Survey of Alabama Wildlife Biologists’ Knowledge, Attitudes, and Practices on Wildlife Health and Zoonoses

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| ABSTRACT |

Wildlife is a critical reservoir for emerging zoonotic diseases with implications for agricultural, domestic animal, and public health. Within a One Health framework, professionals such as wildlife biologists, veterinarians, and physicians collectively influence decision-making processes that shape zoonotic disease dynamics and wildlife health outcomes. Despite their key role in surveillance and prevention, the knowledge, attitudes, and practices (KAP) of wildlife biologists regarding zoonoses remain largely unexplored in Alabama. This study aimed to assess these factors to inform targeted educational and disease prevention strategies. A structured survey was distributed remotely between May 15 and September 20, 2024, to wildlife biologists aged over 19 years who live or work in Alabama. We evaluated the KAP of 150 respondents who completed at least 70% (41/58) of the questions surveyed. Respondents represented a range of affiliations such as state (29.0%) and federal (15.5%) government, academia (25.5%), and private industry (16.1%). Across sectors, most participants were primarily engaged in land and wildlife management (52.3%) or research (25.9%) activities. Survey results revealed moderate knowledge gaps related to zoonotic diseases with a median score of 90% and no respondent achieving a perfect score. Participants most commonly identified academic publications (26.3%) and state wildlife agencies (20.3%) as their primary information sources. Although 65.3% of respondents agreed that personal protective equipment (PPE) is necessary when handling wildlife, only 53.3% reported using PPE consistently (at least 75% of the time). While 83.3% supported requiring wildlife health education for biologists, 61.3% had never taken such a course and only 31.3% had done so within the past five years. Notably, 88.7% expressed interest in further education on wildlife health in Alabama. These findings highlight the need for enhanced educational initiatives and interprofessional collaboration under a One Health approach to improve zoonotic disease preparedness and public health resilience in Alabama.

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| **INTRODUCTION** |

## Background

* Wildlife serve as key reservoirs for emerging and re-emerging zoonotic diseases, posing risks to agricultural production, public health, and biodiversity
* Disease spillover from wild to domestic animals and humans has intensified with habitat encroachment, climate change, and increased wildlife-human contact [(Leal Filho et al. 2025)](https://sciwheel.com/work/citation?ids=17568788&pre=&suf=&sa=0&dbf=0)
* Alabama is a known hotspot for zoonotic spillover due to diverse habitats, abundant wildlife populations, and strong recreational hunting cultures

## Rationale

* Wildlife biologists frequently interact with animals and habitats that pose zoonotic risks, making them essential actors in One Health surveillance [(Anderson Bosch et al. 2010; Rai et al. 2025)](https://sciwheel.com/work/citation?ids=17737072,17701993&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)
* Prior research shows occupational exposure to zoonoses is often underestimated in wildlife professionals [(Schotthoefer et al. 2020; Bonaparte et al. 2021)](https://sciwheel.com/work/citation?ids=10789629,17575826&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)
* Studies suggest that many wildlife professionals lack formal training in disease ecology, biosafety, or zoonotic prevention protocols [(Teel et al. 2022; Daigle et al. 2023)](https://sciwheel.com/work/citation?ids=17737080,15883825&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)
* Few studies have assessed these constructs among wildlife biologists, especially in the U.S. southeast, despite their occupational relevance [(Anderson Bosch et al. 2010; Morse et al. 2019)](https://sciwheel.com/work/citation?ids=17737072,9828021&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)
  + In Alabama, no prior systematic assessment had been conducted on the knowledge, attitudes, and practices (KAP) of wildlife biologists regarding zoonoses

## Framework

* The KAP framework provides a structured way to evaluate factual knowledge, subjective attitudes, and habitual practices of a defined population toward a given issue [(WHO 2008; Andrade et al. 2020)](https://sciwheel.com/work/citation?ids=17831564,12259885&pre=WHO&pre=&suf=&suf=&sa=1,0&dbf=0&dbf=0)
* KAP studies serve as a diagnostic tool to inform tailored interventions and policy actions (Checkap: Zarei et al., 2024).Studies suggest that many wildlife professionals lack formal training in disease ecology, biosafety, or zoonotic prevention protocols [(Teel et al. 2022; Daigle et al. 2023)](https://sciwheel.com/work/citation?ids=17737080,15883825&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)
* KAP surveys have been applied to various populations—including veterinarians, farmers, students, and public health workers—to address zoonotic threats [(Ahmed et al. 2025; Mapatse et al. 2022)](https://sciwheel.com/work/citation?ids=17540489,16509136&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0)

