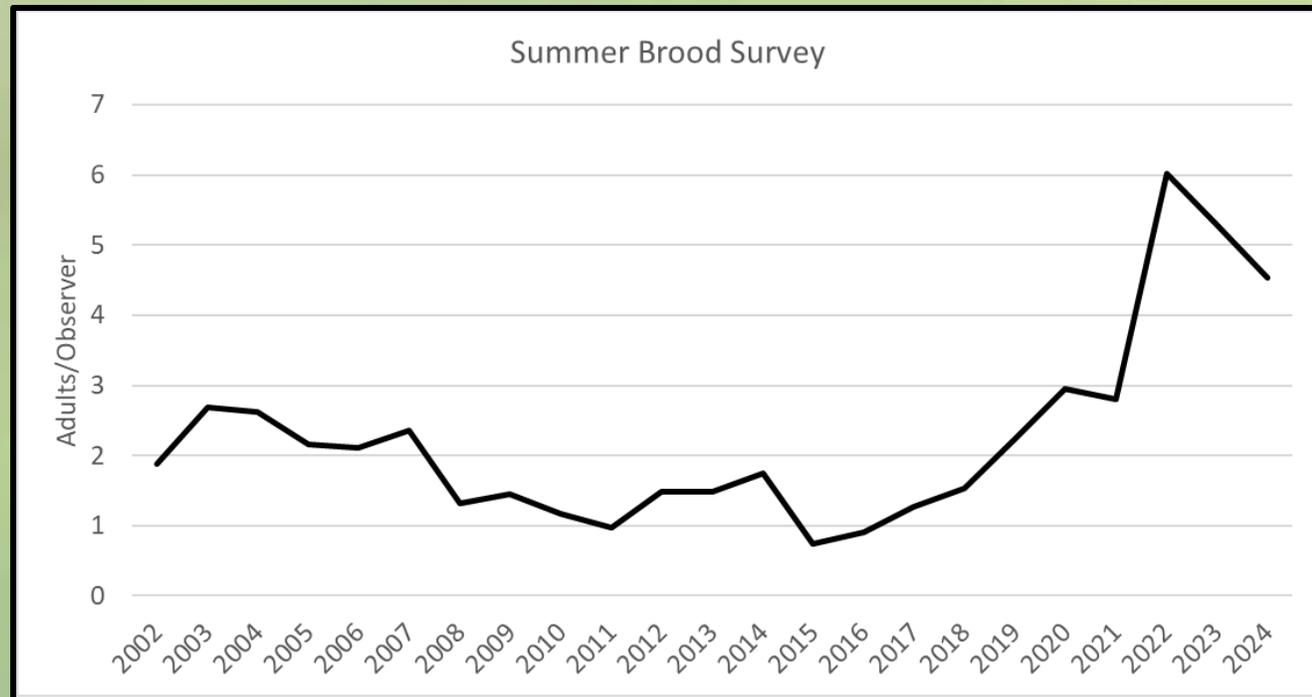
Average Hunt Satisfaction	3.7/5
Satisfaction 0 Harvest	3/5
Satisfaction 1 Bird	4.2/5
Satisfaction >1 Bird	4/5





People Actually Quail Hunt!?

