WESTERN STATES WILD TURKEY TECHNICAL COMMITTEE
AND
WESTERN STATES WILD TURKEY WORKSHOP

4-5 May, 2021
Virtual Meeting

HOSTED BY THE WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

CONTENTS

Note: the 2020 workshop was cancelled due to COVID-19 pandemic restrictions.

Western States Wild Turkey Technical Committee Meeting

4-5 May 2021

Virtual Meeting hosted by Washington Department of Fish and Wildlife
All times are Pacific Time (PT)

AGENDA

Tuesday, 4 May 2021

- → **10:00 – 10:15** **Opening and introductions**
- → **10:15 – 12:00** **State update reports**
- → *12:00 – 1:00* *Lunch*
- → **1:00 – 3:00** **NWTF, BLM/USFS update reports**

Wednesday, 5 May 2021

- → **8:00 – 8:50** **Finish update reports, as needed**
- → **9:00 – 10:15** **Human-turkey conflicts: presentation and discussion**
  - o Managing turkeys in a human-dominated landscape in Washington — *Kile Westerman*
  - o Should the Committee work on a best management practices document for human-turkey conflicts? — *Brian Wakeling*
- → **10:30 – 12:00** **Group discussion**
  - o A Review of Harvest and Population Monitoring Methods for Western Wild Turkeys – review and update of manuscript status, discussion — *Brian Wakeling*
  - o Status of Turkeys in the Western US - document update and discussion — *Kent Fricke*
- → *12:00 – 1:00* *Lunch*
- → **1:00 – 3:00** **Continued discussion as needed**
  - o Future projects discussion
  - o Future meeting schedule discussion

ATTENDEES

The meeting was called to order at 10:00am on May 4, 2021.

In attendance:

State	AZ	Rick Langley
State	AZ	Rana Tucker
State	CA	Kathrine Miller
State	CA	Dan Skalos
State	CA	Matt Meshriy
State	ID	Jeff Knetter
State	KS	Kent Fricke
State	MT	Brian Wakeling
State	NE	Luke Meduna
State	NM	Casey Cardinal
State	NV	Shawn Espinosa
State	OK	Rod Smith
State	OR	Mikal Cline
State	TX	Jason Hardin
State	WA	Sarah Garrison
State	WA	Kile Westerman
State	WY	Joe Sandrini
NWTF	Central Region	Jared McJunkin
NWTF	MT/ID/WY	Collin Smith
NWTF	ND/SD	Clayton Lenk
NWTF	TX/OK/KS/NE	Annie Farrell
NWTF	WA/OR/CA/NV	Kevin Vella
NWTF	Western Region	Patt Dorsey
Canada	Alberta Conservation Association	Mike Verhage
Canada	Alberta Conservation Association	Doug Manzer
Canada	Alberta Province Government	Jason Caswell

STATE REPORTS

in alphabetical order

ARIZONA WILD TURKEY POPULATION STATUS REPORT – 2021

Western States Wild Turkey Technical Committee Meeting – May 4–5, 2021
Hosted virtually by Washington Dept. of Fish and Wildlife

Rick Langley – Wildlife Program Manager
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Rana Tucker – Terrestrial Wildlife Specialist
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Tucson, AZ 85745
(520)628-5376 / rtucker@azgfd.gov

POPULATION STATUS

Turkey populations in Arizona are showing some declines, while some localized populations have shown some increases after the Wallow Fire of 2011. Although we do not have a good way to estimate turkey numbers, Merriam's turkeys are probably between 25,000 and 30,000 in number, whereas Gould's turkeys number around 1,500. In 2011, Arizona had its highest spring permitted hunt to date with 7,698 permits authorized. For the Spring 2021 turkey season, we offered 5,860. Gould's turkey numbers continue to increase within the available habitat in their range and are expanding into lower desert riparian areas outside of their typical mountainous riparian habitat.

REPRODUCTION

Region 1 (Merriam's turkeys) on the eastern side of the state was the only Region that that had any data from fall brood surveys. A total of 575 turkeys were observed: classified as 59 males, 137 females, and 375 poults, for a poult to hen ratio of 2.74. This is similar to the long term average in the Region.

HARVEST

2020 Spring Turkey Season

The 2020 estimated spring harvest was 804 turkeys, which is a decrease from 2019 (-202). The highest recorded harvest for turkeys was 1,374 turkeys in Spring 2007. Spring 2020 hunt success averaged 18%, which was lower than the 2019 average of 22%. Arizona manages for 15-20% hunt success and this average is within those guidelines.

Youth turkey hunters were also able to purchase over the counter spring turkey tags for spring 2020, valid in 10 units. The last year we have harvest data for is 2015. In 2015, hunt success

averaged 34% with 802 hunters expending 2011 hunter days to harvest 271 turkeys. Permitted youth hunts were also offered in 4 units in 2020 with a total of 340 permits offered. 275 youth hunters expended 1107 days to harvest 45 turkeys, for an average hunt success of 16%.

The spring hunt is on a permit drawing system and is limited to shotguns shooting shot. The deadline for applications was in mid-October 2020, for the 2021 season. We have stratified all Merriam's units into two seasons, one that runs for a week, closes for a week, and then reopens for two weeks. The second season opens the week following the first season and runs for three weeks. In this fashion, each season has a week to itself and then two weeks when the season overlaps. This has allowed for an increase in permits without increasing hunter densities because few hunters return during the late season. Some Gould's hunt units have opted to add a third hunt, which opens the week prior to the first hunt and is structured in the same fashion. The season is timed to allow most of the hens to be incubating nests during the hunt. The results of the 2016-17 Gould's study show that Gould's nest later than Merriam's. As a result of this new information, the opening of the Gould's season was shifted later one week on the calendar in 2019. In Arizona, 10 to 20% of the adult hens have a beard that would make them legal in the spring season.

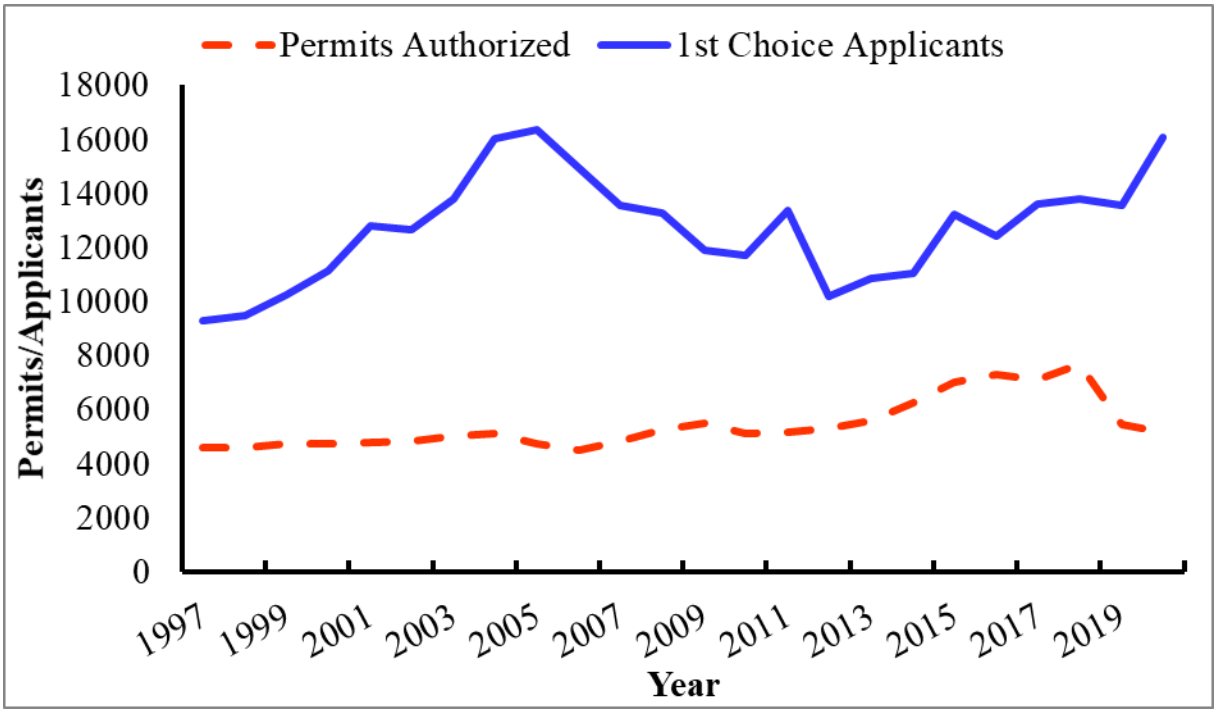


Figure number 1. Spring turkey permits and first choice applicants in Arizona, 1997–2020.

2020 Fall Turkey Season

Fall turkey hunting in Arizona is on the permit draw system, with the exception of fall archery tags which are available over the counter. For most big game species, applicants increase substantially when the opportunity to apply is offered through the online system and turkey hunt

applicants are on an increasing trend. In fall 2020, 8146 hunters applied for the 5,021 permits available. The highest number of fall permits offered was 7,822 in 1993.

Fall archery season is not on the permit drawing system but does require a tag, which may be purchased over the counter. Season dates were August 21 - September 10, 2020 throughout units that have archery turkey hunts. These seasons run concurrently with archery deer seasons.

Fall turkey hunts are only offered in units with Merriam's turkeys. No fall hunts are offered for Rio Grande or Gould's turkeys.

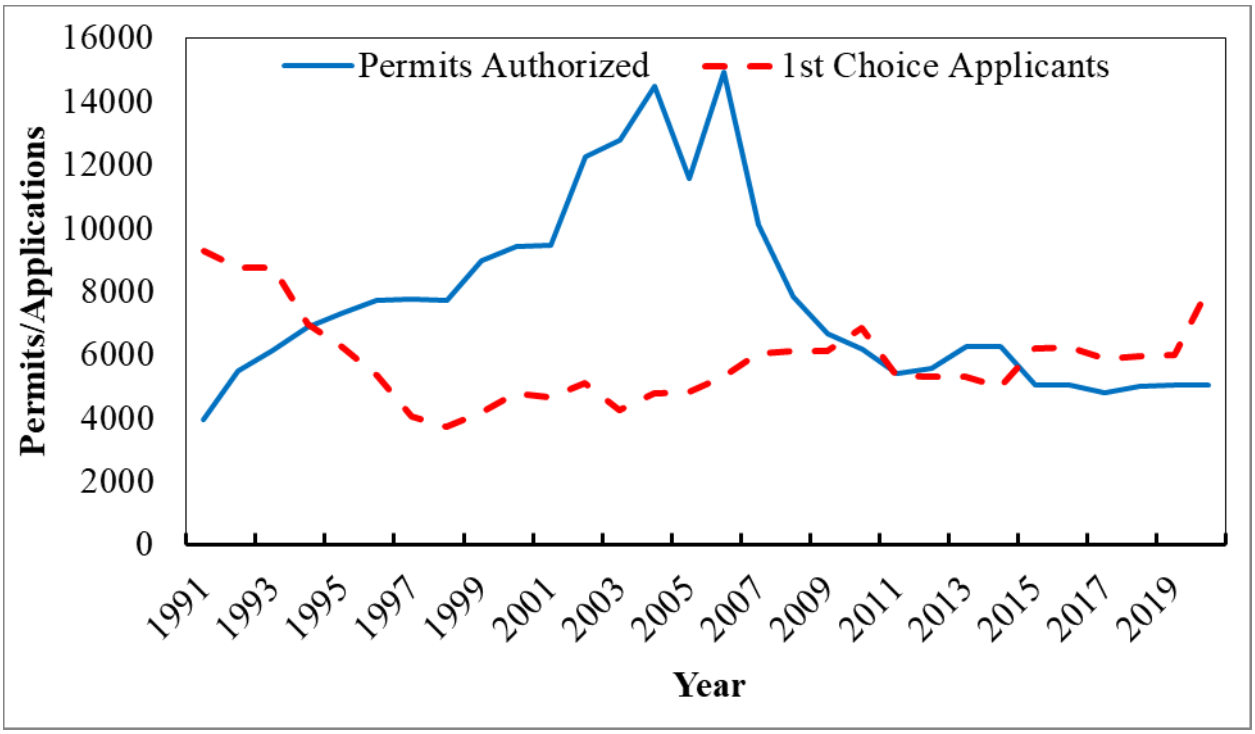


Figure number 1. Fall turkey permits and first choice applicants in Arizona, 1997–2020.

HUNTING INCIDENTS

No turkey hunting incidents were reported in 2019 and 2020.

REGULATION/LEGISLATION CHANGES

The 2020 fall season was the 13th year that fall hunting is limited to shotguns shooting shot. The season is scheduled to open on the same date as most other small game seasons and run for seven days. Hunters must apply in June for the limited permits for fall hunts. The exception is for youth hunters, which for the 12th year, had the ability to purchase over the counter turkey tags and hunt in Units 1, 4A, 4B, 6A, 12A, 23, and 27. Youth hunts run concurrently with the permitted hunts.

RESEARCH

There are currently no active research projects in AZ. Following is a summary of more recent work done.
Regions 1 and 2 wrapped up a project to evaluate hen mortality and harvest rates on hens in fall hunts. This project ran for three years. Region 2 was able to radio-mark 48 hens in two units in 2013, 34 in 2014, 37 in 2015. After a difficult time getting birds habituated to bait sources, Region 1 decided to delay the beginning of the project until the winter of 2014, then radio-marking 52 hens in Unit 1. Another 19 hens were radio-marked in the winter of 2015 in Unit 1. Overall, fall hunting mortality on hens was found to be less than 5%, with illegal take and predation being the leading cause of mortality.

In a partner project with Bret Collier from Louisiana State University, Region 5 studied nesting phenology and habitat use for Gould's turkeys from 2016-2017. A total of 23 Gould's turkey hens from 4 units were instrumented with GPS transmitters that collected hourly coordinates during the day and a roost coordinate in the middle of the night. A turkey technician was provided by LSU, and a second AZGFD intern joined him in May of 2017 to collect roost and nesting habitat information, and track hen movements, mortality, and habitat use by poults. This study resulted in a paper by Collier et al entitled "Reproductive ecology of Gould's Wild Turkeys (Meleagris gallopavo Mexicana) in Arizona", published in the Journal of Wildlife Management in 2020.

EMERGING OR EVOLVING ISSUES

Continued extreme drought brings concerns about the short-term impact on turkey populations. Natural water sources are extremely limited and habitat conditions are poor in much of the turkey habitat

RELEVANT LINKS

Collier, B. A., N. Fyffe, A. Smallwood, B. Oleson, N. W. Bakner, J. R. Heffelfinger, and M. J. Chamberlain. 2019. Reproductive ecology of Goulds wild turkeys in Arizona. Wilson Journal of Ornithology 131: 667-679.[.pdf]

MISCELLANEOUS

Translocations

Arizona remains active in the translocation program but all planned translocations were cancelled due to the pandemic. While Merriam's populations are relatively stable, the established Gould's populations in southeastern Arizona have shown strong recruitment and continue to grow. This has been a great conservation success story for the Department.

Harvest Data

Harvest data used to be collected through a voluntary hunter questionnaire mailed to a subset of permit holders, but it mainly focuses on hunt success. Some age and sex data is collected

through field-check data, but is very limited. The hunt questionnaire was modified for the Fall 2012 and the question was added to determine if the harvested bird was bearded or not and how long that beard was. This will give additional age and sex data that may be able to used in future hunt guidelines and decision making. For Fall 2018, the Department moved to including a QR code on the back of all tags, of which a hunter could scan and submit their hunt results. This resulted in dismal results with only a 3.7% return rate from hunters. The Department has gone back to mailing cards to hunters and sending emails to tag holders, which has resulted in increased return rates and improved quality of data.

Western Association of Fish and Wildlife Agencies
Wild Turkey Workshop

California Department of Fish and Wildlife
2021 Report

Prepared by Katherine Miller and Matt Meshriy
under the supervision of Dan Skalos

Population Status

During the documented history of wild turkey (*Meleagris gallopavo*) management in California, four subspecies have been released into the state: Gould's (*M. g. mexicana*), Merriam's (*M. g. merriami*), Rio Grande (*M. g. intermedia*), and Eastern (*M. g. silvestris*). The first introduction of wild turkey to California was to Santa Cruz Island in 1877. In subsequent years, Gould's, Merriam's, Eastern, and hybrids were released. In the 1990s, California Department of Fish and Wildlife (hereafter, the Department) released Rio Grande, Merriam's, and Eastern wild turkeys, as well as Rio Grande-Eastern hybrids from Kansas. Currently, Rio Grande wild turkeys dominate the lower elevation oak woodlands, while local populations of Merriam's have become established in higher elevations in northern California.

The Department currently does not conduct statewide monitoring of wild turkey populations. In 2016, Department staff obtained data from the North America Breeding Bird Survey (BBS) for California and neighboring states. We determined index of abundance (birds/count) and developed maps using the Inverse Distance Weighting tool in ArcGIS v. 10.3.1. We calculated 5-year (rolling) averages, e.g. 2016 is an average of 2014, 2015, 2016, 2017, and 2018 (Fig. 1). We clipped the maps to the state boundary, and extracted abundance values from random points (n = 50). We then determined population trends for wild turkey in California (Fig. 2). We are including data from 2017 and 2018 as individual years rather than 5-year averages, as 2018 BBS data has not yet been added to the model.

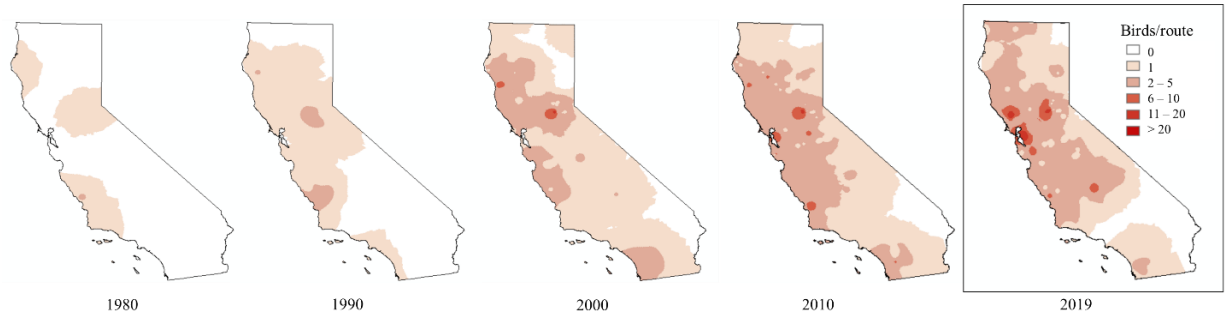


Figure 1: Index of Abundance maps for wild turkey (*Meleagris gallopavo*) in California. The maps represent 5-year rolling averages, e.g. 2010 is an average of 2008 through 2012. The map outlined in black represents 2019 data alone (i.e. not a rolling average).

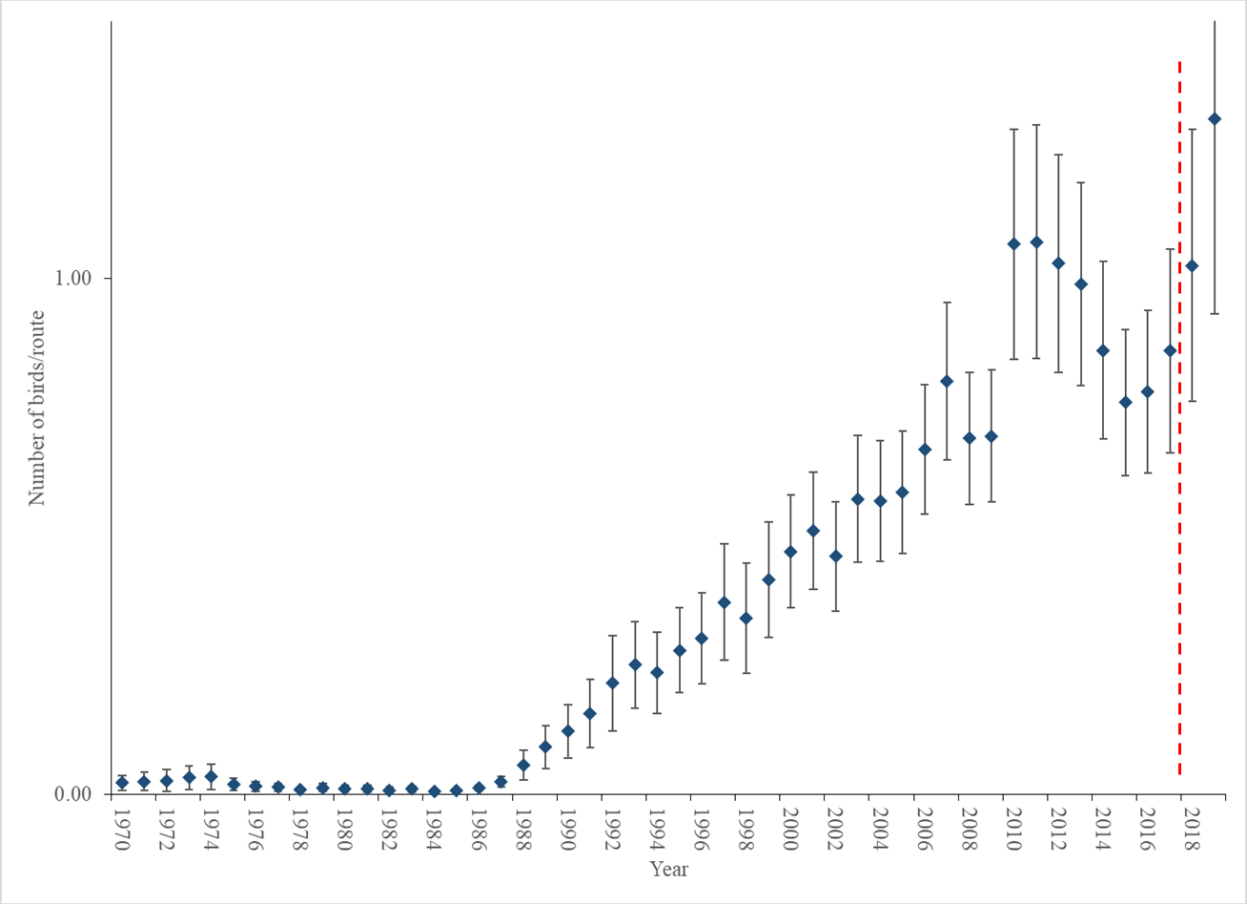
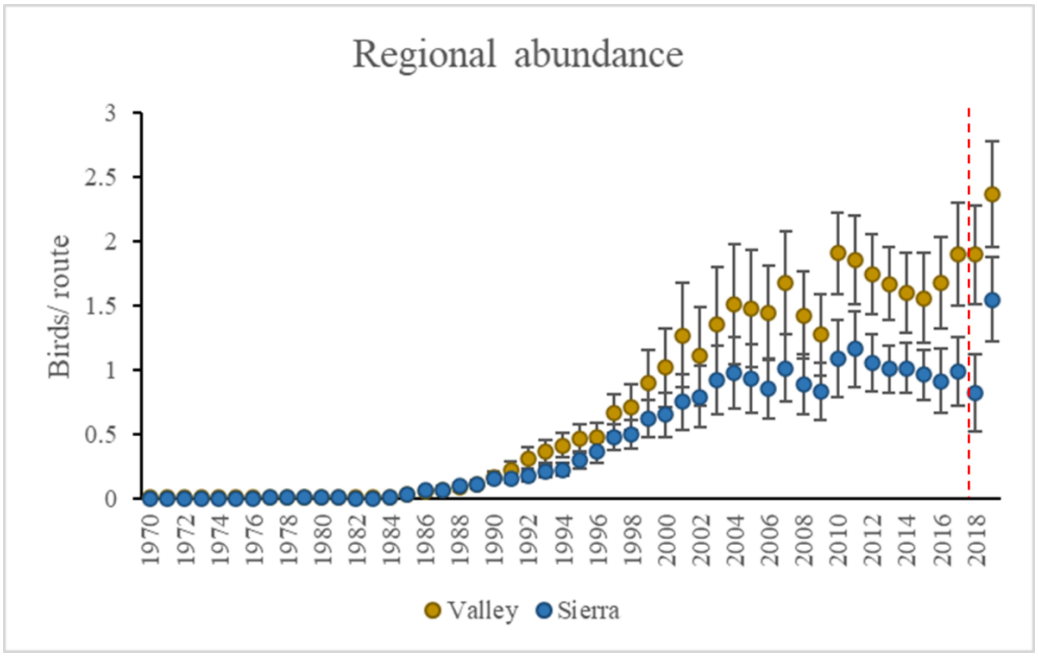
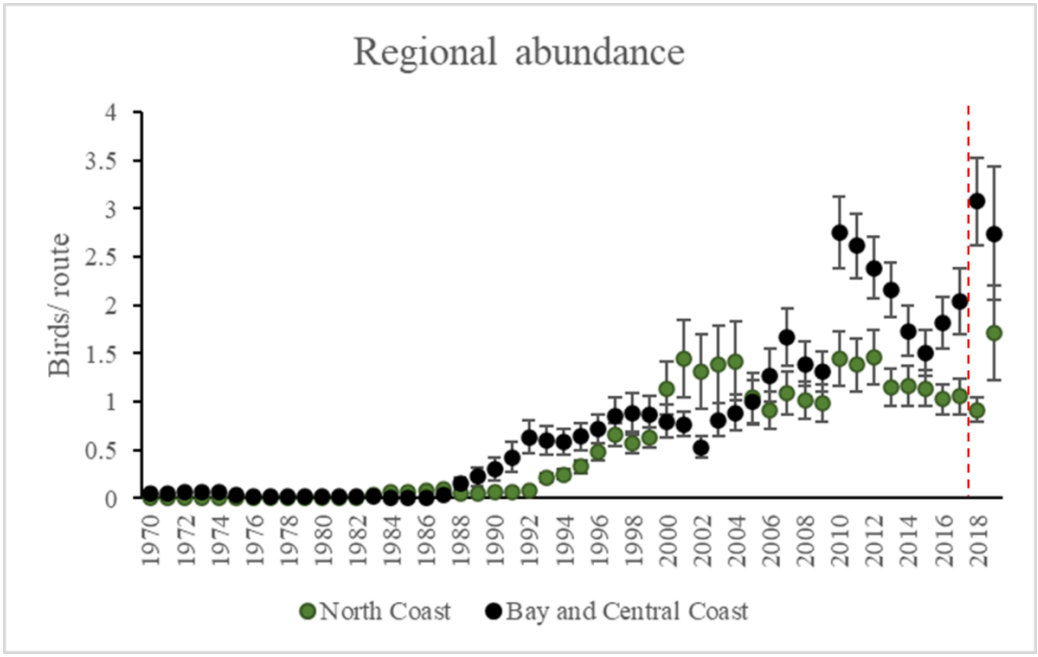


Figure 2: Wild turkey (*Meleagris gallopavo*) population trend in California. We extracted values at random locations (n = 50) from 5-year rolling averages. The red dashed line delineates that the last 5-year rolling average is for 2017; for 2018 and 2019, individual annual data is shown.

The Department also determined regional trends for wild turkey in California (Fig. 3). The regions represent the California State Wildlife Action Plan (SWAP). Three regions (South Coast, Modoc, and Desert) are not included here as the average number of birds/route has consistently been < 1.



a)



b)

Figure 3: Wild turkey (*Meleagris gallopavo*) population trend for four regions of California. We extracted five-year (rolling) averages of indices of abundance at random points in each region as follows: Fig. 3a: Great Valley (n = 22) and Sierra (n = 32); Fig. 3b: North Coast (n = 29), and Bay and Central Coast (n = 17).

Hunt history

The Department began collecting harvest information in 1948 using mail-in surveys distributed to hunters. The first season for wild turkey was established in 1968, and beginning in 1992 the hunters were asked about fall and spring turkey hunt effort separately. In 2014, the Department contracted with Responsive Management for a telephone and email survey on upland game birds and small game mammals. The results for these surveys are available online: http://wildlife.ca.gov/Hunting/Upland-Game-Birds#22503332-harvest-data

In 2017, the Department conducted an on-line survey for resident upland game birds in the 2016-2017 hunting season. We closed the survey prior to the Spring 2017 turkey season, with the expectation that hunters would recall their hunt effort more accurately. We also expected that spring wild turkey hunters would recall their hunt effort for a longer period. Therefore, for wild turkey, we asked for information on Spring 2016 harvest and Fall 2016 harvest. This caused confusion for some turkey hunters, therefore we modified the next survey to more closely follow the hunt year. The results of this survey can be found at the link above, as well.

In the summer of 2019, we conducted a survey of the 2018-2019 hunting season. For wild turkey, this was split into Fall 2018 and Spring 2019. This followed the previous survey's on-line format, with a random sample of upland game bird hunters. These hunters were emailed a link to the survey. We held the survey open for two months and sent out two reminder emails. We extrapolated responses for harvest and hunter effort based on the total number of hunters with upland game bird validations in California.

In the fall of 2018, an estimated 14,967 hunters harvested 7,075 birds over 47,215 hunt days. Hunters were more successful in Yolo, Calaveras, Placer, Colusa, and Tehama counties (Fig. 4). Hunt effort was spread throughout the state but was higher in the same counties listed above, as well as Placer and San Diego counties (Fig. 5). As expected, spring hunt effort and harvest was higher. In the spring of 2019, an estimated 34,969 hunters harvested 22,179 male birds over 127,767 hunt days. Most birds were harvested from Tehama, Butte, Placer, Shasta, and Yolo counties (Fig. 6). Both fall and spring harvest and hunter effort estimates were lower than the previous survey results, possibly because we had a slightly lower response rate (11%, vs 15% in 2016-2017). Staff will conduct a 2020–2021 harvest survey, and the final report will be available on-line later this year.

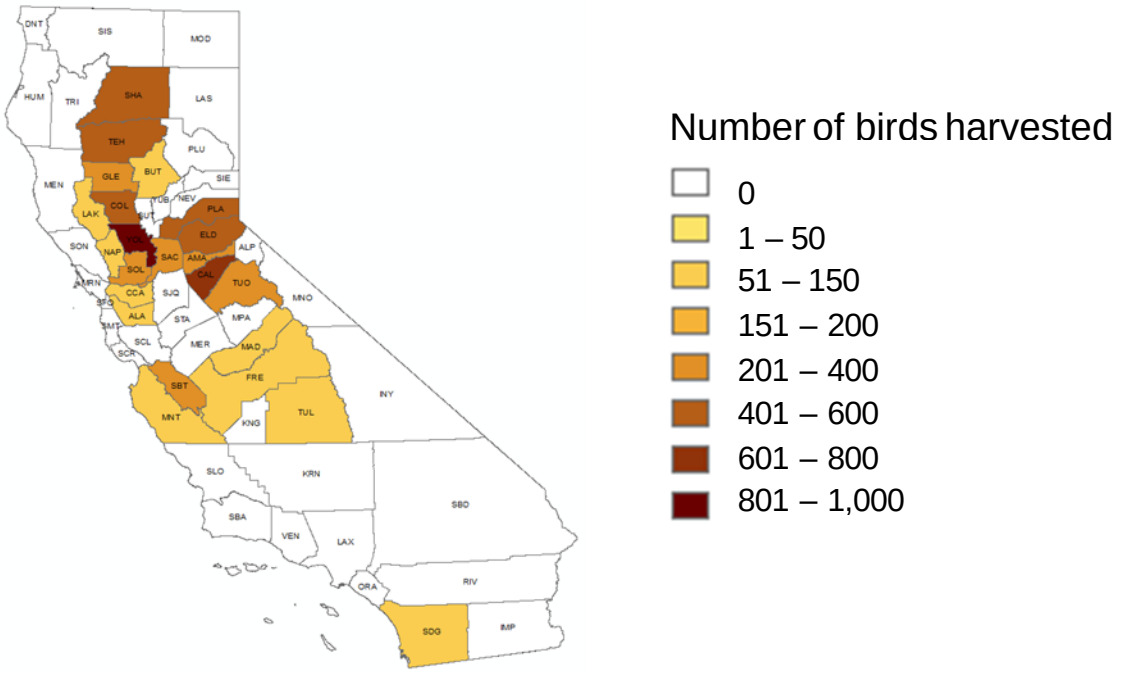


Figure 4: Fall 2018 estimated harvest of wild turkey (*Meleagris gallopavo*) in California.

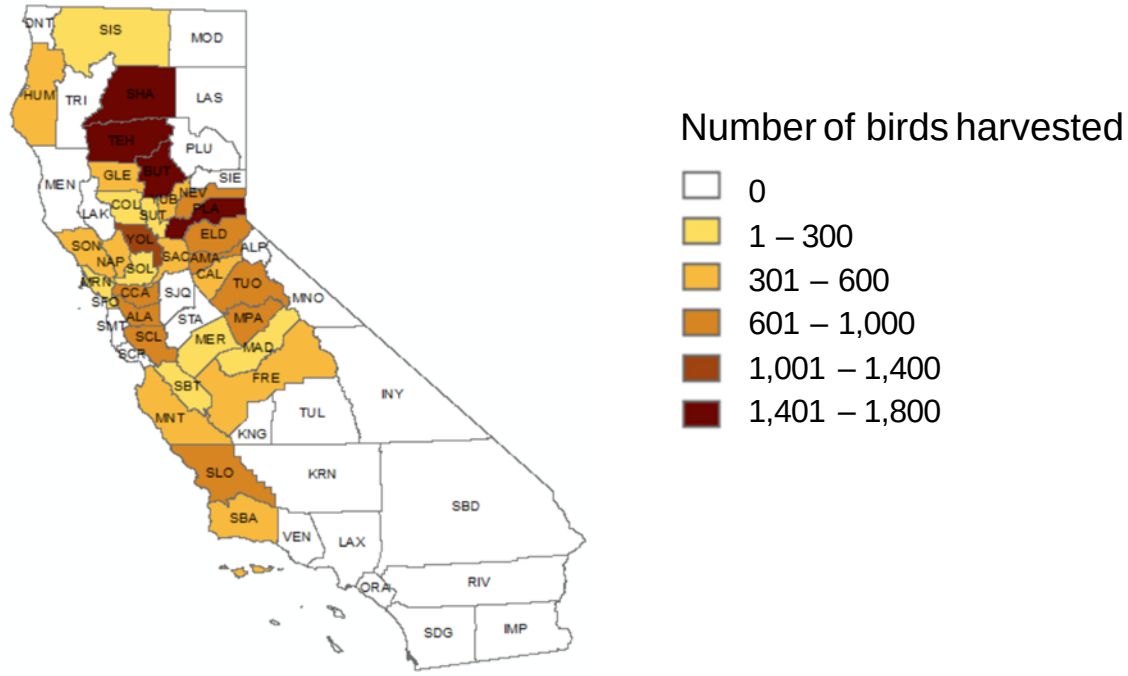


Figure 5: Spring 2019 estimated harvest for wild turkey (*Meleagris gallopavo*) in California.

Mark-recapture at Upper Butte Basin WA

Staff began trapping wild turkeys at Upper Butte Basin WA in 2015. For 4 years, staff banded turkeys (n = 88) with butt-end style bands. Staff have recovered three butt-end bands by hunter harvest, one male during the spring season and two females harvested during the fall season. During the 2017 fall turkey season, a hunter located a butt-end turkey band on the ground that appeared to have been pried open. Staff are investigating whether wild turkeys (mature males in particular) may have the ability to remove the butt-end bands, and are experimenting with the use of rivet bands. Starting in 2019, staff fitted wild turkeys (n = 127, 2019–2021) with both a butt-end band and a rivet band. Trail camera photos captured shortly after the first birds were fitted with both butt-end and rivet bands showed mature male turkeys returning to the trap site with only a rivet band. In February 2020, a mature male bird was captured and fitted with both a butt-end and a rivet style band; the bird was recaptured seven days later and was already missing the butt-end band.

Since the beginning of the project, biologists have recaptured 9 birds, and hunters have reported 19 band recoveries (2017: 2; 2019: 2; 2020: 8; 2021:7). Of the 19 recoveries, 15 were rivet bands. Band returns increased dramatically after rivet bands were first applied. Three of the rivet-banded turkeys that have been harvested had only rivet bands at the time they were killed. All recoveries were from hunter harvested birds on or near the wildlife area except for one which was found on the ground by a hunter at Howard Slough.

Regulation changes

The Department implemented the most recent regulatory change for wild turkey in 2016. As per Section 311(e)(1) of Title 14 of the California Code of Regulations, it is "unlawful to take wild turkey by use of hunting arrows and crossbow bolts unless fitted with a broad head type blade which will not pass through a hole 7/8" in diameter." This aligns the archery hunting requirements to be similar with the large game requirements in California, and is intended to reduce wounding loss.

Assembly Bill 711, signed into law in 2013, stipulates that by July 1st 2019, hunters will be required to use nonlead ammunition when hunting with a firearm in California. The California Fish and Game Commission accepted the Department's recommendations to implement this law in phases. At this time, all hunters in California (including wild turkey hunters) using firearms are required to use nonlead ammunition.