## Objectives

* To assess the knowledge, attitudes, and practices of wildlife biologists in Alabama regarding zoonotic disease risks, field safety behaviors, and information sources.
  + Identify gaps in knowledge of zoonotic disease transmission and management.
  + Examine relationships between education, professional experience, and KAP outcomes.
  + Evaluate attitudes toward wildlife disease surveillance, vaccination, and One Health.
  + Gauge interest in continuing education and barriers to protective practices

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| METHODS |

**Ethics Statement**

* This research was granted exempt status by the Auburn University Institutional Review Board (IRB #FWS-SA2022000923), under Category 2 of the Common Rule as defined by the U.S. Department of Health and Human Services.
* Participants were provided with an introductory information letter in lieu of formal written consent. This document detailed the study's objectives, the voluntary nature of participation, and the confidentiality protocols in place.
* No personally identifiable information (e.g., names, email addresses) was collected at any stage.
* Given the observational nature of the research and the anonymous data collection strategy, participants were not subjected to physical, psychological, or social risk.
* No incentives or compensation were offered for participation.

**Survey Design and Distribution**

* The target sample comprised wildlife biologists either residing in or working within Alabama, USA.
* Eligibility criteria for participants:
  + Minimum age of 19 years
  + Self-identification as a wildlife biologist
  + Wildlife work or residence in Alabama
  + Access to a digital device with internet connectivity
* Survey instrument: electronically administered questionnaire deployed via Qualtrics (Provo, UT, USA).
* The survey was structured into five thematic domains:
  + Demographics: Captured sociodemographic and professional characteristics
  + Knowledge: Assessed factual and perceived knowledge on zoonotic pathogens, wildlife reservoirs, modes of transmission, and surveillance measures.
  + Attitudes: Evaluated perspectives regarding zoonotic disease risk, One Health principles, climate-related threats, and professional responsibilities.
  + Practices: Explored risk-relevant behaviors such as frequency of wildlife contact, PPE usage, field handling procedures, and participation in disease monitoring or vaccination.
  + Interest: Gauged interest in additional educational opportunities, including topic preferences and delivery methods.
* Recruitment efforts utilized professional and institutional channels, including:
  + Auburn University College of Forestry, Wildlife and Environment
  + Alabama Department of Conservation and Natural Resources
  + Alabama Chapter of The Wildlife Society

**Data Management and Processing**

* Raw data were extracted from the Qualtrics platform and analyzed in R (v4.4.1) [(R Core Team 2024)](https://sciwheel.com/work/citation?ids=17833154&pre=&suf=&sa=0&dbf=0)
* Exclusion criteria for collected responses:
  + Completion of less than 70% of survey items
  + The duration to complete the survey was less than five minutes (incongruous data)
  + Failure to meet participant eligibility requirements
  + Automated or fraudulent responses as flagged by Qualtrics' bot detection algorithm

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* Remove:
  + Knowledge responses were coded dichotomously (1 = correct, 0 = incorrect), with an accompanying binary variable indicating certainty (1 = certain, 0 = uncertain).
  + Composite indices were calculated to represent total correct responses (CORRECTnum) and total certain responses (CERTAINnum).
  + These indices were subsequently dichotomized at the sample median, yielding binary variables denoting high vs. low knowledge and certainty.
  + Attitudinal responses, originally collected on 5-point Likert scales, were recoded into ordinal categories: favorable (2), neutral (1), and unfavorable (0). The resulting scores were summed and dichotomized based on the median.
  + Practice-based behaviors were classified into binary risk indicators (1 = higher risk, 0 = lower risk), summed into a composite risk score, and dichotomized at the median.
  + Educational interest items were similarly coded and aggregated into a composite interest index, which was then dichotomized to delineate higher versus lower educational interest.
  + Multiple-response fields (e.g., learning preferences) were expanded into long format for indicator-level analysis.
  + Respondent ZIP codes were mapped to assess geographic distribution and potential clustering of knowledge, behaviors, and interests.

