



NATIONAL FLYWAY COUNCIL
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Implementation Plan for Avian Influenza Surveillance in Waterfowl in the United States

Summer 2024 – Spring 2025



10 July 2024

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INTRODUCTION

This document describes the plan to implement national level surveillance for avian influenza viruses (AIVs) in wild waterfowl. Collaborating entities include the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) National Wildlife Disease Program (NWDP) and Veterinary Services (VS); the U.S. Department of the Interior (DOI) U.S. Geological Survey (USGS) and U.S. Fish and Wildlife Service (USFWS); and the National Flyway Council. The Implementation Plan supports the collection of biological samples, diagnostic testing, data management, and analysis of data obtained by USDA-APHIS-Wildlife Services (WS), other Federal agencies, State wildlife agencies, Universities, and Tribal cooperators.

HPAI SURVEILLANCE GOALS

The goals of this surveillance effort are to maximize our ability to detect and identify the distribution of AIVs in wild waterfowl in the U.S., detect spread of AIVs to new areas of concern, and monitor wild duck populations for introductions of novel viruses (e.g., Eurasian lineage H5 and H7).

The plan focuses on sample collection at the watershed level (HUC4 sub-regional watersheds), and specific watersheds have been selected for sample collection. Watersheds were selected based on areas that have a high mixing of wild bird populations (sometimes from multiple flyways) and previous evidence of influenza infections in wild birds. Sample numbers were based on dabbling duck data from eBird and on populations data from the U.S. Fish and Wildlife Service. If targeted sample numbers are reached within each specified watershed, we can determine with 95% confidence whether the AIVs of interest are present at the time of the surveillance.

IMPLEMENTATION PLAN

1. SAMPLE NUMBERS AND SPECIES

- a. **The sample target numbers are listed in [Appendix 1](#) and apply only to apparently healthy dabbling and diving ducks. This plan does not address any other bird groups or morbidity/mortality samples.**
- b. **The models used to identify priority watersheds and generate target numbers are adaptive and updated annually to incorporate surveillance data from the previous year. Watersheds and target numbers are expected to change each year as duck populations, AIV detections, and other spatial and temporal variables change.**
- c. A list of target species can be found in [Table 1](#). The Fulvous Whistling duck is not taxonomically a dabbling duck, but because of its foraging habits it is included in the same functional group for purposes of this surveillance plan.
- d. Captive-reared and released ducks that are subsequently live-captured or hunter-harvested may be swabbed like any other dabbling duck and will be counted in the watershed target numbers.

2. WHAT TO COLLECT

- a. The target sample numbers in this manual represent samples collected from agency harvested birds, hunter harvested birds, and live wild birds.
- b. One cloacal and one oropharyngeal swab will be collected from each wild bird sampled. Cloacal and oropharyngeal swabs will be combined in the same tube of media.

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Table 1. Target Species for Wild Bird AIV Surveillance

Dabbling Ducks	
American Green-winged Teal	Mallard
American Black Duck	Mottled Duck
American Wigeon	Muscovy Duck
Blue-winged Teal	Northern Pintail
Cinnamon Teal	Northern Shoveler
Fulvous Whistling Duck	Wood Duck
Gadwall	
Diving Ducks	
Bufflehead	Lesser Scaup
Barrow's Goldeneye	Long-tailed Duck
Black Scoter	Red-breasted Merganser
Canvasback	Redhead
Common Eider	Ring-necked Duck
Common Goldeneye	Ruddy Duck
Common Merganser	Spectacled Eider
Common Pochards	Steller's Eider
Greater Scaup	Surf Scoter
Harlequin Duck	Tufted Duck
Hooded Merganser	White-winged Scoter
King Eider	

3. WHEN TO COLLECT

- Sample collection will occur from May 2024 through April 2025.
- There are three seasons in a sampling year: Summer (May – August), Fall (September – November), and a combined Winter/Spring season (December – April). [Appendix 1](#) lists the target sample numbers for each season. Generally, these seasons are intended to correspond with different stages of a bird's annual cycle: Summer = end of breeding season, Fall = fall migration, Winter/Spring = birds on their wintering grounds and spring migration. Because birds may experience these stages at different times depending on the collection site, bird migratory patterns, and climate, there is some flexibility in season cutoff dates if needed. **Contact the NWDP if you have questions about season cutoff dates for your area.**
- It is best to collect a smaller number of samples during repeated sampling efforts than to collect all of a season's target numbers in 1-2 visits. Spacing out sampling collections over time provides a more accurate estimate of AIV activity on the landscape.