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Wild turkey in California

Katherine Miller

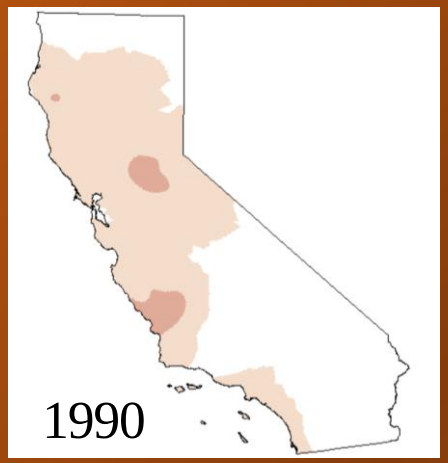
Upland Game Bird Biologist

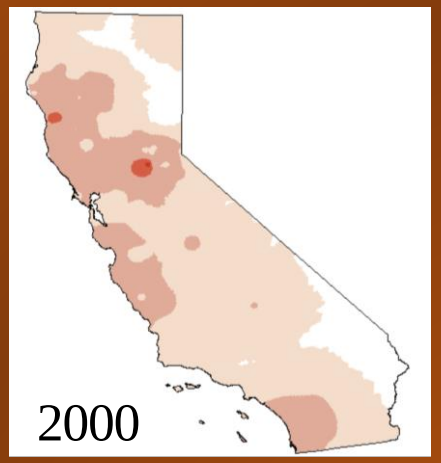
California Department of Fish and Wildlife

Western Wild Turkey Technical Meeting

May 4-5, 2021

Abundance indices
NA Breeding Bird Survey

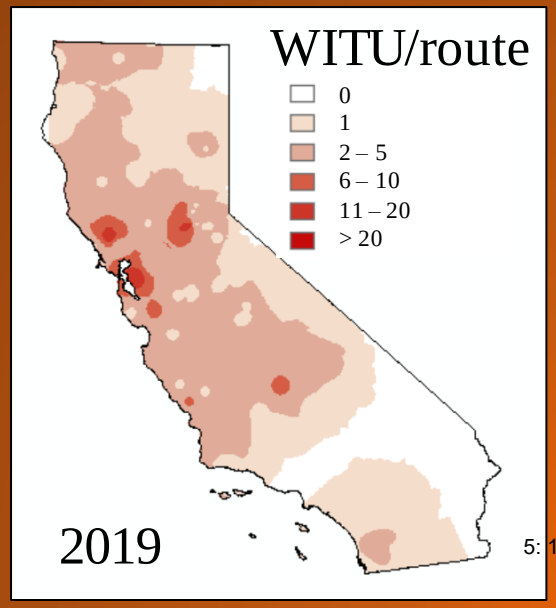




- Map the year's total birds for each route, using start lat/lon.
- Inverse Distance Weighting to create heat maps of abundance indices
- 5-year rolling averages:

2000 = (1998+1999+2000+2001+2002)/5

- 2019 represented as an individual year



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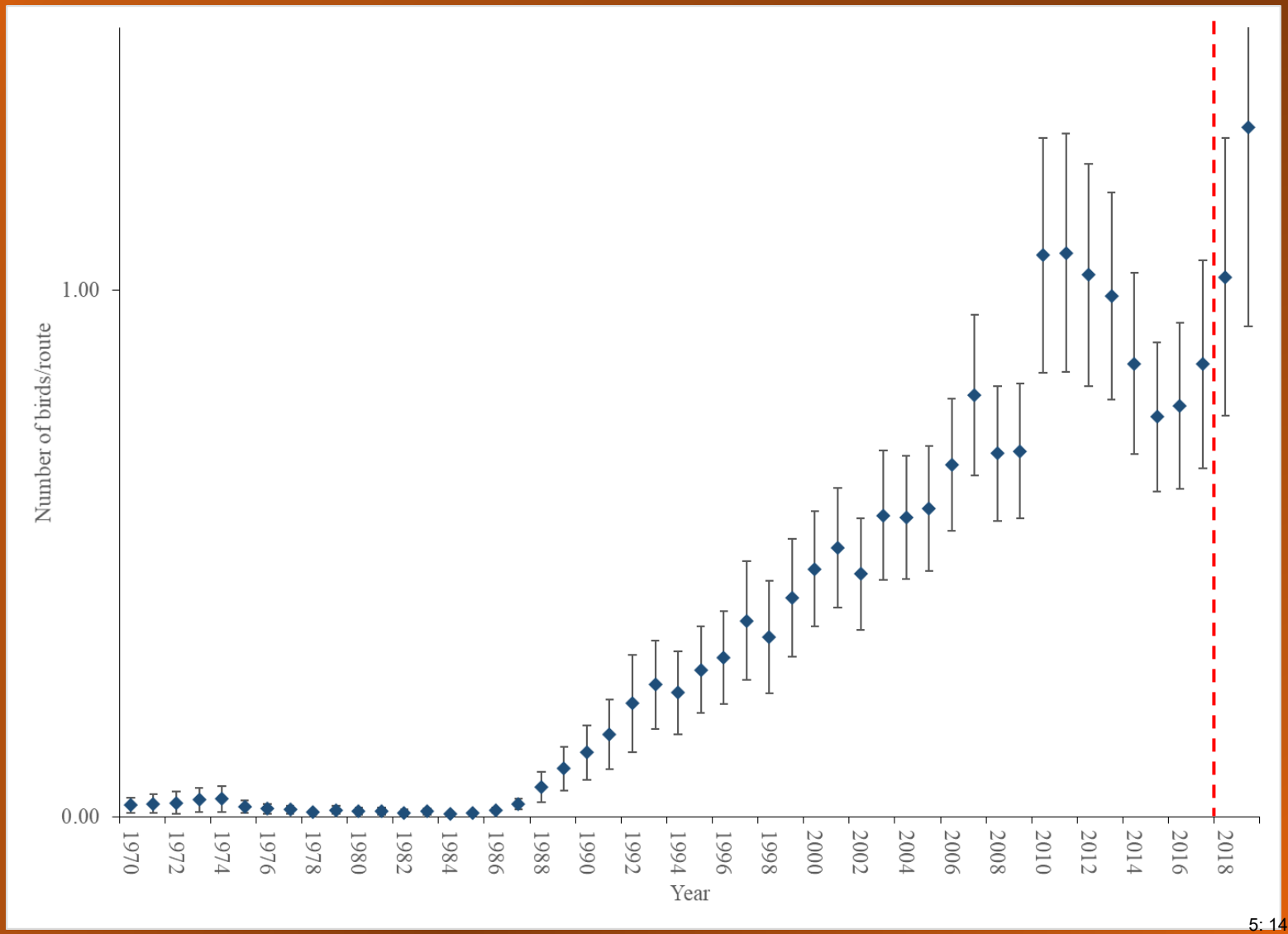
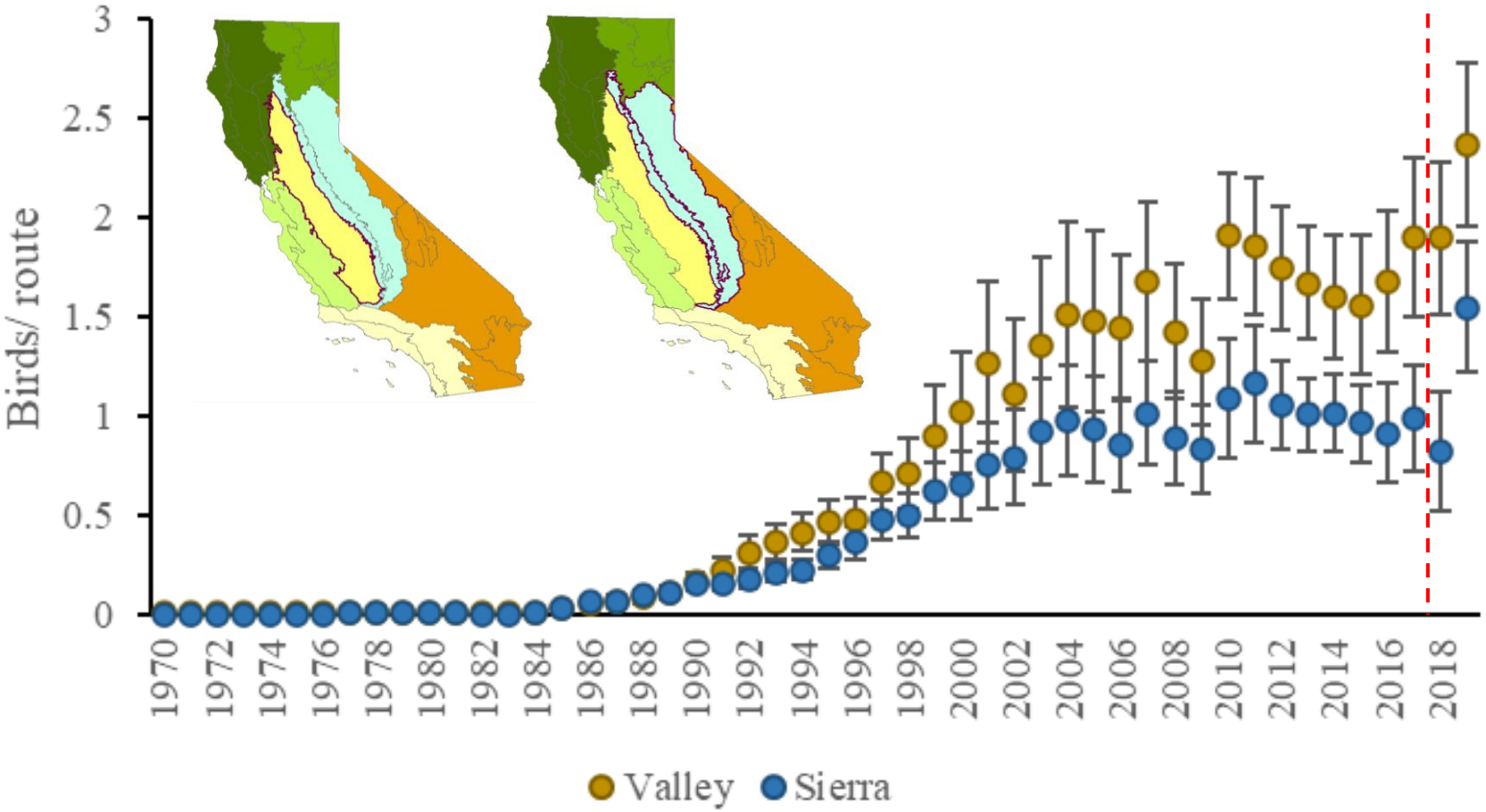
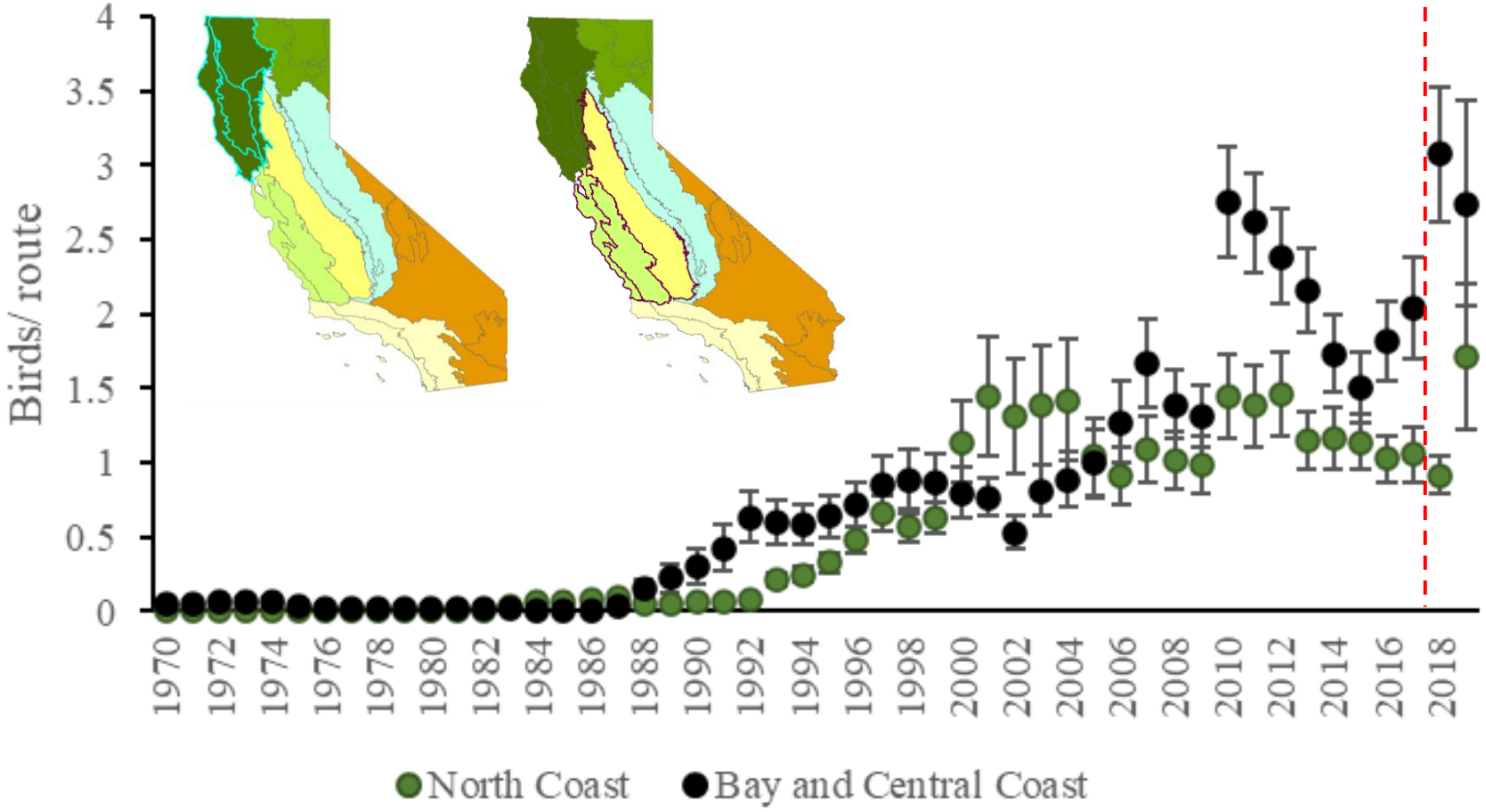
Wild turkey population trends in California



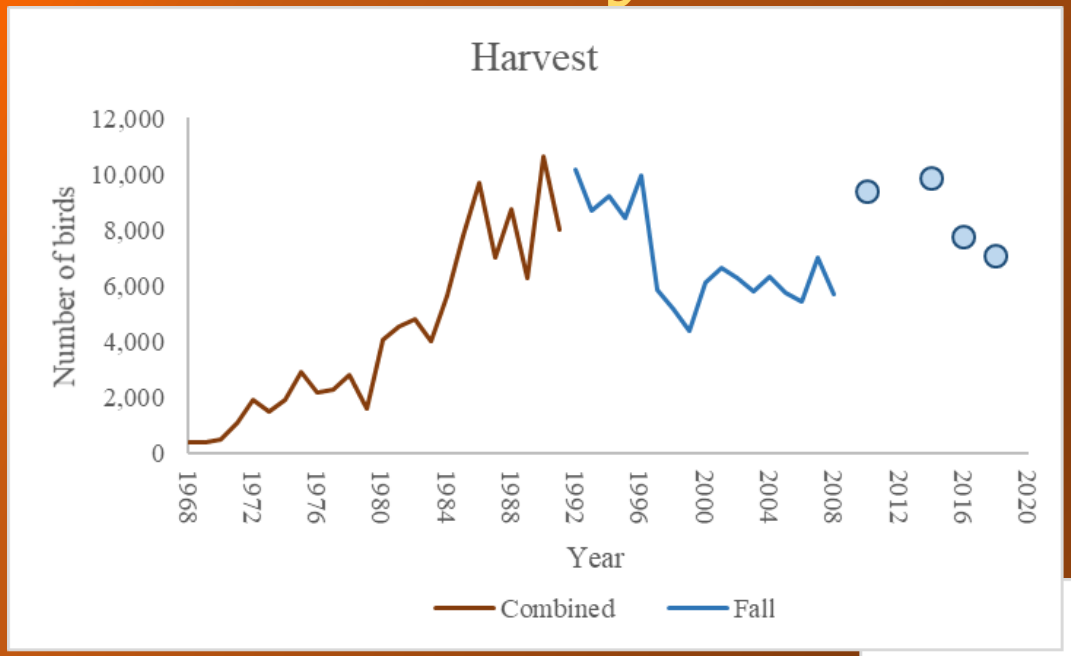
Regional abundance



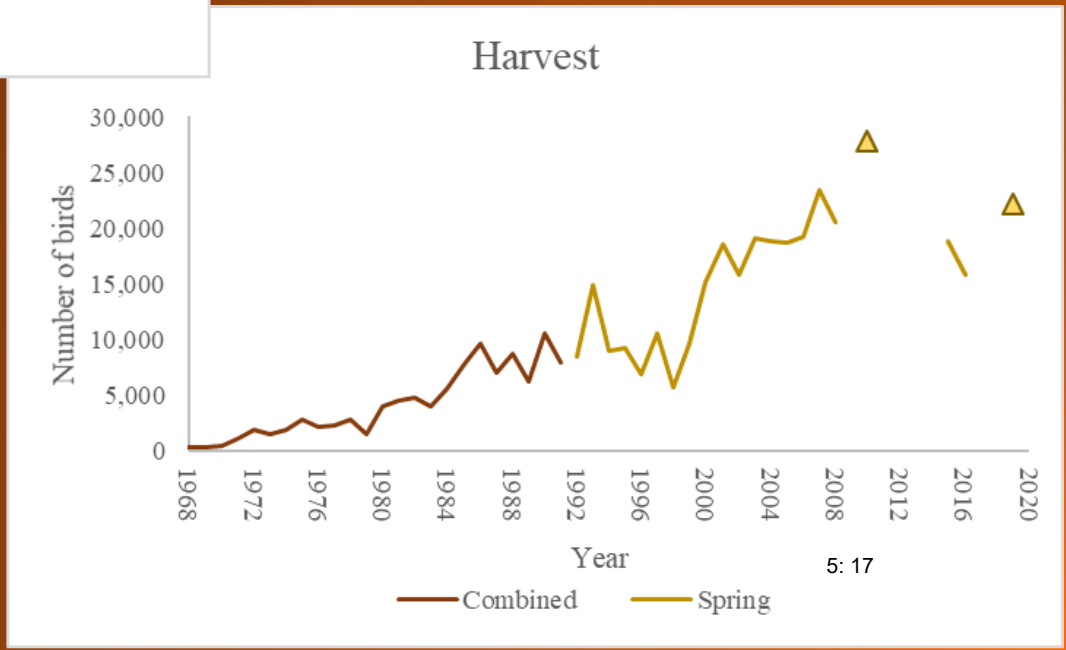
Regional abundance



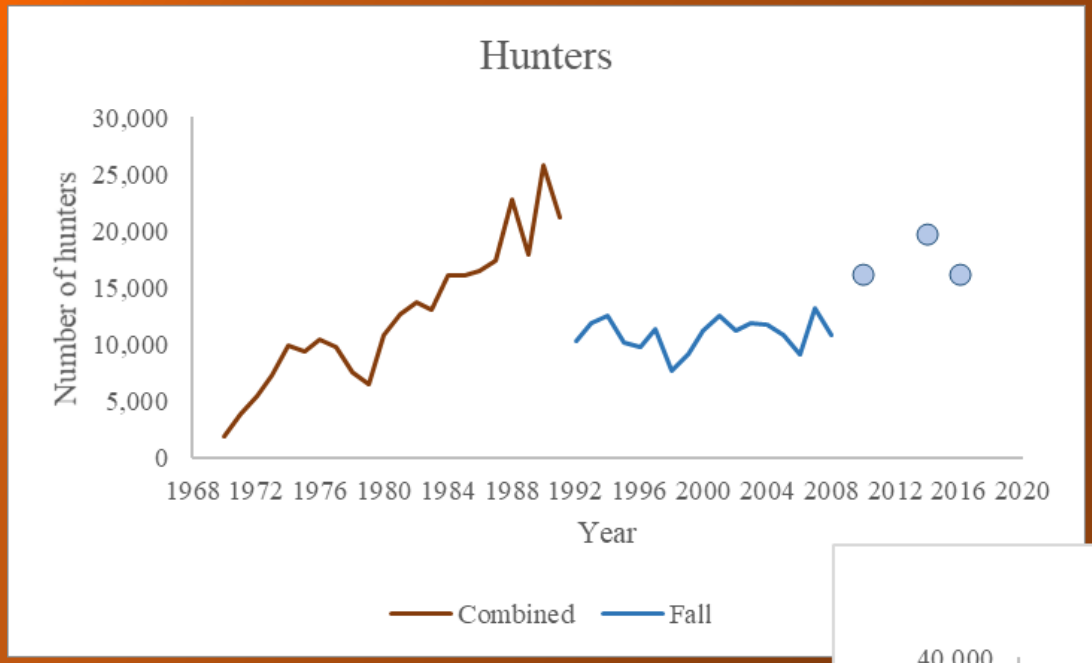
Wild turkey harvest in California



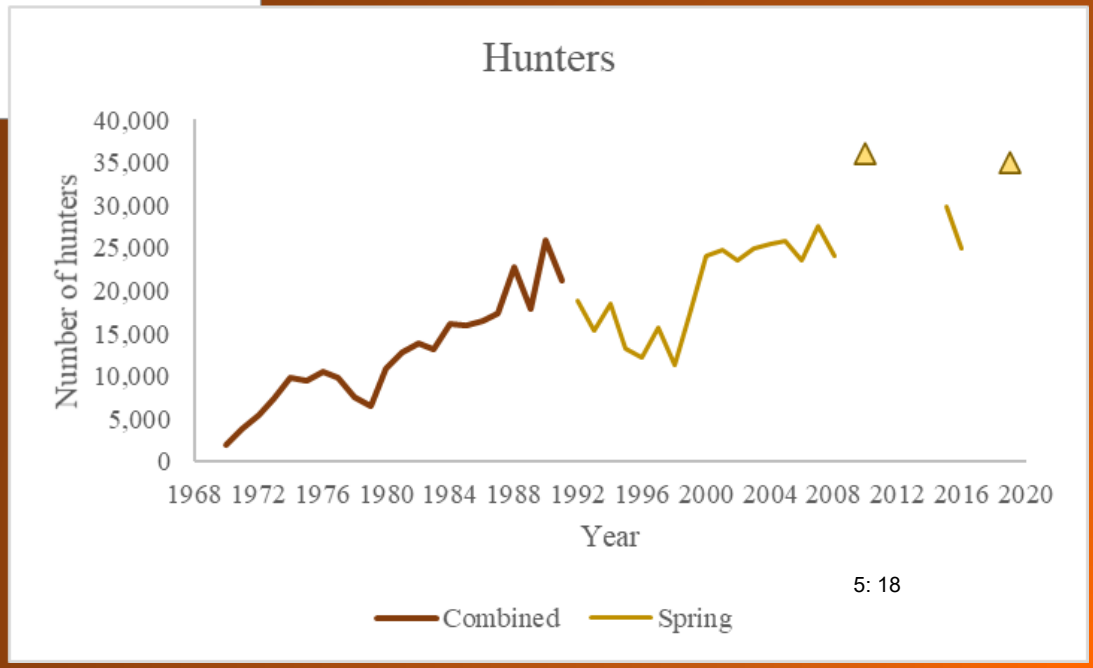
Until the early 1990s, wild turkey harvest was combined across seasons.



Wild turkey hunters in California



Until the early 1990s, wild turkey hunter effort was combined across seasons.



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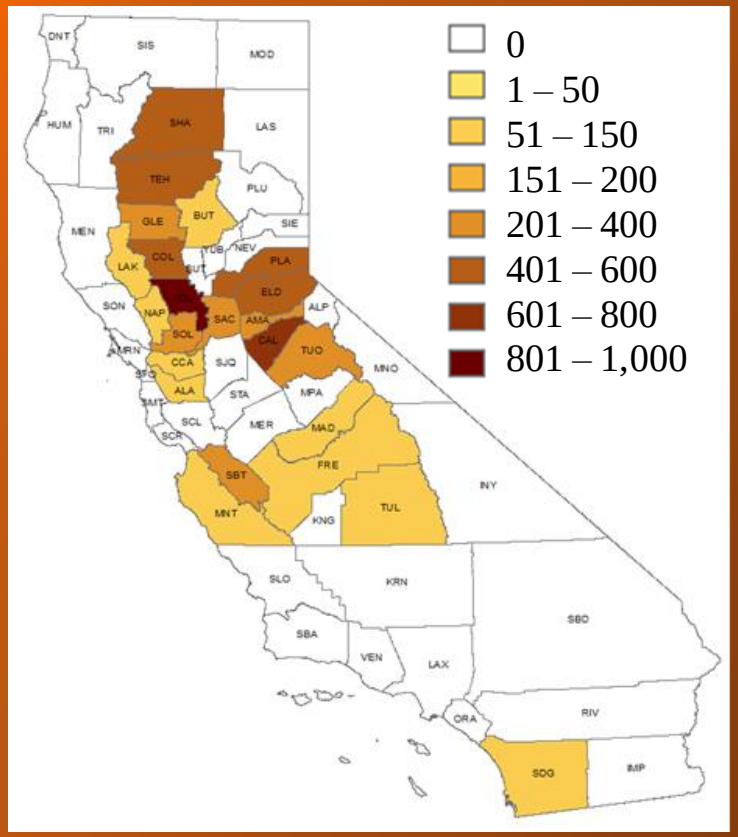
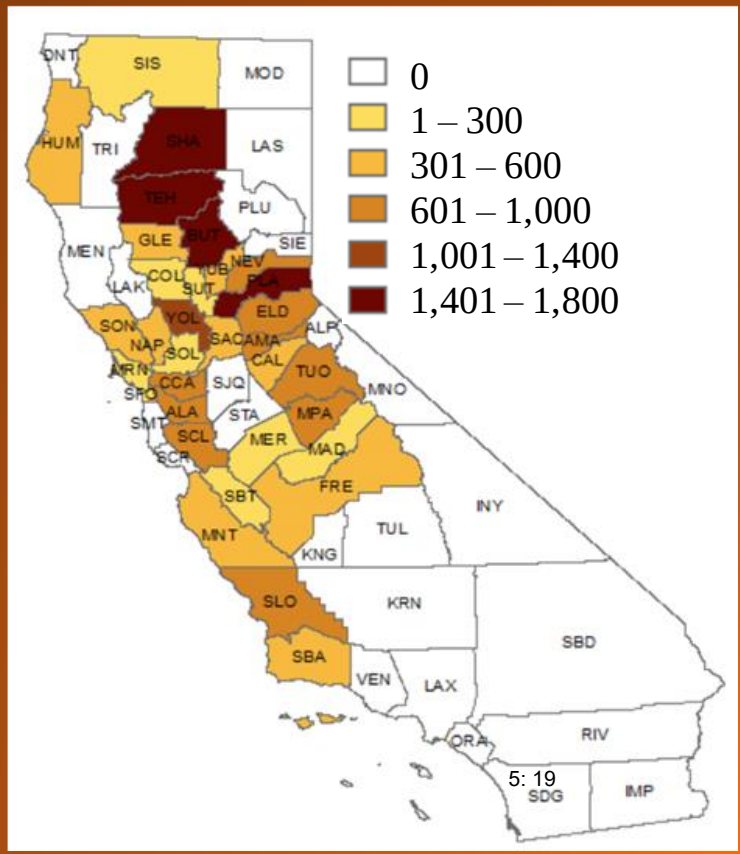
Wild turkey harvest in California



Fall 2018

Tehama, Butte, Shasta, Placer, and Yolo.

Spring 2019



Yolo, Calaveras, Placer, Colusa, and Tehama.

Wild turkey mark-recapture Upper Butte Basin WA

2015–2018:
88 turkeys banded with butt-end bands
3 butt-end bands recovered.
Possible that birds are prying bands off?

Biologists recaptured 9 birds.

1 AHY male banded with both butt-end and a rivet band. Recaptured 7 days later, already missing the butt-end band.

5: 20

Wild turkey mark-recapture Upper Butte Basin WA

2019–2021:
127 turkeys banded with both butt-end and rivet bands (one band on each leg)
15 rivet bands recovered.
3 out of 15 missing accompanying butt-end band.

Questions?

IDAHO WILD TURKEY POPULATION STATUS REPORT – 2021

Western States Wild Turkey Technical Committee Meeting – May 4-5, 2021
Meeting Location Venue – Virtual

Jeffrey M. Knetter – Upland Game & Migratory Game Bird Coordinator
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Boise, ID 83712
208-287-2747/jeff.knetter@idfg.idaho.gov

POPULATION STATUS

Wild turkeys are not native to Idaho, but were first introduced in 1961. Since then, over 6,000 Merriam's, Eastern, Rio Grande, and hybrid wild turkeys were trapped from ten states (including Idaho) and released in Idaho; over 4,000 of these turkeys were of the Merriam's subspecies. These three subspecies have been translocated across the state and hybridized over time; consequently, it is unclear whether pure genetic strains of any of these subspecies persist in Idaho.

Idaho has not established a method to monitor population size or trends. However, Eriksen et al. (2015) estimated population size from spring harvest estimates and a population estimate constant (0.131); harvest was divided by the constant. If applied to Idaho, the spring population size fluctuated between 26,300 and 55,100 birds from 2016-2020; the average population size was 36,000 birds and the trend has increased since 2017.

In general, wild turkeys occupy available suitable habitat within Idaho (Figure 1). However, turkeys are still trapped and translocated, primarily to relieve depredation or nuisance issues. In 2020, 104 birds (42 males and 62 females) were trapped in the Southeast Region and translocated to Nevada. During winter 2021, 109 birds were trapped in the Southeast Region and translocated to the Upper Snake Region to augment an existing population.

REPRODUCTION

No brood survey are conducted in Idaho.

HARVEST

2020 Spring Turkey Season

In spring 2020, an estimated 19,400 hunters harvested approximately 7,000 wild turkeys during general season hunts, and an estimated 600 hunters harvested approximately 200 wild turkeys during controlled hunts. Success rates (harvest/hunters) were 36% for general seasons and 34% for controlled hunts. The bag limit was 2 for general season and 1 for controlled hunt seasons.

2019 Year Fall Turkey Season

In fall 2019, an estimated 4,000 hunters harvested approximately 2,400 wild turkeys during general season hunts, and an estimated 3500 hunters harvested approximately 200 wild turkeys during controlled hunts. Success rates (harvest/hunters) were 55% for general and controlled hunts. Bag limits during fall general seasons vary by region of the state, but the bag limit is 1 bird for controlled hunt seasons. Hunters may use unfilled spring tags during fall general seasons.

HUNTING INCIDENTS

There were no hunting incidents during this reporting period.

RESEARCH

There was no turkey specific research conducted during this reporting period.

REGULATION/LEGISLATION CHANGES

Turkey seasons are set biennially in Idaho. They were last set in January 2020 and no substantial changes were made to seasons. During the 2021 Idaho Legislative session an administrative rule was approved to simplify issuance of turkey tags. Now, there are only 2 tags; a general tag and a controlled hunt tag. Controlled hunt permits were discontinued for use with tags.

EMERGING OR EVOLVING ISSUES

The Idaho Department of Fish and Game is currently developing its first Wild Turkey Management Plan. A draft is expected to be presented to the Idaho Fish and Game Commission in July 2021. Thereafter, the plan would be available for public comment and the Department would seek final approval during fall 2021.

Idaho has one of the fastest growing human populations in the country. With this population growth and associated development, it is likely wild turkey nuisance and depredation issues will continue to increas. The aforementioned Management Plan identifies strategies to respond effectively to these issues.

RELEVANT LINKS

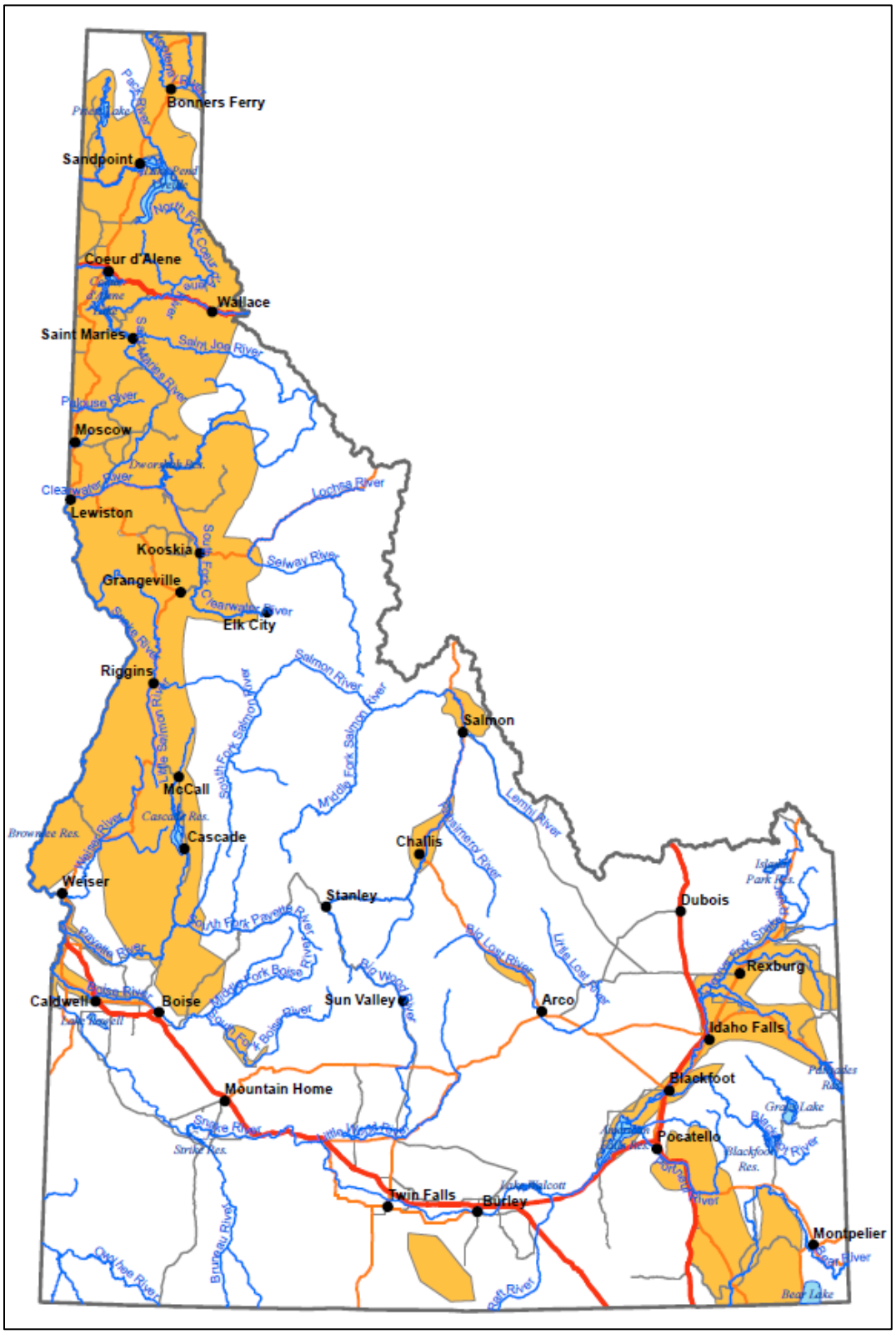
Wild Turkey Hunting Regulations: https://idfg.idaho.gov/sites/default/files/seasons-rules-upland-turkey-2020-2021.pdf?updated=9-20

Wild Turkey Hunting in Idaho: https://idfg.idaho.gov/hunt/turkey

LITERATURE CITED

Eriksen, R. E., T. W. Hughes, T. A. Brown, M. D. Akridge, K. B. Scott, and C. S. Penner. 2015. Status and distributionof wild turkeys in the United States: 2014 Status. Proceedings of the National Wild Turkey Symposium 11:7-18.

Figure 1. Wild turkey distribution in Idaho.



2021 Montana Turkey Status Report - Brian Wakeling

POPULATION STATUS

Montana is occupied primarily by Merriam's turkeys, although there are reports of historical unauthorized releases of eastern turkeys in northwestern Montana. Montana is beyond the historical range of any wild turkeys, but wild turkey populations are robust within the state. The winters of 2019–2020 and 2020–2021 were relatively mild by Montana standards, and good overwinter survival was observed.

Montana does not conduct routine surveys of broods or populations. Consequently, deriving population estimates may be challenging to provide accurately. The most recent estimate of population size was 120,000, but there is no consistent algorithm used to generate that estimate. Hunt success has remained relatively stable around at 17–20% (percent of total licenses reportedly filled in either a spring or fall hunt) during 2008–2019. This index of harvest suggests that turkey populations have remained relatively stable throughout this time period, although anecdotal observations suggest that turkey abundance increased during the past 2 years.

REPRODUCTION

Montana does not collect data on poult production.

HARVEST

Montana generally harvests about 5,000–6,000 turkeys annually. Much of the state may be hunted with licenses that may be purchased over-the-counter, with some limited draw hunting districts in the central part of the state within Region 4. There are several combinations of licenses that may be used during the spring and fall, but a hunter could harvest up to 12 turkeys if every possible license were filled.

Spring Turkey Season

Since 2017, Montana has consistently harvested about 3,250–3,450 male turkeys annually in the spring. About 85% of harvested turkeys in the spring are taken by resident hunters. Spring season is open from April 10–May 16, 2021. During spring seasons, the legal animal is a male wild turkey, and turkeys may be hunted with a shotgun or archery equipment (not crossbows).

Fall Turkey Season

Since 2017, Montana has harvested about 2,00–2,600 turkeys annually in the fall. Fall turkey seasons are open during September 1, 2021–January 1, 2022. During fall seasons, any turkey may be lawfully harvested using shotguns, archery, crossbows, handguns, or rifles. In the fall, some hunting districts are limited to the take of only female or beardless turkeys.

HUNTING INCIDENTS

No hunting incidents have been recorded in Montana during 2020–2021.

RESEARCH

There are no recent or ongoing studies of turkeys in Montana.

REGULATION-LEGISLATION CHANGES

No substantive changes have been made to turkey hunting regulations within Montana within the last legislative session.

RELEVANT LINKS

https://fwp.mt.gov/
https://fwp.mt.gov/hunt/regulations/turkey
https://fwp.mt.gov/binaries/content/assets/fwp/hunt/regulations/2021/2021-turkey-final-for-web.pdf

2021 NEVADA WILD TURKEY REPORT

POPULATION STATUS

Most Nevada wild turkey populations can be considered stable to slightly declining currently. Largely, this is a result of extreme drought conditions that negatively are affecting both Merriam's turkey in central and eastern Nevada upper elevation mountain ranges and Rio Grande turkey populations along riverine lowlands. Quota adjustments have been made in various units to compensate for drought conditions.

HARVEST

A total of 160 tags were issued for the 2020 spring season; however, hunters returned 115 post season questionnaires (72% reporting rate) even though failing to return a questionnaire would render those hunters ineligible to apply for one year. The success rate for the spring turkey hunt was 66% with 90 males harvested consisting of 57 toms (81%) and 13 jakes (19%).

Comparatively, the success rate was up from the 2019 spring season (57%); however the number of tags issued in 2020 was down by 26 from 2019 (n=186). Since tag numbers stabilized in 2011, harvest trends improved until 2018 but have since declined moderately (Figure 1). Sixteen hunters reported that they had an opportunity to harvest a tom but chose not to. Nine hunters reported that they did not hunt during the 2020 season.

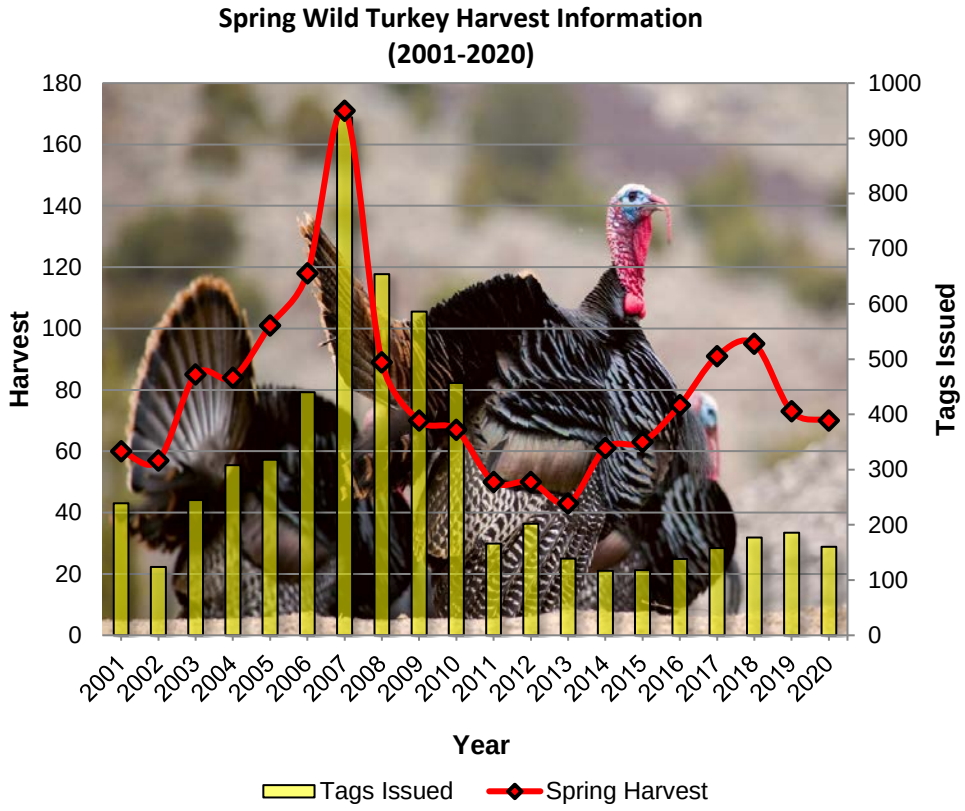


Figure 1. Spring turkey harvest and number of tags issued from 2001-2020.

The 106 tagholders that hunted reported that they scouted a total of 147 days and hunted for 388 days for an average of 1.4 days scouting and 3.7 days hunting in 2020. Compared to 2019, hunters spent a bit more time hunting (3.2 days/hunter in 2019) and less time scouting in 2020 (2.4 days in 2019).

REGULATIONS

Season Structure and Limits

A tag is required to hunt turkeys in Nevada. Tags are available through a draw process or can be issued by a landowner in some unit groups. During the 2020 spring season, most turkey seasons extended from March 28th through May 3rd; however, there were some variations of this season structure depending on unit groups. A limited Junior spring wild turkey hunt is also available for young hunters aged 12 to 18 within seven different hunt unit groups.

A fall hunt for private lands within Paradise Valley of Humboldt County in north central Nevada was also available during 2020; however, the number of tags issued for this hunt was limited by the number of landowners willing to issue a tag. The fall 2020 season extended from October 3 – October 25.

Weapon Type

Turkey can be taken by shotgun or longbow and arrow. Shotguns no larger than a 10-gauge nor smaller than a 20 gauge can be used. Shot size is restricted to no larger than a number 2 pellet.

MISCELLANEOUS

Translocations

The Nevada Department of Wildlife has recently been coordinating with the Idaho Department of Fish and Game regarding opportunities for capturing wild turkeys from southeastern Idaho. During the winter of 2019-2020, high numbers of turkeys were reported by private landowners in the Cub River watershed within the Bear River Range east of Preston, Idaho. This afforded an excellent source stock of wild turkeys for the southern portion of the Ruby Mountains.

After extensive outreach with private landowners along the foothills of the Bear River Range, baiting and trapping equipment were set up in mid-January of 2020. Two capture days yielded 104 Merriam's turkeys consisting of 42 male and 62 female birds. Birds were released on two separate occasions on February 12th and 22nd, 2020 at the Cowboy's Rest Ranch in Hunt Unit 103 (Figure 2). No mortalities were reported during the two release operations. Necklace style VHF transmitters were attached to 11 female turkeys to assist with identifying dispersal areas, survival and nesting areas.