**Statistical Analysis**

* Descriptive statistics were used to summarize study variables:
  + Categorical variables were reported as frequencies and percentages
  + Continuous variables were described using mean, median, standard deviation, and interquartile range
* Survey items were operationalized into predictor and outcome categories aligned with the KAP framework.
* Variable recoding and dimensionality reduction techniques (e.g., binary transformations, ordinal collapsing) were applied to enhance interpretability and analytic robustness.
* Statistical inference procedures included:
  + Chi-square tests for evaluating associations between categorical variables
  + Cramér's V for assessing the strength of association in contingency tables, with values >0.10 considered practically meaningful
  + Wilcoxon rank-sum tests for comparing distributions of continuous variables across binary groups
* Bivariate analyses were conducted to:
  + Examine the stratified distribution of KAP indicators across demographic and experiential subgroups
  + Identify salient covariates for inclusion in subsequent multivariable models
  + Explore correlations between educational/training exposures and favorable knowledge and behavior outcomes
  + Provide empirical insights to inform development of targeted educational interventions and programmatic outreach strategies
* Multivariable analyses were planned to further isolate independent associations between predictors (e.g., education level, occupational affiliation, training history) and KAP outcomes.
  + Logistic regression models were specified for binary outcomes (e.g., high vs. low knowledge), while ordinal logistic models were considered for ordered attitude scales.
  + Model diagnostics were conducted to assess multicollinearity, goodness-of-fit, and specification adequacy.
  + Interaction terms were evaluated to explore effect modification by key stratifiers (e.g., gender, age cohort, professional sector).
* All statistical analyses adhered to a significance threshold of α = 0.05, with 95% confidence intervals reported for effect estimates. Adjustments for multiple comparisons were implemented using the Benjamini-Hochberg procedure to control the false discovery rate.

**Statistical Analyses**

All statistical analyses were conducted in R (version 4.3.2), adhering to recommended practices for Knowledge, Attitudes, and Practices (KAP) survey reporting in public and environmental health research. Descriptive statistics were used to summarize demographic characteristics and individual KAP items, including frequencies and percentages for categorical variables and medians with interquartile ranges for composite scores.

Bivariate analyses were first conducted to explore associations between demographic variables and KAP domains. Binary and categorical associations were evaluated using Chi-squared tests with Cramér's V used to quantify effect sizes, with values ≥ 0.1 considered meaningful. Continuous or ordinal outcomes were analyzed using Wilcoxon rank-sum tests, with rank-biserial correlation coefficients used to estimate effect size (threshold of |r| ≥ 0.3). Predictor-outcome pairs were selected for modeling based on statistical significance (p < 0.05) and theoretical relevance.

Multivariable regression models were constructed to assess independent predictors of each KAP domain, using the following specifications:

* **Knowledge score (CORRECTnum)** was modeled using Poisson regression or, where appropriate based on overdispersion tests, negative binomial regression.
* **Attitude score (ATTITUDEnum)** was modeled using ordinal logistic regression via the proportional odds model.
* **Practice score (PRACbin)** was modeled using binary logistic regression.
* **Interest in training (nTOPICS)** was modeled using Poisson regression.

In addition to composite domain scores, we conducted item-level multivariable models for individual Likert-type attitude questions (e.g., agreement with PPE use, disease monitoring importance, or risk perception). These ordinal outcomes were modeled using ordinal logistic regression with proportional odds, and predictor sets were drawn from relevant demographic, experiential, and knowledge-based variables.

Full models included all theoretically relevant and statistically supported predictors identified in bivariate analyses, and model selection was conducted using backward stepwise AIC via the stepAIC function from the MASS package. Model diagnostics included visual and statistical checks of residuals using the DHARMa package, evaluation of overdispersion where appropriate, and assessment of multicollinearity using variance inflation factors (VIF < 2). Effect sizes from final models were reported as incidence rate ratios (IRRs), odds ratios (ORs), or proportional odds, with 95% confidence intervals.

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| RESULTS |

*Metadata Characteristics*

* Data were collected between May 15 and September 20, 2024, using the Qualtrics platform.
  + Total responses received: 272
    - Excluded due to short duration taken to complete survey (< 5 minutes) or low completion (<70%): 72
    - Excluded due to participant ineligibility or flagged by Qualtrics: 60
  + Final analytic sample: 140 responses

Table X.

| **Variable** | **Mean** | **Median** | **SD** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- |
| QSCORE¹ | 0.88 | 0.90 | 0.12 | 0.5 | 1.0 |

¹ Quality Score generated by Qualtrics based on response patterns, timing, and other behavioral indicators. It ranges from 0 to 1, with higher values indicating a higher likelihood that the response is genuine and attentive (i.e., non-fraudulent or non-rushed).