4. WHERE TO COLLECT

A U.S. map of Hydrologic Unit Code 4 (HUC4) watersheds is shown in [Figure 1](#), and maps of target watershed for each season are shown in [Appendix 2](#). Full page maps of watersheds in each state are available upon request. There is flexibility in watersheds and seasonal targets when on-the-ground conditions deviate from what was anticipated (e.g., no capture opportunities in a watershed due to drought). **Please contact the NWDP if you know that changes need to be made to watershed or seasonal targets.**

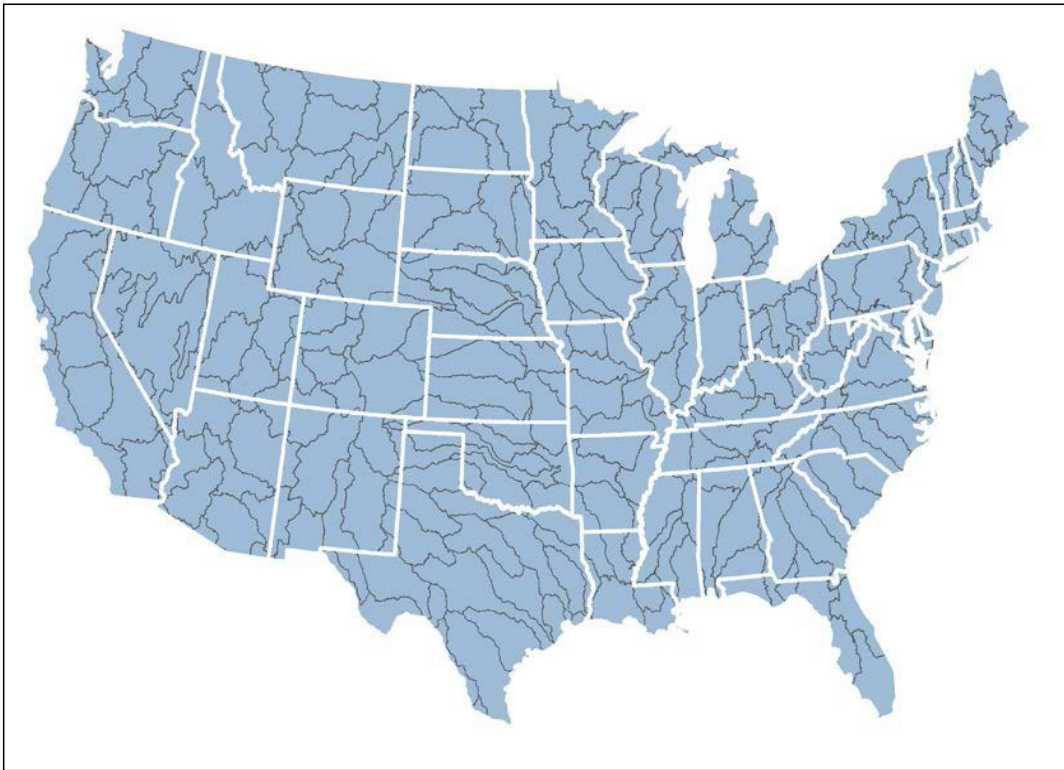


Figure 1. Sub-region watershed (hydrologic unit code 4) map of the continental United States. Watershed boundaries are in gray, state boundaries are in white.

5. SAMPLE SUBMISSION

All samples will be submitted to one of the pre-approved National Animal Health Laboratory Network (NAHLN) laboratories. [Appendix 3](#) lists the names and contact phone numbers of participating laboratories. The NWDP has established Blanket Purchase Agreements (BPA's) with each lab. Each state is assigned to a specific laboratory to use for diagnostics. **Samples shipped to non-contracted labs will not be covered by the NWDP and will be the responsibility of submitting states.** The NAHLN lab will screen samples to determine if type A influenza virus is present; if the test is positive, the NAHLN lab will further analyze the sample using H5- and H7-specific assays. The NAHLN lab will send all samples testing positive for any AIV (including samples testing positive for H5 or H7) to NVSL for sequencing/subtyping.