No translocations were conducted during the fall and winter of 2020-2021 due to the limitations caused by the Covid-19 pandemic. However, habitat conditions were very dry during most of the 2020-2021 winter in Nevada and releasing turkeys into proposed released sites was questioned by local biologists.

Figure 2. Volunteers and NDOW personnel releasing Merriam's turkeys at the Cowboy's Rest Ranch in the southern portion of the Ruby Mountains in Elko County, NV.

Habitat Conditions

Most, if not all, of Nevada is considered in moderate to extreme drought. The Carson River is expected to go dry by mid-July 2021. Most other major river basins including the Walker River and Truckee River received approximately 65% or less of average snowpack. The eastern portion of the state is in a similar situation and primary forage species are expected to suffer and available water sources are expected to dry significantly by mid-summer in Nevada.

New Mexico Department of Game and Fish
2021 Wild Turkey Status Report

New Mexico is home to three subspecies of wild turkey (*Meleagris gallopavo*): Merriam's (*M. g. merriami*), Rio Grande (*M. g. intermedia*), and Gould's (*M. g. mexicana*; Figure 1). Merriam's turkeys occupy most of the mountain ranges in the state, and are typically associated with areas of ponderosa pine. Rio Grande turkeys are found in many of the lower elevation riparian areas in the northeast, central, and southeast portions of the state. Gould's turkeys are confined to riparian areas and woodland-savannas in the Peloncillo and Animas Mountains in southwest New Mexico.

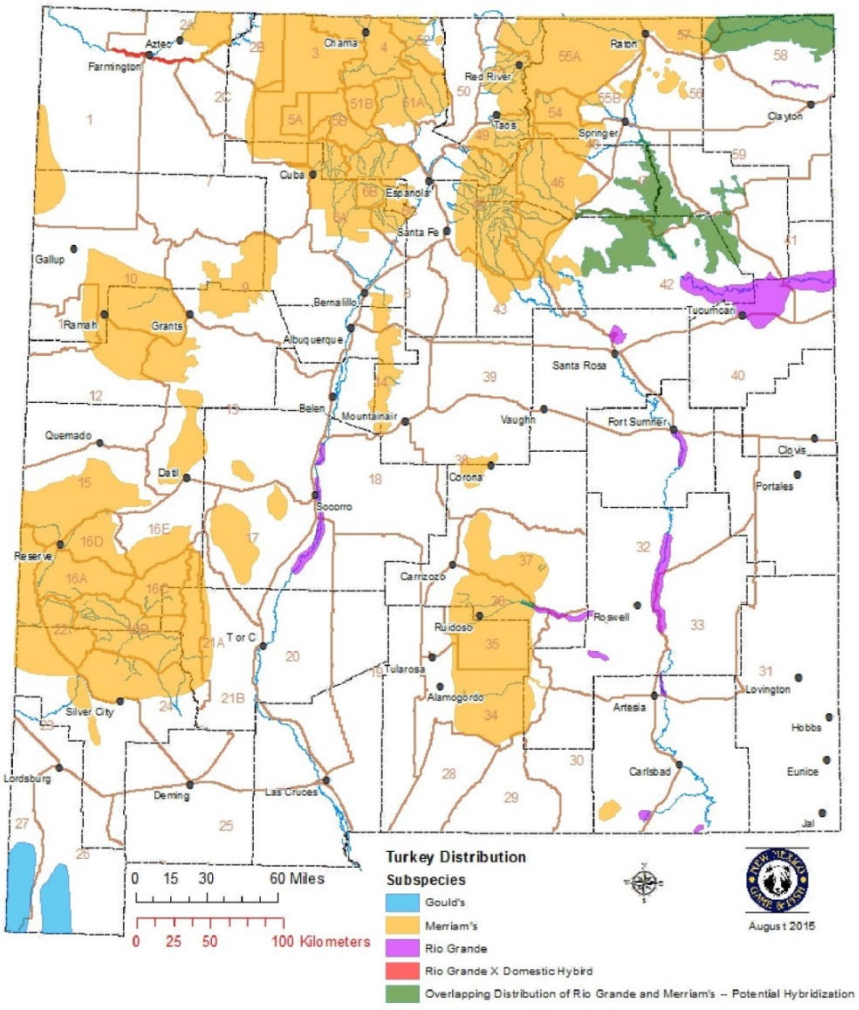


Figure 1. Wild turkey subspecies distribution in New Mexico.

Population Status

The current statewide wild turkey population is unknown. New Mexico has not established a method to monitor population size or trend for Merriam's or Rio Grande turkeys. Based on

calculations from Eriksen et al. (2015), the current New Mexico statewide population is estimated to be 19,850 birds. Population trends seem to be stable the last few years, based on anecdotal observations from field staff and hunters. Breeding bird survey (BBS) data show positive trends for New Mexico's turkey populations (Figure 2), but the BBS has identified an important deficiency in its data for turkey in New Mexico, so caution should be taken when assessing population change from BBS results.

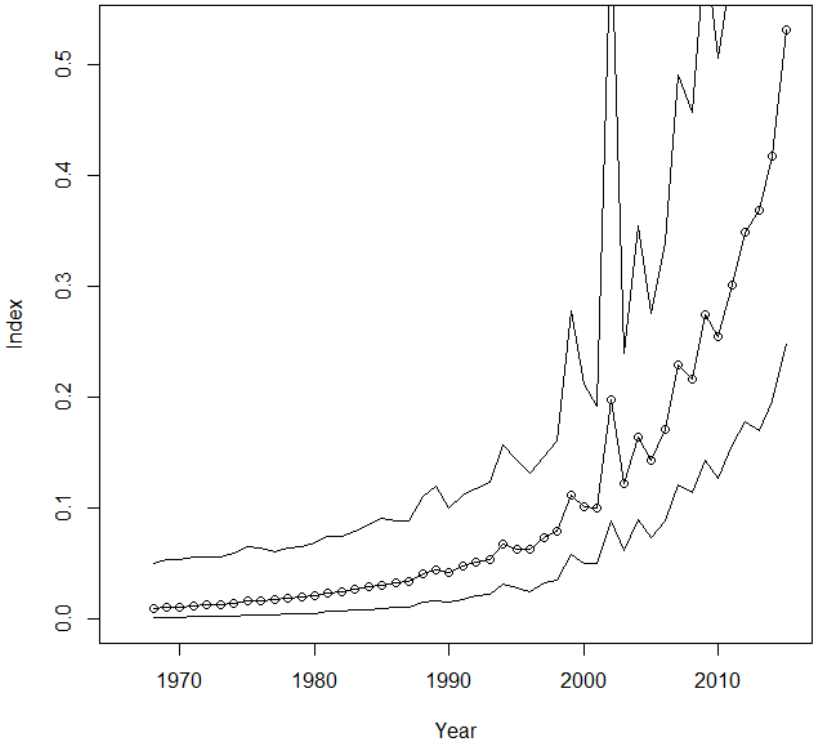


Figure 2. Breeding bird survey trend estimates (1968–2015) for wild turkey in New Mexico.

The Department monitors Gould's turkey populations through spring gobbling surveys. Since 2006, 8–16 routes of varying length have been walked or driven annually to record turkey calls and sightings. Routes historically were concentrated in areas of known roost sites or near water sources. In recent years (2018 to present) survey areas have been selected based on birds with GPS transmitters. From 2006 to 2021, the spring surveys have generally shown an increase in the number of birds observed. Counts have ranged from a low of 18 in 2006 to a high of 226 in 2021. Average number of turkeys counted has increased since 2014, likely aided through the translocation of birds from Arizona (Table 1).

Harvest Regulations

Historic Regulations

Fall hunts were concurrent with deer seasons from 1967–1990, with a special turkey-only fall hunt added in 1986. The turkey and deer seasons were separated in 1990, and the fall season was reduced from two weeks to 6–8 days. The spring season was held in mid-to-late April from 1970–1980, and was established as April 15–May 10 in 1995. Legal shooting hours were from ½ hour before sunrise to sunset from 1967–2010. The bag limit was 1 for both seasons (bearded only in spring) from 1967–1990, after which the spring bag increased to 2 and fall continued at

1. The spring bag reduced to one again from 1998–2003, with a second turkey allowed with the purchase of a second tag. The current regulations went into effect in 2011.

Current Regulations
Legal shooting time is ½ hour before sunrise to ½ hour after sunset. Legal sporting arms include: any shot gun including muzzle loading shotguns using shot only, and bow and arrow. General turkey licenses are available over the counter, though there is a draw for hunts on special areas. Turkey hunters may purchase a spring and/or fall license. The spring season runs from April 15–May 10, with a bag limit of 2 bearded turkeys. Fall seasons run from September 1–30 for archery, and November 1–30 for any legal sporting arm. The fall bag limit is 1 turkey.

Harvest Reporting
In 1961, the Department began to collect information from turkey hunters through mail surveys, but these data were variable in quality due to low response rate. The survey was conducted in-house until 2000, when it was contracted out to DISC Information Services Corporation. In 2006, the contract for conducting the survey was terminated. Efforts to move the survey back in-house experienced obstacles due primarily to staff shortages. For license years (2006–2007 through 2010–2011), the Department did not conduct a post-season turkey harvest survey.

Beginning in 2011, the online Hunter-Trapper Reporting System was modified to include turkey reporting. From 2011–2013, online turkey harvest reporting was voluntary, but this was changed in the 2013–2014 season to mandatory harvest reporting. Current reporting rates average approximately 80%.

Hunter and Harvest Estimates
The number of spring turkey licenses has gradually increased since the 1960s. Average number of hunters has increased from 2,800 in the 1960s to 14,519 in the last 10 years. Harvest estimates have also increased in the last 50 years (Figure 3) from of 68 (1965) to 3,437 (2020). An estimated 10,261 individuals hunted in spring 2020, harvesting an estimated 2,600 birds.

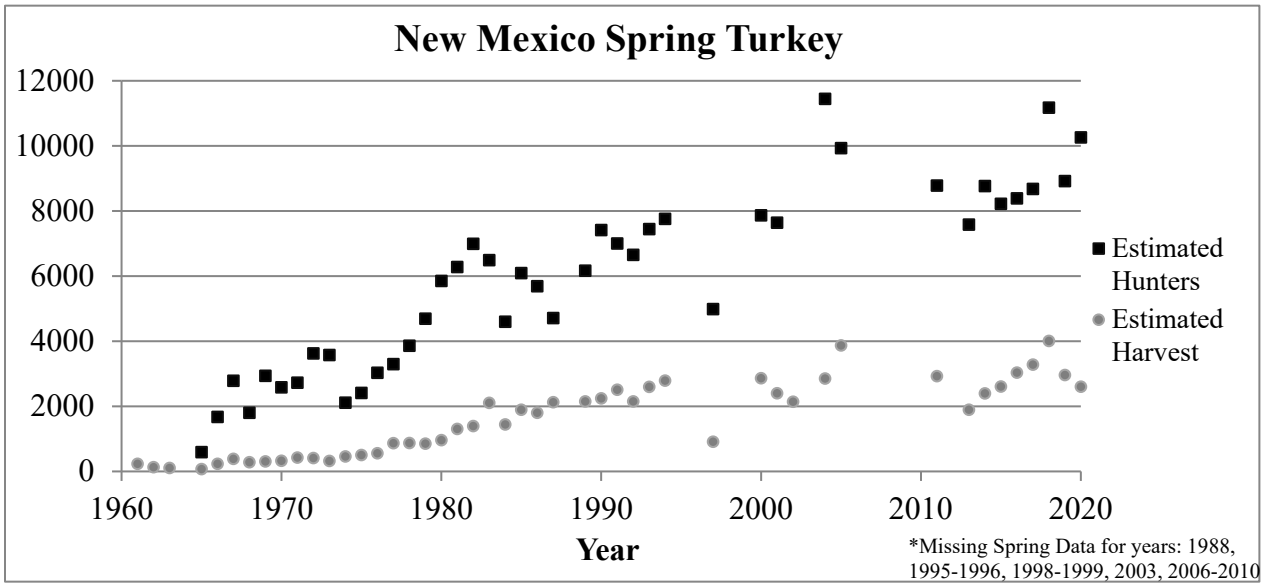


Figure 3. New Mexico wild turkey spring harvest

The number of fall turkey hunters dropped from 20,000 hunters to 3,000 hunters with end of the concurrent deer and turkey fall season. A turkey specific license was not required until 1983, so early estimates of fall turkey hunters were likely not accurate. The separated fall turkey license has allowed the Department to better approximate fall turkey hunters and harvest (Figure 4). Harvest estimates have varied from a high of 1,393 (1983) to a low of 108 (1997). Fall hunting was lower in the 1990s and early 2000s, with a slight resurgence of fall hunters in the last 10 years. An estimated 4,258 individuals hunted in fall 2020, harvesting an estimated 837 birds.

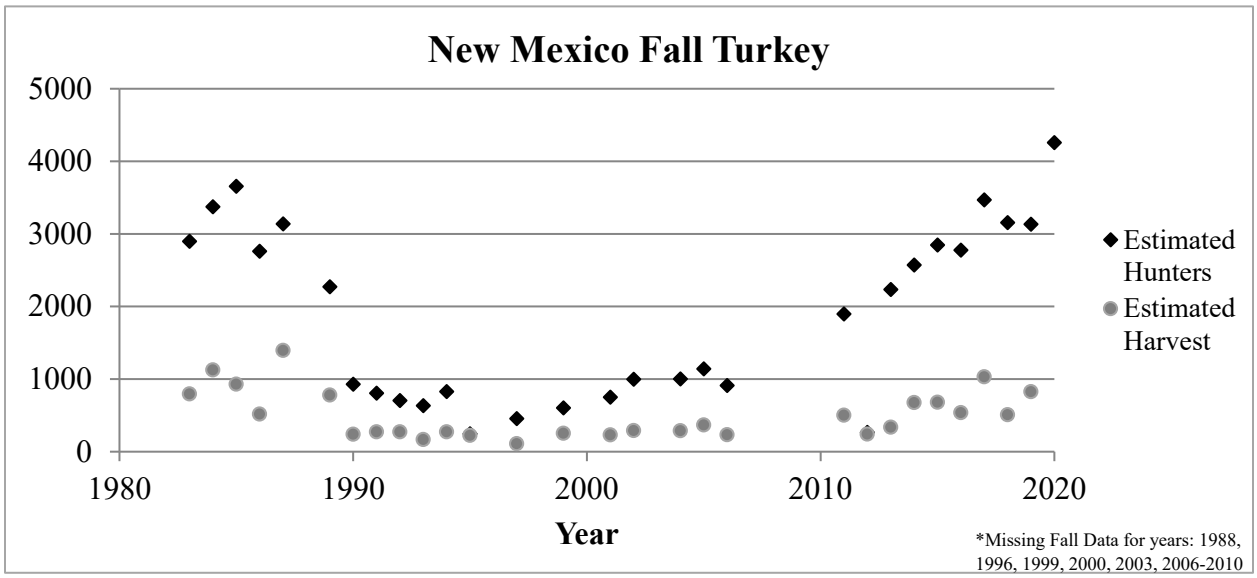


Figure 4. New Mexico wild turkey fall harvest

Research Efforts

The Department is beginning to collect GPS data on Gould's wild turkeys, to implement recovery activities. From 2018 to the present, 39 hens and 30 males have been captured and fitted with GPS backpacks. The transmitters are scheduled to capture a roost location nightly. Some interesting observations thus far include a male moving over 25 miles from capture location, several hens going to Mexico and returning to New Mexico, and the quantity of time the birds spend near human dwellings. The GPS data has also helped target survey areas for the annual spring survey.

Disease

In 2020, several private citizens called and reported turkeys with lesions near Las Vegas, NM. One turkey was captured by law enforcement officers and sent to the wildlife disease lab. The turkey came back as positive for Avian Pox.

Nuisance/Damage Complaints

The Department has received several nuisance and damage complaints regarding wild turkeys in the last year. Primary complaints involve turkeys congregating on agricultural lands or in urban areas. As these lands are under private ownership, hunting pressure is much lighter, leading turkeys to linger in these areas. Several options the state is pursuing to alleviate these issues is encouraging landowners to sign up for Open Gate, the New Mexico private land access hunting program, and translocating turkeys to augment populations in non-problem areas.

Trapping and Translocation Efforts

The Department's long-range management plan includes trapping wild turkeys from areas with large, healthy populations and relocating them to areas with smaller populations or areas where turkeys were previous extirpated. Turkeys have been moved within the state since 1939. Translocations in 2020-21 were postponed to due to COVID-19. A summary of translocations since 2000 can be found in Table 1.

Table 1. New Mexico wild turkey translocations from 2000–present.

Year	Month	Capture Location	Release Location	Male		Female		Total Birds	Subspecies
				Adult	Juv	Adult	Juv		
2000	Mar	Vermejo Park	Pelona Mt.		17	5	6	28	Merriam's
2002	Mar	Texas	Near Roswell					102	Rio Grande
2004	Feb	Chama	Luera Mts.					20	Merriam's
2004	Feb	Chama	Datil					19	Merriam's
2004	Feb	Chama	Sandia Mts.					22	Merriam's
05/06	Winter	Sacramento Mts.	Monticello Canyon, Horse Mt., and NE of Farmington					45	Merriam's
06/07	Winter	Sacramento Mts.	Guadalupe Mts.					18	Merriam's
06/07	Winter	Chama	Magdalena Mts.					17	Merriam's
07/08	Winter	Mayhill	Guadalupe Mts.					10	Merriam's
2008	Summer	Huey WMA	Delaware River	33	5	9		47	Rio Grande
08/09	Winter	Mayhill	Guadalupe Mts.					15	Merriam's
2014	Feb	Cimarron	Guadalupe Mts.					47	Merriam's
2014	Feb	AZ	Peloncillos Mts.	11	1	6	2	20	Gould's
2015	Feb	AZ	Peloncillos Mts.		9	6	3	25	Gould's
2016	Feb	AZ	Peloncillos Mts.		5		10	15	Gould's
2017	Feb	Raton	Guadalupe Mts.	4			1	5	Merriam's
2017	Feb	Raton	Guadalupe Mts.	4	12	16	18	52	Merriam's
2018	Feb	Santa Rosa	NE Roswell, NM	12	4	10	10	36	Rio Grande
2018	Mar	Raton	Guadalupe Mts.	15	16	17	24	72	Merriam's
2019	Feb	Raton	Cebolla Mesa		11	22	19	52	Merriam's

Oregon Wild Turkey Status Report 2019

Population Status and Distribution

No significant change in Oregon's current wild turkey population estimate of 40,000 – 50,000 birds. All 36 Oregon counties have the potential of turkeys. 2021 Outlook: Production continues to be strong in most areas with little indication of environmental limitations. Weather (not habitat) primarily drives reproductive success. The winter of 2020-21 was very mild with average snowpack, followed by a dry spring. Drought conditions bring the threat of wildfire which has the potential to displace wild turkeys in Oregon, but may result in improved future forage conditions, depending on the nature of the fire. The widespread Labor Day fires of 2020 that burned large swaths of the Cascade Range did not occur in core turkey range.

HUNTING

2020 Spring Season

April 15- May 31. Season length unchanged since 1993 (except for addition of youth turkey hunt)
Season Bag limit- 3 bearded birds statewide, but not more than one turkey per day.
In 2020, 16,851 turkey tag holders actually went hunting and harvested 6,589 spring turkeys, up 18% from 2019 (Table 1). Southwest Oregon remains the core area for wild turkey harvest (Figure 1), but 38% of the total harvest occurred east of Cascade Mountains, primarily in the Blue Mountains.

2020 Spring Youth Hunt

Oregon held its 15th youth turkey hunt April 10-11, 2020. The hunt takes place the first full weekend prior to general spring season opener on April 15. The season is open statewide for youth age 17 and under. Oregon offers a reduced-price youth turkey tag valid for resident and nonresident youth during youth turkey hunt and/or general season. Youth harvested 861 turkeys during the 2-day youth season and 47-day general spring season, combined. Youth accounted for about 13% of total spring harvest of turkeys in Oregon in 2020.

2020-21 Fall Season

Oregon simplified fall season regulations in 2020 by eliminating the last controlled hunts, removing limits on total tags available, resulting in 2 general season fall hunts: Eastern and Western. Hunters are allowed to harvest up to 2 fall turkeys, of which only one can be from eastern Oregon. The length of the hunting season was extended to January 31st in 2020 to allow hunters more opportunity to address chronic nuisance and damage issues. A minor modification to the beginning of fall turkey season in western Oregon from October 10th to the "second Saturday in October" now allows for concurrent upland bird openers in October.

In 2020, 5,693 fall turkey tags were sold, up 48% from 2019, almost certainly due to the removal of tag caps. Hunter participation increased 36% and hunting effort was up 42%. Total fall turkeys harvested was estimated at 1,434 birds, up 55% from the previous year. Harvest was fairly evenly divided between east and west with 54% of harvest coming from western Oregon and 46% from eastern Oregon.

Tag & License Fees

Since 2010 youth turkey tags for residents and non-residents cost $10.50. In 2018, an adult resident turkey tag cost $25.50 and adult non-resident turkey tags cost $87.50, up $1.00 and $3.50, respectively, from the previous year. Turkey hunters also must have a general hunting license. Annual hunting licenses for adults are $33.50 for residents and $167.00 for non-residents, up $1.50 and $7.50, respectively, from the previous year. Non-residents have the option of purchasing 3-day license(s) at $31.50 for each 3-days (up $1.00 from 2017).

Beginning in 2022, the Department intends to offer the option for SportsPac purchasers to select either a fall or spring turkey tag.

Turkey Management:

Nuisance and Damage

As in past years, addressing turkey nuisance and damage continues to be the primary management concern among our wildlife districts. The issue is acute on the west side of the state in suburban areas where turkey flocks are increasing and the growth of the human population expands into rural lands. The suburban/urban areas make it difficult to use the preferred management tool, hunting, to control turkey numbers. Trapping and transplant is not a viable option in many of the circumstances because effective methods like the use of rocket nets are not available or due to staff capacity limitations. In almost every case, the problem is created by landowners providing supplemental feed for the turkeys, either knowingly or inadvertently. A number of cities have attempted to craft municipal ordinances that prohibit the feeding of turkeys without restricting residents from feeding other wildlife, such as songbirds.

Very large flocks of wintering turkeys continue to build up in the rural John Day valley, creating issues for farmers and ranchers. A combination of hunting, emergency hunts, and trap/transplant is used to keep these flocks at tolerable levels.

ODFW tracks all wildlife complaints through an internal database. In 1010, turkeys were attributed to 177 of the 2,197 nuisance and damage complaints statewide. The majority of complaints were categorized as "nuisance" (62%). Damage complaints accounted for 30% of the reports.

Trap/Transplant

The Upland Game Bird Program invested in additional capacity in eastern Oregon for the third year in row to assist with trapping, emergency hunts, and landowner complaints. ODFW trapped and relocated approximately 1,326 turkeys during the period of October 29, 2020 to March 3, 2021. All turkeys were trapped in response to nuisance and damage complaints. Captures occurred in Douglas, Grant, Union, and Wheeler counties. Birds were relocated to pre-approved areas where the turkeys are less likely to become a nuisance and will offer public hunting opportunities. In December 2018, in cooperation with the Roseburg District, the program provided a rocket net and capture training class to 33 ODFW biologists.

Hunting Access

In 2020, the Upland Game Bird Program continued efforts to develop a Hunt By Reservation program by partnering with Pheasants Forever to fund a full-time coordinator. Brandon Dyches was hired to fill this position. Brandon has successfully recruited numerous landowners, developed reservation software, a website, and initiated hunts since 2019. While the position will initially be focused on pairing hunters and landowners to address wild turkey nuisance and damage issues, the long-term plan is to include other species in the program. A full report on the spring 2021 Hunt By Reservation program will be provided next year. Further details can be found at: https://myodfw.com/articles/hunt-reservation-program

Habitat

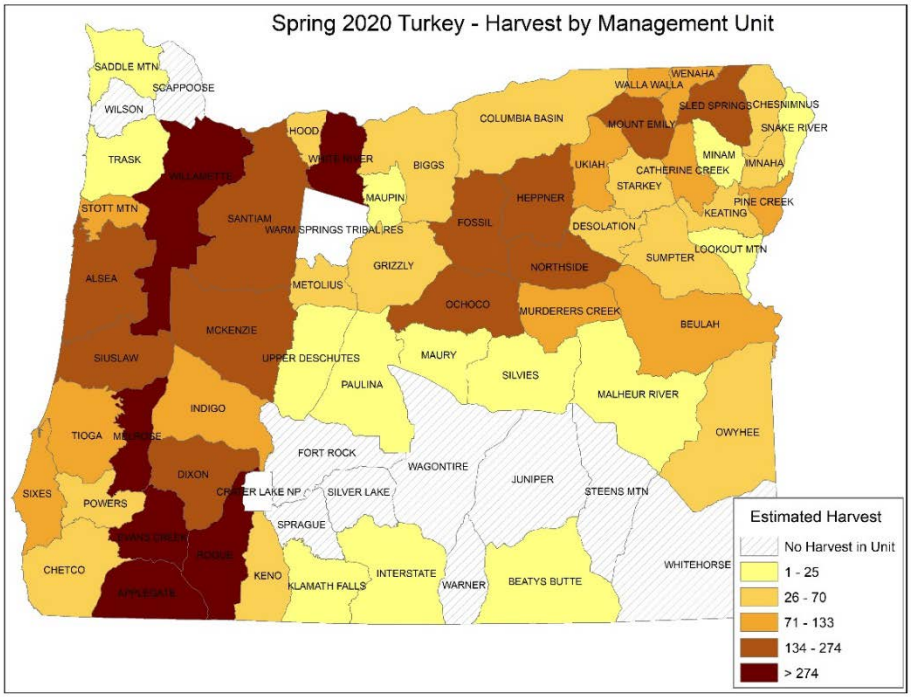
No new projects

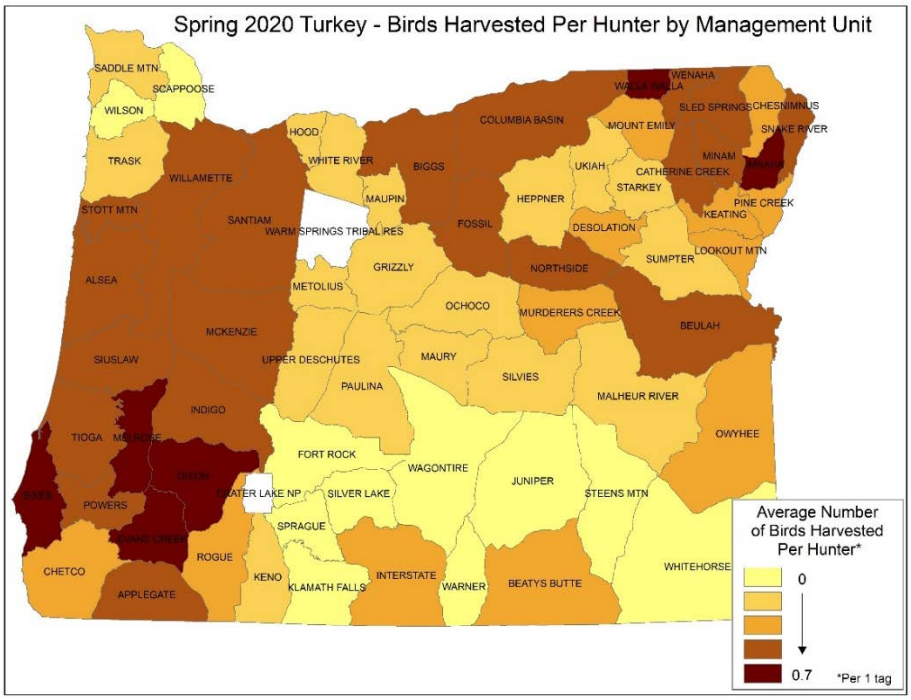
Table 1. Tags sold, participation, and harvest during Oregon's spring turkey seasons, 1987-2018.

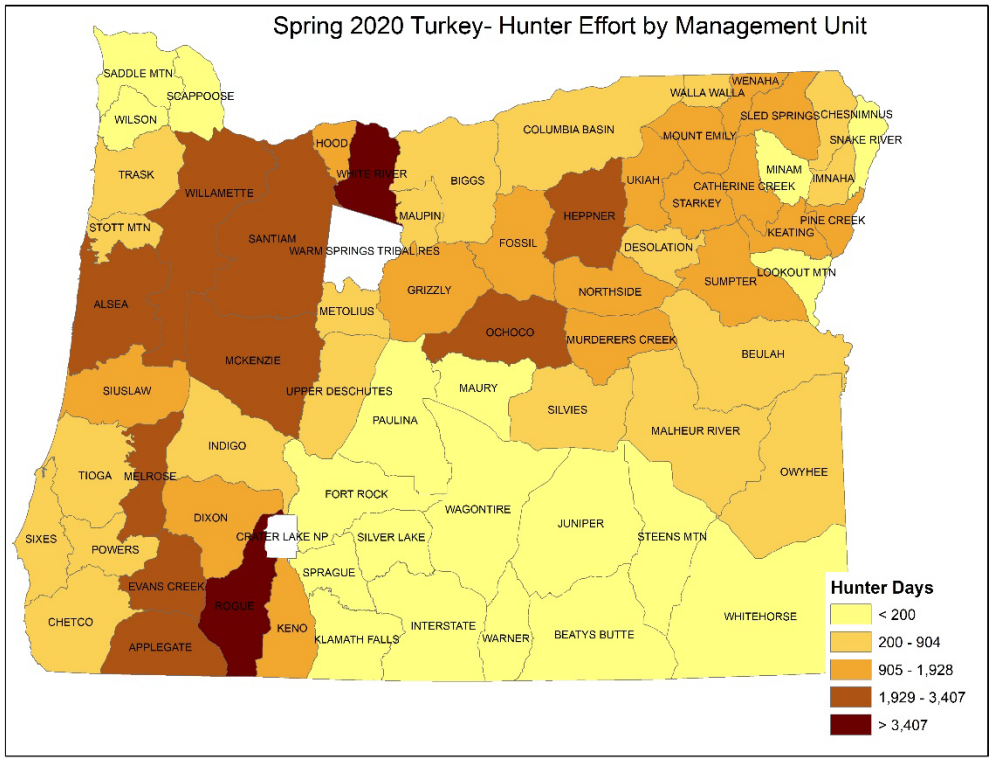
YEAR		Tags Sold	Number Hunted	Hunter Days	Harvest	Harvest Change
1987		8,308	5,003	16,514	425	
1988		3,749	3,055	11,600	563	32%
1989		3,864	2,623	9,788	313	-44%
1990		5,000	3,720	15,557	751	140%
1991		7,159	5,103	27,301	1,086	45%
1992		7,909	6,248	28,384	841	-23%
1993		9,942	7,242	33,117	1,354	61%
1994		9,594	7,531	38,408	1,524	13%
1995		9,947	7,498	35,852	1,631	7%
1996		8,873	6,859	29,661	1,647	1%
1997		9,371	7,396	34,302	1,851	12%
1998	*	12,888	9,037	40,806	2,621	42%
1999	*	18,092	8,240	37,056	2,543	-3%
2000	*	24,426	9,203	40,786	2,590	2%
2001	*	29,276	8,882	40,669	2,729	5%
2002	*	33,498	13,072	55,681	3,699	36%
2003	*	35,936	14,170	63,866	4,093	11%
2004	*	34,580	No Survey			
2005	*	35,662	No Survey			
2006	*	36,501	14,280	55,904	5,279	
2007	*	38,222	14,612	58,157	4,859	-8%
2008	*	36,483	14,320	53,998	4,330	-11%
2009	*	37,828	15,023	58,823	4,575	6%
2010	*	43,676	15,344	62,067	5,437	19%
2011	*	44,790	14,223	54,609	4,132	-24%
2012	*	44,472	12,806	49,832	3,860	-6.5%
2013	*	46,984	13,192	49,547	3,878	<1%
2014	*+	47,335	12,896	55,556	4,242	12%
2015	*+	48,735	13,298	56,490	4,695	10%
2016	*+	49,502	13,716	56,889	5,246	12%
2017	*+	48,538	12,890	54,716	4,797	-9%
2018	*+	50,197	13,983	59,456	5,144	7%
2019	*+	51,312	14,093	58,594	5,596	9%
2020	*+	73,759	16,851	73,759	6,589	18%

* Includes Turkey Tags Sold with Sports Pac Licenses
+ Estimated using mandatory reporting data

Figure 1. 2020 Spring wild turkey harvest maps in Oregon, courtesy of Kelly Walton, Assistant Game Bird Biologist, ODFW.


Spring 2020 Turkey - Harvest by Management Unit
SADDLE MTN
SCAPPOOSE
WILSON
TRASK
WILLAMETTE
STOTT MTN
SANTIAM
ALSEA
SIUSLAW
MCKENZIE
INDIGO
TIOGA
MELROSE
DIXON
SIXES
POWERS
CHETCO
APPLEGATE
ROGUE
HOOD
WHITE RIVER
BIGGS
MAUPIN
WARM SPRINGS TRIBAL RES
METOLIUS
GRIZZLY
OCHOCO
FOSSIL
HEPPNER
COLUMBIA BASIN
WALLA WALLA
WENAHA
SLED SPRINGS
CHESNIMNUS
MOUNT EMILY
SNAKE RIVER
UKIAH
CATHERINE CREEK
MINAM
IMNAHA
STARKEY
PINE CREEK
KEATING
DESOLATION
SUMPTER
LOOKOUT MTN
NORTHSIDE
MURDERERS CREEK
BEULAH
UPPER DESCHUTES
MAURY
PAULINA
SILVIES
MALHEUR RIVER
OWYHEE
FORT ROCK
WAGONTIRE
JUNIPER
STEENS MTN
CRATER LAKE NP
SILVER LAKE
SPRAGUE
KENO
KLAMATH FALLS
INTERSTATE
WARNER
BEATYS BUTTE
WHITEHORSE
Estimated Harvest
No Harvest in Unit
1 - 25
26 - 70
71 - 133
134 - 274
> 274


Spring 2020 Turkey - Birds Harvested Per Hunter by Management Unit
SADDLE MTN
SCAPPOOSE
WILSON
TRASK
WILLAMETTE
STOTT MTN
SANTIAM
ALSEA
SIUSLAW
MCKENZIE
INDIGO
TIOGA
MELROSE
DIXON
SIXES
POWERS
CHETCO
APPLEGATE
ROGUE
HOOD
WHITE RIVER
BIGGS
MAUPIN
WARM SPRINGS TRIBAL RES
METOLIUS
GRIZZLY
OCHOCO
FOSSIL
HEPPNER
COLUMBIA BASIN
WALLA WALLA
WENAHA
SLED SPRINGS
CHESNIMNUS
MOUNT EMILY
SNAKE RIVER
UKIAH
CATHERINE CREEK
MINAM
IMNAHA
STARKEY
PINE CREEK
KEATING
DESOLATION
SUMPTER
LOOKOUT MTN
NORTHSIDE
MURDERERS CREEK
BEULAH
UPPER DESCHUTES
MAURY
PAULINA
SILVIES
MALHEUR RIVER
OWYHEE
FORT ROCK
WAGONTIRE
JUNIPER
STEENS MTN
CRATER LAKE NP
SILVER LAKE
SPRAGUE
KENO
KLAMATH FALLS
INTERSTATE
WARNER
BEATYS BUTTE
WHITEHORSE
Average Number of Birds Harvested Per Hunter*
0
0.7
*Per 1 tag


Spring 2020 Turkey- Hunter Effort by Management Unit
SADDLE MTN
SCAPPOOSE
WILSON
TRASK
WILLAMETTE
STOTT MTN
SANTIAM
ALSEA
MCKENZIE
SIUSLAW
TIOGA
MELROSE
INDIGO
DIXON
SIXES
POWERS
EVANS CREEK
ROGUE
CHETCO
APPLEGATE
KENO
KLAMATH FALLS
INTERSTATE
WARNER
BEATYS BUTTE
WHITEHORSE
HOOD
WHITE RIVER
BIGGS
MAUPIN
WARM SPRINGS TRIBAL RES
METOLIUS
UPPER DESCHUTES
FORT ROCK
CRATER LAKE NP
SILVER LAKE
SPRAGUE
GRIZZLY
FOSSIL
PAULINA
WAGONTIRE
MAURY
JUNIPER
STEENS MTN
OCHOCO
HEPPNER
COLUMBIA BASIN
WALLA WALLA
WENAHA
SLED SPRINGS
CHESNIMNUS
MOUNT EMILY
SNAKE RIVER
UKIAH
MINAM
IMNAHA
CATHERINE CREEK
STARKEY
PINE CREEK
KEATING
DESOLATION
NORTHSIDE
SUMPTER
LOOKOUT MTN
MURDERERS CREEK
BEULAH
SILVIES
MALHEUR RIVER
OWYHEE
Hunter Days
< 200
200 - 904
905 - 1,928
1,929 - 3,407
> 3,407

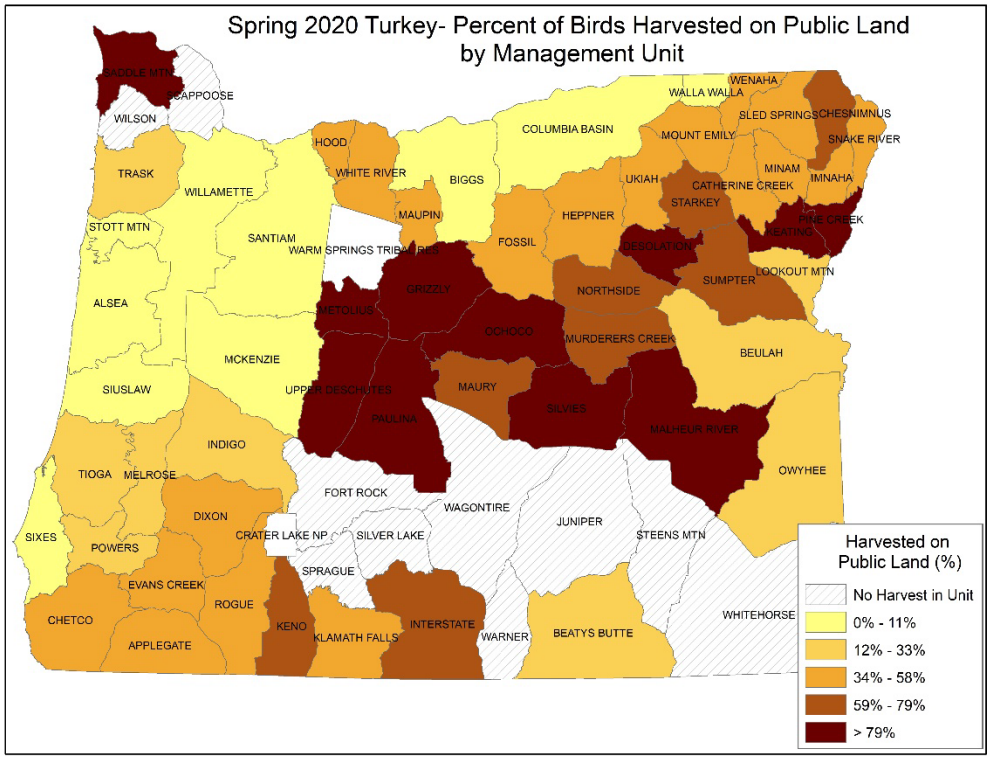

Spring 2020 Turkey- Percent of Birds Harvested on Public Land by Management Unit
SADDLE MTN
SCAPPOOSE
WILSON
TRASK
WILLAMETTE
STOTT MTN
SANTIAM
ALSEA
MCKENZIE
SIUSLAW
TIOGA
MELROSE
INDIGO
DIXON
SIXES
POWERS
EVANS CREEK
ROGUE
CHETCO
APPLEGATE
KENO
KLAMATH FALLS
INTERSTATE
WARNER
BEATYS BUTTE
WHITEHORSE
HOOD
WHITE RIVER
BIGGS
MAUPIN
WARM SPRINGS TRIBAL RES
METOLIUS
UPPER DESCHUTES
FORT ROCK
CRATER LAKE NP
SILVER LAKE
SPRAGUE
GRIZZLY
FOSSIL
PAULINA
WAGONTIRE
MAURY
JUNIPER
STEENS MTN
OCHOCO
HEPPNER
COLUMBIA BASIN
WALLA WALLA
WENAHA
SLED SPRINGS
CHESNIMNUS
MOUNT EMILY
SNAKE RIVER
UKIAH
MINAM
IMNAHA
CATHERINE CREEK
STARKEY
PINE CREEK
KEATING
DESOLATION
NORTHSIDE
SUMPTER
LOOKOUT MTN
MURDERERS CREEK
BEULAH
SILVIES
MALHEUR RIVER
OWYHEE
Harvested on Public Land (%)
No Harvest in Unit
0% - 11%
12% - 33%
34% - 58%
59% - 79%
> 79%

Table 1. Tags available, tags issued, hunter effort and harvest for fall turkey seasons in Oregon, 1994-2018.