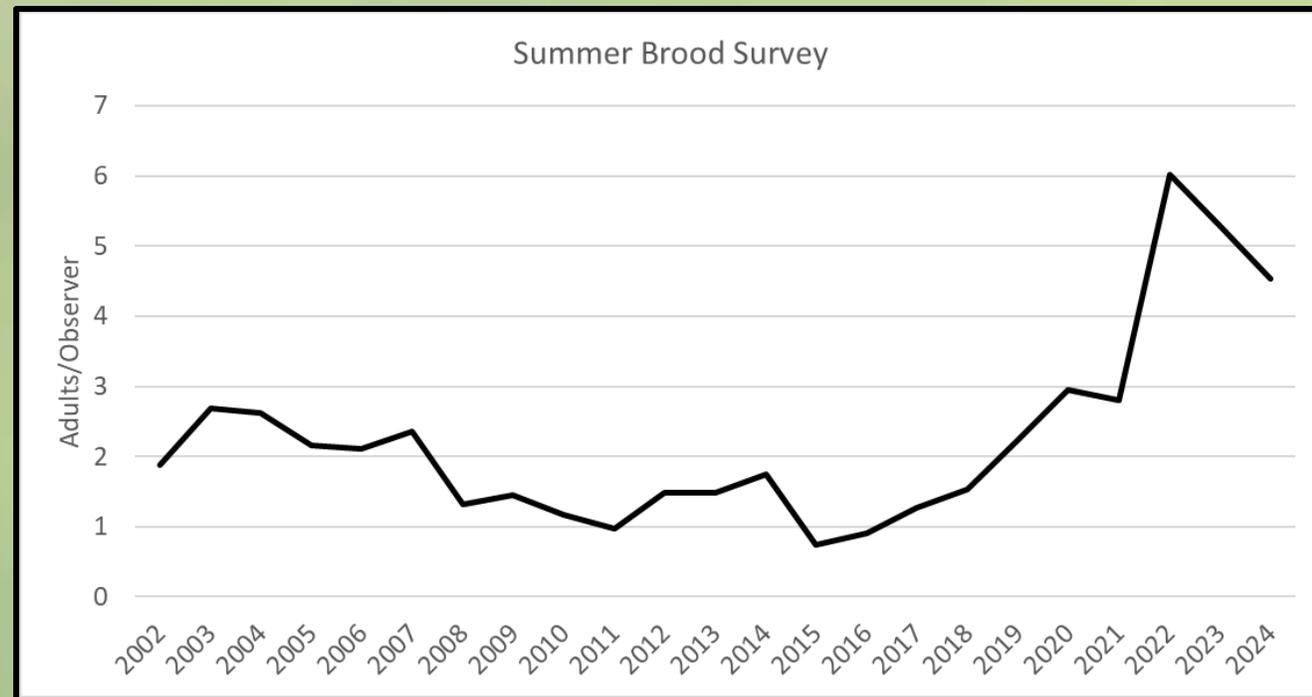
	AR Statewide	AR Ft. Chaffee	TX Statewide
Quail Bagged Per Hour	0.3	0.4	0.6
Coveys Flushed per Hour	0.3	0.5	NA
Quail Bagged per Hunt	0.9	1.3	2.5





People Actually Quail Hunt!?

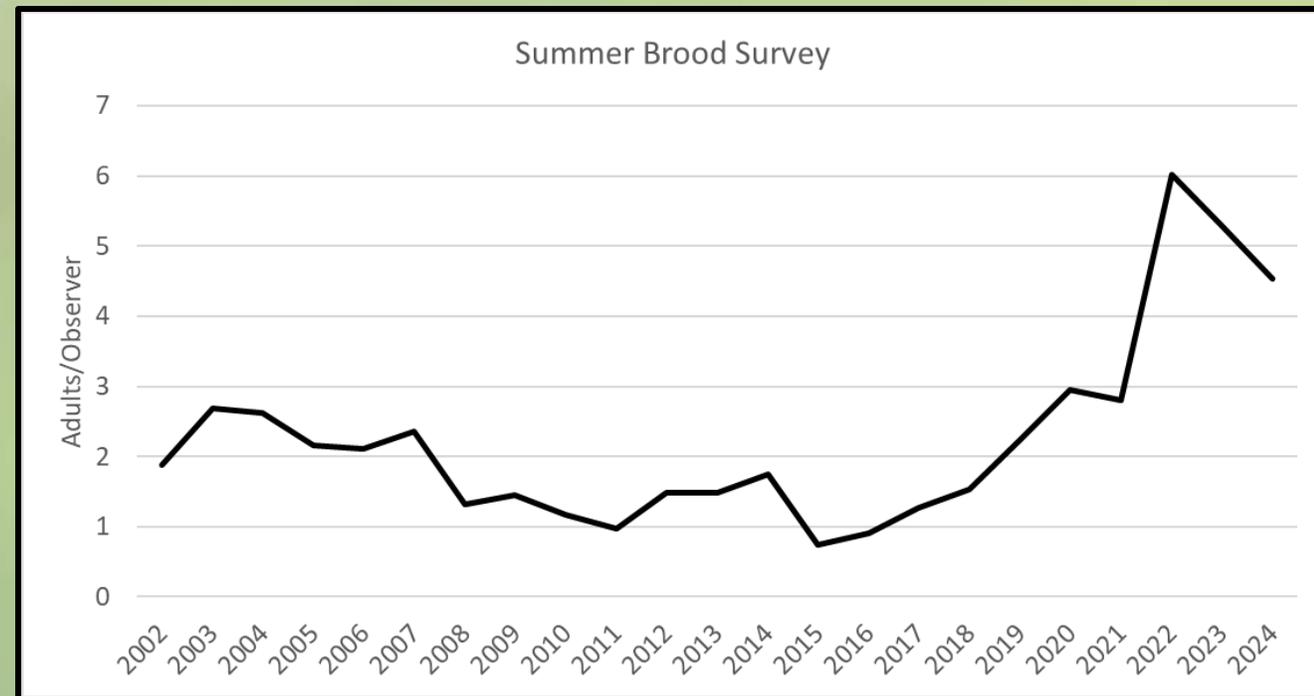
	AR Statewide	AR Ft. Chaffee	TX Statewide	OK Statewide
Quail Bagged Per Hour	0.3	0.4	0.6	0.70
Coveys Flushed per Hour	0.3	0.5	NA	N/A
Quail Bagged per Hunt	0.9	1.3	2.5	2.4