6. PERMITS

The NWDP has a “blanket” scientific collecting permit from USFWS that includes all States except Hawaii. The permit covers the swabbing of most species collected as live birds or hunter harvest by Wildlife Services personnel. **Agency harvest for the sole purpose of disease sampling is only permitted during emergency zoonotic disease outbreaks. Unless directed by the NWDP Emergency Response staff, do not lethally take birds for the sole purpose of disease sampling.** Wildlife Services personnel must have a copy of this permit in the field when sampling. State agency cooperators and banders will need their own permits from USFWS and the USGS Bird Banding Laboratory for live-capture activities, as usual. If HPAI swabbing of live birds is to be conducted as a ‘piggyback’ activity, the banding permit must be amended to allow this activity. The NWDP will complete and submit the annual reporting requirements outlined in the permit for all states collecting wild bird samples. To avoid submitting duplicate copies of reports, State WS offices should not submit their own copies of the annual report to USFWS. For a copy of the

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USFWS permit, see the document “Wild Bird Avian Influenza Surveillance – Field Procedures Manual” or contact the NWDP.

7. COORDINATION WITH OTHER AGENCIES

Sample collection can include efforts by federal, state, Tribal, local, university, and non-governmental participants as needed. Samples intended to count toward watershed target numbers must be entered into the APHIS Veterinary Services Laboratory Submission System (VSLS—see below), regardless of which agency collects the samples.

8. REPORTING FIELD DATA

Each biologist is responsible for entering field data directly into the APHIS Veterinary Services Laboratory Submission System application (VSLS) (<http://vsapps.aphis.usda.gov/vslabsub/login.do>) **within 24 hours** of submitting samples to the laboratory. Each biologist is also responsible for emailing electronic copies of data forms to NWDPData@usda.gov **within 24 hours** of submitting samples to the laboratory. Results may be requested only after field data is entered into the system and results have been received from the diagnostic lab. For new user accounts, please refer to the directions in the document “Wild Bird Avian Influenza Surveillance – Field Procedures Manual.”

MORBIDITY AND MORTALITY SURVEILLANCE

Agencies should investigate wild bird morbidity/mortality events regardless of the time of year, species involved, or the number of samples already collected in the state. **Morbidity/mortality samples do not count towards meeting the watershed targets, as morbidity/mortality events have a different disease risk associated with them, and the data are analyzed differently than those of apparently healthy birds (live-capture and hunter harvest).**

The [USGS National Wildlife Health Center](#) (NWHC) in Madison, WI, is our primary partner for performing diagnostics related to morbidity/mortality events and can provide guidance on the investigation, sampling, and diagnostics for observed avian mortality. Briefly, the NWHC guidance for specimen collection from mortality is to collect and submit whole carcasses. **Do not collect swabs from carcasses submitted to the NWHC. Always contact the NWHC for guidance prior to submitting samples. Sample types submitted will be determined on a case-by-case basis.** The NWHC should be contacted by phone (608-270-2480) or email (NWHC-epi@usgs.gov) prior to shipping any carcass. If NWHC declines to test samples from a morbidity/mortality event and you are still interested in getting results, contact the NWDP.

State or regional veterinary diagnostic laboratories may also be used in morbidity/mortality investigations. Contact your local lab for sample submission instructions. **PLEASE NOTIFY YOUR STATE WILDLIFE SERVICES OFFICE AND THE NWDP IF YOU ARE SENDING MORTALITY SAMPLES TO A STATE OR REGIONAL LABORATORY. If a lab requests multiple sample types (e.g., 3 carcasses and swabs from all other birds involved in the morbidity/mortality event), please keep all samples from the same event together and submit to only one lab.**

OTHER SURVEILLANCE STRATEGIES

Other strategies such as environmental (fecal) sampling and sentinels are useful in specific situations but are not part of this surveillance plan.