Table X.

| **Completion (%)** | **Respondents** |
| --- | --- |
| 100 | 136 |
| 98 | 1 |
| 90 | 2 |
| 77 | 1 |

* The minimum recorded duration was 5.3 minutes, the maximum was 19,144.3 minutes (13.3 days), and the median was 10.6 minutes among the 140 surveys analyzed.
* Participants were permitted to leave and return to the survey at any time during the data collection window, which introduced substantial variation in recorded response durations.
  + To address this, we report response durations based on a trimmed dataset that includes only responses completed within a single uninterrupted session of ≤45 minutes (Table X).
    - Within this subset, 108 respondents (77.1%) completed the survey within the estimated duration window of 15–20 minutes

Table X.

| **Duration (min)** | **Respondents** | **Proportion (%)** |
| --- | --- | --- |
| 0–5 | 0 | 0.0 |
| 5–10 | 64 | 45.7 |
| 10–15 | 35 | 25.0 |
| 15–20 | 9 | 6.4 |

*Demographics*

* The average respondent age was 38.8 years (SD = 13.1), with a range from 20 to 67 years.
  + This age profile reflects a predominance of early- and mid-career professionals (Table X).
* There were approximately 2.7 males for every 1 female respondent in the sample.
* Nearly four out of five respondents (78.6%) held a bachelor’s degree or higher.
* Household income varied widely, with a right-skewed distribution (mean = $76,134; median bracket: $60,001–$70,000 estimated income).
* The occupational activity of respondents was primarily in land or wildlife management, followed by research, and education or administration roles.

Table X. Demographic Characteristics of Survey Respondents

| **Variable** | **Category** | **Count** | **Proportion (%)** |
| --- | --- | --- | --- |
| Age | 20–29 | 43 | 30.7 |
|  | 30–39 | 39 | 27.9 |
|  | 40–49 | 23 | 16.4 |
|  | 50–59 | 23 | 16.4 |
|  | 60+ | 12 | 8.6 |
| Gender | Male | 99 | 70.7 |
|  | Female | 37 | 26.4 |
|  | Prefer not to answer | 4 | 2.9 |
| Race | White | 130 | 92.9 |
|  | Black or African American | 2 | 1.4 |
|  | Asian | 1 | 0.7 |
|  | Other | 2 | 1.4 |
|  | Prefer not to answer | 5 | 3.6 |
| Ethnicity | Not Hispanic or Latino | 130 | 92.9 |
|  | Hispanic or Latino | 5 | 3.6 |
|  | Prefer not to answer | 5 | 3.6 |
| Education Level | < High School / No GED | 1 | 0.7 |
|  | High School Graduate / GED | 12 | 8.6 |
|  | Some College / Associate Degree | 13 | 9.3 |
|  | Technical / Vocational School | 1 | 0.7 |
|  | Bachelor’s Degree (BA/BS) | 60 | 42.9 |
|  | Graduate / Professional School | 53 | 37.9 |
| Annual Income | $0–20,000 | 23 | 16.4 |
|  | $20,001–30,000 | 7 | 5.0 |
|  | $30,001–40,000 | 5 | 3.6 |
|  | $40,001–50,000 | 6 | 4.3 |
|  | $50,001–60,000 | 11 | 7.9 |
|  | $60,001–70,000 | 8 | 5.7 |
|  | $70,001–80,000 | 9 | 6.4 |
|  | $80,001–90,000 | 8 | 5.7 |
|  | $90,001–100,000 | 16 | 11.4 |
|  | $100,001+ | 47 | 33.6 |
|  | Land/Wildlife Management | 78 | 55.7 |
|  | Research | 33 | 23.6 |
|  | Education | 9 | 6.4 |
|  | Administration | 10 | 7.1 |
|  | Consulting | 6 | 4.3 |
|  | Student | 1 | 0.7 |
|  | Other | 3 | 2.1 |

