

## Supplemental Material:

**Supplemental Table S1: Bivariable associations between IAV prevalence and explanatory variables**

Variables	Categories	Estimate	p-value	OR	95% CI
Abundance of wild birds	Low (< 883)	Reference			
	High ( $\geq$ 883)	0.45	0.365	1.57	(0.59-4.13)
Species richness	Low (< 29 sp)	Reference			
	High ( $\geq$ 29 sp)	0.15	0.764	1.17	(0.42-3.21)
Abundance of migrants	Low (< 113)	Reference			
	High ( $\geq$ 113)	0.8135	0.045**	2.26	(1.04 -5.74)
NDVI	Low (< 0.27)	Reference			
	High ( $\geq$ 0.27)	1.23	0.0264**	3.44	(1.15- 8.24)
NDVI 1 month bs	Low (< 0.27)	Reference			
	High ( $\geq$ 0.27)	-0.3195	0.617	0.73	(0.21-2.53)
NDVI 2 month bs	Low (< 0.27)	Reference			
	High ( $\geq$ 0.27)	-0.1149	0.901	0.89	(0.14- 5.41)
NDVI 3 month bs	Low (< 0.27)	Reference			
	High ( $\geq$ 0.27)	-0.6823	0.429	0.59	(0.15- 3.21)
Water body size (km2)	Low (< 0.014)	Reference			
	High ( $\geq$ 0.014)	0.6600	0.31	1.93	(0.54 -6.92)
Water body size 1 month bs	Low (< 0.018)	Reference			
	High ( $\geq$ 0.018)	0.8250	0.167	2.28	(0.71 -7.35)
Water body size 2 month bs	Low (< 0.016)	Reference			
	High ( $\geq$ 0.016)	0.4756	0.607	1.61	(0.26- 9.85)
Water body size 3 month bs	Low (< 0.013)	Reference			
	High ( $\geq$ 0.013)	-0.2155	0.687	0.81	(0.28- 2.29)
Maximum temperature (°C)	Low (< 26)	Reference			
	High ( $\geq$ 26)	-0.09148	0.859	0.92	(0.33- 2.50)
Maximum temperature 1 month bs	Low (< 23)	Reference			
	High ( $\geq$ 23)	-0.4908	0.323	1.14	(0.42- 3.11)
Maximum temperature 2 month bs	Low (< 24)	Reference			
	High ( $\geq$ 24)	0.4483	0.37	1.56	(0.58- 4.17)
Maximum temperature 3 month bs	Low (< 20)	Reference			
	High ( $\geq$ 20)	0.2514	0.623	1.29	(0.47- 3.51)
Minimum temperature (°C)	Low (< 13.5)	Reference			
	High ( $\geq$ 13.5)	0.4812	0.367	1.62	(0.56 -4.59)
Minimum temperature 1 month bs	Low (< 14.2)	Reference			
	High ( $\geq$ 14.2)	0.1340	0.793	1.14	(0.42 -3.11)
Minimum temperature 2 month bs	Low (< 13.4)	Reference			

	High ( $\geq 13.4$ )	-0.3620	0.474	0.69	(0.26- 1.87)
Minimum temperature 3 month bs	Low ( $< 14.5$ )	Reference			
	High ( $\geq 14.5$ )	0.2011	0.695	1.28	(0.47 -3.51)
Humidity (%)	Low ( $< 61.5$ )	Reference			
	High ( $\geq 61.5$ )	-0.6116	0.224	0.54	(0.203-1.45)
Humidity 1 month bs	Low ( $< 61.9$ )	Reference			
	High ( $\geq 61.9$ )	0.2384	0.645	1.27	(0.46-3.50)
Humidity 2 month bs	Low ( $< 62.7$ )	Reference			
	High ( $\geq 62.7$ )	0.1391	0.792	1.15	(0.41-3.24)
Humidity 3 month bs	Low ( $< 62.7$ )	Reference			
	High ( $\geq 62.7$ )	0.1162	0.823	1.12	(0.41-3.11)

**Supplemental Table S2: Sampling effort detail. Total number of samples collected in the study period, number of positive samples, samples inoculated in eggs and successfully sequenced.**

Number of samples collected	Number of samples positive for M gene (Ct<38)	Number of samples inoculated in eggs (Ct<35)	Number of isolates	Number of completely sequenced isolates
4349	90	35	16	10

**Supplemental Table S3. Species identified in the Lluta River wetland between September 2015 and October 2020.**

Family / Bird species	Commun Name	Maximum count on site	Residency Status
<b>Anatidae</b>			
<i>Spatula cyanoptera</i>	Cinnamon teal	36	R
<i>Anas bahamensis</i>	White-cheeked pintail	40	R
<i>Anas georgica spinicauda</i>	Yellow-billed Pintail	2	R
<i>Spatula discors</i>	Blue-winged teal	1	A (M)
<i>Oxyura jamaicensis</i>	Andean duck	1	A
<b>Charadriidae</b>			
<i>Pluvialis dominica</i>	Golden plover	25	M
<i>Charadrius nivosus</i>	Snowy plover	2	R
<i>Charadrius semipalmatus</i>	Semipalmated Plover	30	M
<i>Charadrius vociferus peruvianus</i>	Killdeer	10	R