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**APPENDIX 1. Number of Wild Bird Samples to be Collected by State,
2024-2025 Surveillance Year**

Watershed by State	Summer (May - Aug) Sample Numbers	Fall (Sep - Nov) Sample Numbers	Winter/ Spring (Dec - Apr) Sample Numbers	Grand Total
Alabama				
Middle Tennessee-Elk	176	0	212	388
Alaska				
Lower Yukon River	330	0	0	330
Middle Yukon River	330	330	0	660
South Central Alaska	330	330	330	990
Southeast Alaska	0	330	0	330
Arizona				
Lower Colorado	0	324	0	324
Arkansas				
Lower Arkansas	0	0	204	204
Lower Mississippi-St. Francis	0	244	244	488
California				
Klamath-Northern California Coastal	312	0	0	312
Sacramento	0	332	332	664
San Francisco Bay	0	0	330	330
Tulare-Buena Vista Lakes	0	326	328	654
Colorado				
North Platte	0	150	150	300
Rio Grande Headwaters	311	318	0	629
South Platte	0	0	327	327
Connecticut				
Connecticut Coastal	0	0	304	304
Delaware				
Delaware-Mid Atlantic Coastal	0	108	112	220
Florida				
Southern Florida	0	0	325	325
St. Johns	0	323	324	647
Georgia				
Apalachicola	0	275	0	275
Hawaii				
Oahu	N/A*	N/A*	N/A*	N/A*
Idaho				
Middle Snake	280	0	0	280
Upper Snake	305	0	323	628

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Watershed by State	Summer (May - Aug) Sample Numbers	Fall (Sep - Nov) Sample Numbers	Winter/ Spring (Dec - Apr) Sample Numbers	Grand Total
Illinois				
Lower Illinois	0	322	325	647
Upper Mississippi-Kaskaskia-Meramec	0	324	328	652
Indiana				
Upper Illinois	0	289	295	584
Wabash	0	311	0	311
Iowa				
Des Moines	0	318	0	318
Upper Mississippi-Iowa-Skunk-Waps	0	307	0	307
Upper Mississippi-Maquoketa-Plum	0	322	0	322
Kansas				
Kansas	0	165	0	165
Middle Arkansas	0	322	327	649
Neosho-Verdigris	0	168	0	168
Kentucky				
Lower Ohio	0	0	264	264
Louisiana				
Boeuf-Tensas	0	0	333	333
Louisiana Coastal	0	333	333	666
Maine				
Kennebec	269	287	0	556
Penobscot	221	0	0	221
Saco	142	0	0	142
St. John	290	0	0	290
Maryland				
Lower Chesapeake	0	150	150	300
Massachusetts				
Connecticut	52	58	58	168
Merrimack	0	30	66	96
Michigan				
Southeastern Lake Michigan	314	0	318	632
Southwestern Lake Huron-Lake Huron	0	306	0	306
St. Clair-Detroit	320	316	0	636
Minnesota				
Minnesota	329	328	331	988
Mississippi Headwaters	0	315	0	315
Red	124	124	0	248
St. Croix	0	127	0	127
Upper Mississippi-Black-Root	0	172	0	172

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Watershed by State	Summer (May - Aug) Sample Numbers	Fall (Sep - Nov) Sample Numbers	Winter/ Spring (Dec - Apr) Sample Numbers	Grand Total
Mississippi				
Lower Mississippi-Big Black	0	0	332	332
Lower Mississippi-Yazoo	0	333	333	666
Missouri				
Lower Mississippi-St. Francis	0	83	83	166
Lower Missouri	0	0	332	332
Montana				
Kootenai-Pend Oreille-Spokane	0	323	0	323
Missouri-Marias	326	325	0	651
Nebraska				
Kansas	0	152	0	152
Nevada				
Central Lahontan	0	328	0	328
New Hampshire				
Connecticut	134	150	149	433
Merrimack	0	318	276	594
Saco	97	0	0	97
New Jersey				
Delaware-Mid Atlantic Coastal	76	82	85	243
New Mexico				
Rio Grande-Elephant Butte	0	0	322	322
Upper Pecos	0	324	0	324
New York				
Southeastern Lake Ontario	0	0	318	318
Southwestern Lake Ontario	0	271	0	271
North Carolina				
Chowan-Roanoke	180	0	83	263
Neuse-Pamlico	0	319	324	643
North Dakota				
James	0	232	0	232
Missouri-Oahe	0	232	333	565
Red	148	147	0	295
Ohio				
Muskingum	0	264	0	264
Upper Ohio	99	113	0	212
Western Lake Erie	0	291	306	597
Oklahoma				
Lower Arkansas	0	0	120	120
Neosho-Verdigris	0	107	0	107