Year	Tags Available	Tags Issued	Number Hunted	Hunter Days	Harvest	Harvest Change	Percent Success
1994	900	140	91	80	42		46%
1995	900	200	151	518	67	60%	44%
1996	900	200	104	435	66	-1%	63%
1997	900	276	212	540	135	105%	64%
1998	900	365	213	749	113	-16%	53%
1999	900	330	265	787	144	27%	54%
2000	900	322	243	676	122	-15%	50%
2001	1,000	1,000	662	2,437	257	111%	39%
2002	2,000	1,932	1,234	4,965	519	102%	42%
2003	3,000	2,613	1,666	5,949	755	45%	45%
2004	3,100	2,080	1,378	5,570	605	-20%	44%
2005	3,100	2,299	1,625	6,395	743	23%	46%
2006	3,425	2,537	1,708	6,562	694	-7%	41%
2007	3,525	2,673	1,881	8,135	779	12%	41%
2008	3,725	3,327	2,081	7,996	835	7%	40%
2009	4,725	3,718	2,595	10,426	1,138	36%	44%
2010	4,925	2,886	1,897	7,714	807	-29%	43%
2011	5,025	2,476	2,188	7,661	660	-18%	30%
2012	5,025	2,489	1,548	6,859	690	5%	45%
2013	5,025	2,752	1,715	7,576	692	0%	40%
2014	5,000	3,154	1,957	8,366	921	33%	47%
2015	5,000	3,388	1,929	8,086	880	-4%	46%
2016	5,000	3,468	1,888	8,122	847	-4%	45%
2017	5,100	3,359	1,932	8,424	926	9%	48%
2018	5,100	3,513	2,148	9,088	1,008	9%	47%
2019	5,500	3,857	2,187	9,333	928	-8%	42%
2020	*	5,693	2,985	13,217	1,434	55%	48%

*Tag limits removed in 2020

Western States Wild Turkey Workshop
SOUTH DAKOTA
2021 WILD TURKEY STATUS REPORT
Chad Lehman, Senior Wildlife Biologist

Population Status

Three subspecies (eastern, Rio Grande, and Merriam's turkeys) occur in the state at varying levels. Eastern turkeys are most common in the eastern riparian/cropland habitats. Rio Grande turkeys occur in smaller populations in eastern and south-central South Dakota. Merriam's turkeys primarily occur west of the Missouri River in prairie riparian and ponderosa pine habitats.

Demographic Model for the Black Hills:

We have created a demographic prediction model based on previous research from the Black Hills. We have incorporated precipitation data and correlated that information with reproduction and poult survival. We have broken out the results by southern, central, and the northern Black Hills. This year we incorporated data from the second year of the northern Black Hills Merriam's turkey study. The results for the 2020 models are presented below.

RESULTS DEMOGRAPHIC MODEL 2020

THE SOUTHERN BLACK HILLS MODEL

After running 100,000 simulations that asymptotic growth rate had a mean lambda of 1.36. The standard deviation was 0.16 (95% C.I. = 1.05-1.68).

THE CENTRAL BLACK HILLS MODEL

After running 100,000 simulations that asymptotic growth rate had a mean lambda of 1.15. The standard deviation was 0.13 (95% C.I. = 0.90-1.39).

THE NORTHERN BLACK HILLS MODEL

After running 100,000 simulations that asymptotic growth rate had a mean lambda of 0.74. The standard deviation was 0.06 (95% C.I. = 0.62-0.87).

MEAN LAMBDA FOR THE ENTIRE BLACK HILLS MODEL

Averaging the 3 areas for the Black Hills gives a mean lambda of 1.08. The standard deviation was 0.12 (95% C.I. = 0.86-1.31)

DEMOGRAPHIC MODEL FOR GRANT COUNTY:

We have also created a demographic prediction model based on latest research from Grant County, South Dakota. Data collection occurred 2016-17 in prairie habitats from the northeast portion of the state.

RESULTS

The mean finite rate of lambda was 1.107 (95% CI = 0.943, 1.275) in Grant County. The elasticities of each lower-level vital rate indicate that lambda was most greatly affected by proportional changes in adult hen survival, and that adult fecundity had a greater effect on lambda than yearling hen fecundity.

DEMOGRAPHIC MODEL FOR LAKE COUNTY:

We have also created a demographic prediction model based on radio-telemetry data collected in Lake County, South Dakota. This county is located in prairie habitats of Region 3.

RESULTS

The mean finite rate of lambda was 0.62 (95% CI = 0.33, 0.94) in Lake County. Based on data from 2019 this population is declining and lambda is most sensitive to adult female survival. Elasticity values associated with adult female survival rate were the greatest (0.475) and values associated with juvenile female survival (0.243) and adult reproduction (0.243) were followed by yearling reproduction (0.008) and male survival (0.000).

Hunt history

In 2019, South Dakota Game, Fish, and Parks sold a total of 16,687 turkey hunting licenses (Fig. 1). Wild turkey harvest appears to be stable (Fig. 2, 3, 4).

Fig. 1. Number of turkey licenses sold for the state of South Dakota from 1995-2019.

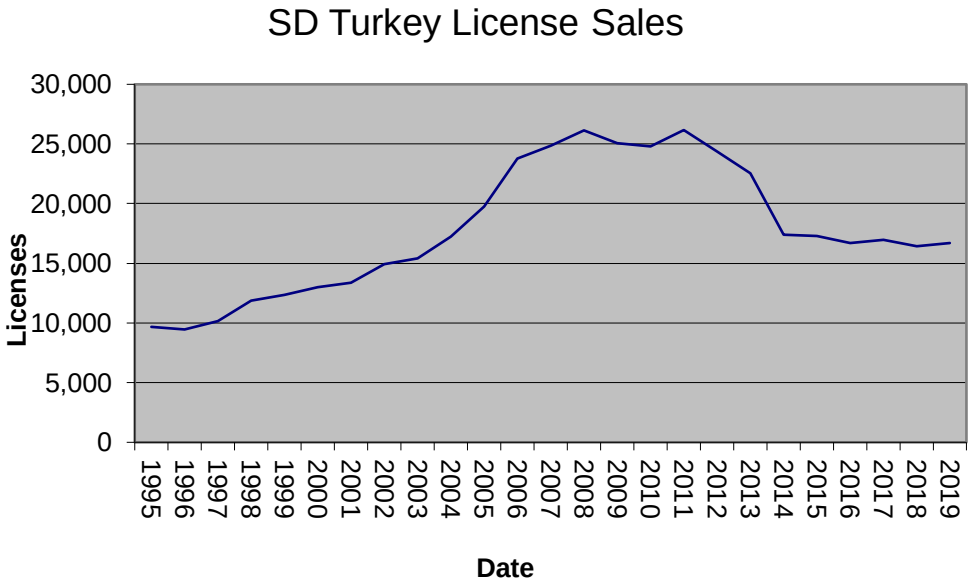


Fig. 2. State turkey harvest projections for South Dakota from 1995-2019.

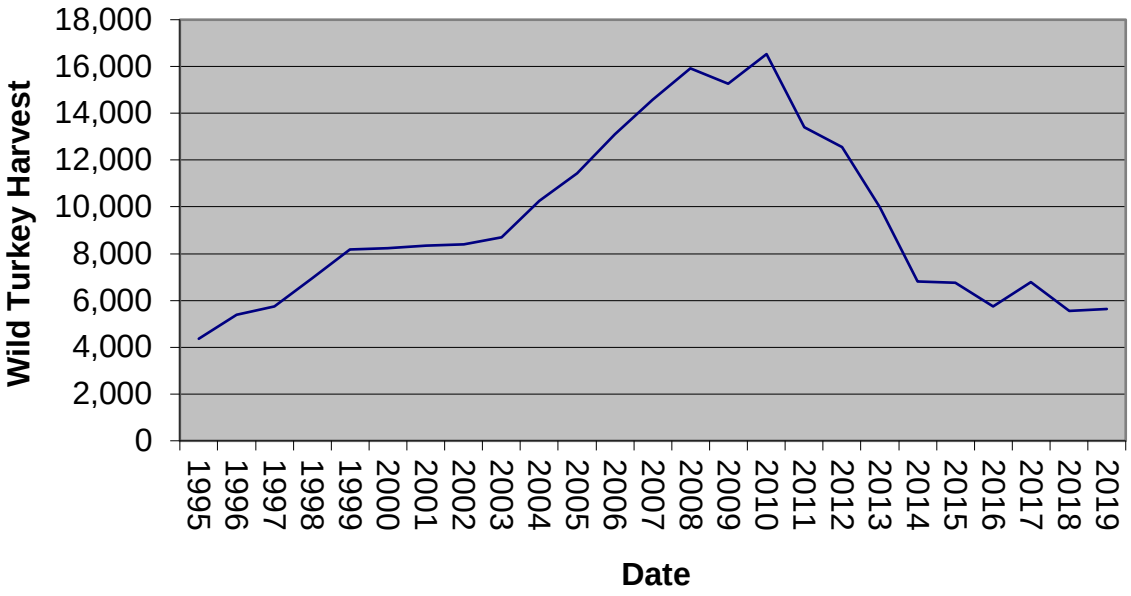


Fig. 3. Black Hills spring harvest projections from 1995-2019.

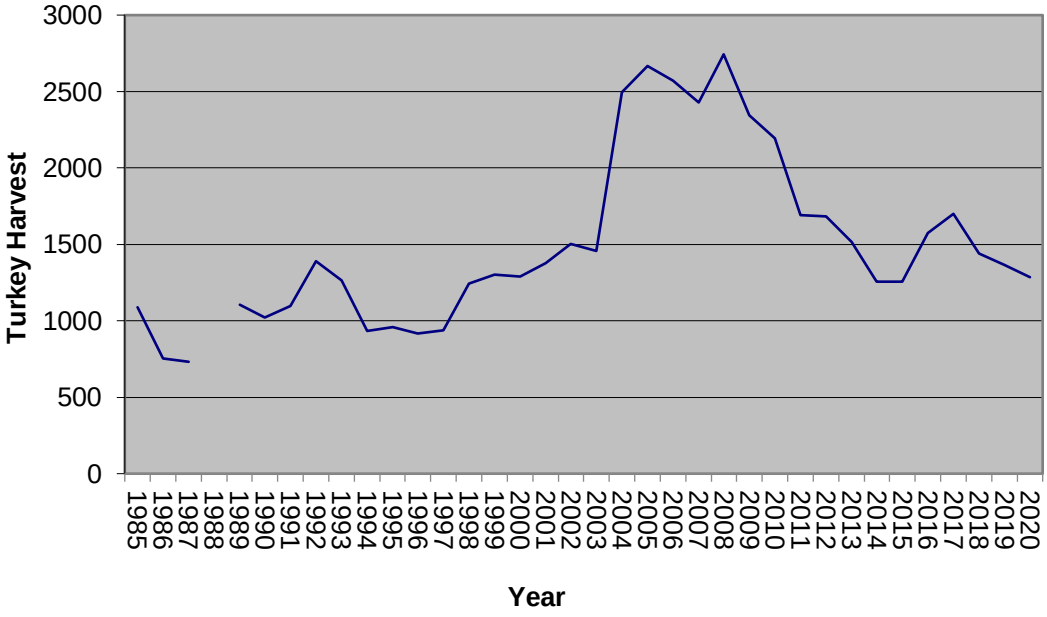
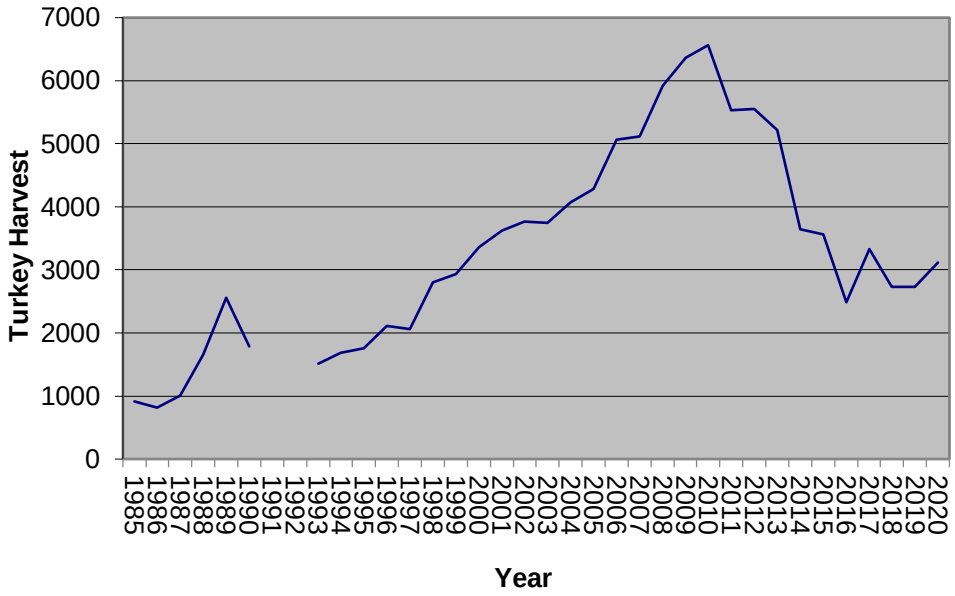


Fig. 4. Prairie spring harvest projections from 1995-2019.



Season framework (by season or weapon class)

Hunter requirements (age, hunter education)

Hunter education is not required to turkey hunt with shotgun or rifle. All big game archery licensees under 16 and all first-time archery big game licensees, regardless of age, must possess a National Bowhunter Education Foundation certificate or certificate of completion from a bowhunter education course approved by any state or provincial government. Those under 16 must also possess the standard HuntSAFE Card. Regular licenses are available to anyone 12 years and older. We have a mentored hunting program for kids aged 10-16 for residents only.

Fall season structure (by weapon)

Fall units are opened based on spring harvest success. If the units meet our criteria of our spring harvest success (see our management plan) they can be opened (usually by County) and licenses are allocated at the discretion of the wildlife manager. Once an allocation is set only 8% of those licenses are available to non-residents. We also have a mentored hunting program for kids aged 10-16 for residents only. Most units allow for use of all weapons during fall (rifle, shotgun, and archery).

Spring season structure (by weapon)

We have several spring units which usually follow the county boundaries with the exception of the Black Hills which is a larger unit encompassing several counties. Licenses are over-the-counter for residents and non-residents in the Black Hills unit. Draw units occur for the prairie units with 8% of the allocation going to non-residents. We also have a mentored hunting

program for kids aged 10-16 for residents only. We also have separate seasons for archery, Custer State Park, and several other special draw units in Parks. Some units only allow shotgun and archery, but others (mostly west of the Missouri River) allow for rifles to be used in spring.

Bag limits

Varies, but typically one bird in spring and fall. In some cases we allow for 2 birds to harvested by residents only.

Shooting hours

One-half hour before sunrise to sunset.

Harvest data (how collected, what it means)

Harvest surveys collected from hunters following seasons. Used in guiding management, particularly for setting fall seasons.

Nuisance or damage reports

Collected by Animal Damage Specialist.

Translocations

In 2019-20, a total of 90 turkeys were trapped and relocated in Region 1. Merriam's turkeys were moved from ranches in the Black Hills to other areas of the Black Hills or western South Dakota.

Research activities

A central Black Hills Merriam's turkey research study through Montana State University has been placed on hold and we hope this project gets funded in the near future.

Regulation changes

Of note, we changed our spring regulations to not include rifles last season. No new regulations for this year.

Other

Please review our South Dakota Wild Turkey Management Plan for updates and management direction at:

https://gfp.sd.gov/UserDocs/nav/WildTurkeyPlan.pdf

TEXAS WILD TURKEY POPULATION STATUS REPORT

WAFWA Wild Turkey Technical Committee Meeting – May 4-5, 2021
Teams Virtual

Jason Hardin – Turkey Program Leader
Texas Parks and Wildlife Department
P.O. Box 279
Buffalo, Texas 75831
903-322-2770 / Jason.hardin@tpwd.texas.gov

POPULATION STATUS

Texas has the highest density of Rio Grande wild turkeys in the country with a population estimate of 500,000. The Rio Grande wild turkey population is found in the western 2/3 of Texas, primarily along and west of the Interstate 35 corridor, east of the Pecos River, and south of Interstate 10. However, smaller populations are found beyond these east/west strongholds. Eastern wild turkeys can be found in localized populations in the eastern third of Texas. Eastern wild turkeys only number around 10,000 and are in genetically isolated island populations. A small island population of approximately 500 Merriam's wild turkeys is located in the Davis Mountains of West Texas. The wild turkey distribution in Texas is illustrated in Figure 1.

Prior to the summer of 2006, an annual summer production survey was conducted by Texas Parks and Wildlife Department (TPWD) Wildlife Division staff. However, this survey was discontinued due to insufficient sample sizes and insufficient measures of survey effort to make reliable production estimates. Texas' Small Game Harvest Survey provides a weak measure of the Rio Grande wild turkey population status in Texas. This survey historically goes out to 20,000 hunters at the end of February each year. This places spring turkey hunter and harvest data over 14-16 moths after the spring harvest being reported. For this reason, Texas will begin targeting turkey hunters following the spring turkey season this summer to collect more timely survey data. Texas also has mandatory reporting of Eastern wild turkey harvest, and this provides a stronger measure of population status.

In 2020, TPWD updated a presence/absence survey utilizing an ArcGIS Online grid. The 10-minute grid allows staff to report the presence or absence of wild turkeys within a specific grid (Figure 1). While this is not a measure of the population it does provide insight into the expansion and contraction of populations over time.

There are 198 Breeding Bird Survey (BBS) routes in Texas. BBS data shows a general increasing trend in the Texas wild turkey population from 2008 to 2017 (Figure 2). Although BBS may not provide fine scale data, it may be appropriate at a statewide scale for assessing general population trends.

HARVEST

2019 Spring Turkey Season

Texas' Small Game Harvest Survey is mailed out to 20,000 hunters annually. The survey is mailed just prior to the spring turkey season. Therefore, results of the survey are only for the previous spring season. Survey results are typically published mid-summer. During the 2019 spring turkey season 39,875 hunters harvested 17,428 wild turkeys. This is the second lowest estimate of spring turkey hunters and third lowest estimate of harvest since the survey began in 1981. Hunters experienced a 43.40% success rate. This success rate is slightly higher than the long term mean of 42.54%. Figure 3 identifies long-term spring hunter and harvest trends.

2019-2020 Fall Turkey Season

During the 2019-20 fall turkey season 29,256 hunters harvested 10,550 wild turkeys. This is the lowest number of fall turkey hunters and harvest since the survey began in 1987-88 season. Hunters experienced a 40.40% success rate, which is above the long-term mean of 38.32%.

2020 Eastern Turkey Season

TPWD requires mandatory reporting for all harvested Eastern wild turkeys. Reporting is completely through TPWD's My Texas Hunter Harvest App or online (www.tpwd.texas/turkey). During the 2020 eastern wild turkey season hunters reported harvesting 195 wild turkeys. This is up 30% from 2019 and up 6% above the 3-years average.

REGULATION CHANGES

The Texas Parks and Wildlife Commission recently approved several wild turkey regulation changes that will become law September 1, 2021:

1. The Commission closed the turkey season in Panola County due to low harvest reporting and a shrinking distribution of the local population.
2. The Commission moved the wild turkey north/south spring zone line to Highway 90 west of San Antonio. This simplifies regulations and moves the opening day of the spring season back 2-weeks in 22 counties.
3. The Commission enacted mandatory harvest reporting requirements for all counties with a 1-bird annual bag. This expansion will include Bastrop, Caldwell, Colorado, Fayette, Jackson, Lavaca, Lee, Matagorda, Milam, and Wharton Counties.

2020 TEXAS HUNTING ACCIDENT REPORT

Texas sold 1,301,289 hunting licenses during 2019-20 hunting season. The 2020 Texas Hunting Accident Report identified 24 hunting related accidents. Of those 24 accidents 1 was fatal. Fourteen (14) of the hunting accidents involved shotguns, 8 involved rifles, and 2 involved handguns. Of the 24 accidents, 11 involved dove hunting, 6 involved feral hog hunting, 2 involved rabbit hunting, 1 involved deer hunting, 1 involved duck hunting, 1 involved nongame birds/snakes, 1 involved predator hunting, and 1 involved wild turkey hunting.

RESEARCH

UAV-FLIR Survey Methodology

Researchers at University of Missouri recently completed year one of a two-year project testing UAV-FLIR technology for surveying roosted wild turkeys. This in a continuation of a pilot project conducted by TPWD staff in 2019. The first field season was conducted in the Rolling Plains and Cross Timbers ecoregions. Year 2 of the study will focus on the Post Oak Savanna and Pineywoods ecoregions. Our objectives are to test the potential for this technology to identify roosted wild turkeys across multiple ecoregions, discern between wild turkeys and other similar sized species (vultures), and assess effort required to scale the survey up from a ranch-scale to larger landscapes.

Wild Turkey Disease Surveillance in the Rolling Plains of Texas

Texas Parks and Wildlife staff conducted a disease surveillance pilot study in the Texas Rolling Plains along the Texas/Oklahoma border. Wildlife agency staff, landowners, and hunters along the Texas and Oklahoma line have observed apparent wild turkey population declines over the past few years beyond typical weather-related population cycles. Some land managers and hunters have suggested disease and parasites may be the cause for the apparent decline.

Staff trapped, banded, and collected whole blood and serum from 120 wild turkeys in Collingsworth, Childress, Cottle, and Hardeman Counties, Texas. Staff collected another 99 fecal samples from the same birds. Test results reported three (3 – 2.5%) wild turkeys positive for Avian Influenza antibodies (H7N1). Staff and the Texas A&M Veterinary Lab in Gonzales believe the infections were low path and birds had recovered based on the overall health of the birds at the time of capture. Two (2 – 1.7%) were positive for REV (reticuloendotheliosis virus) included one of the AI positive wild turkeys.

Of the 120 wild turkeys captured, staff provided 99 fecal samples for testing parasite loads. Fecal samples revealed 33% infection rates of Eimeria, which is known to cause coccidia in domestic turkeys, and tapeworm eggs. This was anticipated as most wild turkeys will carry some parasite loads at one point in their life.

Our findings suggest disease and parasites, while expectedly present, are not present at levels believed to be detrimental to the sustainability of the wild turkey population in the Texas Rolling Plains.

RESTORATION

TPWD reengaged in Eastern wild turkey restoration efforts in 2014. Over the past 8 years TPWD, with the assistance of Southeastern and Midwestern state partners and NWTF, has released over 1,500 wild turkeys at 16 sites in east Texas. Texas has utilized a super stocking approach to these restoration efforts releasing 80-100 birds per site at a ratio of 1 male per 3 females. Restoration efforts are focused on three priority landscapes: The Neches River PA following the Neches River from Lake Palestine south to the Angelina National Forest; the Trinity River PA from eastern the southern portion of Navarro County south to Walker and

Grimes Counties; and the Sulphur River PA following the Sulphur River, White Oak Creek and Cypress Creek watersheds across all or portions of Bowie, Camp, Cass, Delta, Franklin, Hopkins, Morris, Red River and Titus Counties.

Since 2014, 1522 wild turkeys have been released east Texas. During the winter of 2021 TPWD staff released 278 wild turkeys from Maine, Missouri, North Carolina, and Texas.

RELEVANT LINKS

Texas Hunting Accident Report (2002-2020) https://tpwd.texas.gov/education/hunter-education/accidents

Texas Hunting Regulations: https://tpwd.texas.gov/regulations/outdoor-annual/hunting/seasons/statewide/

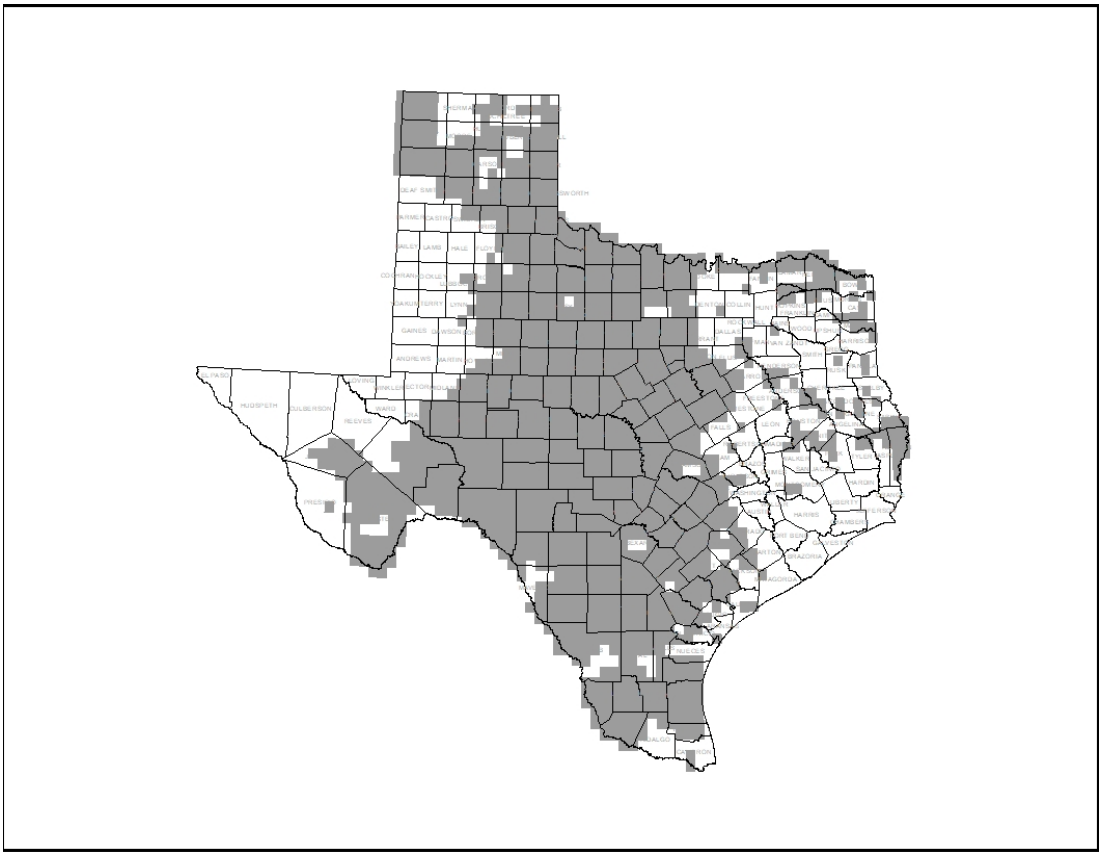


Figure 1. Texas wild turkey distribution.

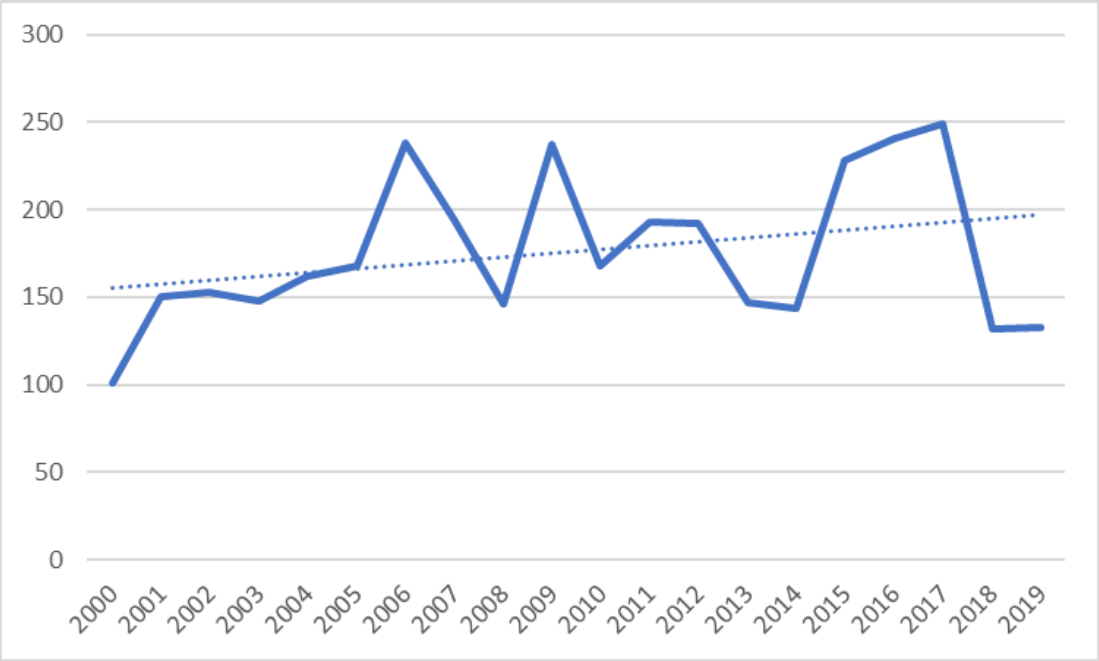


Figure 2. Breed bird survey trends for wild turkeys in Texas (2000-2019).

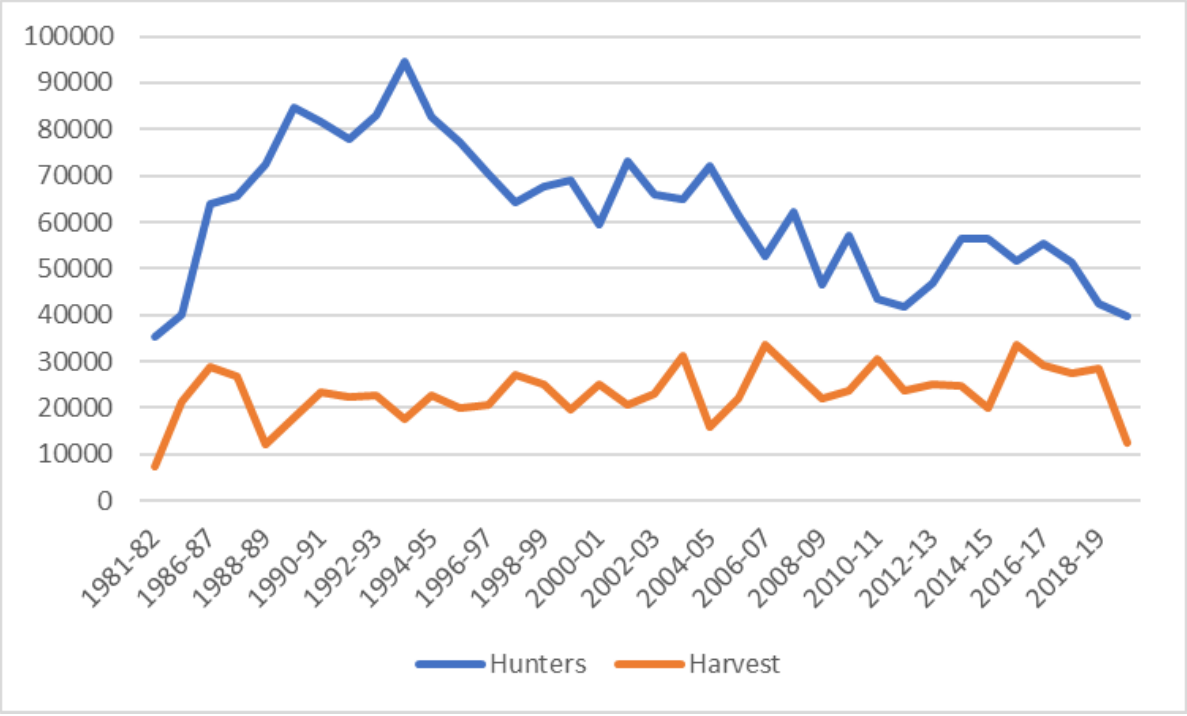


Figure 3. Spring turkey hunters and harvest as determined by TPWD's Small Game Harvest Survey.

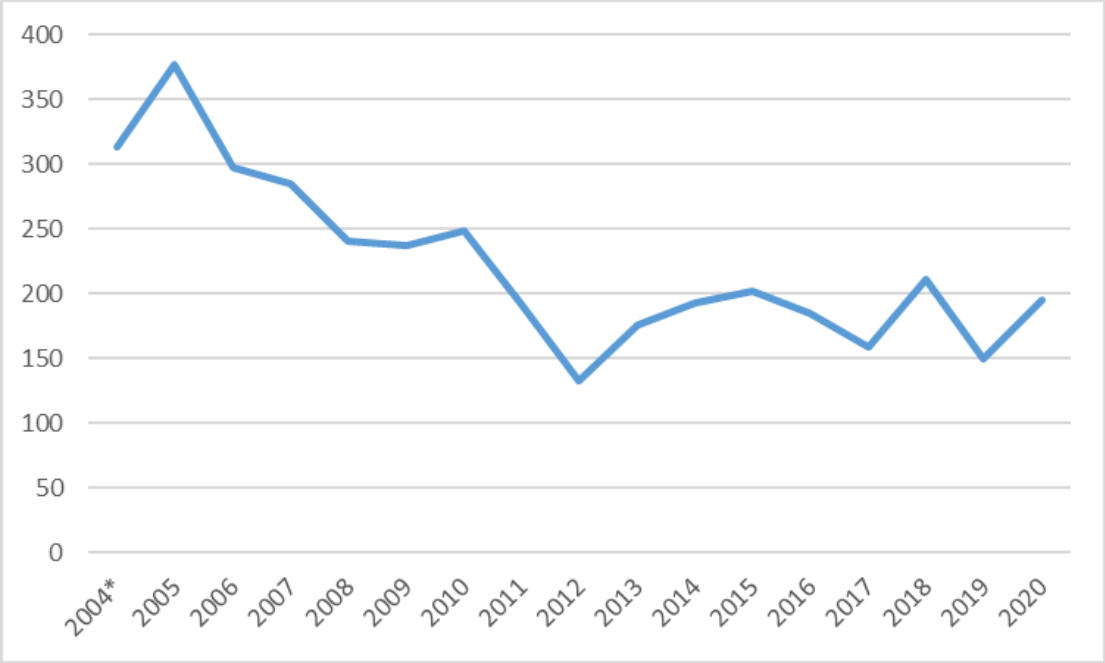


Figure 4. Eastern wild turkey harvest.

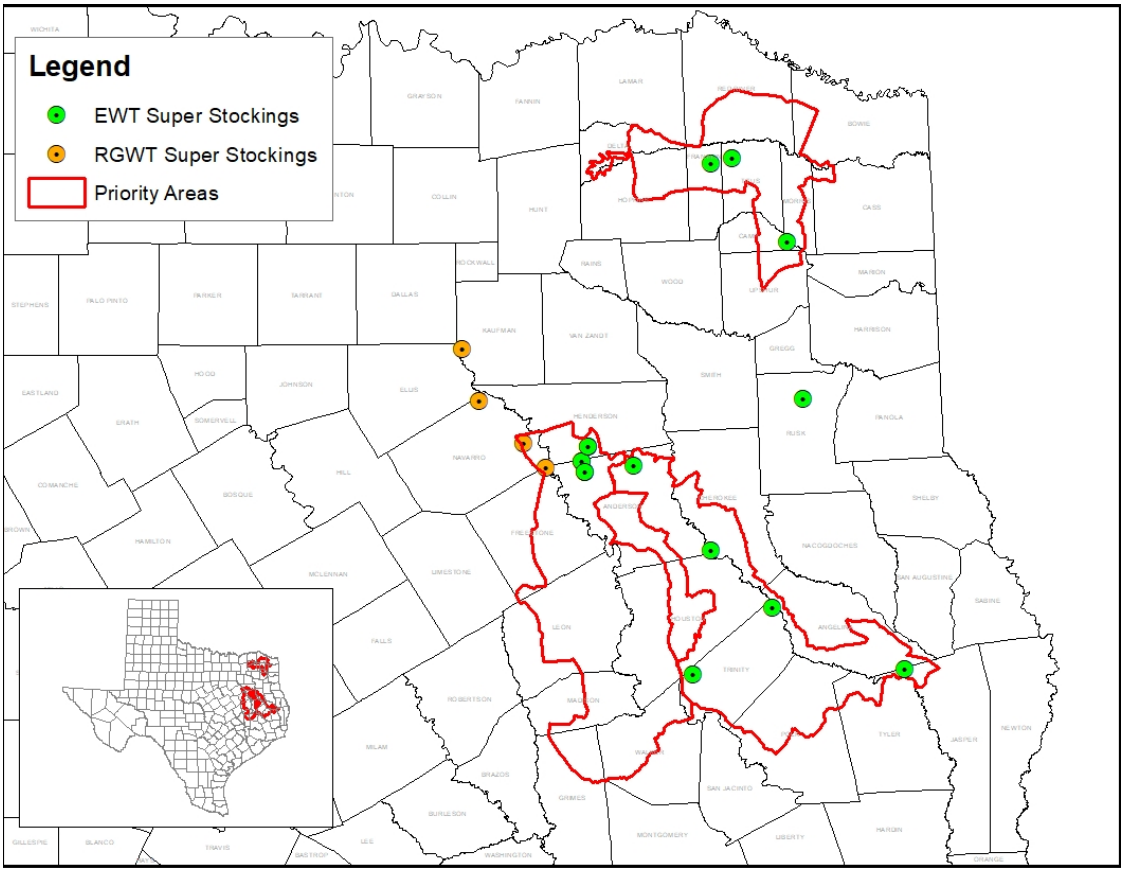


Figure 5. Super Stocking from 2014 to 2021.

Figure 6. UAV FLIR flight over roosted wild turkeys in Texas

Wild Turkey Status and Trend Report

STATEWIDE

SARAH GARRISON, Statewide Small Game, Furbearer, and Resident Game Bird Specialist

Management Guidelines and Objectives

Wild turkeys were first successfully introduced in Washington in 1960. Population augmentation from 1984 through 2003 expanded their distribution and increased hunting and wildlife viewing opportunities (WDFW 2005).

In January 2006, the Department adopted a statewide Turkey Management Plan (WDFW 2005) as a supplement to the Game Management Plan in response to increasing populations and issues related to turkey management. Population management strategies from this plan were included and updated in the 2015-2021 Game Management Plan (WDFW 2014). The statewide management goals for wild turkeys are to:

1. Preserve, protect, perpetuate, and manage wild turkeys and their habitats to ensure healthy, productive populations.
2. Manage wild turkeys for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, wildlife viewing cultural and ceremonial uses by Native Americans, and photography.
3. Manage statewide wild turkey populations for a sustained harvest.

Hunting Seasons and Recreational Harvest

Hunter effort and harvest of wild turkeys are estimated based on the analysis of mandatory hunter reports. Hunters owe reports on all turkey tags, including tags they did not use. Successful hunters are required to submit the date, location, and sex of harvested birds. This mandatory reporting system has allowed for better estimates of harvest and hunter participation than estimates made prior to the reporting requirement.

Within Washington State, Game Management Units (GMUs) have been grouped to define seven turkey Population Management Units (PMUs, Table 1, Figure 1). Changes in harvest, as an indicator of population trend, have been tracked at the PMU level. Improvements were made to the turkey harvest data analysis routine in 2011 and 2016, which could account for some variations in estimates and should be considered when comparing data across years.

Table 1: Game Management Units (GMUs) included in each Population Management Unit (PMU).

PMU	PMU Name	GMUs Included
10	Northeast	101-136
15	Southeast	139-186
20	North Central	All 200 GMUs
30	South Central	All 300 GMUs EXCEPT GMU 382 & 388
35	Klickitat	GMUs 382, 388, 568-578
40	Northwest	All 400 GMUs PLUS GMUs 601-627
50	Southwest	All 500 GMUs EXCEPT 568-578 PLUS GMUs 633-699

The statewide spring general season from April 15 to May 31 has been in place since 2008. The spring season is for male turkeys and turkeys with visible beards only. The spring season limit is three birds with some area restrictions.

Fall opportunities have varied and generally expanded over the years. In 2018, the fall general season in GMUs 101-154 and 162-182 expanded to run continuously from September 1 to December 31. Also in that year, the permit hunt in Klickitat County changed to a fall general season opportunity. The fall seasons allow harvest of either sex with a bag limit of four birds with some area restrictions.

Two permit hunts were available in fall 2019. These occurred in Okanogan County (Methow, GMUs 218-231 and 242) and Kittitas County (Teanaway, GMU 335). Fall permit hunts allow harvest of either sex with a bag limit of one bird.