*Nearly 80% of respondents considered themselves wildlife biologists, though self-identification did not always align with formal certification or academic background. Respondents’ primary institutional affiliations varied, with most working in* ***state government (32%)****,* ***academic or research institutions (24%)****, or* ***federal government roles (16%)****. Fewer reported affiliations with nonprofit organizations, private industry, or professional societies.*

*Experience in the field also varied: about* ***one-quarter were relatively new to the profession (<1 year)****, while nearly* ***20% reported more than two decades of experience****. This variation in career tenure is relevant when considering attitudes and practices shaped by institutional memory, training exposure, and generational shifts in professional norms.*

*In terms of* ***primary activity****, a majority (56%) identified their role as focused on land or wildlife management, while others specialized in research (24%), administration (7%), education (6%), or consulting (4%). A small number of respondents selected “Other,” with open-text responses referencing veterinary medicine, student status, and policy engagement.*

*Knowledge*

Table X.

| **Statement** | **Answer** | **Correct** | **Certain** | **Reference** |
| --- | --- | --- | --- | --- |
| Wild pigs may serve as a source of infectious disease transmission to humans and domestic animals | True | 92.7% | 94.0% | [(Miller et al. 2017; Shitindo 2024)](https://sciwheel.com/work/citation?ids=10226562,17838082&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| Brucellosis affects reproduction in domestic animals but is not a concern for wildlife | False | 62.7% | 73.3% | [(Kithuka et al. 2025; Gual-Gonzalez et al. 2023)](https://sciwheel.com/work/citation?ids=17838084,17575839&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| CWD is primarily transmitted among cervids (deer/elk) through ticks | False | 82.0% | 96.0% | [(Bhattarai et al. 2024)](https://sciwheel.com/work/citation?ids=17838093&pre=&suf=&sa=0&dbf=0) |
| Avian influenza has been found in wild and domestic birds in Alabama | True | 80.7% | 85.3% | [(USDA 2025; Thompson et al. 2024)](https://sciwheel.com/work/citation?ids=17838080,17838091&pre=USDA&pre=&suf=&suf=&sa=1,0&dbf=0&dbf=0) |
| Avian influenza does not kill wildlife. | False |  |  | [(United States Department of Agriculture 2025; Thompson et al. 2024)](https://sciwheel.com/work/citation?ids=17838080,17838091&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| SARS-CoV-2 (COVID) can infect deer | True | 61.3% | 67.3% | [(Verma et al. 2024; Palmer et al. 2021)](https://sciwheel.com/work/citation?ids=17838085,17838095&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| SARS-CoV-2 from wildlife can infect humans | False | 58.7% | 58.7% | [(Bertin Mikolo et al. 2024; Gryseels et al. 2020)](https://sciwheel.com/work/citation?ids=17838086,10424454&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| Rabies has been found in all states that border Alabama | True | 90.0% | 96.7% | [(Kunkel et al. 2023; Davis et al. 2024)](https://sciwheel.com/work/citation?ids=17119149,17465434&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| How is rabies transmitted? | Bites | 76.0% | 80.7% | [(Karunarathna et al. 2024; Kumar et al. 2023)](https://sciwheel.com/work/citation?ids=17838099,16509229&pre=&pre=&suf=&suf=&sa=0,0&dbf=0&dbf=0) |
| How should you dispose of a fresh wild turkey carcass found in Alabama? | Incinerate | 56.0% | 69.3% | [(USDA 2023; ADAI 2023)](https://sciwheel.com/work/citation?ids=17838079,17838113&pre=USDA&pre=ADAI&suf=&suf=&sa=1,1&dbf=0&dbf=0) |

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| DISCUSSION |

able X. Attitudes Toward Wildlife Health and Education

| **Statement** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| --- | --- | --- | --- | --- | --- |
| PPE is necessary when handling wildlife | X% | X% | X% | X% | X% |
| Climate change poses a threat to wildlife health | X% | X% | X% | X% | X% |
| Wildlife biologists should be required to take a course in wildlife disease and zoonoses | X% | X% | X% | X% | X% |
| I would participate in a free, online course on wildlife health and zoonoses | X% | X% | X% | X% | X% |
| I would attend a free, one-day wildlife health and zoonoses symposium | X% | X% | X% | X% | X% |

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| APPENDICES |

## Appendix X – Study Instrument

Start of Block: Introduction

We are looking to understand the experiences, attitudes, and opinions of wildlife biologists in Alabama toward wildlife health to improve our understanding of the state of knowledge of wildlife professionals regarding zoonotic diseases. Understanding what YOU as a wildlife professional know and think about wildlife health will give YOU an actionable voice and seat at the table. This project is funded by the U.S. Fish and Wildlife Service and developed by personnel in Auburn University’s College of Forestry, Wildlife and Environment. Your survey responses will be anonymous, and no identifying factors will be collected. If you have any questions, comments, or concerns about the survey, please reach out to Rylee Tomey (rdt0029@auburn.edu). We greatly appreciate your input. To begin, click the next button below. Thank you for your participation.