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Watershed by State	Summer (May - Aug) Sample Numbers	Fall (Sep - Nov) Sample Numbers	Winter/ Spring (Dec - Apr) Sample Numbers	Grand Total
Oregon				
Middle Columbia	0	319	0	319
Oregon Closed Basins	330	327	0	657
Willamette	295	0	330	625
Pennsylvania				
Delaware-Mid Atlantic Coastal	100	0	0	100
Susquehanna	0	0	287	287
Upper Ohio	54	62	0	116
Puerto Rico				
Puerto Rico	N/A*	N/A*	N/A*	N/A*
Rhode Island				
MA-RI Coastal	308	0	318	626
South Carolina				
Edisto-Santee	0	0	383	383
South Dakota				
James	0	100	0	100
Missouri-Oahe	0	100	0	100
Tennessee				
Lower Mississippi-Hatchie	0	0	332	332
Texas				
Brazos Headwaters	0	332	0	332
Neches	0	0	298	298
Trinity	0	325	0	325
U.S. Virgin Islands				
Virgin Islands	N/A*	N/A*	N/A*	N/A*
Utah				
Bear	0	324	0	324
Great Salt Lake	330	333	0	663
Vermont				
NE Lake Ontario-Lake Ontario- St. Lawrence	0	307	0	307
Virginia				
Chowan-Roanoke	0	0	175	175
Lower Chesapeake	0	148	154	302
Potomac	158	0	0	158
Washington				
Lower Columbia	0	325	0	325
Puget Sound	302	329	0	631
Upper Columbia	0	322	0	322

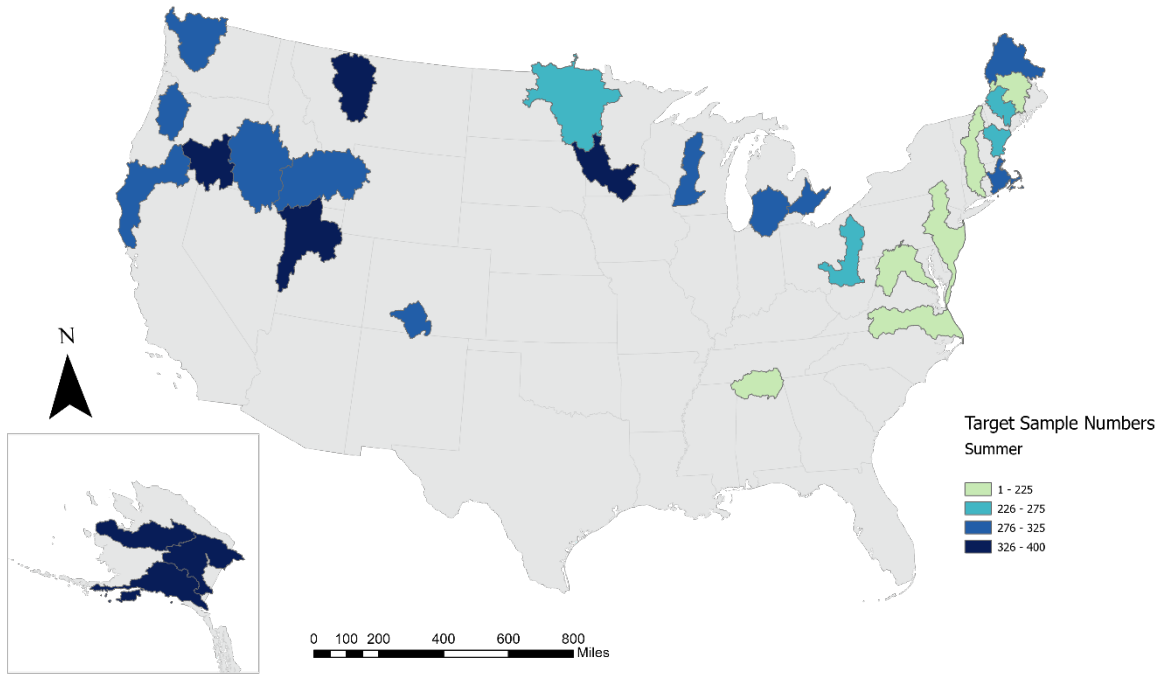
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Watershed by State	Summer (May - Aug) Sample Numbers	Fall (Sep - Nov) Sample Numbers	Winter/ Spring (Dec - Apr) Sample Numbers	Grand Total
West Virginia				
Potomac	61	0	0	61
Upper Ohio	82	93	0	175
Wisconsin				
Northwestern Lake Michigan	0	304	0	304
St. Croix	0	149	0	149
Upper Mississippi-Black-Root	0	141	0	141
Wisconsin	309	0	0	309
Wyoming				
North Platte	0	158	156	314
Grand Total	7,824	17,676	12,802	38,302