Turkey hunting is open to shotgun, archery, and crossbow hunting during the spring and fall seasons. Dogs, baiting, electronic decoys, and electronic calls are not legal in Washington. Non-electronic decoys are permitted. In 2006, the Fish and Wildlife Commission adopted a regulation permitting falconers to hunt turkeys during the fall and winter.

Current regulations are considered relatively conservative. Spring season timing results in harvest of gobblers after peak breeding. The season ends before most nests hatch, so disturbance is minimized. Fall seasons have been expanded in certain areas to increase hunting pressure in response to increased complaints regarding turkey damage and human-wildlife conflict.

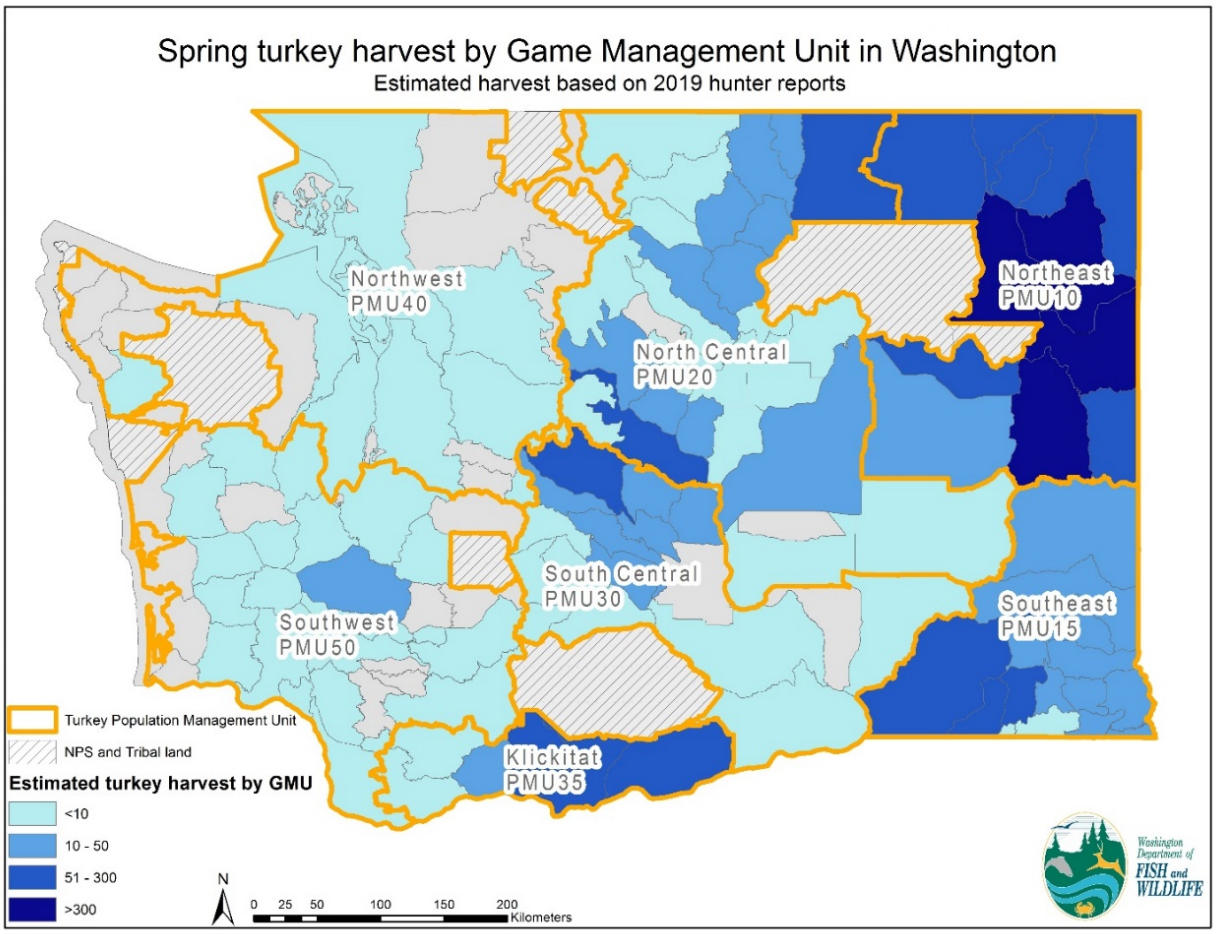


Figure 1: Estimated spring turkey harvest in each Game Management Unit based on 2019 hunter reports.

Statewide participation in spring turkey hunting has varied around an average estimate of 11,169 hunters since 2012 (Figure 2). In 2019, participation was 2% above this average at 11,347 hunters. Estimated harvest, on the other hand, has shown a fairly steady increase over the same period, with 2019 harvest (5,824 birds) 27% above the average of 4,599 since 2012.

Recently, depredation on agricultural land caused by turkeys and conflicts with humans has increased in parts of eastern Washington. Liberal fall general seasons are in place here to help address these issues. Participation in fall hunting continues to increase, with fall harvest following suit (Figure 3). In examining these data, it's important to consider that while the spring season has remained constant, the fall season has expanded over the last several years. Since 2012, an average of 3,514 hunters have pursued turkey each fall. In 2019, hunter participation was 37% above this average at 4,803 hunters. Fall harvest in 2019 (3,093 birds) was 75% above the eight-year average of 1,772 birds. Permit hunters reported an additional 8 birds taken during fall permit hunts.

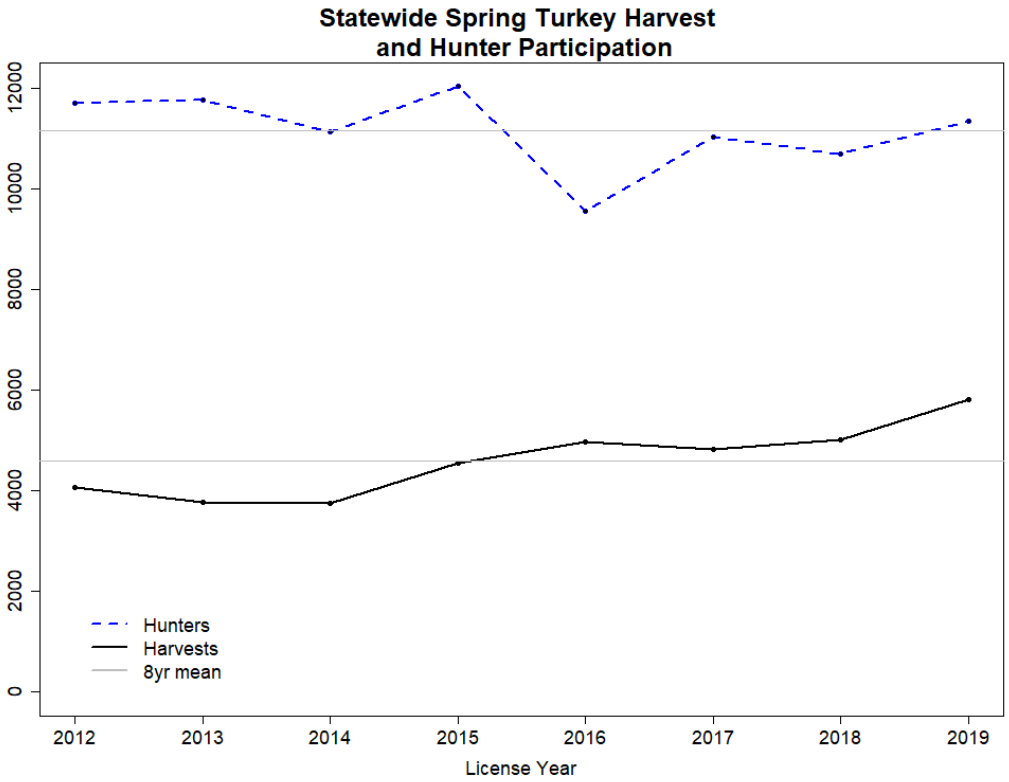


Figure 2: Estimated statewide spring turkey harvest and hunter participation, 2012-2019, with 8-year means.

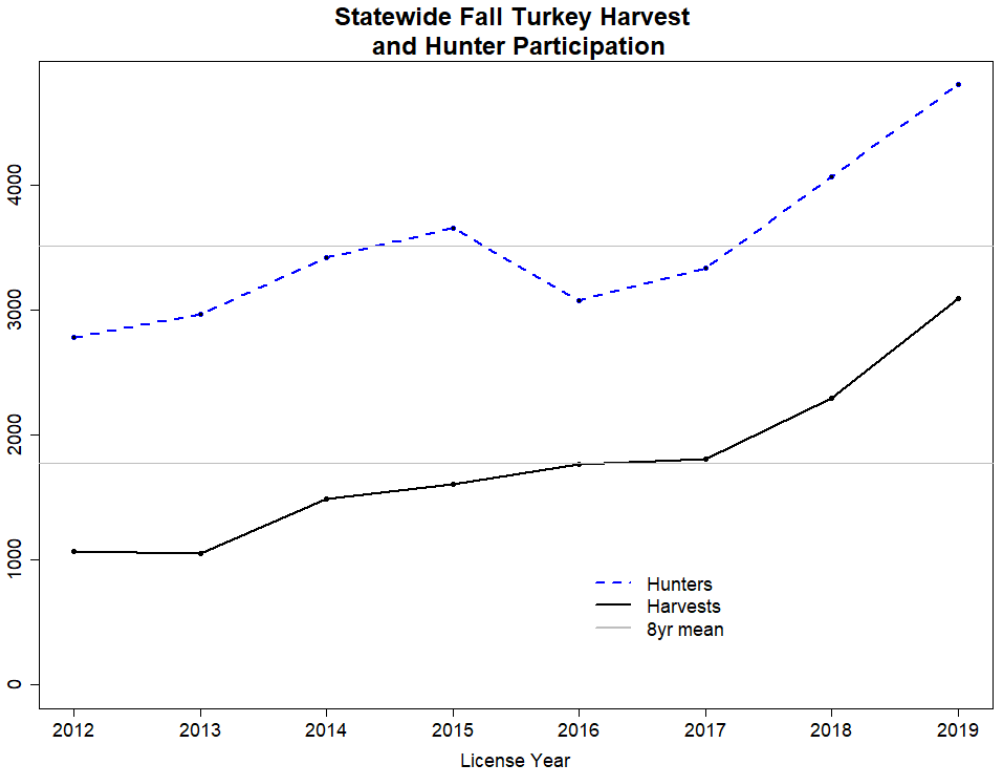
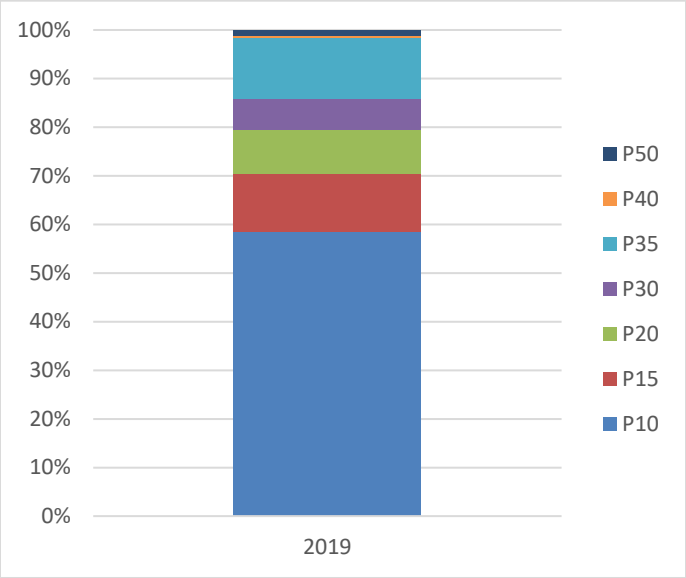


Figure 3: Estimated fall turkey harvest and hunter participation, 2012-2019, with 8-year means.



The majority of spring turkey hunting activity occurs in the northeast (PMU 10; Table 2). In 2019, spring harvest in this PMU represented 66% of the total statewide spring harvest. The remaining hunting activity is largely distributed though eastern Washington, with little hunting in western Washington (PMU 40 and 50) where turkey populations are less robust.

Figure 4: Proportion of days hunted in each Population Management Unit (PMU) out of the total number of days hunted statewide in the 2019 spring season.

Table 2: Estimated spring turkey harvest in each turkey Population Management Unit (PMU) 2012-2019.

PMU	2012	2013	2014	2015	2016	2017	2018	2019
P10	2,512	2,400	2,461	3,097	3,421	3,331	3453	3847
P15	642	533	500	531	590	499	563	643
P20	203	188	181	260	270	331	326	480
P30	162	143	137	157	208	175	172	186
P35	514	474	436	475	461	417	456	598
P40	5	5	1	3	2	5	23	12
P50	30	25	25	38	28	56	25	39

Population Monitoring

Harvest and hunter effort data are used as an index to population trends. Standardizing harvest estimates by the amount of hunter effort expended to achieve that level of harvest can provide some indication of whether populations are increasing, decreasing, or stable.

A stable number of hunters with increasing harvest creates an increasing trend in hunter success (harvests per hunter), indicating that the statewide turkey population is likely increasing (Figure 4). Since 2012, hunter success has averaged 42% during the spring season. In 2019, spring hunter success was 21% above this average, with 51% of hunters successful in harvesting a spring turkey. The fall season shows a similar increasing trend, though this could be influenced by the expanded opportunity (increasing season length) during those years. The number of days hunted per successful harvest is a similar metric for indexing population trend. This metric shows a decreasing trend, with 2019 (9 days per harvest) 14% below 2012-2019 average (10 days per harvest) for the spring season. Fewer days required to successfully harvest a bird indicates an increasing population of birds available for harvest.

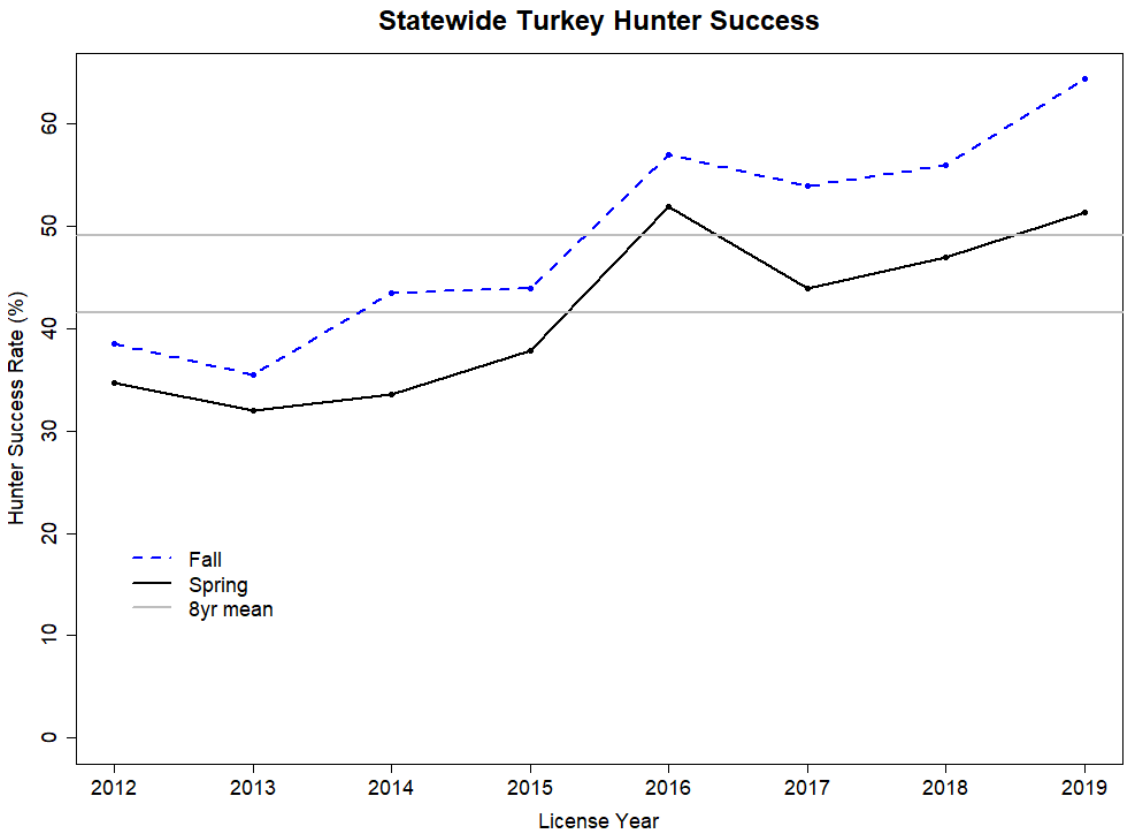


Figure 4: Hunter success rate (harvests per hunter) for the spring and fall seasons, 2012 – 2019.

Within each PMU, the number of days hunted per harvest is variable, but all units show a stable to decreasing trend, indicating that populations at the PMU level are stable to increasing, with the exception of northwestern Washington (PMU 40; Figure 5). Very little hunting activity occurs in this unit, so small sample sizes make any assessment of trends difficult.

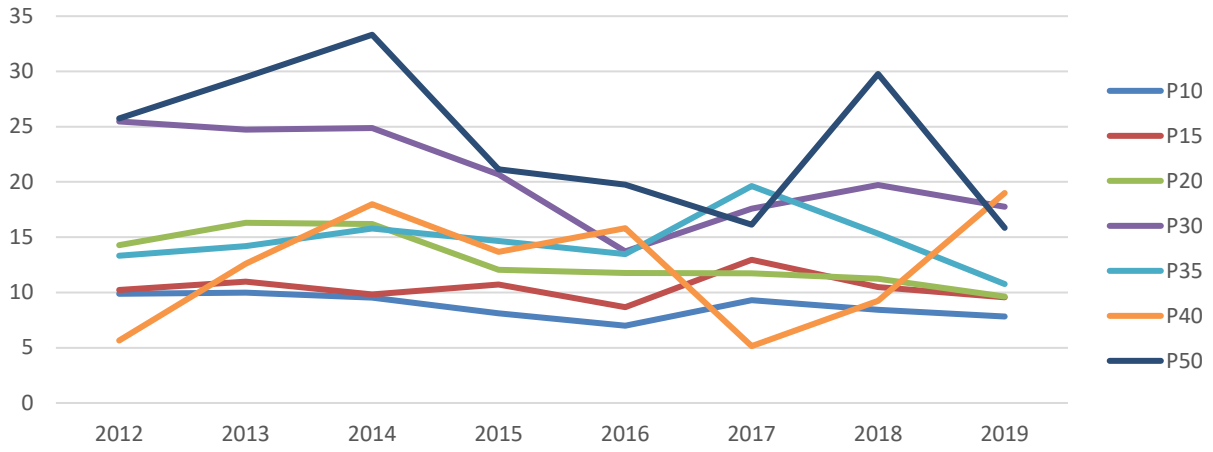


Figure 5: Number of days hunted per successful harvest during the spring season in each PMU, 2012 - 2019.

Habitat

Habitat enhancement priorities are identified in the 2015-2021 Game Management Plan (WDFW 2014). Of special interest are habitat improvements that increase habitat values for a variety of wildlife species in addition to turkeys. The Klickitat Oak Habitat Initiative began in May 2009 focusing on improving oak stand health and understory habitat on the Klickitat Wildlife Area and surrounding lands in Klickitat County. Other efforts have focused in northeast Washington to provide enhanced food resources through weed control, agricultural manipulation, and forest improvements. WDFW works closely with the National Wild Turkey Federation (NWTF) on efforts to promote and fund habitat enhancement work.

Population Augmentation

There were no new releases of turkeys in any PMU across the state and none are planned in the future. Turkeys are present in most of the areas that would be considered suitable habitat. Concerns related to human-wildlife conflict have precluded introductions in the recent past. WDFW management plans identify trapping and translocation as a potential response to damage and nuisance complaints, but in these cases turkeys are only be moved to areas where populations already exist. Few translocation activities have occurred in recent years.

Management Conclusions

Turkey populations across the state appear to be stable to increasing with the largest concentrations in eastern Washington. The statewide spring hunter success rate continues to increase, despite increases in fall harvest, indicating that the increased fall seasons are not adversely impacting populations. Turkey damage and complaints are being reported from eastern Washington, especially Spokane County. Additional hunting opportunities have been created in these areas to help address these complaints. WDFW will be reviewing ways to focus hunter effort and other management tools in areas with private lands experiencing damage. Management decisions will seek to maintain high hunter success rates in the spring while also addressing human conflict issues.

Determining population trends for wild turkey in western Washington is limited by lack of data. Wild turkeys are likely reproducing at low levels but maintaining a viable population in PMU 50. Low harvest in this area may be due in part to more restrictive access policies put in place by private landowners.

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Washington Department of Fish and Wildlife. 2014. 2015-2021 Game Management Plan. Wildlife Program, Washington Department of Fish and Wildlife, Olympia, Washington, USA.

WAFWA Wild Turkey Technical Committee
2021 Workshop
Washington Dept. of Fish & Wildlife
- Virtual meeting -

WYOMING STATE REPORT

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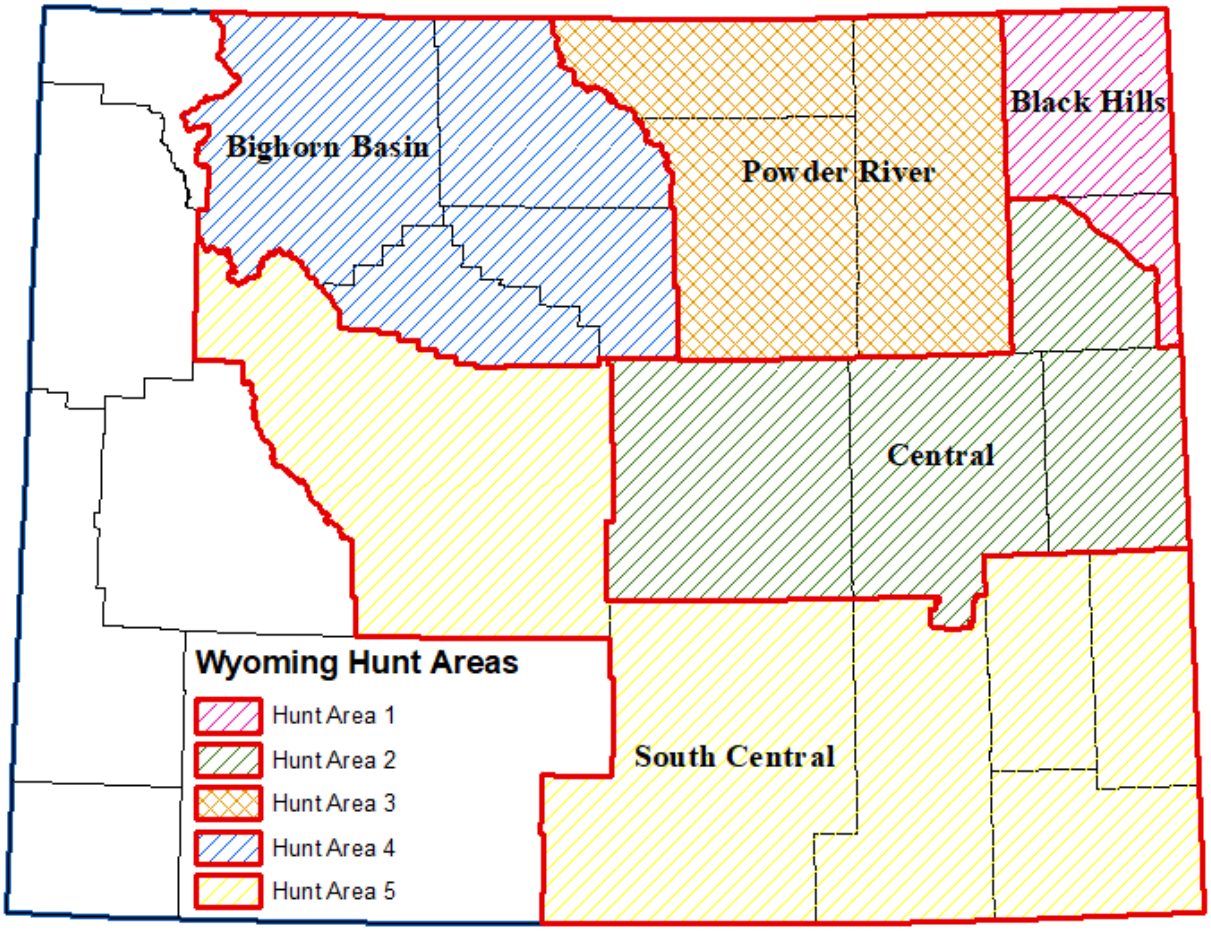


STATEWIDE SUMMARY:

Wyoming Game and Fish has been working to simplify hunting regulations and we have probably made the most progress with our wild turkey hunting regulation (Chp. 20). In 2014, the State moved from fourteen wild turkey hunt areas (HA) to five. As part of this process, hunt areas were grouped by management strategy. Currently, season structures in each HA follow two of three generally accepted management strategies:

- Emphasis on spring gobbler hunting with limited, either sex fall hunting in Hunt Areas 1, 4, and 5.

- Substantial spring and fall hunting opportunity to reduce population numbers when appropriate in Hunt Areas 2 and 3.

In an effort to further simplify the wild turkey hunting regulations and better align seasons with nesting chronology, a move towards a standard, spring opening date was initiated in 2020. With this change, 4 of the 5 wild turkey hunt areas opened April 20th this spring. Along with the change in the opener, the closing date for all hunt areas was changed to May 31st to balance impacts to hunter opportunity with landowner concerns about seasons that are too long.

- On average the later opening date in Hunt Areas 1 & 4 is now 7 or 8 days later (depending if leap year) with 11 days added to the end of the season for a net, average gain of 4 or 5 days.

- HA 3 now has the longest spring season running from April 1 – May 31.

- The opening date in HA's 2 & 5 is now 19 days later, and it moves the closing date back 11 days for a net loss of 8 days.

The standardized April 20 – May 31 spring season structure was chosen for the following reasons: *These are some items that were used for justification*

- *On average, a bit over half of the spring wild turkey hunting in Wyoming occurs in the Black Hills (HA 1). This area also provides the vast majority of public land, spring wild turkey hunting. As such, its management is more closely scrutinized; and statewide standardizations, when implemented, should enhance management in this hunt area.*

- *To ensure hunting pressure is focused after most nesting and incubation has begun. The change shifts harvest more into the period sometimes referred to as the "second peak of the gobbling," which reduces mortality on dominate toms during the first gobbling period, and should increase mating success.*

    - *Recent research has indicated wild turkeys use what is referred to as an exploded lek mating system, wherein only a few dominate toms breed most of the hens. However, instead of strutting on a stationary lek, the birds in a given area move about the landscape - kind of like a big mobile lek. Most of the strutting and gobbling behavior observed beginning in February and through the middle of April is not attracting hens to mate, but rather establishing a "pecking order" that will decide who ultimately breeds. Further, researchers are finding the ability of non-dominant males to successfully breed hens can*

be suppressed by the presence of dominant toms. If the dominant toms are removed from the population, it is unknown how much time needs to elapse before remaining toms are be able to successfully mate. Moving the season later helps ensure most hens are bred by the best quality toms.

- *A dominance hierarchy also is found in hens, and research suggests that until the dominant hen nests, the subordinate hens may not begin nesting. If breeding with the dominant hen is delayed, nesting of the other hens may be delayed as well.*

- *Research in the Black Hills of Wyoming and South Dakota has revealed the peak of nest initiation fluctuates yearly, occurring between about the third and fourth week in April.*

- *After the majority of hens are incubating, hunting pressure can be focused on the "second peak of gobbling." During this time there is some evidence that toms become more mobile, as they cover ground looking for females that have not been bred or are attempting to re-nest. As such, they become more vocal and definitely call vulnerable. It is also the timeframe that the Guidelines for Managing Merriam's Wild Turkeys recommend they be hunted.*

- *Several major roads on the Black Hills National Forest (BHNF) are seasonally closed until mid-May; and vehicle access to a significant portion of the BHNF limited most years due to mud and snow.*

- *Several outfitters and landowners in Black Hills requested and supported the later opening and closing dates.*

- *The later opener can benefit landowners by moving hunting season into a more favorable weather period, which is further removed from calving and other spring ranch and farm chores.*

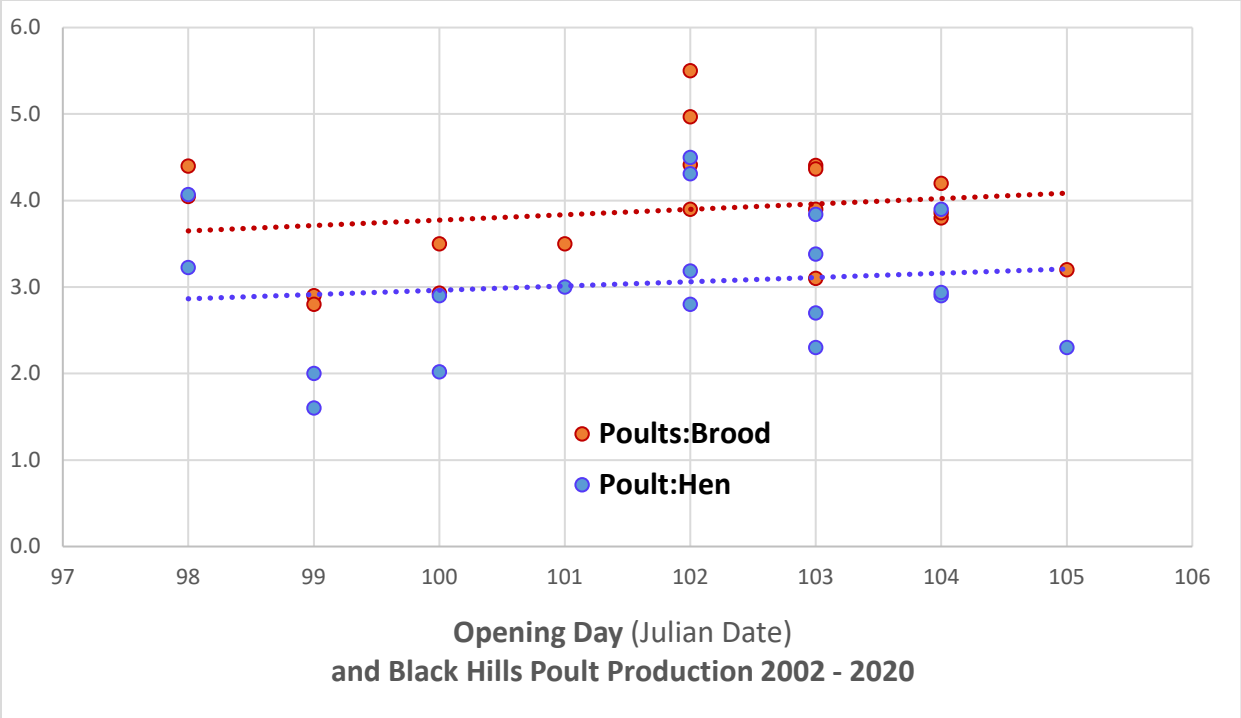
- *Contacts this year with a large number of non-residents indicates are planning trips for mid to late May, and I only have had one call from a nonresident hunter interested in hunting the opener. Our later season seems to be very attractive to non-residents as most other states have earlier seasons.*

- *Outside of the Black Hills, the other hunt areas should benefit from the later standard opener as its timing helps move the spring season away from barnyard hunting and muddy conditions.*

- *The season dates in HA's 2 and 3 will allow more dispersal of birds to disperse on to public land before season starts (HA 2) and closes (HA 3).*

- *With respect to Hunt Area 3 retaining an April 1st opener and moving the closing date later, the Sheridan Region has justified this stating most all of the turkeys are found on private land, and there have been problems with depredation and nuisance birds. Consequently, they desire that area continue to be managed for maximum fall and spring harvest to reduce turkey numbers.*

- *See graph below for observed wild turkey poult production as related to opening day in the Black Hills since 2002. There is a slight positive correlation in the two, although it is not significant, and spring weather still has a larger impact on poult production and survival. The poult:brood figure is also the best predictor of future turkey populations that I have found given the data we collect.*



Following a population peak in about 2008 or 2009, wild turkey numbers declined statewide before improving between 2014 and 2017. The decline was most ostensibly due to reduced poult survival and recruitment between 2008 and 2013, a consequence of adverse weather conditions during incubation and early brood rearing most years. However, some of the decline and poor productivity was due to harsher winter weather that led to increased mortality of all sex and age classes and poor body condition of hens going into breeding.

Spring and early summer weather from 2015 through 2017 was more favorable, and wild turkey numbers responded by increasing in many locations. Although, in 2016 and 2017, observed poult:hen ratios and winter flock counts dropped in a few areas. This may have been a response to late winter and early spring weather in those locations and / or substantial, anecdotal increases in avian and meso-predators.

In 2018, spring harvest declined in all hunt areas from 2017 levels suggesting a statewide population decline, or at least a reduction in mature tom numbers. On the heels of the spring 2018 season, productivity returned to about average levels, but poult survival was compromised, as late spring and early summer weather was wetter in many locations.

Poult production and survival in most areas was in line with long-term averages or slightly above in 2019. However, subsequent winter and early spring weather was fairly severe in many areas reducing over-winter survival. 2020 saw some of the historically highest poult production across the state, and this past winter was mild, but this spring has brought several significant snow events to some areas of the state. Overall, wild turkey numbers statewide have increased over the past two years.

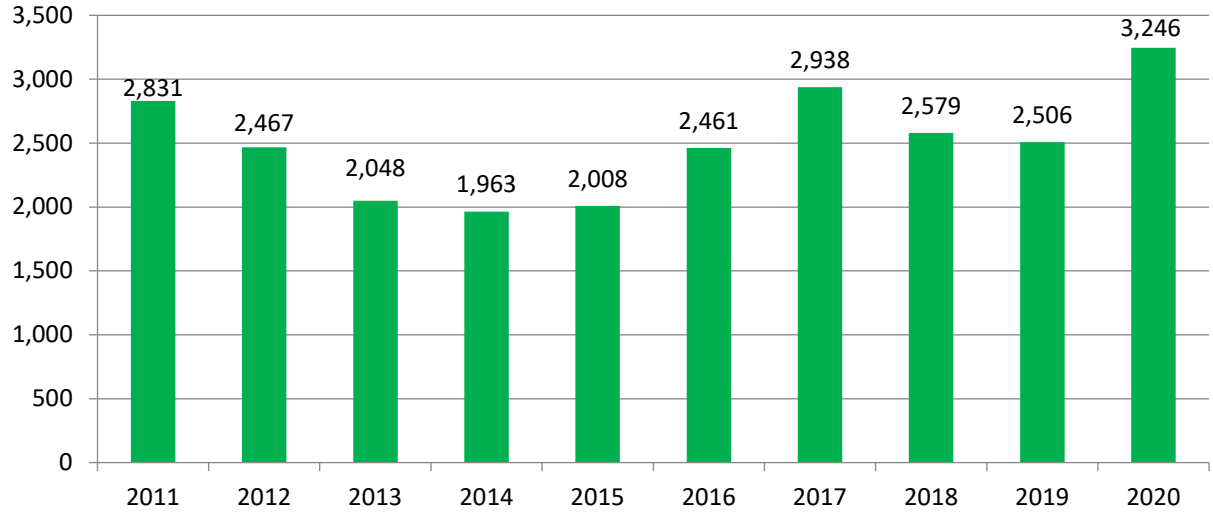


Figure 1. Statewide Spring Gobbler Harvest (2011 – 2020), *includes negligible numbers of hens.*

Between 2017 and 2019 a drop in total license sales was driven by declining resident participation that outpaced increased non-resident participation. However, last spring saw a 33% increase in resident hunter participation from the previous 8 year average, a period during which overall resident participation did not vary much. Non-resident participation was about identical to the previous 8 year average but down 25% from the previous year. While these changes in participation were probably strongly linked to COVID-19 restrictions, it does indicate the later spring season may lead to increased resident hunter participation in the future.

Hunter success continued a steady increase for several years through 2017 before dropping slightly in 2018 and again in 2019. But, it recovered some last spring (Figure 2).

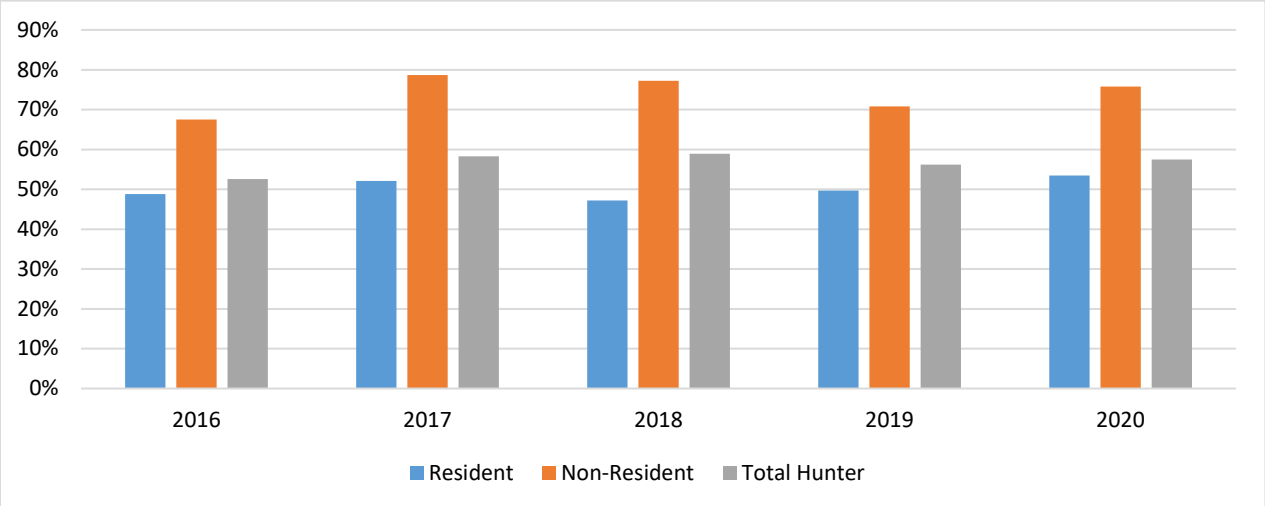


Figure 2. Statewide, Spring Wild Turkey Hunter Success 2016 – 2020.

Similarly, hunter effort (days per harvest) decreased for several years before climbing between 2018 and 2020 (Figure 3).

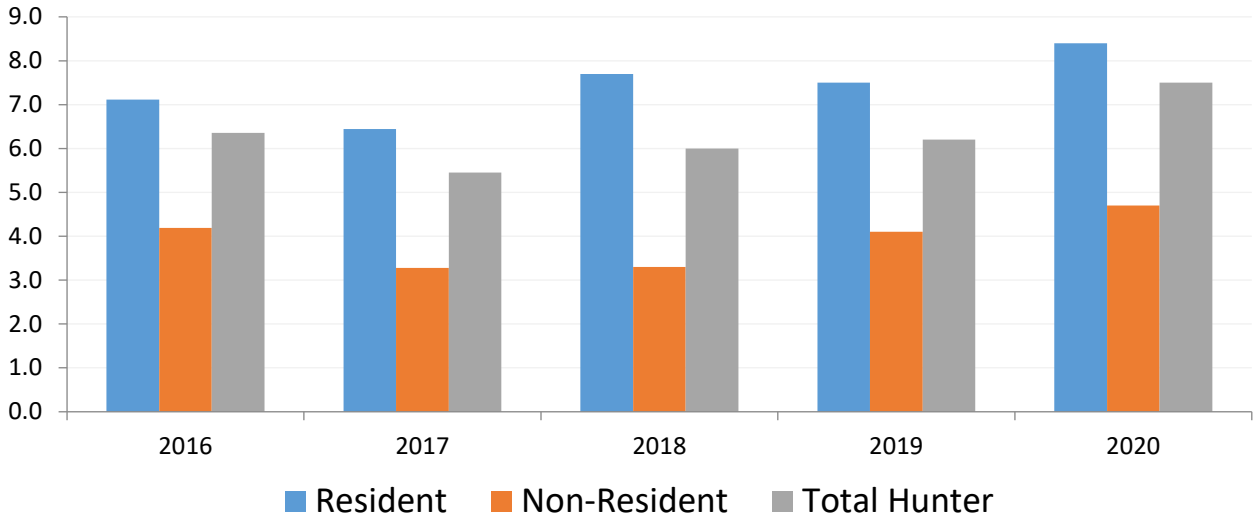


Figure 3. Statewide, Spring Wild Turkey Hunter Effort (Days per Harvest) 2014 – 2018.