End of Block: Introduction

Start of Block: Demographics

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What year were you born?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Do you live and/or work in Alabama

* Yes
* No

What is the zip code of your current residence? (5 digit zip code)

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Select the race that best describes you:

* American Indian or Alaskan Native
* Asian
* Black or African American
* Native Hawaiian or Other Pacific Islander
* White
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* I prefer not to answer

Do you identify with Latino, Hispanic, or Spanish origin?

* Yes
* No
* I prefer not to answer

What is your gender?

* Male
* Female
* Other
* I prefer not to answer

What was your approximate household income in 2019?

* $0-20,000
* $20,001-30,000
* $30,001-40,000
* $40,001-50,000
* $50,001-60,000
* $60,001-70,000
* $70,001-80,000
* $80,001-90,000
* $90,001-100,000
* $100,001+

What is the highest degree or level of education you have completed?

* Did not graduate high school/no GED
* High school graduate/GED
* Technical/Vocational School
* Some College/AA or AS (2-year degree)
* College Graduate/BA or BS (4-year degree)
* Graduate or Professional School

Do you have a degree in wildlife biology, ecology, or management or related field?

* Yes
* No

Are you certified by The Wildlife Society (TWS) as a wildlife biologist?

* Yes
* No

Have you taken a formal course on wildlife health?

* Yes
* No

(If ‘Yes’) When did you take a formal course on wildlife health?

* + <5 years
  + 5-10 years
  + >10 years

Do you consider yourself to be a wildlife biologist?

* Yes
* No

For how many years have you been employed as a wildlife biologist?

* <1 year
* 1-5 years
* 5-10 years
* 10-20 years
* >20 years

Which type of activities best describe the primary focus of your work in wildlife biology?

* Land/Wildlife Management
* Research
* Administration
* Consulting
* Education
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is your primary affiliation in the field of wildlife biology?

* Federal Government
* State/Provincial Government
* Private Industry
* Academic/Research Institution
* Nonprofit/Conservation Organization
* Tribal
* Professional Societies or Associations
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Block: Demographics

Start of Block: Practices & Activities

How frequently do you come into direct physical contact with wildlife in Alabama as part of your employment duties?

* Daily
* Weekly
* Monthly
* Rarely
* Never

What percentage of the time do you spend in the field as part of your employment duties? (Slider)

* 0%
* 10%
* 20%
* 30%
* 40%
* 50%
* 60%
* 70%
* 80%
* 90%
* 100%

Do you regularly collect samples in the field from wildlife in Alabama?

* Yes
* No

Do you regularly handle samples in the laboratory or field that have been collected from wildlife in Alabama?

* Yes
* No

(If ‘Yes’) When collecting samples, the animal is typically:

* + Alive - Not Sedated
  + Alive - Sedated
  + Dead

If you handle or collect samples from wildlife in Alabama, do you utilize personal protective equipment (PPE)?

* Yes
* No
* Not Applicable

How often do you use PPE when handling or collecting samples?

* Never (0%)
* Rarely (1%-24%)
* Sometimes (25%-75%)
* Usually (76%-99%)
* Always (100%)

In which counties do you regularly come into contact with wildlife in Alabama? Select all that apply.

|  |  |  |
| --- | --- | --- |
| * Autauga * Baldwin * Barbour * Bibb * Blount * Bullock * Butler * Calhoun * Chambers * Cherokee * Chilton * Choctaw * Clarke * Clay * Cleburne * Coffee * Colbert * Conecuh * Coosa * Covington * Crenshaw * Cullman * Dale | * Dallas * DeKalb * Elmore * Escambia * Etowah * Fayette * Franklin * Geneva * Greene * Hale * Henry * Houston * Jackson * Jefferson * Lamar * Lauderdale * Lawrence * Lee * Limestone * Lowndes * Macon * Madison * Marengo | * Marion * Marshall * Mobile * Monroe * Montgomery * Morgan * Perry * Pickens * Pike * Randolph * Russell * Saint Clair * Shelby * Sumter * Talladega * Tallapoosa * Tuscaloosa * Walker * Washington * Wilcox * Winston |

Did you have a hunting/trapping license for the state of Alabama in the past three years (2020-2023)?