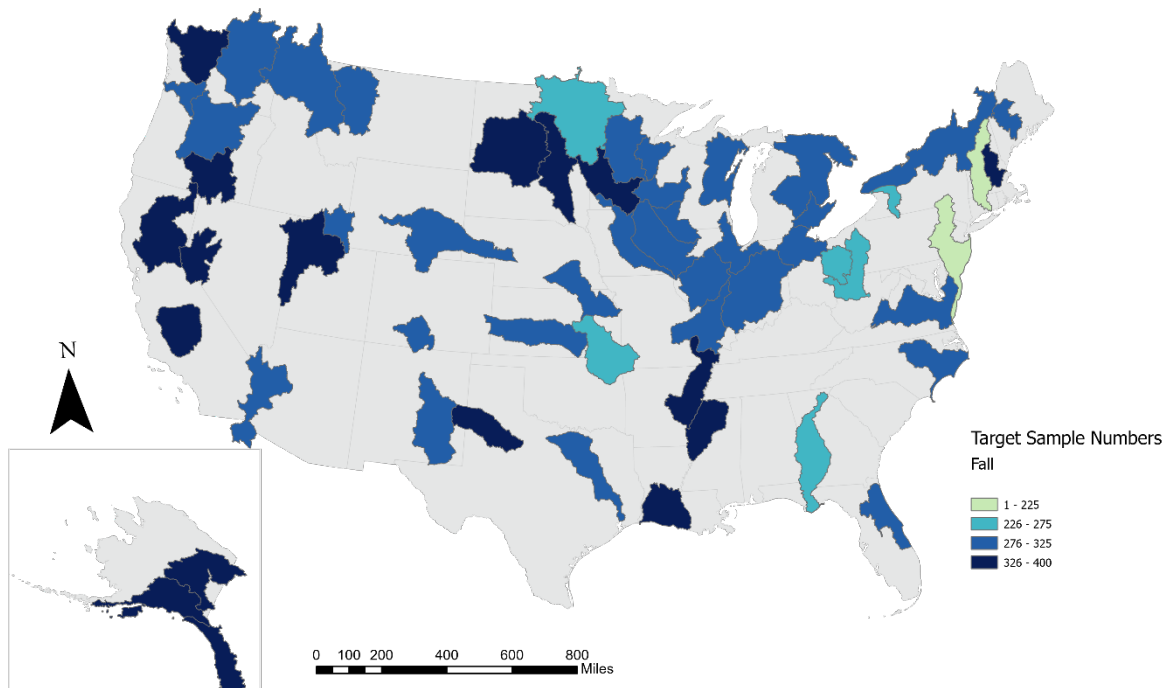
*Opportunistic sampling will occur in Hawaii, Puerto Rico, and U.S. Virgin Islands. No target numbers have been assigned to these States/Territories. Samples from these regions may also include wild bird species other than dabbling and diving ducks.

APPENDIX 2. Maps of Target Watersheds by Season

Summer (May – Aug):