In general, hunter success and effort statistics suggest a statewide wild turkey population that has been stable or declining over the past three years. This contrasts the evidence from harvest levels, which remained stable in 2018 & 2019 before climbing significantly in 2020. This jump in harvest was driven by a 63% increase in resident take of spring turkeys, while non-resident take declined 22%. Again, we suspect this was an artifact of increased outdoor recreating during the COVID pandemic by residents and decreased non-resident participation, rather than a significant population increase.

In an attempt to augment hunter opportunity and address a request from some hunters for an early fall archery season, archery only wild turkey seasons were added to Hunt Areas 1, 2, 4 and 5 in 2017. These seasons run the month of September and allow hunters possessing a valid fall wild turkey license to pursue wild turkeys with archery equipment, no special archery license required. In HA 3, the regular season opens on September 1, giving both archery and firearm hunters an additional month of hunting. Harvest statistics suggest the addition of an archery only period for the fall hunt did not affect harvest or participation.

Fall hunting participation generally witnessed a steady decline from the mid 1990's until reaching a plateau over the past decade or so. In fact, over the ten years or prior to 2020, hunter numbers remained fairly consistent with an average participation of about 1,700 individuals. However, fall hunting participation increased substantially in 2020 to just over 2,400 total hunters (figure 4). A change likely indicative of increased interest in hunting due to the extension of COVID mitigation measures limiting other types of recreation and vacation activities. Resident, fall hunter numbers increased 34% and non-resident participation increased 51%.

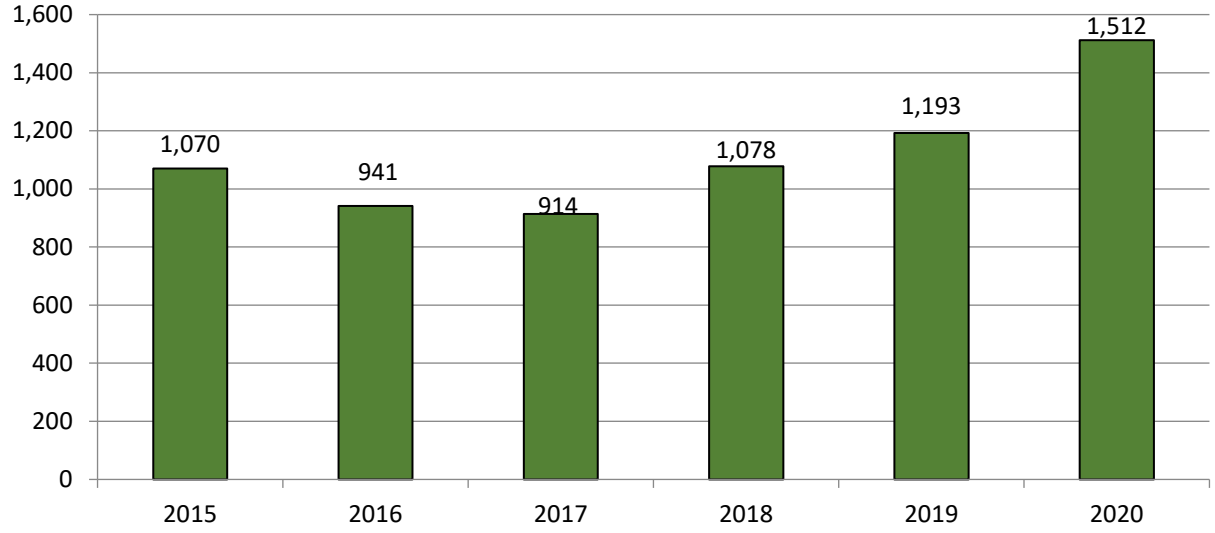


Figure 4. Statewide, Fall Harvest of Wild Turkeys (2015 – 2020), *includes hens and toms*

Beginning in 2016 wild turkey hunters have been surveyed regarding method of harvest. During the past five spring hunting seasons, shotguns have been overwhelmingly used, with archery gear and shotguns together accounting for just over 80% of all the wild turkeys taken. Choice of method of take varies between residents and non-residents, with about 70% of residents relying on shotguns or archery equipment, while a bit over 90% of non-residents use the same. During the fall hunt, method of take has been more evenly split between all rifled firearms and shotgun / archery hunters combined, with slightly more hunters relying upon shotguns and archery gear.

The difference in method of take between the spring and fall seasons is likely due to spot and stalk hunting being used almost exclusively in the fall, coupled with the fact that rifle wielding deer hunters holding a wild turkey license often hunt wild turkey while pursuing deer. This latter fact also accounts for the large shift in non-resident method of take between the two seasons. Whereas about 90% of non-residents use shotguns or archery gear in the spring to hunt, most non-residents do not bring a shotgun when they come to Wyoming to hunt big game, and only about 50% use this equipment to hunt wild turkeys in the fall.

SOME HUNT AREA SPECIFIC DATA:

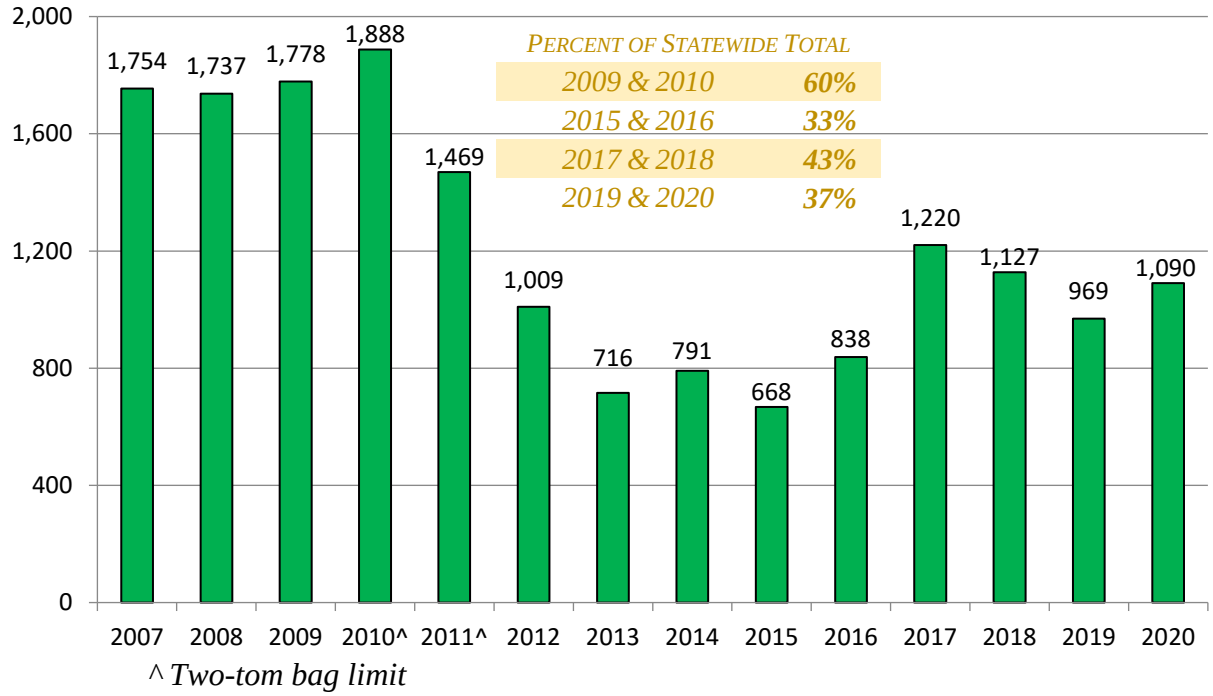


FIGURE 5. BLACK HILLS (HUNT AREA 1) SPRING HARVEST (2007 – 2020).

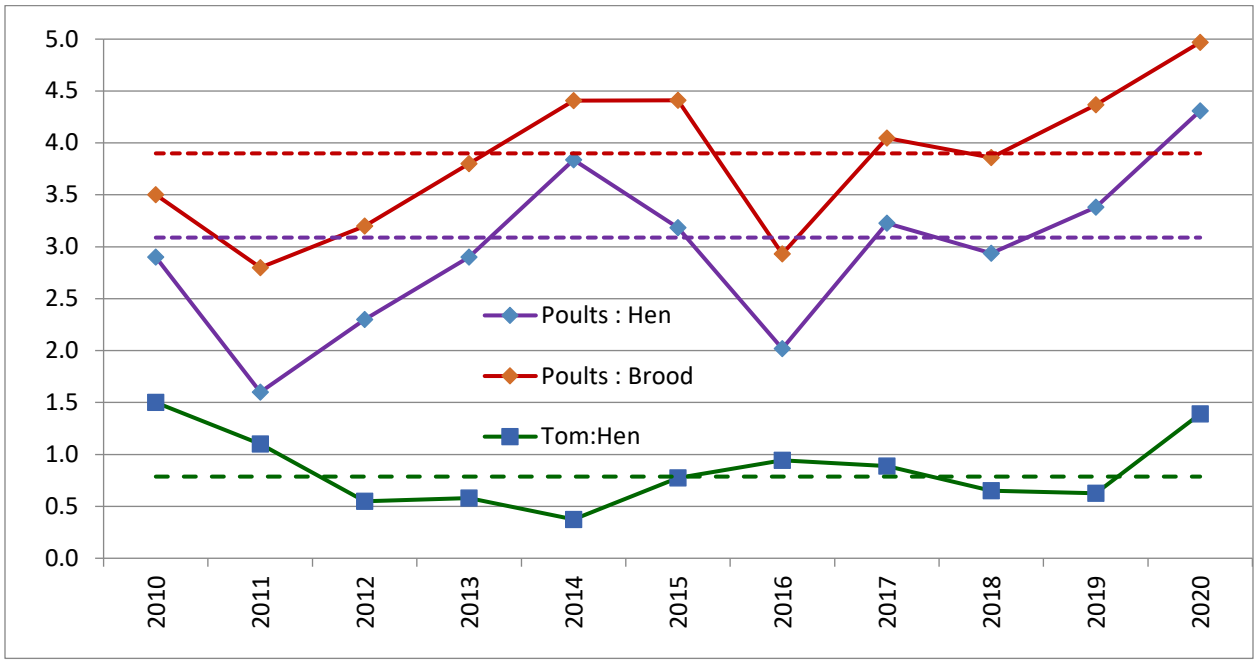


Figure 6. Wild turkey productivity in the Black Hills of Wyoming (2010 - 2020).
Dashed lines represent long-term (1998 – 2020) average values.

Hunting season dates and limitations, with changes for this fall and next spring:

Fall 2021

Hunt Area	Type	Archery Dates[1] Opens	Archery Dates[1] Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
1	Gen	N/A		Sep. 1	Sep. 30		Any wild turkey, archery only
1	Gen	N/A		Nov. 1	Nov. 30		Any wild turkey
2	Gen	N/A		Sep. 1	Sep. 30		Any wild turkey, archery only
2	Gen	N/A		Oct. 1	Dec. 31		Any wild turkey
2	3	N/A		Sep. 1	Sep. 30	~~200~~ 400	Any wild turkey valid within Converse and Natrona counties, archery only
2	3	N/A		Oct. 1	Dec. 31		Any wild turkey valid within Converse and Natrona counties
3	Gen	N/A		Sep. 1	Dec. 31		Any wild turkey
3	3	N/A		Sep. 1	Dec. 31	250	Any wild turkey
4	Gen	N/A		Sep. 1	Sep. 30		Any wild turkey, archery only
4	Gen	N/A		Nov. 1	Nov. 30		Any wild turkey
5	Gen	N/A		Sep. 1	Sep. 30		Any wild turkey, archery only
5	Gen	N/A		Oct. 1	Dec. 31		Any wild turkey

[1] State statutes and regulations do not provide for special archery seasons for wild turkey. Therefore, they must be set forth in the limitations section.

Spring 2022

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	Gen	N/A		Apr. 20	May 31		Any male wild turkey or any wild turkey with a visible beard
2	Gen	N/A		Apr. 20	May 31		Any male wild turkey or any wild turkey with a visible beard
2	3	N/A		Apr. 20	May 31	200	Any male wild turkey or any wild turkey with a visible beard valid within Converse and Natrona counties
3	Gen	N/A		Apr. 1	May 31		Any male wild turkey or any wild turkey with a visible beard
3	3	N/A		Apr. 1	May 31	400	Any male wild turkey or any wild turkey with a visible beard
4	Gen	N/A		Apr. 20	May 31		Any male wild turkey or any wild turkey with a visible beard, except the Wyoming Game and Fish Commission's Yellowtail Wildlife Habitat Management Area shall be closed
4	1	N/A		Apr. 20	May 31	50	Any male wild turkey or any wild turkey with a visible beard
5	Gen	N/A		Apr. 20	May 31		Any male wild turkey or any wild turkey with a visible beard

HARVEST DATA COLLECTION AND REPORTING:

- No mandatory reporting or harvest registration.
- Harvest survey conducted in house – Sample of licensed hunters.
- Each hunter surveyed assigned a unique identifying number.
- E-mail to all license holders for which we have e-mail address requesting they complete on-line survey. Initial request is followed up several times if no response.
- All non-responding e-mail requests, and those for whom we have no e-mail, are sent letter requesting they take on-line survey, or fill out the enclosed survey form and return in pre-paid envelope.

WILD TURKEY HUNTING INFORMATION:

- Licensing: All resident and nonresident wild turkey hunters, including persons under fourteen (14) years of age, shall possess a valid wild turkey license. Wild turkey hunters under fourteen (14) years of age shall be accompanied by an adult.
    - Each person licensed to hunt or fish in Wyoming (with a few exceptions) shall purchase one (1) conservation stamp valid for the calendar year. Hunters or anglers who acquire a lifetime conservation stamp or a conservation stamp authorization from the Department's Electronic Licensing Service are not be required to meet the stamp's signature provision.
    - No person shall apply for or receive more than one license for a wild turkey during any one season, except as otherwise provided. The maximum bag limit for wild turkey for any person with the proper license shall not exceed one wild turkey per license.
    - No person shall apply for or receive more than one fall wild turkey license and one spring wild turkey license in any calendar year. After the initial drawing is completed, a person may apply for and receive up to three wild turkey licenses valid for each season, provided that at least two of those licenses are Limited Quota Type 3 licenses. However, no person shall apply for and receive more than a total of three wild turkey licenses valid for the fall season and no more than a total of three wild turkey licenses valid for the spring season.
- Legal Methods of Take: Wild turkey may only be taken by any shotgun, centerfire firearm, .17 HMR or larger rimfire firearm with an overall cartridge length greater than one (1) inch *(.22 short, long and LR are not legal)*, any muzzle-loading firearm, or any archery equipment.
- Legal Hunting Hours: Except as otherwise provided, upland game birds and wild turkey may only be taken from one-half (1/2) hour before sunrise to sunset.

- Tagging: When dating a carcass coupon, the entire day and month of the kill shall be completely cut out and removed. The carcass coupon shall be signed, dated and attached to the carcass of any big game or wild turkey or the carcass or hide of any trophy game animal in such a manner as to be plainly visible before leaving the site of the kill. When the animal is in transportation, the carcass coupon may be carried by the person accompanying the carcass so that the coupon shall not be lost.

- Evidence of Sex. During the spring season in those hunt areas limited to the taking of male wild turkeys or any wild turkey with a visible beard, a visible beard shall remain naturally attached to the carcass as a means of identification in the field and while the wild turkey is being transported.

- Hunter Safety Required: Except as otherwise provided, no person born on or after January 1, 1966, may take wildlife by the use of firearms on land other than that of their own family, unless that person can demonstrate they have obtained a certificate of competency and safety in the use and handling of firearms. Attendance and successful completion of a hunter safety course offered by an association or governmental agency approved by the Commission satisfies the requirements of this section.

- Hunter Mentor Program**:** Any person born on or after January 1, 1966, who has not received a certificate of competency and safety in the use and handling of firearms may apply to the Department for a special authorization to take wildlife with the use of a firearm while being accompanied by a mentor. A special authorization issued to an individual shall be in the possession of the recipient at all times while in the field. The applicant shall apply on the Department website. Any person acting as a mentor to a mentee with a special authorization pursuant to this section shall accompany the mentee at all times to provide constant supervision.

WYOMING WILD TURKEY LICENSE TYPES AND PRICING:

License Type	Price
Nonresident Fall	$74.00
Nonresident Fall Landowner	$74.00
Nonresident Spring	$74.00
Nonresident Spring Landowner	$74.00

License Type	Price
Pioneer Fall Turkey	$2.00
Pioneer Heritage Fall	$10.00
Pioneer Heritage Landowner Fall	$10.00
Pioneer Heritage Landowner Spring	$10.00
Pioneer Heritage Spring	$10.00
Pioneer Landowner Fall	$2.00
Pioneer Landowner Spring	$2.00
Pioneer Spring Turkey	$2.00
Resident Fall	$16.00
Resident Fall Landowner	$16.00
Resident Spring	$16.00
Resident Spring Landowner	$16.00

Some parting notes and thoughts:

- Wyoming's statewide wild turkey working group is now an ad hoc committee with five members. The Division Chief, at my request, made this change to better capture the type of work and workload we were doing. I continue to chair this committee.

- With SD going to shotgun / archery only in the spring – there may be a little more traction for WY to go this way; but the biggest proponent on the WGF Commission is no longer a Commission member. However, this year it seems like I have checked more hunters with scoped, varmint or AR platform rifles than shotguns.

- There has also been a quiet push from a couple quarters to ban shooting wild turkeys on the roost – This is another thing that has not gotten much traction from admin.

- If we want a standardized brood count survey methodology for the western states, then I recommend we consider separating out Merriam's and Gould's. I don't believe the SE protocol is real applicable to high elevation populations. May be just dandy for lower elevation birds on the west coast or Hawaii; and Rio's in the TX, OK, KS world. Therefore, might be best to separate by ssp. i.e. Gould's and Merriam's to have a different protocol for Eastern and Rio's.

NATIONAL WILD TURKEY FEDERATION REGIONAL REPORTS

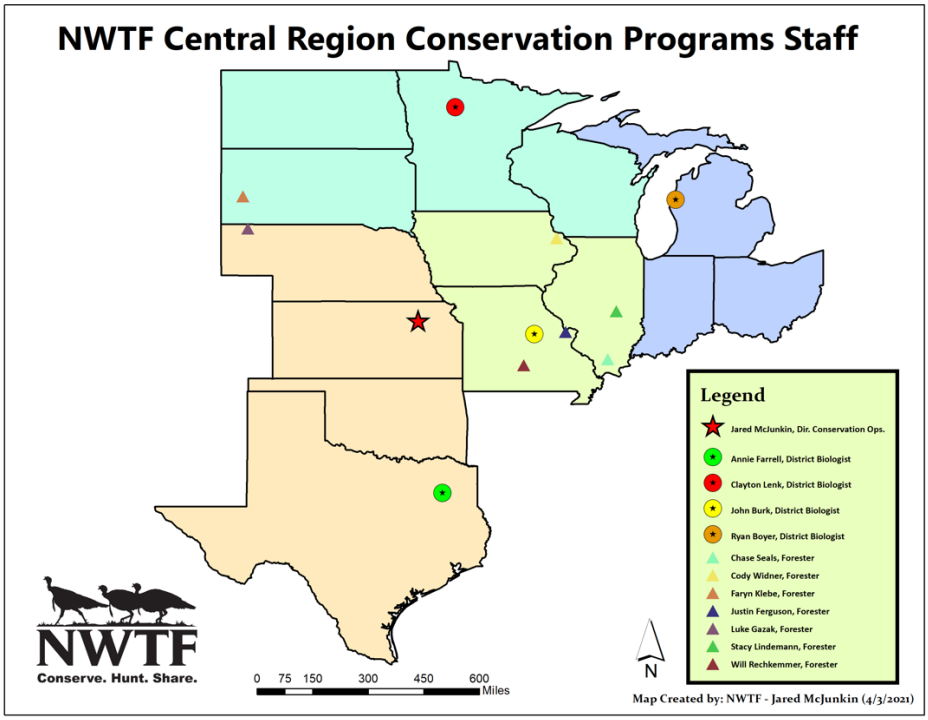
NWTF Western Region Conservation Update
WAFWA Wild Turkey Workshop – Virtual, May 4th-5th, 2021

Submitted by: Jared McJunkin | Director of Conservation Operations – Central Region

NWTF Reorganization

Covid-19 significantly impacted the NWTF in 2020, with a significant budget shortfall, resulting in a reduction in force and reorganization, as well as an evolved conservation delivery strategy for the future. Hunting Heritage field staff oversight was transferred to NWTF-NHQ staff and term-limited CP field staff now report directly to DCOs.

- Conservation Programs lost several staff across the country, both in the field and at NWTF-Headquarters.
- Reorganization included a reduction in the number of DCOs and expansion of DCO territories, resulting in West, Central and Eastern DCO Regions overseen by Patt Dorsey, Jared McJunkin, and Doug Little.
- Three new staff in the WAFWA states of ND, SD, and NE:
    - Clayton Lenk – District Biologist (MN, ND, SD, WI)
    - Faryn Klebe – Forester (Rapid City, SD)
    - Luke Gazak – Forester (Chadron, NE)



Save the Habitat. Save the Hunt.

Below are FY2020 accomplishments for the WAFWA states encompassed by the NWTF's Central Region

- Hunter Access – **50,958 acres** opened to public hunting access
- Habitat Conservation – **187,793 acres** conserved/enhanced
    - **Kansas** – 45,149 acres Conserved/Enhanced | 4,554 acres Hunter Access
    - **Nebraska** – 5,350 acres Conserved/Enhanced | 1,520 acres Hunter Access
    - **North Dakota** – 20,284 acres Conserved/Enhanced Acres | 24,848 acres Hunter Access

- **Oklahoma** – 35,339 acres Conserved/Enhanced
- **South Dakota** – 69,523 acres Conserved/Enhanced | 20,036 acres Hunter Access
- **Texas** – 12,328 acres Conserved/Enhanced

HUNTING HERITAGE SUPER FUND PROJECTS

The Super Fund was generally frozen over the last 16 months but below is a summary of SF accomplishments since this workshop last met in 2019 (FY19 & FY20).

Texas – **$313,211** allocated for *Save the Habitat. Save the Hunt.* matched with **$2M** from partners

- Save the Hunt – **$45,768** approved in FY19 and FY20 to support education/outreach (NWTF Outreach programs, 4H Shooting Sports, NASP, Outdoors Tomorrow, etc.)
- Save the Habitat – **$149,768** was directed to conservation efforts in FY19 and FY20 including $79,000 for conservation projects and equipment purchases with partners such as TPWD

Oklahoma – $284,932 allocated for *Save the Habitat. Save the Hunt.*, matched with **$2M** from partners

- Save the Hunt – **$105,999** approved to support JAKES, scholarships, WITO, Wheelin' Sportsmen, OFS Youth Forestry & Wildlife Camp, Oklahoma FFA, NASP, and the Scholastic Shooting Sports Program.
- Save the Habitat – **$117,500** directed to conservation efforts, including projects on ODWC WMAs, Rx burning equipment, mastication work on Black Kettle NGLs, support for Oklahoma Rx Burn Association

Kansas – **$112,886** allocated for *Save the Habitat. Save the Hunt.,* matched with **$1.77M** from partners

- Save the Hunt – **$12,300** approved to support education/outreach including NWTF Outreach programs, JAKES, 4H Shooting Sports, NASP, $5,000 in support of KDWPT's Walk-In-Hunting-Area Program, $5,000 to support KDWPT's Track Chair program
- Save the Habitat – **$100,586** was directed to conservation efforts including projects on KDWPT Wildlife Areas, equipment purchases to enable habitat work such as prescribed burning and tree planting. An additional $15,000 was provided to KDWPT for the Red Hills Access Initiative and $5,000 for the South Fork Republican River Restoration.

Nebraska – **$100,000** allocated for *Save the Habitat. Save the Hunt.,* matched with **$2.9M** from partners.

- Save the Hunt – Super Funds were awarded in support of education/outreach efforts including NWTF Outreach programs, 4H, NASP, other shooting sports programs, and $12,000 in support of the NGPC Open Fields & Waters
- Save the Habitat = **$90,716** was directed to conservation efforts including: $5,000 in support of the Cooperative Forester position, $7,500 in support of forest restoration efforts in the Black Hills-Pine Ridge Focal Landscape, and $15,000 in support of the 1,520-acre Charcoal Creek Acquisition in northwest Nebraska.

North Dakota – **$14,000** allocated and matched with more than **$633k** from our partners

- Save the Hunt – **$3,000** was allocated to a disabled veteran hunt as well as high school trap shooting teams.
- Save the Habitat – **$11,000** directed to conservation efforts like habitat projects with local chapters as well as federal partners.

South Dakota – **$74,822** in Super Fund dollars allocated to projects and matched with nearly **$400,000** from our partners

- Save the Hunt – **$26,150** awarded in support of 4H, shooting sports, youth events, equipment, hunter access, and the SDWF legacy fund

- Save the Habitat – **$48,672** directed to conservation efforts like habitat projects on state and federal lands as well as support of the Black Hills Forester position

AGENCY PARTNERSHIPS AND OTHER ACTIVITIES

Texas Partnerships

- NETX CDN Habitat Incentive Program – NWTF and TPWD work cooperatively with the Northeast Texas Conservation Delivery Network (LMVJV) to conserve and enhance habitat on private lands through the Habitat Incentive Program. Since inception in 2017, we have delivered over $900,000 on the ground in cost-share assistance, impacting over 17,000 acres of private lands.
- Texas Longleaf Implementation Team – NWTF staff serve on steering committee and chair of project review working group. TLIT was selected as a Texas By Nature 2021 Conservation Wrangler.
- Eastern Wild Turkey cooperatives – NWTF works with TPWD on habitat suitability assessments for EWT super stockings. Three cooperatives received turkeys in the 2021 trapping season, and two new cooperatives will be evaluated for 2022.

Kansas Department of Wildlife, Parks & Tourism (KDWPT)

- Wild Turkey Management Committee – provide input on management, statutory changes, etc.
- Continued involvement in the Kansas Forest Service Advisory Board

Nebraska Game & Parks Commission (NGPC)

- Conservation Roundtable – serve on sustainable funding subcommittee and E. red cedar committee
- Nebraska Hunter R3 Coordinator – NWTF recently renewed our agreement for this R3 position
- Cooperative Forester – renewed our agreement to continue this great partnership effort for two more years and hired new forester

North Dakota Game and Fish (NDGF)

- Continue partnership and support of the NWTF District Biologist position.

Riparian Restoration Initiative (NPRRI, etc.)

- The RFP for the 2019 & 2020 cycles of the Northern Plains Riparian Restoration Initiative (NPRRI) resulted in 16 projects receiving funding in the eligible states of MT, ND, SD, WY. Seven projects in ND and one in SD have received funding. When completed, these projects will result in 5,767 acres improved. NWTF funds amounting to $43,000 are being matched with $938,790 in partner funds. The NPRRI remains a popular program for riparian enhancement funding assistance throughout the NWTF's West and Central Regions
- NWTF is currently developing a broader riparian initiative encompassing 10 states and targeting more non-traditional partners such as those in the water and agricultural space.

U. S. Forest Service

- Region 2 – continue to expand partnership with FS-R2, including housing shared forester position in FS office, the Collons riparian project in NE, funding to build a water-jet stinger for riparian plantings in NE
- Region 8 - continue to partner with FS-R8, where we have active stewardship project on Sam Houston National Forest and a CCSA on Caddo-LBJ National Grasslands in Texas. Funded equipment purchases to increase prescribed burning on the Ouachita National Forest in Oklahoma and did habitat improvement work on Blue Mountain WIHA.

POLICY

Conservation Policy – Supported key policy/legislative issues

- Oklahoma – NWTF was a member of a TNC-led coalition to recognize the value of public lands in Oklahoma through a Public Lands Resolution that passed the house and senate.
- Kansas – Provided an opposition letter for HB2331, which enabled transferrable landowner/tenant deer permits
- Nebraska – Provided testimony against LB468, a bill to establish a landowner damage compensation program for wildlife damage. NWTF also listed in NSF testimony against LB305, which was a proposal to move the Director of NGPC from an NGPC-Appointment to Governor-Appointment and LB 615, which was a proposal to move NGPC Commissioners from Governor appointments to elected officials.
- South Dakota – Supported successful push by SD Game Fish & Parks to ban use of rifles during Spring turkey season

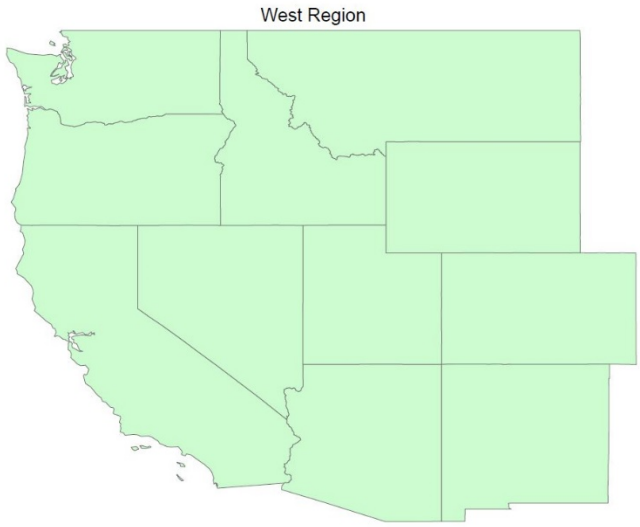
MISCELLANEOUS

- Playa Lakes Joint Venture – NWTF staff continue service on JV Management Board
- Oaks and Prairies Joint Venture – NWTF continues to house and administer the RCPP grant, and field staff serve on the JV Management Board
- NFI Forester Accomplishments – TX and NE have NFI Foresters and they have influenced 4,224 acres and conserved/enhanced 2,975 acres

NWTF Western Region Conservation Update

WAFWA Wild Turkey Workshop – Virtual Meeting May 4th -5th, 2021

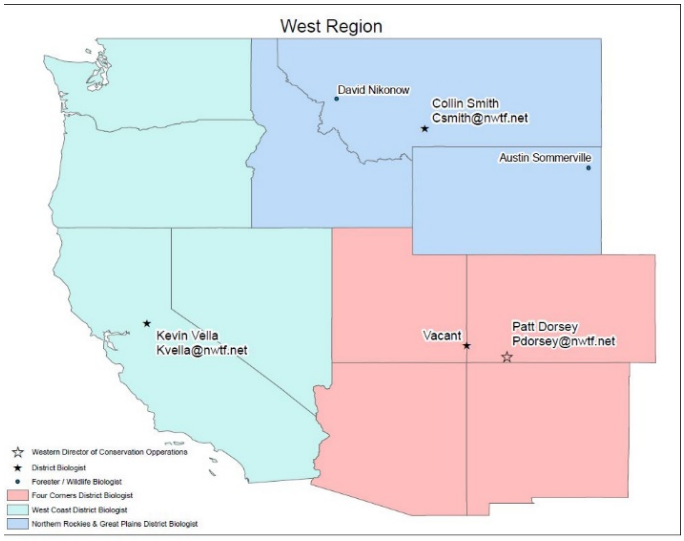
Submitted by: Patt Dorsey | Director of Conservation Operations – West Region



Reorganization - COVID-19 impacted the NWTF's fundraising significantly. Structurally this required that we became a leaner organization. On the conservation side of our organization, we did that in two ways:

1. Reduction in staff. We went from five regions to three. The West Region picked up Montana and Wyoming. We also lost some DB positions. For the West Region we went from four District Biologists to three.

2. Re-thinking how we approach conservation needs in each Region. We are looking for how we can invest in projects that lead to landscape level outcomes vs. investing in random acts of conservation. We realize that we can achieve landscape level outcomes with small projects. Those projects just need to share purpose, priorities and goals.



Staffing – Patt Dorsey, Director of Conservation Operations; Kevin Vella, Pacific Coast District Biologist; Collin Smith, Northern Rockies & Plains District Biologist; David Nikonow, Western Montana Cooperative Biologist; and Austin Sommerville, Black Hills Cooperative Forester.

Vacancies, Recent Hires, Positions Being Developed - Jamie Nogle, the biologist for CO, UT, AZ, NM, recently resigned and we are in the process of hiring a new biologist for that position.

Save the Habitat. Save the Hunt. – **Save the Habitat. Save the Hunt.** was a 10-year initiative the NWTF started in 2013. The goals are to conserve 4 million acres of wildlife habitat, recruit 1.5 million hunters and open 500,000 acres to hunting access by 2023.

The NWTF surpassed its hunter recruitment goal in 2019. Our 8-year total is 1,530,603 hunters created through outdoor programming, including Families Afield. We surpassed our hunting access goal in 2018. We opened 66,826 acres in 2019 and 41,096 acres in 2020, bringing our 8-year total to 667,772 acres. We surpassed our goal to conserve 4 million acres of habitat in 2020. We conserved 653,676 acres in 2019 and 428,801 acres in 2020 bringing our 8-year total to 4,012,270 acres conserved.

2019 was a good year for the NWTF. However, COVID-19 greatly affected our ability to work with partners and our measurable were reduced significantly in 2020.

The highlights in this report include:

- Hunter Access
- Habitat Conserved;
- Hunters Produced;
- Superfund Expenditures;
- Conservation Delivery; and,
- Policy

HUNTER ACCESS

Arizona – 5,800 acres
California – 4,900 influenced acres
Colorado – 0
Idaho – 0
Montana - 17,125 acres – Support of the FWP Block Management program
Nevada – 0
New Mexico - 0
Oregon – 38,550
Utah - 0
Washington – 0
Wyoming - 112,520 acres - Support of the WGFD Access Yes program and the 4,350-acre Moskee Acquisition in the Black Hills

HABITAT CONSERVATION

Arizona – 14,029 forest, riparian & grassland acres combined
California – 14,989 forest, riparian, &grassland acres combined
Colorado – 4,441 forest, riparian & grassland acres combined
Idaho – 5,866 forest, riparian & grassland acres combined
Montana – 52,065 forest, riparian & grassland acres combined
Nevada – 4,356 forest, riparian & grassland acres combined
New Mexico – 178,054 forest, riparian & grassland acres combined
Oregon – 4,586 forest, riparian & grassland acres combined
Utah – 133,733 forest, riparian & grassland acres combined
Washington – 722 forest, riparian & grassland acres combined
Wyoming – 14,358 forest, riparian & grassland acres combined

HUNTERS Produced (since 2012, includes families afield program)

Arizona – 4,079 hunters
California – 1,378 hunters
Colorado – 3,439 hunters
Idaho – 47,510 hunters
Montana – 4,688 hunters
Nevada – 138 hunters
New Mexico – 5,680 hunters
Oregon – 15 hunters
Utah – 12,516 hunters

Washington – 803 hunters
Wyoming – 6,457 hunters

HUNTING HERITAGE SUPER FUND

In 2019 & 2020 the Idaho, Montana and Wyoming state chapters offered winter Hunting Heritage Super Fund sessions. In 2020 it was necessary to temporarily suspend Super Fund expenditures due to impacts from COVID-19, which resulting in some projects being postponed. A formal application process was utilized to solicit Hunting Heritage Super Funds proposals in each state. Super Fund awards consisted of support for a variety of projects to include habitat enhancement, hunting access, hunting outreach, wild turkey research, conservation education and law enforcement. The Hunting Heritage Super Funds continue to see match rates in excess of 20:1.

The following are summaries of the 2019 & 2020 Hunting Heritage Super Fund allocations by state.

- *California* - CANWTF allocated $12,710 in super funds toward hunting heritage events in California, and $4,475 toward habitat enhancement for water development in Southern California.

- *Idaho*- IDNWTF allocated $11,250 in Super Funds. These funds were matched with approximately $27,146 in partner funds. Projects included tree & shrub plantings, habitat equipment, shooting sports program support, scholarships and volunteer travel.

- *Montana* - MTNWTF allocated $37,500 in Super Funds. These funds were matched with approximately $2,768,130 in partner funds. Projects included prescribed burning, forest management, riparian restoration, invasive weed management, hunter access program support, shooting sports support, conservation education, volunteer travel and scholarships.

- *Nevada* - NVNWTF allocated $17,750 in Super Funds. Projects included tree, shrub, and seed plantings, habitat equipment (helicopter purchase support), shooting sports program support, wild turkey translocation support, scholarships and volunteer travel.

- *Oregon* - ORNWTF allocated $4,000 toward aspen stand improvement as part of the Starr Aspen project.

- *Washington* - WANWTF allocated $21,900 in super funds. Projects include shooting sports program support, hunting heritage event support, scholarships, volunteer travel, and potential habitat enhancement projects.

- *Wyoming* - WYNWTF allocated $18,500 in Super Funds. Funding was matched with approximately $12,710,200 in partner funds. Projects included land acquisition, riparian restoration, hunter access program support, volunteer travel and scholarships.

CONSERVATION DELIVERY –

ARIZONA

- The NWTF is continuing its partnership with the Arizona Game and Fish Department to enhance habitat in multiple mountain ranges, improving wild turkey habitat and roost sites for Merriam's and Gould's alike. NWTF works with AZGFD on allocating game tag revenues to habitat projects that benefit Gould's and Merriam's wild turkey.

CALIFORNIA

- The NWTF is working with multiple partners on the Eshom Project to implement a $4.9 million dollar Cal Fire grant to improve forest health on 1,775 acres. In addition, the NWTF and the CDFW are partnering in multiple capacities, including completing year six of a wild turkey banding project, habitat enhancement projects and direct engagement with R3 by presenting at multiple events (R3H3, Advanced Hunter Ed, etc.).

COLORADO

- The NWTF is working with partners on numerous projects in Colorado that directly impact wild turkeys, including the Rocky Mountain Restoration Initiative, benefitting the state's forests on a landscape level; the Colorado Hydro-Ax Program, benefitting 1,000's of acres of forested and riparian areas; wide scale pinyon-juniper mastication projects, reducing insect infestations and fuel loads; and numerous wildfire mitigation projects. We also funded projects on Bonny and Spanish Peaks SWAs.

IDAHO

- NWTF local chapters are collaborating with IDFG through the IDFG Commissioners Community Challenge Grant program to improve wildlife habitat on WMAs in southeast and south-central Idaho. The benefits from these projects provide long term results. Wild turkeys, deer, moose, upland game birds and many non-game species will benefit from these projects.
    - In SE Idaho, the Pocatello chapter is planting 800 trees with tree watering boxes on three IDFG wildlife management areas, to include the Portneuf WMA, Georgetown WMA and Blackfoot River WMA.
    - The Twin Falls chapter (Magic Valley) is working with IDFG to improve habitat on the Big Cottonwood GPA. These projects include shrub and grass restoration to rehabilitate areas degraded by previous wildfires, and planting bur oak along Big Cottonwood Creek.

MONTANA

- The NWTF continues its partnership with the USFS and FWP Upland Game Bird Enhancement Program to collaboratively fund the NWTF western Montana Cooperative Biologist position, which increased the amount of wild turkey habitat conserved or enhanced on western Montana National Forests and state lands by over 9,150 acres since September 2015. Through the provision of the biologists' technical assistance in the design stage of project development, forest management projects primarily targeting fuels reduction are more effectively able to enhance and increase wildlife habitat diversity for wild turkeys, forest grouse and other wildlife. Projects that have been planned and implemented in 2019 & 2020 include the following:
    - Frenchtown Face - Lolo NF 166 acres of prescribed fire
    - Petty Creek - Lolo NF 103 acres of prescribed fire
    - Beaver Soup - Helena Lewis and Clark NF 150 acres of prescribed fire
    - Horseshow Hills - Lolo NF 70 acres of prescribed fire and 10 acres of thinning
    - Colt Summit - Lolo NF 100 acres of prescribed fire

NEVADA

- Since 2017 the NWTF has supported the establishment of a new population of Merriam's wild turkeys in the Toiyabe range in North Central NV through multiple stocking events. Birds were from sourced from a population near Colville, WA. This population had its first hunting season in spring of 2020 with 100% success. The Nevada State Chapter has also partnered with NDOW to help fund the Corners for Quail Program, wildfire rehabilitation/reseeding, sagebrush planting, and supporting other wild turkey stocking events throughout the state.

NEW MEXICO

- The NWTF auctions one and raffles on Gould's wild turkey license in New Mexico to generate additional funding for the Gould's Wild Turkey Management Program. This year raffle tickets were sold on-line and our ticket sales increased about threefold. In 2020 we sold 1,499 tickets and raised $29,980 gross sales (before fees) for Gould's turkey management. Congratulations to this year's winner Tanner Alexander of Illinois!