<i>Pluvialis squatarola</i>	Grey Plover	8	M
<b>Laridae</b>			
<i>Chroicocephalus serranus</i>	Andean gull	350	R
<i>Chroicocephalus maculipennis</i>	Brown-hooded gull	300	R
<i>Leucophaeus pipixcan</i>	Franklin gull	2300	M
<i>Larus dominicanus</i>	Kelp gull	300	R
<i>Larus belcheri</i>	Belcher's Gull	60	R
<i>Leucophaeus modestus</i>	Grey gull	3000	R
<i>Thalasseus elegans</i>	Elegant tern	90	M
<i>Larosterna inca</i>	Inca Tern	25	R
<i>Sterna hirundinacea</i>	South American tern	3	R
<i>Sternula antillarum</i>	Least Tern	1	A (M)
<i>Rynchops niger cinerascens</i>	Black Skimmer	66	M
<b>Scolopacidae</b>			
<i>Calidris canutus</i>	Red Knot	1	M
<i>Calidris alba</i>	Sanderling	700	M
<i>Calidris bairdii</i>	Baird's sandpiper	8	M
<i>Arenaria interpres</i>	Ruddy turnstone	8	M
<i>Calidris pusilla</i>	Semipalmated Sandpiper	6	M
<i>Calidris himantopus</i>	Stilt Sandpiper	15	M
<i>Calidris minutilla</i>	Least sandpiper	2	M
<i>Tringa semipalmata</i>	Willet	19	M
<i>Actitis macularius</i>	Spotted sandpiper	5	M
<i>Calidris melanotos</i>	Pectoral sandpiper	2	M
<i>Phalaropus tricolor</i>	Wilson's Phalarope	8	M
<i>Numenius phaeopus</i>	Whimbrel	500	M
<i>Limosa haemastica</i>	Hudsonian Godwit	16	M
<i>Tringa flavipes</i>	Lesser Yellowlegs	10	M
<i>Tringa melanoleuca</i>	Greater Yellowlegs	50	M
<b>Haematopodidae</b>			
<i>Haematopus palliatus palliatus</i>	American oystercatcher	123	R
<i>Haematopus ater</i>	Blackish oystercatcher	18	R
<b>Ardeidae</b>			
<i>Egretta caerulea</i>	Little Blue Heron	8	R
<i>Bubulcus ibis ibis</i>	Cattle Egret	1	R
<i>Egretta thula thula</i>	Snowy egret	30	R
<i>Ardea alba egretta</i>	Great egret	30	R
<i>Egretta tricolor</i>	Tricolored Heron	1	A
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	84	R
<i>Nyctanassa violacea</i>	Yellow-crowned Night-Heron	1	A
<b>Rallidae</b>			
<i>Fulica leucoptera</i>	White-winged Coot	1	R

<i>Fulica ardesiaca</i>	Slate-colored Coot	20	A
<i>Gallinula galeata</i>	Common Gallinule	32	R
<b>Pelecanidae</b>			
<i>Pelecanus thagus</i>	Peruvian Pelican	60	R
<i>Sula variegata</i>	Peruvian Booby	20	R
<b>Threskiornithidae</b>			
<i>Plegadis chihi</i>	White-faced Ibi	3	R
<i>Platalea ajaja</i>	Roseate Spoonbill	1	A
<i>Plegadis ridgwayi</i>	Puna Ibis	4	A
<b>Phalacrocoracidae</b>			
<i>Phalacrocorax brasilianus brasilianus</i>	Neotropic Cormorant	42	R
<b>Falconidae</b>			
<i>Falco sparverius</i>	American Kestrel	2	R
<i>Falco peregrinus</i>	Peregrine falcon	1	R
<b>Tyrannidae</b>			
<i>Lessonia oreas</i>	Andean Negrito	2	R
<i>Lessonia rufa</i>	Austral Negrito	2	R
<i>Muscisaxicola maculirostris</i>	Spot-billed ground tyrant	1	R
<i>Muscisaxicola maclovianus</i>	Dark-faced ground tyrant	1	R
<b>Troglodytidae</b>			
<i>Troglodytes aedon</i>	House wren	5	R
<b>Emberizidae</b>			
<i>Zonotrichia capensis</i>	Rufous-collared Sparrow	26	R
<b>Cathartidae</b>			
<i>Cathartes aura jota</i>	Turkey Vulture	94	R
<b>Icteridae</b>			
<i>Leistes bellicosus</i>	Peruvian meadowlark	8	R
<i>Molothrus bonariensis</i>	Shiny Cowbird	4	R
<b>Columbidae</b>			
<i>Columbina cruziana</i>	Croaking Ground-Dove	4	R
<i>Zenaida meloda</i>	West Peruvian Dove	23	R
<i>Zenaida auriculata</i>	Eared Dove	2	R
<b>Thraupidae</b>			
<i>Conirostrum cinereum</i>	Cinereous Conebill	17	R
<i>Xenospingus concolor</i>	Slender-billed finch	31	R
<b>Phoenicopteridae</b>			
<i>Phoenicopus chilensis</i>	Chilean Flamingo	2	A

**Residency Status: R: Resident, M: Migratory, A: Accidental**

**Supplemental Table S4: Ranges of meteorological and landscape variables during the sampling months**

<b>Variables</b>	<b>Min</b>	<b>Max</b>	<b>Median</b>
<b>Min. Temp (C°)</b>	9	18	14
<b>Max. Temp(C°)</b>	20	30	26
<b>Rainfall (mm)</b>	0	3	0.37
<b>Humidity (%)</b>	55.7	68.30	61.50
<b>NDVI</b>	0.18	0.31	0.27
<b>Water body size (km2)</b>	0.0045	0.0333	0.014