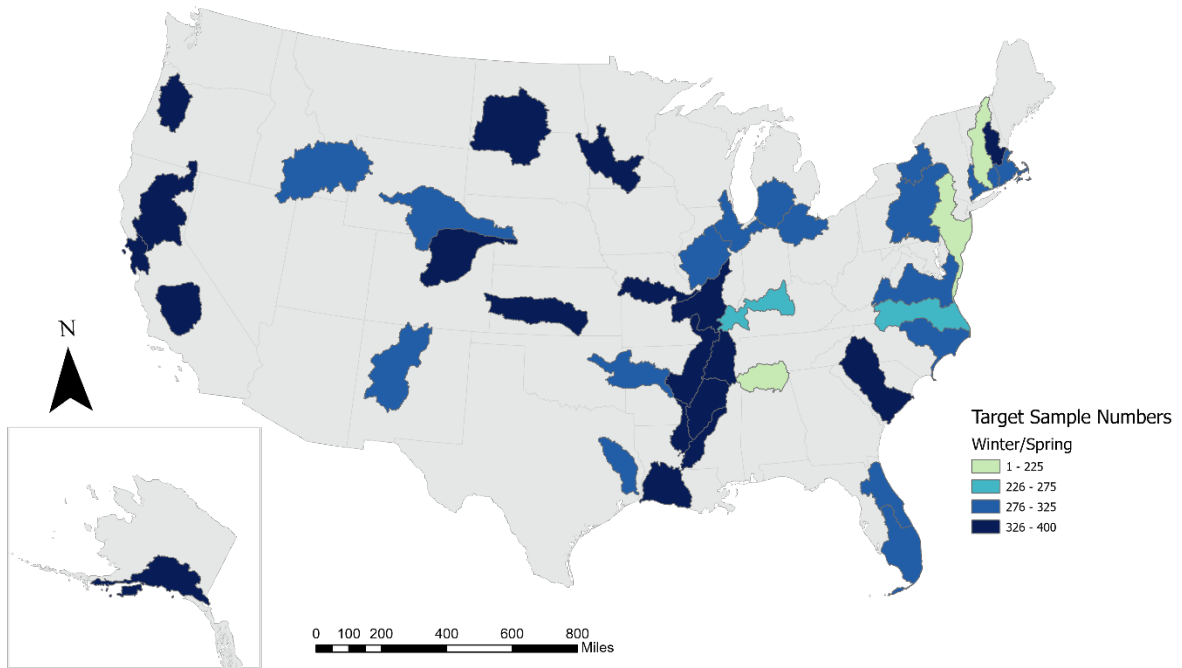


Fall (Sep – Nov):



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Winter/Spring (Dec – Apr):



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APPENDIX 3. Participating NAHLN Laboratories

STATES	NAHLN LAB	SHIPPING ADDRESS	TELEPHONE
AK, AZ, CA, HI, NV	California Animal Health & Food Safety Laboratory PO# Contact NWDP	California Animal Health & Food Safety Laboratory University of California, School of Vet Med 620 West Health Science Drive Davis, California 95616	Phone: 530-752-8709
ID, MT, OR, UT, WA	Oregon State University Veterinary Diagnostic Lab PO# Contact NWDP	Oregon State University Veterinary Diagnostic Laboratory Magruder Hall 134 700 SW 30th St Corvallis, Oregon 97331-8628	Phone: 541-737-3261
FL, ME, NH, NC, VT, PR/USVI	Bronson Animal Disease Diagnostic Laboratory PO# Contact NWDP	Bronson Animal Disease Diagnostic Laboratory 2700 North John Young Parkway Kissimmee, Florida 34741	Phone: 321-697-1400
GA, NJ, NY, SC, VA, WV	Animal Health Diagnostic Center College of Vet Med, Cornell University PO# Contact NWDP	Animal Health Diagnostic Center College of Veterinary Medicine Cornell University 240 Farrier Road Ithaca, New York 14853-8002	Phone: 607-253-3900
CT, DE, MD, MA, PA, RI	Pennsylvania Veterinary Laboratory PO# Contact NWDP	PA Veterinary Laboratory, Pennsylvania Department of Agriculture 2305 North Cameron Street, Harrisburg, PA 17110	Phone: 717-787-8808
IL, IN, MI, OH	Michigan State University Veterinary Diagnostic Laboratory PO# Contact NWDP	Michigan State University Veterinary Diagnostic Laboratory College of Veterinary Medicine 4125 Beaumont Road Lansing, MI 48910	Phone: 517-353-0635
AL, AR, IA, KY, LA, MS, MO, TN	Mississippi State University Veterinary Research and Diagnostic Lab PO# Contact NWDP	Mississippi Veterinary Research & Diagnostic Laboratory 3137 Highway 468 West Pearl, MS 39208	Phone: 601-420-4768
MN, NM, ND, SD, WY	Colorado State University College of Veterinary Medicine PO# Contact NWDP	Colorado State University Veterinary Diagnostic Laboratory 2450 Gillette Drive Fort Collins, CO 80526	Phone: 970-297-1281
KS, NE, OK, TX, WI	Kansas State University, Diagnostic Laboratory PO# Contact NWDP	Kansas State Veterinary Diagnostic Laboratory 2005 Research Park Manhattan, KS 66502	Phone: 785-532-5651
CO	Wildlife Disease Diagnostic Laboratory (WDDL) PO# Contact NWDP	Wildlife Disease Diagnostic Laboratory (WDDL) Attn: Jeffrey Chandler 4101 LaPorte Ave Fort Collins, CO 80521	Phone: 970-266-6090