OREGON

- ODFW is partnering on both the SON (Ochoco NF) and Starr Aspen (Malheur NF) Stewardship Projects in Central Oregon to enhance wild turkey habitat - utilizing funds from the Upland Game Bird Program. ODFW and NWTF also partner through the sale of two statewide big game tags at NWTF banquets that directly benefit ODFW's Access and Habitat Program.

UTAH

- NWTF is actively engaged in helping implement Utah's Watershed Restoration Initiative. The NWTF is helping increase aspen regeneration in Cold Springs Wildlife Management Area with Utah Division of Wildlife Resources. This project involves work on state and adjacent private land and will benefit hundreds of acres of wild turkey habitat.

WASHINGTON

- The NWTF, Washington Department of Fish and Wildlife and Pheasants Forever partnered on a habitat improvement project on private lands along the Touchet River, part of WDFW's "Feel Free to Hunt" access program. In addition to creating better forage and brood-rearing habitat for wild turkeys, the project improved streamside habitat for salmonids and bull trout and controlled weeds on 80 acres using local volunteers from the NWTF and Pheasants Forever.

WYOMING

- The NWTF has continued its partnership with Wyoming state Forestry, NRCS and Weston County NRCD in maintaining the WY Black Hills Cooperative Forester position. This position has been extremely successful in providing capacity to assist these partners with landowner enrollment, design and implementation of forest management practices on private forest lands through available assistance programs. Since the position's inception in 2014, the NWTF forester has enhanced/conserved 5,189 acres, and has influenced an additional 31,642 acres through management plan development.

- Over the last three years, the NWTF has played an integral role in the delivery of the Northeast Wyoming Forest Resiliency Project. This project is $1.3 million, multi-partner NRCS RCPP project

aimed at improving forest health through pre-commercial thinning on privately owned forest in Campbell, Weston and Crook Counties. The NWTF Cooperative Forester stationed in Weston County continues to provide technical assistance on behalf of multiple partners in the Black Hills region. The Weston County office received approximately $492,000 to fund meadow retention and thinning projects that total 1,237 acres. Thirty-nine treatment units totaling 789 acres have been completed in Weston County to date.

NORTHERN PLAINS RIPARIAN RESTORATION INITIATIVE (NPRRI)

The RFP for the 2019 & 2020 cycles of the NPRRI resulted in 16 projects being funded in the eligible states of Montana, Wyoming, North Dakota and South Dakota. Four projects in Montana and three in Wyoming have received funding, which when completed will result in 1,099 acres of improvements. NWTF funds amounting to $15,500 are being matched with $434,724 in partner funds. The NPRRI remains a popular program for riparian enhancement funding assistance throughout the western and central region northern plains states.

NATIONAL FORESTRY INITIATIVE

Through a partnership agreement, NRCS and NWTF are working together to foster greater stewardship of our natural resources by helping forest landowners in a variety of areas across the country. Working out of NRCS field offices, 24 foresters in 23 states deliver technical and financial assistance through Farm Bill conservation programs administered by NRCS on private lands throughout the nation. These foresters provide additional support for NRCS staff, as well as landowners, in developing forest management plans and advising on best management practices that benefit forest resources, as well as wildlife. Staffing of these positions with trained foresters and wildlife biologists as well as delivery of services began in the early summer of 2019. Below are accomplishments to date (conserved and influenced acres combined).

National Forestry Initiative	Acres (conserved and influenced acres)
Idaho (placed in Moscow, ID)	3,282
Montana (placed in Bozeman, MT)	7,648
Washington (placed in Chehalis, WA)	2,210
National	119,146

OTHER KEY ROLES SERVED BY NWTF STAFF:

- Northern Great Plains Joint Venture – District Biologist Collin Smith continues to serve on the NGPJV Management Board representing NWTF
- State NRCS Technical Committees – District biologists provide recommendations on conservation programs through involvement on the STAC's (Washington State Wildlife Subcommittee – District Biologist Kevin Vella is a member of the subcommittee.)
- Conservation Leaders for Tomorrow – Director of Conservation Operations, Patt Dorsey is Advisory Committee member and instructor
- Arizona Habitat Partnership Committee – Biologist assists State Chapter
- California DFW Upland Game Bird Advisory Committee Member – District Biologist Kevin Vella is an active member of the committee.

- California Hunting and Conservation Coalition – District Biologist Kevin Vella is an active member and has helped to chair multiple meetings.
- Colorado – Colorado Sportsman's Caucus
- Montana FWP Upland Game Bird Advisory Council – District Biologist Collin Smith and Project Biologist Dave Nikonow regularly attend council meetings and provide updates on collaborative efforts to enhance upland game habitat throughout the state.
- Idaho Fish and Game & Idaho Department of Lands - Currently working to explore collaborative opportunities to assist in the delivery of GNA forest management activities in central Idaho.
- Idaho Fish and Game – NWTF staff will be working with IFG staff to evaluate potential release sites to augment wild turkey populations in south central Idaho in the Magic Valley region.
- Nevada State Legislature, Legislative Luncheon - Friends of Nevada Wildlife bi-annually hosts an event called "A Taste of Nevada" at the state capitol. In 2019 all state legislators and legislative staff were invited to taste a host of different dishes of wild game that were harvested in the state of Nevada. The event promotes hunting and angling in Nevada, and creates awareness to the lawmakers of this state how conservation is funded. District Biologist Kevin Vella attended and represented the NWTF.
- Oregon Conservation and Recreation Board – OCRF helps to bring awareness to the huge impact that outdoor recreation has on Oregon's economy. OCRF also allocates funding to projects across the state that positively impact outdoor recreation and conservation activities. District Biologist Kevin Vella is working with the OCRF board to help fund a portion of the Starr Aspen Project on the Malheur NF.
- Oregon Fish and Game Commission – District Biologist Kevin Vella and State Chapter Officers helped to support changes to fall wild turkey hunting in Oregon as proposed by ODFW
- Washington Fish and Wildlife Commission – District Biologist Kevin Vella and Washington State Board Officers worked directly with WDFW and the Commission to highlight concerns over a proposal that would allow rimfire rifles as a legal method of take for fall wild turkey. Both WDFW and the Commission heard the NWTF's concerns and agreed to hold off on the proposal for this year.
- Western Association of Fish & Wildlife Agencies – represented the NWTF at the summer on-line meeting
- Artemis podcast, for women turkey hunter
- Habitat University podcast, creative habitat management tools.

U. S. Forest Service

- Region 1 – NWTF staff and the R1 Making Tracks coordinator met to update the Regional Making Tracks strategic plan and guiding document in 2020
- Region 2 – Hubbard, Buffalo Forks and Big Creek Stewardship projects on the Grand Mesa-Uncompahgre-Gunnison National Forest. Rocky Mountain Restoration Initiative in Southwest Colorado is a national pilot for shared stewardship.
- Region 3 **–** Zuni/Bluewater stewardship projects on the Cibola National Forest. We have completed about 9,500 acres on this landscape over the life of this agreement.
- Region 4 **–** Upper Provo Watershed restoration on the Uinta-Wasatch-Cache National Forest. This project will help protect drinking water for about 1.5 million people on the Wasatch Front.
- Region 5 – The NWTF continues to partner with R5 through the Cleveland-Icehouse and Eshom Stewardship Agreements. Pacific Coast District Biologist has also presented on multiple stewardship training webinars, as well as organizing a Facebook Live event to highlight the NWTF/USFS Making Tracks Partnership.

- Region 6 - The NWTF continues to partner with R6 through the SON and Starr Aspen Stewardship Agreements and actively participate in the Making Tracks Partnership

POLICY

Conservation Policy – Supported key policy/legislative issues

- AZ – Actively engaged in the Arizona Sportsmen's Foundation on a variety of policy and land use issues.
- CA - NWTF signed on in support of added funding to proposed CDFW budget in 2019 and 2021. In the state legislature, the NWTF supported – the creation and funding of *Nesting Bird Habitat Incentive Program*, the extension of the *California Habitat Conservation Fund*, the *re-establishment of increased probationary periods* for egregious poaching offenses, and the *authorization* of CDFW to make payments to for-profit businesses out of the Big Game Management Account.
- CO – Active in the Colorado Sportsmen's Caucus. Signed onto letter against the Humane Society of the US petition to ban live traps for bobcats. Also sent out an action alert and authored an independent letter.
- NM – Signed onto letter against the Humane Society of the US petition to ban trapping
- WA – NWTF wrote both the Governor and the Director of WDFW in support of opening the 2020 spring wild turkey hunting season to promote responsible recreation at the height of the COVID 19 pandemic.


THE **NWTF** IS DEDICATED TO THE CONSERVATION OF THE WILD TURKEY AND THE PRESERVATION OF OUR HUNTING HERITAGE.

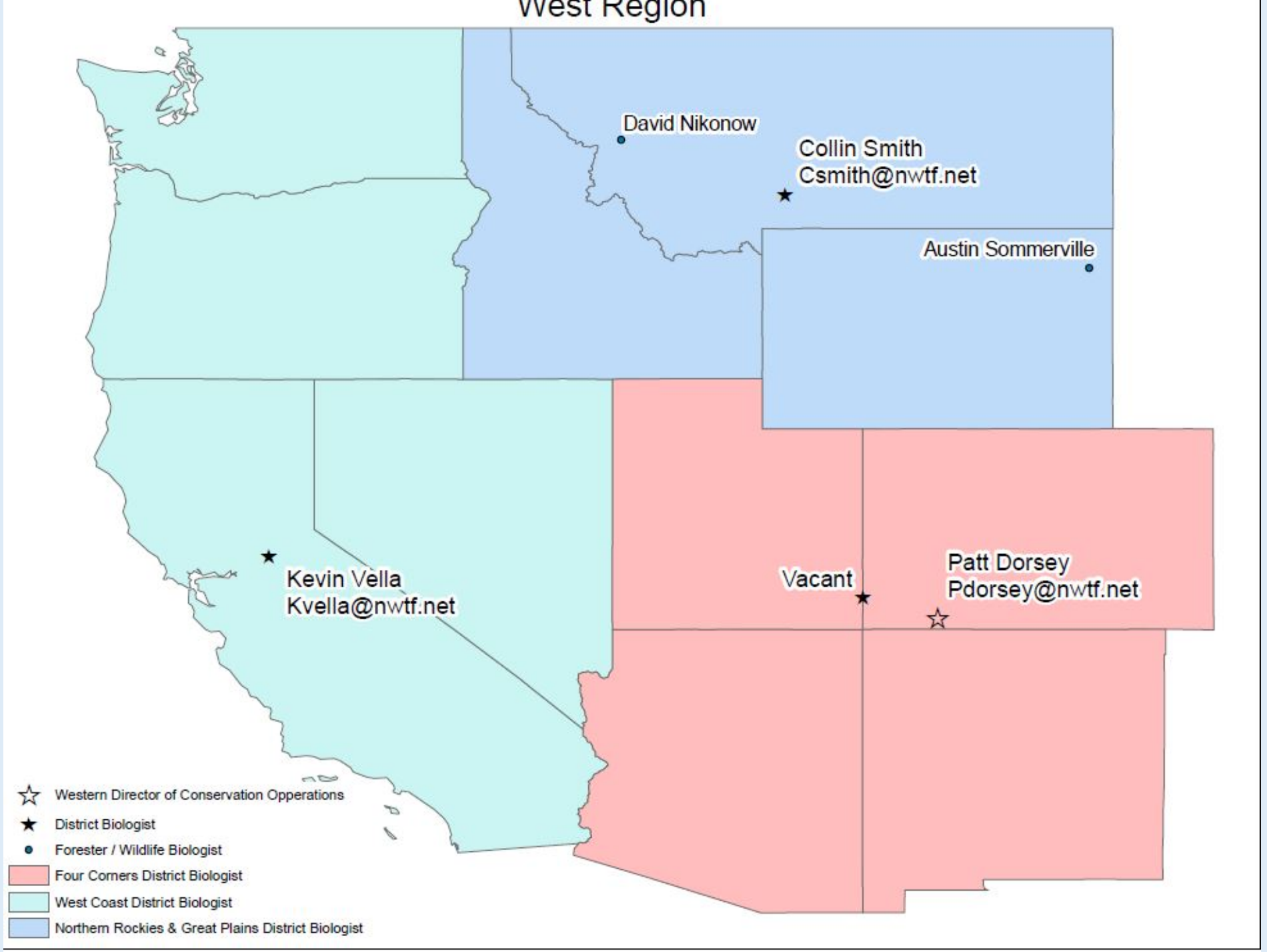
4 Shared Values

Water

Forests &
Wildlife

Communities

Recreation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Western Director of Conservation Opperations
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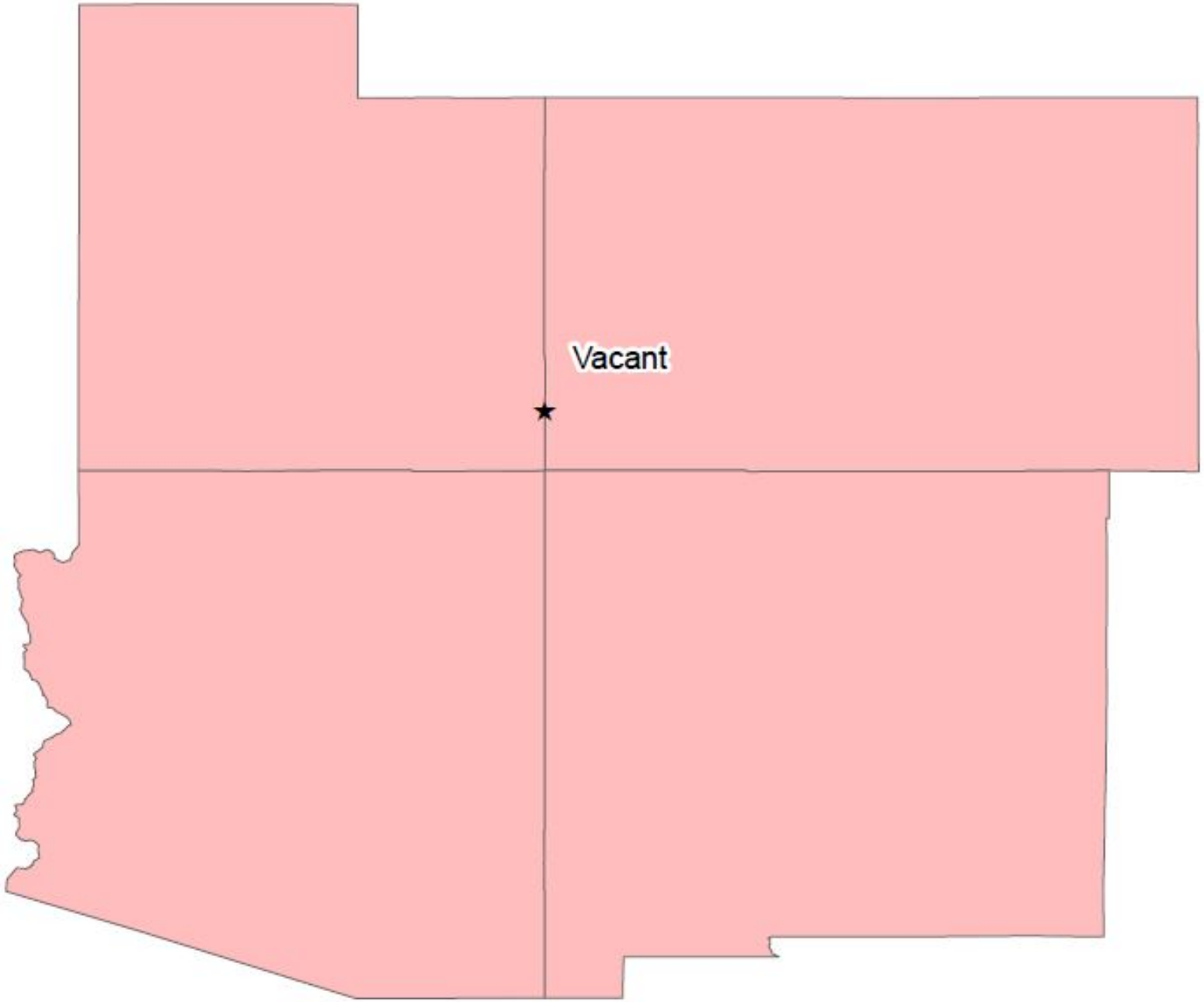
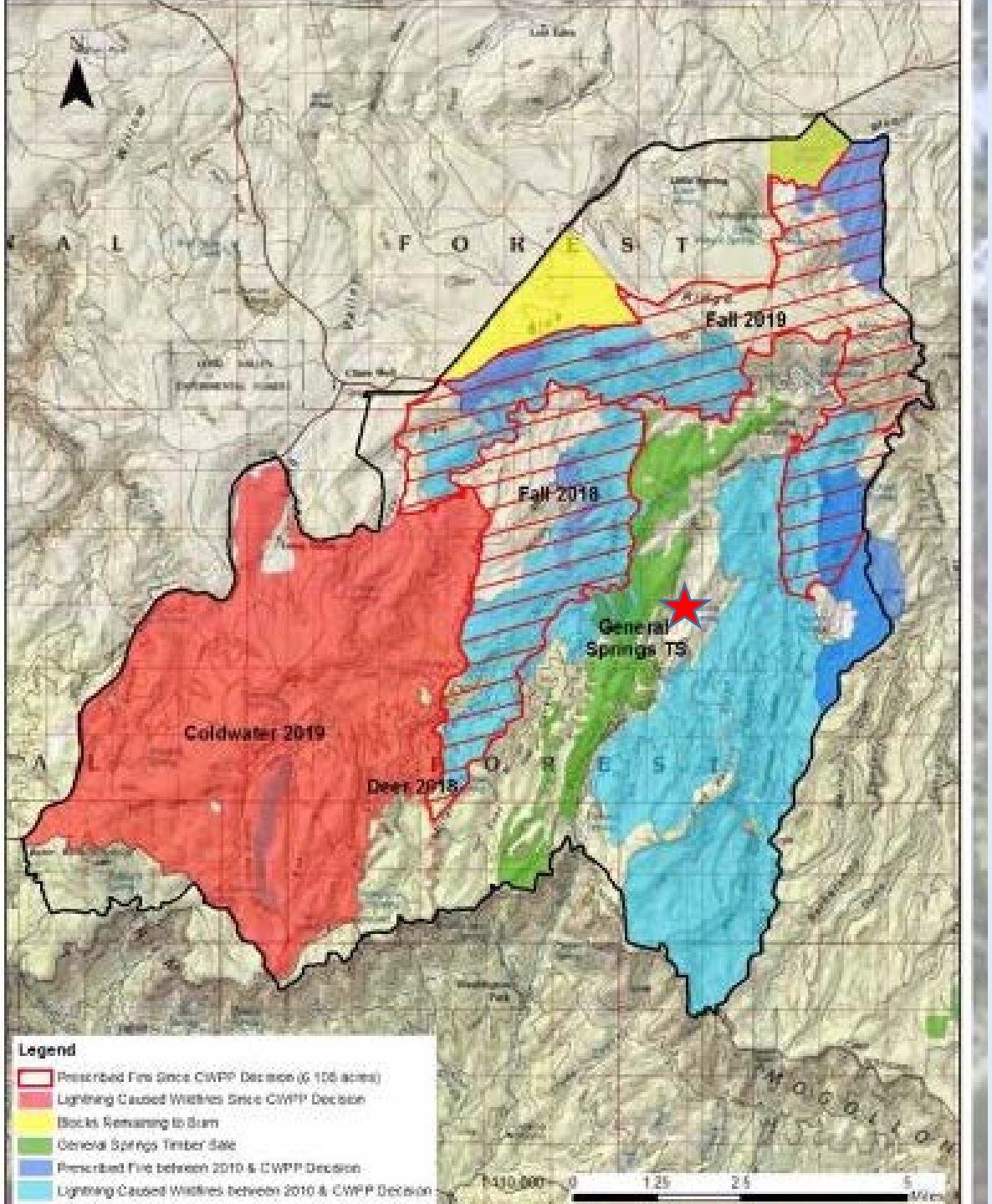
Forester / Wildlife Biologist
Four Corners District Biologist
West Coast District Biologist
Northern Rockies & Great Plains District Biologist


Vacant

Rocky Mountain Restoration Initiative

A National Pilot for SHARED STEWARDSHIP


Fall 2019
Fall 2018
General Springs TS
Coldwater 2019
Deer 2018
Legend
Prescribed Fire Since CWPP Decision (6,105 acres)
Lightning Caused Wildfires Since CWPP Decision
Blocks Remaining to Burn
General Springs Timber Sale
Prescribed Fire between 2010 & CWPP Decision
Lightning Caused Wildfires between 2010 & CWPP Decision
0
1.25
2.5
5

$29,980

Created by Makinshine
from Noun Project


6:21

Impact not acres!

Created by Ben Didier
from Noun Project

Created by Luis Prado
from Noun Project

Created by Adrien Coquet
from Noun Project

BMPS FOR HUMAN-TURKEY CONFLICTS

Brian Wakeling proposed that the committee consider development of a Best Management Practices document for human-turkey conflicts. The committee discussed and reviewed recent example products from the Human Wildlife Conflict Working Group for both deer and black bears (www.fishwildlife.org/afwa-inspires/human-wildlife-conflicts), then agreed to pursue this effort. The proposed document will not be prescriptive nor a position statement, but will present options for managing conflicts and tradeoffs associated with each technique. Brian Wakeling will lead this effort, and core volunteers will include Joe Sandrini, Casey Cardinal, Mikal Cline, Jeff Knetter, and Sarah Garrison.

MONITORING METHODS FOR WESTERN WILD TURKEYS

The committee has completed a final draft of A Review of Harvest and Population Monitoring Methods for Western Wild Turkeys. This document will be published in a special issue of the Wildlife Society Bulletin as part of the 12th National Wild Turkey Symposium Proceedings. The symposium was originally planned for June 2021 but delayed to 2022 due to pandemic restrictions.

8 February 2021
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RH: Monitoring methods for western wild turkeys

A Review of Harvest and Population Monitoring Methods for Western Wild Turkeys

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ABSTRACT Several subspecies of wild turkey (*Meleagris gallopavo*) are managed throughout the western USA for wildlife viewing and hunting, including Merriam's (*M. g. merriami*), Rio Grande (*M. g. intermedia*), eastern (*M. g. silvestris*), and Gould's (*M. g. mexicana*) wild turkey. In addition to the variety of subspecies (and hybrids), the West also comprises a wide variety of occupied vegetative communities throughout an array of state and federal jurisdictions. In 1993, the Colorado Division of Wildlife published the *Management Guidelines for Merriam's Wild Turkeys* (Hoffman et al. 1993). Since that time, harvest and monitoring methods have evolved. Harvests are monitored through mandatory or voluntary phone surveys, online surveys, mail surveys, email surveys, mobile phone applications, field checks, and wing or foot collections. Populations are monitored through harvest indices, summer brood surveys, winter flock counts, winter classifications, summer classifications, presence-absence surveys, camera traps, forward-

looking infrared, aerial surveys, telemetry, weather indices, citizen science reports, and a variety of modeling approaches. We provide a limited review highlighting the substantive strengths and challenges associated with each population monitoring technique to provide agencies and organizations involved in monitoring harvest and populations of turkeys with an overview to assist in selecting appropriate tools for use in their jurisdiction.

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KEY WORDS eastern wild turkey, Gould's wild turkey, harvest monitoring, Merriam's wild turkey, population monitoring, Rio Grande wild turkey, techniques

The Western Association of Fish and Wildlife Agencies (WAFWA) member states (Arizona, California, Colorado, Hawaii, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming) manage throughout western USA several subspecies of wild turkeys - Merriam's (*Meleagris gallopavo merriami*), Rio Grande (*M. g. intermedia*), eastern (*M. g. silvestris*), and Gould's (*M. g. mexicana*) – for wildlife viewing and hunter harvest. In several areas, interbreeding and subspecific hybridization have occurred where subspecies intermingle. The biological and ecological habits of these turkeys, their relative abundance, and the variety of vegetative communities that they occupy make standardized monitoring a challenge. Despite consistent interest in standardized approaches (e.g., Mason et al. 2006), the challenges associated with standardization remain substantial.

Biologists and decision makers do not have perfect knowledge of the quantity of wildlife that will be harvested during an upcoming hunting season, how many wildlife were taken during the last hunting season, or how many animals exist on the landscape, making harvest

management an ongoing challenge. The lack of perfect knowledge extends to upcoming climatic and weather events and the effects those events will have on habitat availability, productivity, survival, and predator-prey dynamics. Due to uncertainty, the public, wildlife professionals, and decision makers often demand more surveys, mandatory reporting, and more stringent regulation to ensure no (Type I) errors are made. Alternatively, agencies and managers may argue that budgets are limited, expensive monitoring is unnecessary, and anecdotal observation indicate existing harvest strategies are adequate, thereby ensuring that management decisions do not unnecessarily restrict hunting opportunities due to (Type II) errors. Biologists must make recommendations in the face of this uncertainty and balance the trade-offs in precision, accuracy, cost, logistical burden, and species management (e.g., Wakeling 2005).

In the early 1990s, harvest and population monitoring of western wild turkeys were addressed as part of the *Management Guidelines for Merriam's Wild Turkeys* (Hoffman et al. 1993). Since that publication, an evaluation of common techniques used for harvest and population monitoring has not been undertaken specifically for western wild turkey management, although advances in monitoring and techniques have been employed. Hence, our objective was to document the current population and harvest indices used by managers and the inferences that may be drawn from the techniques commonly employed to manage wild turkeys by member agencies of WAFWA.

METHODS

To document harvest and population monitoring methods in use or development within the western USA, we queried members of the WAFWA Western States Wild Turkey Technical Committee (WSWTTC). The WSWTTC includes managers that are the most knowledgeable on current population monitoring practices within their jurisdictions. We asked that each member

provide supporting literature regarding practices within their jurisdiction, and we reviewed additional literature relevant to each method described. We identified the benefits and challenges associated with each method based on existing published peer reviewed and gray literature so that managers may weigh the strengths of each method as they determine which to employ within their jurisdiction (Table 1).

HARVEST MONITORING

There are many methods of monitoring wild turkey harvests, including phone surveys, online surveys, mail surveys, email surveys, mobile phone applications, mandatory reporting, field or physical checks, and wing or foot collections from harvested turkeys. These data are used to estimate the take and assess the sustainability of harvest (Lancia et al. 2005). Harvest estimates may be used as data for other population monitoring approaches, including population models, or they may be used as an assessment of population trend independently. Harvest monitoring techniques have been developed to assess composition of turkey harvests (i.e., Pelham and Dickson 1992, Rumble et al. 1995, Wakeling et al. 1997*a*), yet most assessments of catch-per-unit-effort (CPUE) are used to draw inferences on turkey populations.

Catch-per-unit-effort is an index that can be derived from hunter harvest data, generally standardizing turkey harvest by a measurable unit of hunter effort (e.g., total harvest/total days hunted). Biologists can use CPUE to adjust seasons and regulate harvest (e.g., McCall et al. 2020). For instance, Arizona uses the proportion of successful hunters as 1 parameter to adjust permit levels for fall and spring turkey hunting (Arizona Game and Fish Department 2017, McCall et al. 2020). If the 3-year mean proportion of successful hunters exceeds 20%, a permit increase is considered; if the 3-year mean proportion of successful hunters is less than 15%, a permit decrease is considered. Trends in CPUE may reasonably approximate relative abundance

if the relationship between effort and harvest changes linearly and in proportion to abundance (Lancia et al. 2005). The relationship between CPUE and turkey population abundance has been correlated with band-recovery modeling (Lint et al. 1995) and recruitment surveys (Butler et al. 2015). Catch-per-unit-effort has also been used to develop temporally-specific turkey abundance estimates (Clawson et al. 2015). When used to assess population trends, harvest monitoring is more than simply estimating harvest.

Managers often use CPUE to index harvest by comparing mean days-to-harvest or the proportion of hunters successfully harvesting a turkey (often called hunter success) through time or among hunting districts, generally within the context of total reported harvest. If hunter numbers remain similar among years, the assumption is that increases in harvest or hunter success correlates with increases in turkey populations, whereas reductions in harvest or hunter success correlates with declines in turkey populations (e.g., Lancia et al. 2005). A corollary assumption is that if a turkey population increases (or decreases) and hunter numbers are allowed to increase (or decrease) and hunter success remains similar to prior years, then regulations were adjusted appropriately (e.g., Arizona Game and Fish Department 2017).

For any harvest monitoring survey, agencies should evaluate how survey responses are influenced by sampling biases associated with each technique. For example, probability-based samples involve a random selection of a subset of license holder to receive a survey (Lukacs et al. 2011). Self-reporting by hunters provides agencies an alternative to probability-based sampling and allows all hunters to voluntarily participate in harvest reporting (Lukacs et al. 2011). Response bias (the likelihood that all hunters respond at similar rates regardless of their hunt duration or success, for example) may differ and should be recognized (Curtin et al. 2005).

Although management agencies use a wide range of harvest monitoring methods, some biases remain similar regardless of survey technique (e.g., some hunters will provide misleading information), whereas others are influenced to a greater extent by the survey technique (e.g., nonresponse bias). New technologies often require specific equipment (e.g., computers for online surveys, smart phones for mobile phone applications) and may be used differentially by respondent age (e.g., Kaplowitz et al. 2004). Survey techniques may be used alone or combination to provide the information needed to estimate harvest or index populations. The primary variables that these survey techniques collect are data on harvest, hunter effort, CPUE, characteristics of harvest (e.g., sex and age), and location of harvest.

Phone Surveys

Phone surveys are routinely conducted by selecting phone numbers from lists compiled from hunters with licenses or permits authorizing participation in a specific hunt. Although in certain situations with a small number of hunting authorizations a complete survey of all participants is possible, samples are generally taken at random to obtain estimates for a particular variable with a predetermined degree of accuracy and confidence (e.g., Arizona Game and Fish Department 2008). Phone surveys can provide quality control if a knowledgeable surveyor conducts the questionnaire (Cada 1984) and asks questions to determine the accuracy of responses (e.g., determining if a subadult male or adult female turkey was harvested based on specific questions).

Biases may remain in reaching individuals because the public is sometimes unwilling to respond to phone calls when they do not know precisely who is contacting them. Additionally, phone surveys require substantial human resources to conduct the survey (Arizona Game and Fish Department 2008), and knowledgeable surveyors are not always available. Determining realized expenses for each survey can be challenging, but a survey of WAFWA agencies in 2008

indicated that phone surveys could be among the more expensive to implement (Arizona Game and Fish Department 2008). Under the best of circumstances, hunters reporting harvest are not always accurate in their reporting. A long-term data set from this type of survey will retain a relatively standard set of biases over time and can serve as a valuable trend-over-time index for annual comparisons, although non-response biases may be changing (Curtin et al. 2005) and secondary surveys can verify changes in these biases over time.

Online Surveys

Online surveys are posted on a website to collect specific harvest or observational data. Access to the website may be open to anyone that encounters it, limited only to those with specific access coding (like hunter identification and permit numbers), or to those directed to the website through mechanisms like targeted emails or listing in printed hunting regulations. Completion of an online survey may be compelled through mandatory requirements, occasionally with financial penalties and limitations on subsequent hunting opportunities for failure to participate. Each of these factors influence the likelihood that hunters may complete a survey and results will be truly reflective of harvest. For instance, Nevada had response rates for most hunts that exceeded 93% in 2020, which was influenced by a $50 penalty fee or ineligibility to apply to hunt for 1 year for failure to comply (Nevada Department of Wildlife, unpublished data).

Biases may exist based on the likelihood for specific demographic classes to use a particular response platform. For instance, online surveys were used to a lesser extent than mail surveys for older respondents (Kaplowitz et al. 2004). In Arizona, online respondents reported greater harvest success and harvest of greater mean point class male deer (*Odocoileus* spp.) than did mail respondents; while statistically significant, the effect size was small (Arizona Game and Fish Department 2008). In general, hunters that participate in a hunt are more likely to report

than those that did not participate, and hunters that harvested an animal are more likely to respond than hunters that did not harvest an animal (Arizona Game and Fish Department 2008).

Mail Surveys

Mail surveys are sent to a statistically valid random sample of hunters. Hunters that do not respond may be sent a reminder and 1–2 follow-up questionnaires to increase response rate and determine nonresponse biases. Data are generally manually entered into a database and may be screened for accuracy, although in some cases automated data recorders may be used. Mail questionnaires response rates vary without incentives or penalties (10–40%; Arizona Game and Fish Department 2008), which increases nonresponse bias and sampling error. Supplementary phone surveys can assist with determining nonresponse biases and reporting rates.

A disadvantage to mail surveys is the delay between the conclusion of hunting season and the final compilation of the harvest report. With postal preparation and delivery, the subsequent follow-up, data compilation, subsequent electronic entry, and analysis, several months to a year may pass before a final harvest report is completed. Also, if hunters do not respond to the first mailing, but wait for the follow-up, several months can elapse between the end of the hunt season and when the hunter receives a survey by mail. This can affect the accuracy of the report given by the hunter (Keegan et al. 2011). Some agencies used mail survey in the past but are transitioning to other harvest monitoring methods due to the high labor input and cost, and the delay in a final report associated with this type of survey.

Email Surveys

Email is often used as a method to deploy an online survey, although in rare instances a response to an email may comprise the actual survey. Email surveys are relatively easy to implement if hunters provide useful email addresses and respond to emails dependably. Email offers nearly

instantaneous transmission of the survey with little to no cost, but often is associated with low response rate (Schonlau et al. 2002). Similar to mail and phone surveys, hunters may not consistently respond or respond in a timely or accurate fashion. Some other biases remain similar as well, like hunters that participated and hunters that successfully harvested are more likely to respond than hunters that did not participate or those that participated and did not harvest. Surveys in general tend to overestimate harvest by 5–10% due to these biases when independent harvest surveys are compared with mandatory physical checks (Munig and Wakeling 2005).

Mobile Phone Applications

As smartphones increase in popularity, state agencies are making harvest reporting available through mobile phone apps. Mobile phone apps provide an additional electronic resource for collecting harvest information from hunters. Much like email and online surveys, this survey is relatively easy to set up and implement, and survey results are returned instantaneously. Mobile applications may be biased because some of the hunting population may not have access to the required technology or may not have chosen to download the harvest reporting application; age plays a role in the acceptance of new technologies as well (Dalessandro 2018). Technologically proficient hunters are more likely to respond, thus a representative subsample of the hunting population may not be collected. Additionally, mobile phone applications for harvest reporting are often developed for individual states and their software may be regionally specific. Consequently, nonresident hunters may be less likely to report harvest using these applications. Agencies may be likely to use mobile phone application reporting in conjunction with another method for surveying hunters, such as an online survey.

Mandatory Reporting

Mandatory reporting can be a regulatory aspect added to any survey approach. To be successful, mandatory reporting must come with a consequence if a hunter fails to report. Nevada has a regulation that makes a hunter ineligible to participate the following year for failing to report or requires a substantial financial penalty to become eligible to participate. Other states (e.g., New Mexico) are using a variety of penalties and incentives to encourage reporting. Without a penalty, hunters may not comply with mandatory reporting (Hale 2013, Cardinal 2017).

The rationale for implementing a mandatory reporting requirement should consider the data quality received through existing surveys. For instance, surveys are used to obtain a representative sample that may be used to infer the total harvest. Often, voluntary harvest reporting is biased to successful hunters (Arizona Game and Fish Department 2008, Lukacs et al. 2011). Requiring unsuccessful hunters to confirm their lack of harvest, hunter effort, and areas hunted helps biologists more accurately estimate hunting pressure and success rates, which in turn can affect the number of permits made available to hunters in subsequent years. When response rates decline, the accuracy and bias of the sample becomes difficult to determine and the likelihood of yielding spurious results increase. Return rates on survey questionnaires can influence harvest estimate accuracy and precision. Yet with 300–400 responses, the variability of estimates generally stabilize (Arizona Game and Fish Department 2008). Measuring variability is important because agencies may under sample (yielding inaccurate or imprecise estimates) or oversample (expending greater financial resources than needed) without a good estimate of sampling variation. Prior to implementing mandatory harvest reporting for all species hunted in New Mexico, survey response rates were about 40% in a mail survey (prior to 2006) and 23% in an online survey (Hale 2013). With the implementation of mandatory harvest reporting, response rates now average 80% (Cardinal 2015, 2016, 2017). An unknown subset of hunters will still fail

to report, which may influence the reliability of the estimate (Lukacs et al. 2011). To better estimate nonresponse bias, a follow up survey may be conducted to sample non-reporting individuals.

Field or Physical Checks

Field or physical checks of harvested wild turkeys by trained personnel can provide information on the sex and age composition of fall and spring harvest. This can be especially useful during late-fall either-sex hunting seasons when field checks can reveal bias in hunter self-reported harvest. These errors in hunter self-reported harvest remain fairly standard unless composition in harvest changes dramatically; errors in classifying subadult males and adult females are observed most commonly (Sandrini 2003). Beards and spurs on subadult males may be difficult to detect, and hunters may disregard plumage differences.

Age and sex of harvested wild turkeys can be determined during physical inspections. Sex differences can be difficult to determine in wild turkeys less than 4 months of age, and proper identification of late hatch poults during early fall seasons can be challenging at times, although breast feather tip color is an effective determinant (Pelham and Dickson 1992). Young-of-the-year turkeys may be differentiated until their second fall using the molt pattern of rectrices (Pelham and Dickson 1992). Females may be classified as young of the year in either fall or spring hunts based upon plumage. In the fall, age of harvested males can generally be classified as subadults, 1.5 years old, 2.5 years old and ≥3.5 years old based upon tail coverts, beard length, and spur length (Schorger 1957, Steffen et al. 1990, Backs and Weaver 2001). Age may be classified with tarsometarsus lengths as well (Wakeling et al. 1997*a*). Field checks increase the accuracy of harvest data because trained biologists collect the desired information (Rupp et al. 2000).

Efficiently and effectively contacting successful hunters with game in hand to secure adequate sample sizes can be challenging. Strategically placed check stations along major travel routes, limiting the extra distance hunters need to travel to reach the check station, and contacting individual hunters with mail or email information regarding the check stations can improve participation. Enacting regulations requiring mandatory physical checks with penalties for noncompliance improve compliance but may unnecessarily complicate regulations. Field checks may not be practical for large-scale harvest monitoring due to human resource commitments (Rupp et al. 2000). Because turkey seasons (both spring and fall) could potentially extend over a month, a check station scheduled over an opening weekend may be sufficient to index harvest and hunter experiences. Changes in weather can influence a single weekend check station data (Sandrini 2003), and managers should use caution in drawing inferences under these conditions.

Wing or Foot Collections

The wing feathers (ninth and tenth primaries), breast feathers, and the metatarsus along with attached foot of wild turkeys can be used to determine the age and sex of harvested birds (Pelham and Dickson 1992, Wakeling et al. 1997*a*, Backs and Weaver 2001). These body parts can be collected remotely using drop off collection sites (wing and foot barrels) or by solicited mail (feather return mailings). Data based on parts collections can be used to verify hunter self-reported harvest and in some abundance models (Sandrini 2003, South Dakota Department of Game, Fish and Parks 2016). Sample sizes of about 20% of the total harvest is needed to make them reliable for use in abundance estimation using models that incorporate parts collection data or to make accurate inferences about relative age and sex distribution of harvest (South Dakota Department of Game, Fish and Parks 2016).

POPULATION MONITORING

Despite interest in exact population density, even the best efforts to census (i.e., a complete enumeration of individuals within a population) wildlife is imperfect except in few circumstances (Locke 2007). For that reason, we did not discuss census techniques but focused our synthesis on the most reliable population indices.

Spring or Fall Harvest as Population Index

Spring male turkey harvest can index population trends in wild turkeys (Healy and Powell 2000), although with substantial limitations (e.g., Hoffman 1990). Spring male turkey harvest is assumed to index populations when hunter numbers are limited by regulation. In the Black Hills of Wyoming, increases in spring gobbler harvest, winter flock counts, and measures of poult production have generally correlated (Sandrini 2003). Additionally, hunter participation or active license number purchases often track wild turkey populations like other game birds (Strickland et al. 1994). In other words, when game bird populations are abundant, more hunters tend to participate in hunting, whereas when their populations wane, hunters pursue hunting those species less. However, wild turkey hunter participation tends to lag about 2 years in response to perceived changes in wild turkey population abundance (Sandrini 2003).