People Actually Quail Hunt!?

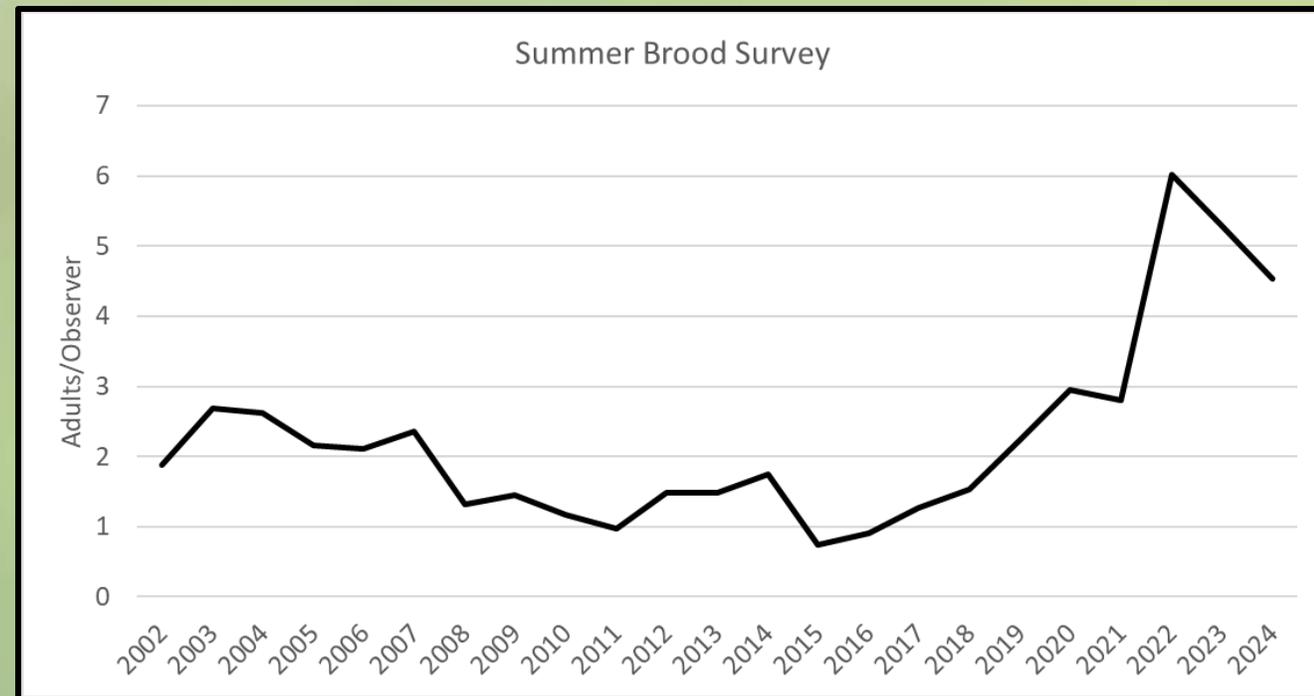
	AR Statewide	AR Ft. Chaffee	TX Statewide	OK Statewide	KS Statewide
Quail Bagged Per Hour	0.3	0.4	0.6	0.70	0.3
Coveys Flushed per Hour	0.3	0.5	NA	N/A	N/A
Quail Bagged per Hunt	0.9	1.3	2.5	2.4	1.1





People Actually Quail Hunt!?

	AR Statewide	AR Ft. Chaffee	TX Statewide	OK Statewide	KS Statewide	GA Public
Quail Bagged Per Hour	0.3	0.4	0.6	0.70	0.3	0.2
Coveys Flushed per Hour	0.3	0.5	NA	N/A	N/A	0.4
Quail Bagged per Hunt	0.9	1.3	2.5	2.4	1.1	N/A





Where to go?