* Yes
* No

End of Block: Practices & Activities

Start of Block: Health Knowledge

Wild pigs may serve as a source of infectious disease transmission to both humans and domestic animals in Alabama.

* True (Correct)
* False
* I don't know

Brucellosis affects reproduction in domestic animals but is not a concern for wildlife.

* True
* False (Correct)
* I don't know

Chronic Wasting Disease (CWD) is primarily transmitted among cervids (deer/elk) through ticks.

* True
* False (Correct)
* I don't know

Avian influenza has been found in wild and domestic birds in Alabama.

* True (Correct)
* False
* I don't know

Avian influenza does not kill wildlife.

* True
* False (Correct)
* I don't know

SARS CoV2 (COVID) can infect deer.

* True (Correct)
* False
* I don't know

SARS CoV2 (COVID) from wildlife can infect humans.

* True
* False (Correct)
* I don't know

Rabies has been found in ALL states that border Alabama.

* True
* False (Correct)
* I don't know

How is rabies transmitted?

* Bites (Correct)
* Blood
* Athropods
* Urine
* Feces
* I don't know

How should you dispose of a fresh wild turkey carcass that was found in Alabama?

* Incinerate (Correct)
* Bury
* Field dress and consumption
* Place in a dumpster
* Ignore
* I don't know

End of Block: Health Knowledge

Start of Block: Attitudes & Beliefs

CWD was present in Alabama before the 21st century

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

Bats are significant carriers of many infectious diseases in Alabama

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

Personal Protective Equipment (PPE) is necessary when conducting fieldwork that does not directly involve zoonotic diseases

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

Epizootic Hemorrhagic Disease (EHD) is a major threat to human health

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

The only way to deal with zoonotic diseases in wildlife (such as rabies) is to let nature take its course

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I believe that...* Reducing the population of certain wild species in affected areas will eliminate infectious diseases in Alabama

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I believe that...* Current plans to manage wildlife populations in Alabama will be effective in controlling infectious diseases

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I believe that…* Surveillance is essential to successful infectious disease management

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I believe that...* The vaccination of wildlife, such as for rabies, should be considered for other diseases

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I am concerned…* About the current prevalence of wildlife diseases in Alabama

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I am concerned...* That infectious diseases will affect Alabama’s biodiversity

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I am concerned...* That wildlife diseases in my region will affect my health or my family’s health today.

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

*I am concerned...* That climate change will impact wildlife health in Alabama.

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

End of Block: Attitudes & Beliefs

Start of Block: Interest

A course on wildlife health should be required for a major in wildlife biology

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

Information on wildlife health can be acquired through continuing education rather than in undergraduate courses

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

All critical elements (including aspects of wildlife health) can be acquired through on-the-job training and experience

* Strongly Agree
* Agree
* Neutral
* Disagree
* Strongly Disagree

Is the information you need regarding wildlife health in Alabama easily accessible to you?

* Yes
* No

What is your preferred source to obtain information regarding wildlife health in Alabama? Please select all that apply.

* Friends/Family
* State Wildlife Agency
* Academic Publications
* Social Media
* News Sources
* Conferences
* I have not looked for health information
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Would you be interested in learning more about wildlife health in Alabama?

* Yes
* No
* Unsure

If there was a free course on wildlife health in Alabama, how would you like to participate? Please select all that apply.

* One day, in-person conference
* One day, virtual conference
* Year-long, once a month, virtual conference
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What topics would you like to obtain more information regarding wildlife health in Alabama? Please select all that apply.

* Rabies
* Influenza
* Leptospirosis
* Raccoon roundworm
* Vector borne diseases
* CWD
* SarsCoV2
* One Health
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End of Block: Education

Start of Block: Final Remarks

Please write any additional comments, questions, or concerns below

End of Block: Final Remarks

## Appendix X – Processed Variables