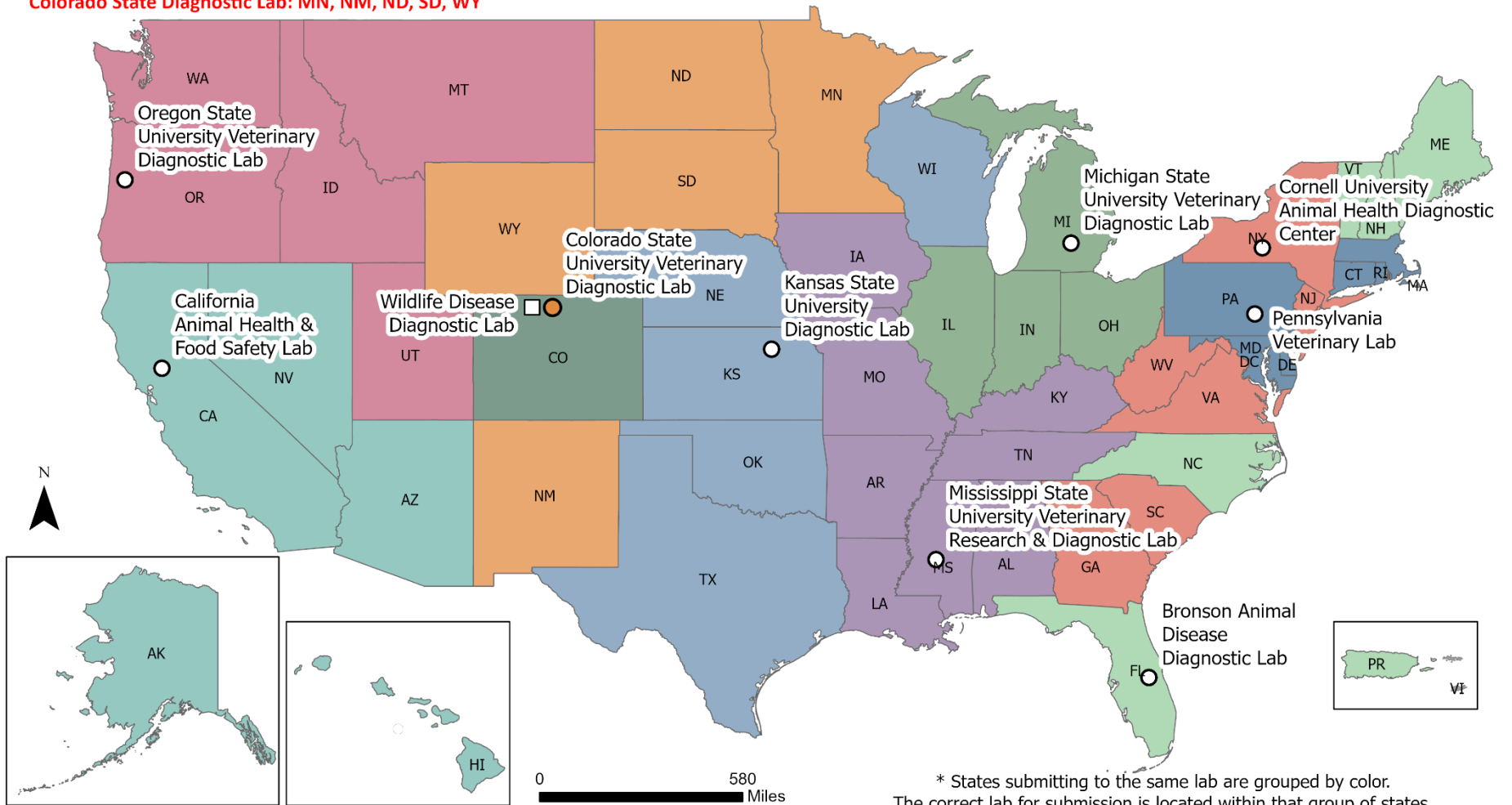
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NAHLN Lab State Assignments* 2024-2025 WS Wild Bird Surveillance

Wildlife Disease Diagnostic Lab: CO

Colorado State Diagnostic Lab: MN, NM, ND, SD, WY



* States submitting to the same lab are grouped by color. The correct lab for submission is located within that group of states.