HAROLD ALEXANDER	QFA	0	0.04	0.02	0.19	0.07	0	0.07
HOPE UPLAND	QFA	0	0	0	0	0	0.08	0
JACK MOUNTAIN	QFA	0.33	0.08	0.33	0.25	0.08	0.08	0.42
LITTLE BAYOU	QFA	0	0.05	0.48	0.33	0.48	1.86	1.57
MUD CREEK	QFA	0.17	0	0	0	0	0	0
PEA RIDGE	QFA	0.25	1.22	0.36	0.06	0	0	0
STONE PRAIRIE	QFA	0.17	0.22	0.44	0.22	0.28	1.06	1.06
SYLAMORE	QFA		0.81	1.33	1	1.62	1.05	

2024 ANNUAL QUAIL PROGRAM REPORT

Prepared by Clint Johnson, Quail Program Coordinator

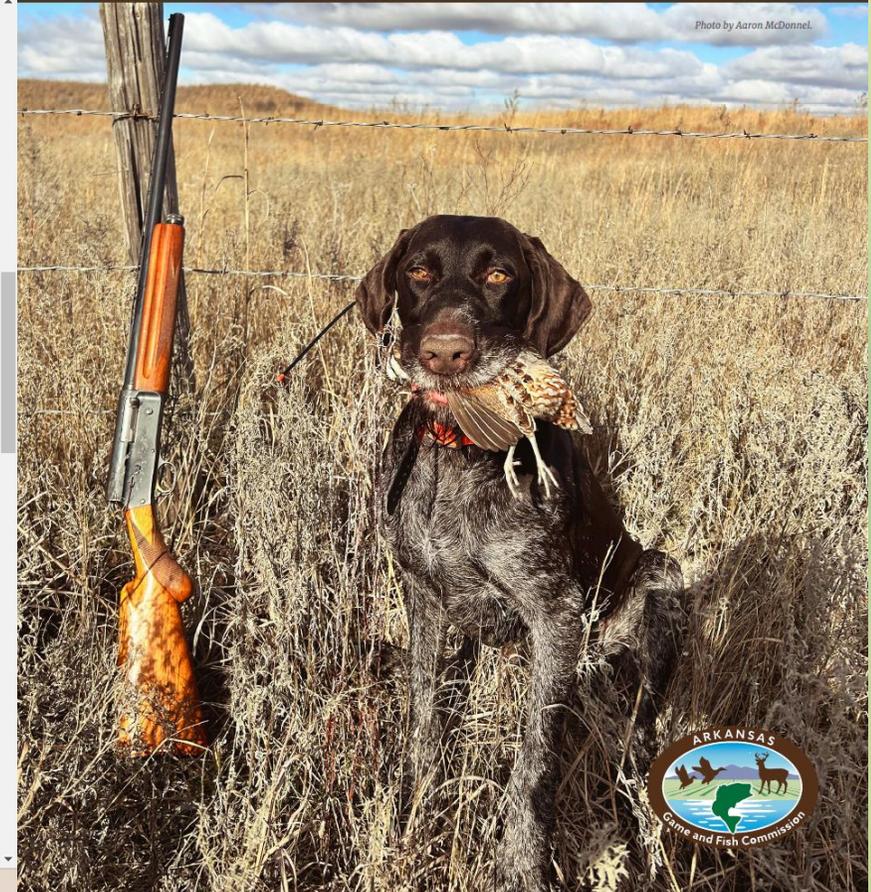


Photo by Aaron McDonnell.

agfc.com/hunting/more-game/quail/

proceeds from hunting licenses, the 17.001 of a cent Conservation Sales Tax and Farm Bill funding helps fuel thousands of acres of habitat enhancement work every year. Although we will likely never see a statewide increase in quail populations, bobwhites can still be found in healthy numbers on properties where management occurs. In many places in the state, huntable populations still exist and we are working to grow the list each year.

[Click Here to View the 2023 Quail Focal Area Report](#)

Helpful Resources

- [Annual Quail Program Report](#) →
- [Quail Hunter Log](#) →
- [Bringing Back the Bobwhite Booklet](#) →
- [Meet "Bob White"](#) →
- [Quail Surveys](#) →
- [Land Management Videos](#) →
- [Landowner Assistance](#) →

Receive Relevant Alerts ✕

[Download a Northern Bobwhite Ringtone](#) [↑ TOP](#)

29°F Sunny 12:36 PM 2/21/2025

Final Thoughts

Cut Down Trees

Burn Stuff

Quail/Turkey Observations