In some circumstances, total harvest or hunt success (percent of hunters successfully harvesting a turkey) for either spring or fall hunts can be used as a measure of CPUE (Lancia et al. 2005). Regulatory changes in permitted or licensed hunters that result from social inputs rather than biological inputs may influence harvest and hunt success (McCall et al. 2020). Theoretically, as turkeys become more or less abundant, the number of turkeys harvested (if permits remain stable) or hunt success and days-to-harvest (if permits change) change with abundance. Specifically, hunt success will decrease or days-to-harvest will increase as turkeys

become less abundant. Conversely, hunt success will increase or days-to-harvest will decrease as turkeys become more abundant. Wildlife agencies may choose to increase or decrease permits in response to trends in these metrics. Arizona uses this approach (Arizona Game and Fish Department 2017, McCall et al. 2020). Other factors can influence harvest, such as weather or food availability, so using trends through time is important when considering these indices; a single year of high or low harvest may not truly represent population trends.

Summer Brood Surveys

Wild turkey poult production and survival seem to be the primary factors influencing the dynamics of western wild turkey populations, as winter survival of hens most years is relatively high (Rumble and Hodorff 1993, Rumble et al. 2003, Lehman 2005, Lehman et al. 2006). Because adult survival is generally high, population growth may be influenced to a greater extent by changes in poult survival (Pollentier et al. 2014). However, severe winter weather can substantially increase adult male mortality and may differentially affect males and females in some locations (Cahoy 2009, Toy 2011).

Therefore, brood surveys are a valuable approach to monitoring for spatial and temporal variation in wild turkey demographics, especially related to reproductive output. The chief objective of brood counts is to index annual reproduction in a population of wild turkeys, whereas classification counts also incorporate male to female ratios. Brood surveys can be used to gain insight into population trends (Rumble et al. 2003, Wakeling and Lewis 2005) and assess distribution of wild turkeys during summer. Annuals fluctuations in brood size can be incorporated into post-breeding matrix projection models (South Dakota Department of Game, Fish and Parks 2016). Comparisons of brood survey indices among regions and states are probably best conducted using a standardized protocol (National Wild Turkey Technical

Committee 2019). Although recruitment may not be directly comparable among states due to a lack of consistency in yearling nesting (e.g., Wakeling and Lewis 2005), comparisons within consistent regions across time can be valuable using a standardized approach.

Brood counts can be useful for hunting season forecasts based upon a general correlation between brood counts and hunter success the subsequent fall and spring (Wunz and Ross 1990), especially 2-years post hatch (Sandrini 2012). Data from Wyoming's Black Hills suggest that about half of the variation in spring gobbler harvest is explained by mean poult per brood ratios 2 years prior (Sandrini 2012); in the Black Hills most male harvest in the spring are 2-year-old turkeys (Steinke 2006, Toy 2011). At times, managers have attempted to develop inferences about population densities from brood data (Bartush et al. 1985).

Despite efforts at standardization of brood surveys (National Wild Turkey Technical Committee 2019), some states (e.g., Montana, Nevada) do not conduct summer brood or classification surveys. In many states, brood counts are done strictly to determine annual production. No attempt is made to estimate population densities or to depict population trends, yet these data may be used in some population models (South Dakota Department of Game, Fish and Parks 2016).

Precipitation amount and timing and temperature can influence poult production and survival (Schwertner et al. 2005). In Wyoming, no single weather parameter accounted for a high proportion of the annual fluctuations in poult:female ratios, although an inverse relationship existed between spring precipitation and brood size (J. M. Sandrini, Wyoming Game and Fish Department, unpublished data). South Dakota's post-breeding matrix projection model uses precipitation data collected during winter, incubation, and poult-rearing periods because it influences population demographics (South Dakota Department of Game, Fish and Parks 2016).

Cold temperatures coupled with precipitation in the spring seem to limit recruitment, but the relationship is complex (South Dakota Department of Game, Fish and Parks 2016). Summer brood counts are a more direct measure of effect than using weather data as a surrogate.

Standardized brood counts using accepted protocols are important for effective surveys (National Wild Turkey Technical Committee 2019). In Texas, Butler et al. (2007*b*) reported that poult:female counts could index reproduction or recruitment at localized levels, but they did not perform well on an ecoregion scale probably because of inconsistent sample sizes. In compiling data from multiple sources without set count routes, all observations should be recorded by individual flock and include the date, location description, and specific geographic coordinates in addition to the numbers of poults and number and sex of adults observed. This will enable the person compiling the data to remove suspected duplicate sightings. The quality of the data generally improves with the experience of observers.

Broods typically are mobile and more visible from the beginning of July into the fall; by September poults can be large and difficult to distinguish from hens (Anderson 2007). Therefore, brood counts should be conducted between early July and late August (National Wild Turkey Technical Committee 2019). Natural mortality of poults is greater in early summer, so broods observed during earlier counts can be larger than broods observed later. If counts are conducted over too long a period, the attrition of brood sizes may confound the ability to detect real differences in annual poult production (Hubbard et al. 1999; Vangilder and Kurzejeski 1995). Therefore, biologists should conduct counts during the same 1-month window each year (National Wild Turkey Federation Technical Committee 2019).

Observed poults per female may be influenced in some landscapes because yearling hens are often unsuccessful, inconsistent, or non-nesters (Rumble and Hodorff 1993, Rumble et al.

2003, Wakeling and Lewis 2005). In some western states where yearling females do not contribute substantially to annual poult production, years with greater proportions of yearling females may bias observed productivity figures low (Wakeling and Lewis 2005). To understand the effect of females without young, excluding groups of females without young from classification efforts is recommended when comparing mean brood size or poult:female ratios.

Classification Counts

Classification counts should occur during the same time period and in conjunction with brood counts. Because wild turkeys can be widespread across a variety of vegetation types in the summer (especially males and females without broods), an effort should be made to survey all occupied areas, ideally in proportion to their occurrence on the landscape. Surveys may be conducted by vehicle, horseback, or on foot. As a population index, summer roadside counts are of limited utility because population changes of almost 50% must occur before these surveys can reliably detect a change in population size (Shaw 1973). Summer roadside surveys can detect changes in measured ratios more effectively, but ratios are influenced by population age structure (Wakeling and Lewis 2005) and spatial segregation by sex (Shaw 1973).

Winter Flock Counts

In winter, wild turkeys congregate, so the birds are relatively easy to observe and count. As such, winter counts can provide a general index to detect trends and annual fluctuations in some wild turkey populations. Many factors influence the number of wild turkeys present at a particular count site, so personnel must count turkeys at the same locations and approximate times each year to maintain a valid index. Although turkeys may not use all sites each year, all sites should be surveyed each year. Also, the number of wild turkeys at a particular count site may have an upper limit due to limited roost sites, behavioral dominance (Zornes and Lanka 2007), or the

availability of human-related foods on farms and ranches (Sandrini 2003). Changes in total winter flock numbers may only be indicative of gross population changes when an area has not reached saturation (Sandrini 2003, Anderson 2007).

Timing of counts in relation to severity of winter weather can affect the number of birds detected (Anderson 2007). During mild winters, turkeys may not congregate on sites with artificial foods by December and birds often disperse by March. Hoffman et al. (1993) recommended counting turkeys during late February and early March. By that time, most winter mortality has occurred, but turkeys are still concentrated. However, in many lower elevation sites across the West, regular flock attendance around ranch and farm compounds can decrease in late February as turkeys begin to move with the onset of more moderate weather. To assure wintering flocks are counted when they reach peak size, we recommend conducting winter counts in January or February. Counts should be completed over 2–3 weeks to reduce biases from double-counting or missing birds that move. Landowners may be willing to count the turkeys on their property and this can save considerable agency time and effort. However, personnel should only use counts from landowners who express a genuine interest. Otherwise, the counts are likely to be estimates rather than an actual count (Cook 1973, Anderson 2007). In Wyoming, a historical review of data from individual ranches combined with personal visits with landowners determined that landowners frequently overestimate the number turkeys that overwinter on their property (Sandrini 2003).

A time series of annual winter counts can be used to detect population trends or changes within comparatively limited areas such as drainages or particular ranches or on a broader scale if data is consistently available. Yet inferences about trends throughout larger areas are less reliable because it is unlikely managers are aware of all winter-feeding sites and they may not

survey all potential sites during a survey period. During mild winters, many turkeys remain dispersed due to the availability of natural foods.

Winter Classifications

Wild turkeys can be classified in winter to estimate post-fall and pre-spring hunt sex ratios within a population. Age ratios, however, may be difficult to determine because by winter, young-of-the-year females are often too large to be accurately distinguished from adult females by size alone. Winter classifications can be difficult to make accurately where large flocks congregate (Hoffman et al. 1993). Winter classifications may also under-represent the proportion of adult and yearling males because they tend to be more mobile than hens at that time of year (Hoffman et al. 1993).

The ideal winter male:female ratio in a population has not been identified, but ratios skewed toward females (e.g., a ratio of 1 male to 3 females) are generally accepted as satisfactory because of the polygynous breeding structure of turkey populations (e.g., Hoffman et al. 1993). If male:female ratios of 1:1 or greater are documented during winter classifications, as may be the case where harvest is restricted or absent, increased harvest of males may help increase abundance because males may outcompete females for limited winter food sources (Zornes and Lanka 2007). In fact, several wild turkey populations confined to river and creek bottom areas in southeast Wyoming became extirpated after the male:female ratio reached or exceeded 1:1 (Anderson 2007).

Turkeys should be classified during winter counts in January or February because concentrations tend to be more dependable (Anderson 2007). Small groups can be classified on a tally sheet or with a multi-unit mechanical tally counter. If groups of 50 or more birds are encountered, it is helpful to use a high-resolution digital video recorder, an audio recorder, or an

assistant to record data. An observer can classify very large groups of birds (>150) effectively by arriving at known area of concentration before turkeys are present and classify the turkeys as they arrive.

Presence-absence Surveys

Spring gobble counts, data from automated cameras (see below), and anecdotal observations are examples of presence-absence surveys. Spring gobble counts do not index populations (Hoffman 1990) but do document presence of occupied habitat or minimum counts. Request for citizen-scientist reporting of incidental observations is another example of presence-absence surveys that will provide an estimate of occupied range, but these reports are not as useful for minimum counts.

Monitoring occupied range or minimum numbers can be useful when populations are at low levels or recently introduced. Arizona uses both of these techniques to monitor range expansion in the mountain ranges where Gould's turkeys were released (J. R. Heffelfinger, Arizona Game and Fish Department, unpublished data). Likewise, New Mexico has monitored Gould’s turkeys using walking transects of gobbling counts to record minimum populations. Although these tools can be useful for determining presence, they are not sensitive to changes in abundance and should not be used for that purpose.

Occupancy models incorporate presence-absence surveys like spring gobble counts (MacKenzie et al. 2002, MacKenzie et al. 2003). Multiseason models provide substantial improvements over simpler models (e.g., Pollentier et al. 2019). Pollentier et al. (2019) determined that standard 1.6-km spacing among calling-listening stations for turkeys did not eliminate spatial dependence, indicating greater distances between stations may be warranted for standard models. Occupancy modeling is valuable because it can address imperfect detection that

462 may be related to variation in a range of factors, including individual behavior and vegetation
463 structure and composition (e.g., Royal and Link 2006).

464 Though not widely used for surveying turkeys, acoustic data can be used as a presence-
465 absence survey and to estimate minimum population counts. During the late 1980s and 1990s,
466 Gould's turkeys in New Mexico were surveyed using gobble counts (Dahlquist et al. 1990). The
467 recordings were digitized to produce an oscillogram and spectrogram to differentiate individual
468 male turkeys. Spectrograms were compared to identify the unique number of male turkeys.
469 Spectrograms of passerine songs have been used to conduct spatially explicit capture-recapture
470 experiments (Dawson and Efford 2009). This methodology is typically used on smaller scaled
471 projects and would be a large financial investment to pursue on a large scale for monitoring wild
472 turkey populations.

473 **Automated Cameras**

474 Automated cameras (i.e., camera traps) are effective at determining presence-absence and may
475 be used to estimate turkey relative abundance and age and sex ratio (Cobb et al. 1996, Dubay et
476 al. 2007). Some studies that use automated cameras failed to address detection probabilities,
477 which may lead to parameter underestimation (Damm et al. 2010). Estimates derived from
478 automated cameras assume that a direct relationship exists between captured images and density
479 of the species being surveyed (Jacobson et al. 1997, Silveira et al. 2003).

480 Financial costs to implement a survey using automated cameras are generally less
481 expensive than mark-recapture studies (Keller 2019). Much of the expense is the initial
482 acquisition of automated cameras, but maintenance, repair, replacement, and human resource
483 costs can make annual expenses high as well. In practice, Dickson et al. (2016) successfully used
484 100 cameras to determine estimates of occupancy of Merriam’s turkeys on the Kaibab Plateau in

northern Arizona. In southern Arizona, Dubay et al. (2007) used cameras to determine the relative abundance of an expanding, but limited Gould's turkey population. Yet in a study in Florida, Olson et al. (2011) concluded that baited camera traps may be challenging to use to reliably estimate wild turkey abundance, although specific modifications to bait and camera placement make their use for monitoring populations suitable (Keller 2019). Specifically, placement of baits and automated cameras in openings may yield biased results for some classes of wild turkeys. Hence, design considerations are critical to successful use of automated cameras (Keller 2019).

Forward Looking Infrared

Forward looking infrared (FLIR) surveys may be conducted aerially or from the ground and use a high-resolution temperature differential to detect images. Turkeys have proven challenging to survey with this technology. Ruttinger et al. (2014) used radiotelemetry and handheld ground FLIR to locate roosting male eastern turkeys in southwestern Georgia. In Texas, Butler et al. (2006) determined that roosting turkeys were undetectable from the ground unless their heads were exposed.

Use of FLIR surveys from aerial platforms are similarly challenging. In Texas, Locke et al. (2006) was unable to aerially detect roosting turkeys using a portable FLIR camera because of altitudinal restrictions for safe helicopter flight and lack of thermal contrast of turkeys. Topography and aerial obstructions, such as utility poles, towers, and wires required that helicopters fly at higher altitudes. Additionally, there was little difference in external temperatures of turkeys, tree branches, rocks, and bare ground. Wakeling et al. (1999) attempted to aerially survey Merriam’s turkeys from a fixed-wing aircraft in northern Arizona but concluded that dense ponderosa pine (*Pinus ponderosa*) canopy obscured turkeys and thermal images were too small to detect with an infrared camera. Subsequently, Wakeling et al. (2003) attempted to use fixed-

wing aircraft to conduct a FLIR survey of known numbers of domestic turkeys placed on the ground within varying canopy closures during mid-winter and determined that even in areas with no canopy closure, domestic turkeys were undetectable due to their insulative capabilities. Summer FLIR use may be more effective because during this period turkeys may be radiating heat rather than in winter when turkeys are trying to retain heat (Wakeling et al. 2003).

Aerial Surveys

Traditional aerial approaches have received little use for turkeys, although in some cases Rio Grande wild turkeys may occupy vegetation communities that are sufficiently open, and the turkeys may be in flocks of sufficient size to make aerial surveys possible. In Texas, both fixed-wing aircraft (Butler et al. 2007*a*) and helicopters (Butler et al. 2008) have been effective under certain conditions to monitor turkeys. Based on surveys of decoys, fixed-wing surveys had sufficient power (>80%) in open terrain to detect a 10–25% change in population size (Butler et al. 2007*a*). Butler et al. (2008) observed a similar ability to detect change using helicopters and radiomarked turkeys in open conditions. Vegetation cover and flock size influenced detectability and the ability to enumerate individuals.

There is little information on the use of unmanned aerial vehicles (UAVs) for management of turkeys. However, UAVs are becoming a useful wildlife management tool for other species. Jones et al. (2006) detected various wading bird species in wetland and agricultural areas using fixed-wing UAVs. Chabot and Bird (2012) compared staging flock counts of migrating Canada geese (*Branta canadensis*) and snow geese (*Chen caerulescens*). Monitoring of colony nesting birds in tropical and polar environments by UAVs proved an order of magnitude more precise than traditional ground counts (Hodgson et al. 2016).

Telemetry

In research, telemetry is often used to determine occupancy and survival of turkeys, though recent advancements in Global Positioning System (GPS) telemetry systems have increased the ability to collect data on nest location and fate, brood survival, movement patterns, and habitat selection. Very High Frequency (VHF) radio transmitters were the standard for turkey telemetry data collection until recently, when GPS transmitters became small enough for use on turkeys. Spatial accuracy using GPS transmitters are substantially better than VHF radiotelemetry for evaluating habitat use and movements (Guthrie et at. 2011). For both VHF and GPS telemetry, the inferences made from the study design will affect the number of individuals that need to be marked, as well as the applicability of the study results to other populations (Fuller et al. 2005). For instance, efforts to accurately estimate cause-specific mortality or high-resolution movement corridors require substantially greater numbers of marked animals than do detections of large-scale flock movements.

Studies on survival of adults and poults (e.g., Lehamn et al. 2008), reproductive success (Rumble and Hodorff 1993), and hunting impact on populations (McCall et al. 2020) have all been undertaken using telemetry. Telemetry data is also useful for assessing movement patterns and habitat use and can be used by biologists to assess turkey response to habitat manipulations (Wakeling 1997, Wakeling et al. 1997*b*). Disadvantages of using telemetry for monitoring turkey populations include high study cost and high labor investment (especially for VHF telemetry), and the invasive nature of the capture and marking process. Results are generally site specific, although useful inferences are often drawn for management across larger scales (Fuller et al. 2005). Management agencies are more frequently using telemetry to evaluate management actions, and telemetry is no longer relegated only to research investigations.

Weather Factors

555 Cold and wet spring weather has been shown to negatively affect eastern wild turkey nest
556 success and poult survival (Vangilder and Kurzejeski 1995; Roberts and Porter 1998*a*, *b*;
557 Lowrey et al. 2001). Clawson et al. (2015) estimated vulnerability coefficients from a statistical
558 population reconstruction analysis, along with a time series of harvest and hunter-effort data to
559 reconstruct a male eastern wild turkey population in Missouri. They reported that total
560 precipitation in June positively correlated and the number of cold days in April negatively
561 correlated with yearling male:adult male ratios the following spring. They concluded that the
562 turkey population is controlled primarily by weather factors influencing reproduction, and
563 weather data could be used to indicate when harvest regulations should be adjusted or remain
564 stable. In South Dakota, a study of 57 females over 3 years documented that poult survival was
565 negatively correlated with cold and wet weather in June (Lehman et al. 2008). Although
566 monitoring weather does not provide a precise barometer for turkey populations, certain
567 generalities can be expected: drought reduces population productivity; cold and wet weather
568 during early brood-rearing reduces survival of young; and hard frozen snow may limit access to
569 winter food and reduce overwinter survival (Wakeling and Rogers 1998, Lehman et al. 2008,
570 Clawson 2015).

571 **Reports from Citizen Science**

572 Citizen science provides substantial, organized reports in some instances, such as Breeding Bird
573 Survey (BBS) or Christmas Bird Count (CBC). These surveys cover large geographical areas and
574 provide long-term data sets that may prove useful in documenting changes in occupied range and
575 minimum observations. Despite their broad coverage, these organized counts lack resolution on
576 finer scales and are not designed to monitor turkey population abundance. Even in comparison to
577 general turkey surveys (e.g., spring gobble counts), the resolution of these large-scale surveys

may be inadequate to detect even gross changes in local populations. Biologists need to consider the scale of the data in relation to the questions of interest.

Christmas Bird Counts.—In 1910, a single wild turkey was documented in a CBC circle in South Carolina and represented the very first observation of a wild turkey on a CBC survey. Although turkeys have increased substantially in detections through time, CBC data may not be good indicators of local wild turkey abundance and density as CBC circles may or may not be evenly distributed across quality wild turkey habitat in the area of interest to wild turkey managers. The most useful indicator CBCs provide is likely long-term population numbers across large landscapes. In regions or states with non-contiguous turkey habitat, CBC data will likely be less useful to managers than in states or regions with contiguous habitat. Across multi-state regions of similar land cover, CBC will likely provide useful insight into general and long-term population trends. In the western US, CBC circles may be outside traditional or quality wild turkey habitat and ranges. The timing of CBCs, during a time of year when wild turkeys are not as vocal as during their breeding season, may also lead to under-detection bias. Winter weather, including snow cover, may also lead to a bias in either over or under-detection in observations due to bird behavior. Winter weather, along with road conditions, may inhibit CBC observations and as expected are not uniform across years in any particular region of the West.

Breeding Bird Survey.—The BBS is a long-term avian monitoring program (started in 1966), where volunteers skilled in avian identification collect bird observations along roadside survey routes (Sauer et al. 2013). However, the BBS suffers from much of the same challenges as do CBC for monitoring turkey populations and its utility is limited.

eBird.—eBird is an online checklist program that allows birders to record avian species observations, with a goal to maximize the utility and accessibility of bird observations made by

bird watchers (Sullivan et al. 2009). The web-interface allows participants to submit their observations into a globally accessible unified database. As a monitoring tool, turkey seasonal ranges and range changes may be detected through eBird. The data could also be used for decision support tools and modeling relative abundance. eBird users are not evenly distributed across the landscape, thus locations that are difficult to access may not have sightings, even though there are turkeys present. For these reasons, we recommend that this data is best used in conjunction with more rigorous monitoring programs.

Marking Studies and Modeling

Marking studies (e.g., visible marks without telemetry) can be used to estimate turkey population size, survival, and cause-specific mortality in those areas where this information is deemed important. Band recovery from hunter harvest is a common example of this approach (Vangilder and Kurzejeski 1995). For most situations, the investment in marking is substantial and may be cost-prohibitive when compared to the need for this information. This intensive level of monitoring and investigating may be warranted if agencies want to determine the effects from a management change (e.g., hunt structure changes) or estimate population size and growth following introductions (e.g., Gould's turkey restoration [Dubay et al. 2007]). In some situations, turkeys may be marked for a different purpose (e.g., monitor movements or habitat use), but ancillary data from the marked birds may be used to draw inferences on the demographics of the marked population. Data derived from marking studies may be used to inform population models in some instances. These models should incorporate known variations in survival and recruitment among years (Rumble et al. 2003, Wakeling and Lewis 2005).

SUMMARY

This description of the methods for monitoring harvest and population demographics of western wild turkeys is designed to assist resource management agencies in selecting and using indices appropriately. Knowledge of the strengths and limitations of each technique can guide implementation and inference from the data collected. Individual biological, social, financial, and political situations dictate which tools will be applied to monitor wild turkey populations within each jurisdiction. Biologists should use caution when drawing inferences and provide statistically appropriate recommendations. Management agencies are challenged to provide sound science on which to base inferences, while at the same time managing fiduciary responsibilities effectively as well. The public, trust managers, and trustees always seek more precise and unbiased estimates. Investing in overly precise estimates may take greater time or financial resources than are reasonable or necessary. The accuracy and precision needed to make effective decisions should be defined before seeking answers.

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Table 1. Summary of monitoring methods used to index harvest and populations for western wild turkeys, benefits and challenges associated with each method, and selected references.

Monitoring method	Benefits	Challenges	Selected references
Harvest			
Mandatory reporting	Appropriate sample sizes, near-complete reporting	Requires incentives or penalties to be effective, increased expense, penalize hunters for errors, possible negative effect on recruitment and retention	Munig and Wakeling 2005, Lukacs et al. 2011, Hale 2013, Cardinal 2017
Phone survey	Statistically valid, accurate, and precise	Expensive to implement and time consuming, may be a nonresponse bias due to likelihood to answer call	Cada 1984, Curtin et al 2005

Online survey	Inexpensive	Statistically challenging, not randomly selected or complete unless coupled with another technique	Kaplowitz et al. 2004, Arizona Game and Fish Department 2008
Mail survey	Traditional approach and recognized, statistically valid sampling approach easily applied	Expensive to deploy and generally requires additional effort to input responses, response biases may be changing with time	Arizona Game and Fish Department 2008, Keegan et al. 2011
Email survey	Inexpensive to deploy, can be used as easy reminder for other surveys	Nonresponse bias may be substantial and related to age of hunter	Schonlau et al. 2002, Munig and Wakeling 2005
Mobile phone application	Convenient	May be expensive to deploy, generally state specific and nonresident hunters may not	Dalessandro 2018

		use, bias based on age of hunter	
Field check	Accurate assessment of harvest by trained biologists, ancillary benefits of hunter contacts	High human resource cost, checks may be small sample or biased sample	Pelham and Dickson 1992, Wakeling et al. 1997*a*, Rupp et al. 2000, Backs and Weaver 2001
Wing or foot collection	Ease of deployment, accuracy of assessment	Small or biased sample of harvest	Pelham and Dickson 1992, Rumble et al. 1995, Wakeling et al. 1997*a*, Backs and Weaver 2001
Population			
Harvest indices	Standardized, repeatable, relatively simple to collect, relatively inexpensive, generally robust trend indicator	May violate assumptions of catch-per-unit-effort, some methods may introduce bias	Hoffman 1990, Healy and Powell 2000, McCall et al. 2020

Summer brood surveys	Standardized, repeatable, effective at documenting young:female ratios	Lacks statistical power to detect changes in populations, substantial human resource commitment, regional differences in yearling turkey nesting make comparisons among areas difficult	Shaw 1973, Rumble et al. 2003, Wakeling and Lewis 2005, Pollentier et al. 2014, National Wild Turkey Technical Committee 2019
Winter flock counts	Standardized, repeatable, provides a minimum count	Dependent on winter conditions and artificial feeding, large flocks may be difficult to enumerate, substantial human resource commitment	Cook 1973, Anderson 2007, Zornes and Lanka 2007
Winter classifications	Repeatable, simple method	Dependent on winter conditions, sexes may	Anderson 2007, Zornes and Lanka 2007

		segregate, age may be difficult to effectively determine, substantial human resource commitment	
Presence-absence survey	Many methods available to deploy, ease of implementation, statistically valid methods to address data	Complex statistical analyses, precision and power may have limitations	MacKenzie et al. 2002, MacKenzie et al. 2003, Royal and Link 2006, Pollentier et al. 2019
Automated cameras	May be deployed in statistically valid design, objective data collection	Camera placement may bias results, marked turkeys may improve inference, substantial human resource commitment, substantial	Cobb et al. 1996, Dubay et al. 2007, Damm et al. 2010, Olson et al. 2011, Keller 2019

		financial investment to acquire cameras	
Forward-looking infrared	Objective design	Limited ability to reliably detect turkeys, expensive to use from aerial platform, may require radiomarked turkeys to improve efficacy	Wakeling et al. 1999, Wakeling et al. 2003, Locke et al. 2006, Ruttinger et al. 2014
Aerial survey	Objective design	Limited ability to reliably detect turkeys, expensive to use from aerial platform, may require radiomarked turkeys to improve efficacy	Butler et al. 2007*a*, Butler et al. 2008,
Telemetry	Robust statistical designs available	High human resource and financial investment, dependent on statistical design and sample size	Rumble and Hodorff 1993, Fuller et al. 2005, Lehman et al. 2008, McCall et al. 2020

Weather indices	Inexpensive, generally easy to collect, often adequate corollary for population index	Often explains only a portion of variation in population, best used in conjunction with other methods, site-specific variation may be challenging to index	Vangilder and Kurzejeski 1995; Roberts and Porter 1998*a, b*; Lowrey et al. 2001; Lehman et al. 2008; Clawson et al. 2015
Citizen science	Inexpensive, often large human resource commitment	Statistical inference may be challenging, reliant on observers with unknown training, may have low precision and low power, often suitable for only large scale spatial or temporal comparisons	Sullivan et al. 2009, Sauer et al. 2013
Marking studies and modeling	Robust statistical designs available	High human resource and financial investment,	Vangilder and Kurzejeski 1995, Rumble et al. 2003,

	dependent on statistical design and sample size	Wakeling and Lewis 2005, Dubay et al. 2007

STATUS OF WILD TURKEY IN THE WESTERN US

The committee reviewed and discussed updates to the 2019 Status of the Wild Turkey in the Western United States document that was produced from the previous workshop. The 2021 version of this document is in progress and will report on Breeding Bird Survey and Christmas Bird Count data, research priorities, and statewide wild turkey population trends, monitoring methods, and monitoring shortcomings for state wildlife agencies in the western United States. Kent Fricke is taking the lead on coordinating updates to the document.

2019 Status of the Wild Turkey in the Western United States

Western Wild Turkey Workshop — Western Association of Fish and Wildlife Agencies

The Western Wild Turkey Technical Committee recognizes there is currently limited ability for state wildlife agencies to consistently monitor and estimate wild turkey populations and annual harvest through sport hunting. Increased consistency of monitoring methods across states would improve our overall understanding of wild turkey population dynamics at a broad scale. Currently, the only consistent, region-wide effort that quantifies population trends is the Breeding Bird Survey (Figures 1 and 2) and Christmas Bird counts. However, while these surveys provide some quantification of wild turkey population trends, they are not conducted in wild turkey-specific habitat, and thus have limited ability to elucidate and predict population trends of this species.

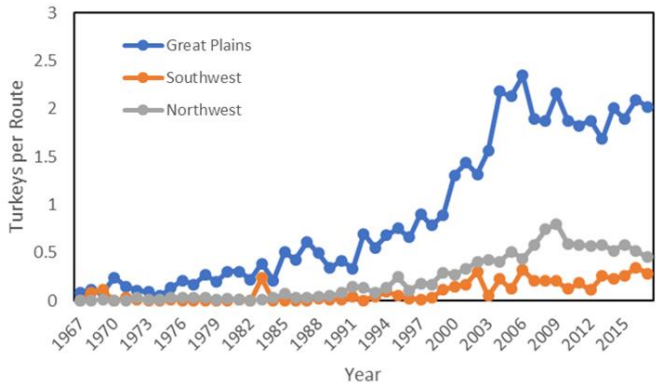

Figure 1. Average turkeys per route detected along Breeding Bird Survey routes in western U.S. regions (1967-2017).

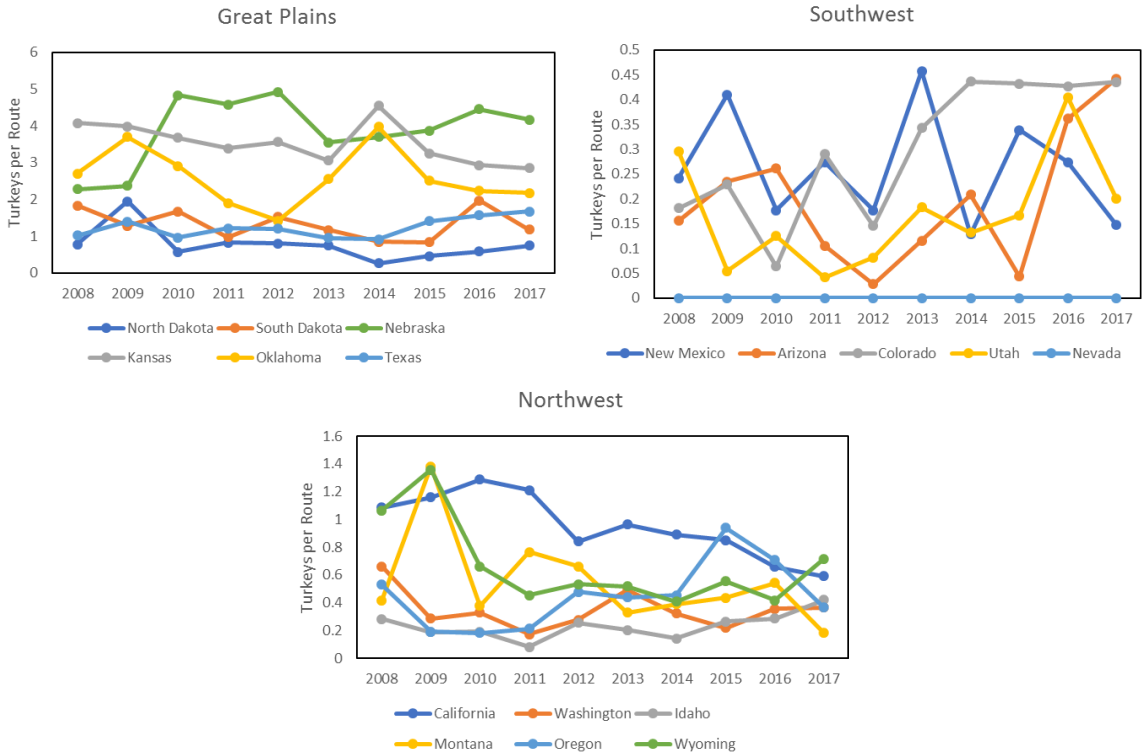

Figure 2. Average turkeys per route detected along Breeding Bird Survey routes in western U.S. regions from 2008-2017.

Consistent survey efforts by multiple states will improve state wildlife agencies' ability monitor, analyze, and compare data across landscapes to determine long-term trends and improve our ability to predict population changes.

Research Priorities

- Primary
    - Investigate western wild turkey subspecies' habitat use, habitat selection, nest success, poult recruitment, and movements among various habitat types and land ownerships.
    - Evaluate techniques for successfully reducing damage conflicts and impacts of damage control on western wild turkey subspecies' population levels, survival, movements, and habitat use.
    - Determine impacts of spring and fall harvest on western wild turkey subspecies populations.
- Secondary
    - Determine the direct and indirect impacts of western wild turkey subspecies on native wildlife.
    - Determine factors limiting western wild turkey subspecies populations in some habitat types and areas.
    - Develop a statewide or ecoregion-scale monitoring technique for estimating western wild turkey subspecies populations.
    - Determine nesting phenology, nest site selection, and movements of Gould's wild turkeys.
    - Identify the distribution of various subspecies of wild turkeys based on genetic analyses (currently under investigation by University of Nebraska—Lincoln).

Table 1. Statewide wild turkey population trends, monitoring methods, and monitoring shortcomings for state wildlife agencies in the western United States.

Region	State	Population Status		Primary Monitoring Methods		Monitoring Shortcomings
		5-year	10-year	Populations	Harvest	
Great Plains	North Dakota					
	South Dakota	Stable/Declining	Stable/Declining	Research/Matrix Modeling	Hunter Harvest Surveys	Ability to adequately monitor enough areas. Can only conduct research in smaller regions at a time.
	Nebraska	Declining	Declining	Rural Mail Carrier Survey	Hunter Harvest Surveys	Lack of Population Information (e.g., brood, survival), Poor survey response rates, Questionable population trend method
	Kansas	Declining	Declining	Rural Mail Carrier Survey	Hunter Harvest Surveys	Harvest Rates, Population Estimates
	Oklahoma	Declining	Declining	Winter Flock Surveys, Brood Survey	Hunter Harvest Surveys	Imprecise data, Observer error
	Texas	Increasing	Increasing	none	Hunter Harvest Surveys	Hunter survey response rates--not specific to turkeys, No population surveys
Southwest	Arizona	Stable	Declining	none	Hunter Harvest Surveys	Hunter survey response rates, No population surveys
	New Mexico	unknown	unknown	none	Hunter Harvest Surveys	No population monitoring, Non-response bias in hunter surveys
	Colorado	Unknown, appears to be stable or increasing	Increasing	none	Hunter Harvest Surveys	No population monitoring
	Utah	Increasing	Increasing	none	Hunter Harvest Surveys	No population monitoring
	Nevada					
Northwest	California	Declining	Deslining	Breeding Bird Survey	Hunter Harvest Surveys	No population monitoring
	Washington	Stable/Increasing	Stable/Increaing	none	Hunter Harvest Surveys	No population monitoring, poor precision in hunter harvest surveys
	Idaho	Increasing	Stable	none	Hunter Harvest Surveys	No population monitoring
	Montana					
	Oregon	Increasing	Increasing	none	Hunter Harvest Surveys	No population monitoring
	Wyoming	Increasing	Declining	Area specific--not statewide: Winter Flock Survey, Brood Survey	Self-reported Hunter Harvest Surveys	No population estimation or modeling

FORMATTING GUIDELINES FOR STATE REPORTS

The committee elected to adopt standard formatting guidelines for state reports. These guidelines are adapted from the Southeast Turkey Working Group to provide guidance (not requirements) for producing and formatting state reports.

Western States Wild Turkey Technical Committee
Formatting Guidelines for State Status Reports

Adapted from the Southeast Wild Turkey Working Group – Formatting Guidelines for State Status Reports. Jason L. Isabelle – Southeast Wild Turkey Working Group Chair. 20 July 2015.

In an attempt to standardize formatting for the Western States Wild Turkey Technical Committee proceedings, the following are guidelines for committee members when developing state wild turkey status reports. Although this will require additional time the first year to standardize formatting, it should greatly reduce the amount of time host states spend compiling the proceedings. The Appendix contains an example template that can be used when formatting reports; highlighted indicates areas where text should be entered.

In addition to using the Appendix as a guide, here are some general guidelines when developing state reports:

- Use Times New Roman (TNR) size 12 font throughout, other than title of report, which should be size 14 font
- Use one space following periods
- Single space text including table and figure headings
- Use 1" margins throughout report
- Left justify text throughout
- Do not insert page numbers (this will be done when formatting proceedings)
- If you do not have information for a heading/section (e.g., no ongoing or recently completed research), do not include heading in report
- Place table titles above tables and figure titles below figures
- Tables and figures may appear with text in body of report or at end of report
- Submit report to host state as MS Word document

Heading formatting should be as follows:

PRIMARY-LEVEL HEADING

Begin text here. Text, text, text.

Second-level Heading

Begin text here. Text, text, text.

<u>Third-level heading</u>

Begin text here. Text, text, text.

Figures and tables should be stand alone and not linked to other files (e.g., MS Excel spreadsheet) because this causes formatting issues when compiling proceedings. **Tables and figures should be saved as image files (e.g., JPEGS) before being inserted into reports.**

One method of saving tables and figures as image files is as follows:

1. Create table or figure in MS Word
2. Copy table or figure and paste into a blank MS PowerPoint slide (when pasting, select “keep source formatting and embed workbook”)
3. Right-click on the table or figure in the PowerPoint slide and select “save as picture”
4. Copy newly-created picture file (wherever you saved it) and paste into status report

Given this approach, it is critical that tables and figures are formatted exactly as you would like them to appear in the proceedings and that they have been thoroughly proofed because the person compiling the proceedings will not be able to manipulate (edit) the image files.

The following provides information about items that could/should be included under associated report headings:

POPULATION STATUS

Provide information about statewide and regional (if available) population trends. Any population indices would be appropriate to include under this heading. Because most states have completed population restoration, there is no associated restoration heading in report guidelines. Therefore, information about ongoing or recently-completed restocking should be included in this section.

REPRODUCTION

Provide information from brood surveys, including statewide and regional (if available) trends.

HARVEST

Spring Turkey Season

Provide spring turkey season harvest information.

Fall Turkey Season

Provide fall turkey season harvest information if applicable.

HUNTING INCIDENTS

Provide information about number of turkey hunting incidents that occurred in your state. Long-term trend data (if available) would likely be of interest.

RESEARCH

Provide brief summaries of ongoing or recently completed research projects. Also include citations for publications resulting from research projects.

REGULATION/LEGISLATION CHANGES

Provide information about regulation/legislative changes that have recently been approved and/or have recently been implemented.

EMERGING OR EVOLVING ISSUES

This heading provides opportunity to include information about a variety of relevant issues. Some examples include disease-related issues (could also be included under POPULATION STATUS heading) or regulation changes being considered, etc.

RELEVANT LINKS

If applicable, provide website links to relevant information not included in the report (e.g., links to brood survey reports, regulations booklets, other publications, etc.).

MISCELLANEOUS

Include information not related to other headings.

Appendix A. Standard format for state reports (Highlighted text indicates where information should be entered)

STATE WILD TURKEY POPULATION STATUS REPORT – Year

Western States Wild Turkey Technical Committee Meeting – Month date–date, year
Meeting Location Venue – City, State

Biologist name – Job Title
Agency
Street Address
City, State, Zip Code
Phone number / E-mail address

POPULATION STATUS

Begin text here. Text, text.

REPRODUCTION

Begin text here. Text, text.

HARVEST

Year Spring Turkey Season

Begin text here. Text, text.

Year Fall Turkey Season

Begin text here. Text, text.

HUNTING INCIDENTS

Begin text here. Text, text.

REGULATION/LEGISLATION CHANGES

Begin text here. Text, text.

RESEARCH

Begin text here. Text, text.

EMERGING OR EVOLVING ISSUES

Begin text here. Text, text.

RELEVANT LINKS

Begin text here. Text, text.

MISCELLANEOUS

Begin text here. Text, text.

Figure number. Begin text here. Text, text.

Table number. Begin text here. Text, text.

2022 WORKSHOP

The 2022 Western States Wild Turkey Workshop will be hosted by Montana Fish, Wildlife and Parks.