

Table S1. Summary of the management practices and ecological characteristics of the urban greenspaces within the Lower Mainland of British Columbia, Canada at which Spotted Towhees were captured in 2022-2023 breeding and 2022-2024 non-breeding seasons.

	Alaksen/Reifel		Fleetwood	Tynehead	Terra Nova
Size (~ hectares)	Alaksen 349	Reifel 648	49	260	39
	~825 total				
Designated Uses	National Wildlife Area; agriculture (crops and cattle)	Bird Sanctuary	Recreation; urban forest	Preservation of salmon habitat; recreation;	Recreation; agriculture (community garden, orchards, crops); heritage site; ecological preservation
Land Cover	70% agriculture; and 30% mixed forest, shrubland, and restored grasslands (ECCC 2023b)	65% tidal marshes; 10% mixed habitat of grasses, forbs, trees, and shrubs; 5% cultivated land; and 1% tidal mud flats (ECCC 2023a)	~75% forest; and ~25% scenic gardens, sports fields and courts, spray park, picnic areas, and playground	~70% forest; and ~30% field, restored grassland and meadow (GVRD 2004)	~50 forest and shrubland slough; ~20% agriculture; ~15% restored grassland; ~10 managed heritage homestead; and ~5% recreation
Dominant Over Story	Common Hawthorn (<i>Crataegus monogyna</i>) and Alder (<i>Alnus</i> spp.)	Pacific Crab Apple (<i>Malus fusca</i>) and Common Hawthorn	Big Leaf Maple (<i>Acer macrophyllum</i>), Red Alder (<i>Alnus rubra</i>), and Western Redcedar (<i>Thuja plicata</i>)	Western Hemlock (<i>Tsuga heterophylla</i>), Mountain Hemlock (<i>Tsuga mertensiana</i>), and Western redcedar	Common Hawthorn, Pacific Crab Apple, and Willow (<i>Salix</i> spp.)
Dominant Under Story	Himalayan Blackberry (<i>Rubus bifrons</i>), Salmonberry (<i>Rubus spectabilis</i>), and grasses	Himalayan Blackberry and ferns	Himalayan Blackberry and Salmonberry	Himalayan Blackberry, Salmonberry, ferns, and horsetails	Himalayan Blackberry, grasses, and sedges

Table S2. The number of Spotted Towhees of each sex (female or male) and age (SY or ASY, HY or AHY) demographic captured at each of the four study sites within the lower mainland of British Columbia, Canada during the breeding and non-breeding seasons. The number of birds captured in different years are shown together in one cell, separated by a “/”. Research was not conducted at Fleetwood or Tynehead during the non-breeding season, thus sample sizes are denoted as “-”.

Site	Breeding Season (2022 / 2023)				Non-Breeding Season (2022 / 2023 / 2024)				TOTAL (2022 / 2023 / 2024)
	Second Year		After Second Year		Hatch Year		After Hatch Year		
	Female	Male	Female	Male	Female	Male	Female	Male	
Alaksen/Reifel	3 / 2	6 / 9	6 / 4	13 / 5	1 / 1 / 0	9 / 4 / 0	4 / 0 / 0	4 / 6 / 1	46 / 31 / 1
Fleetwood	3 / 3	7 / 2	3 / 1	7 / 3	-	-	-	-	20 / 9 / -
Terra Nova	3 / 5	8 / 2	3 / 2	8 / 4	1 / 5 / 4	3 / 5 / 5	3 / 0 / 1	5 / 2 / 8	34 / 25 / 18
Tynehead	3 / 3	3 / 1	1 / 1	6 / 3	-	-	-	-	13 / 8 / -
Total (Sex)	12 / 13	24 / 14	13 / 8	34 / 15	2 / 6 / 4	12 / 9 / 5	7 / 0 / 1	9 / 8 / 9	
Total (Age)	36 / 27		47 / 23		14 / 15 / 9		16 / 8 / 10		205

Table S3. Iris color principal component 1 (PC1) and 2 (PC2) estimated marginal mean \pm standard error values for Spotted Towhees of varying age, sex, and age-sex categories captured across different sites within the lower mainland of British Columbia, Canada during the 2022-2023 breeding and 2022-2024 non-breeding seasons.

Breeding Season			Non-Breeding Season		
Category	PC1	PC2	Category	PC1	PC2
Age			Age		
ASY	-0.49 \pm 0.20	-0.17 \pm 0.10	AHY	0.15 \pm 0.29	0.04 \pm 0.15
SY	-0.26 \pm 0.19	0.01 \pm 0.09	HY	0.67 \pm 0.25	-0.33 \pm 0.13
Sex			Sex		
Female	-0.71 \pm 0.21	-0.32 \pm 0.10	Female	0.14 \pm 0.33	-0.14 \pm 0.17
Male	-0.04 \pm 0.17	0.16 \pm 0.08	Male	0.67 \pm 0.19	-0.15 \pm 0.10
Age-Sex			Age-Sex		
ASY Female	-0.97 \pm 0.32	-0.51 \pm 0.15	AHY Female	0.08 \pm 0.52	-0.16 \pm 0.26
SY Female	-0.45 \pm 0.28	-0.13 \pm 0.14	HY Female	0.21 \pm 0.42	-0.12 \pm 0.21
ASY Male	-0.02 \pm 0.21	0.17 \pm 0.10	AHY Male	0.21 \pm 0.27	0.25 \pm 0.14
SY Male	-0.07 \pm 0.24	0.15 \pm 0.12	HY Male	1.13 \pm 0.27	-0.54 \pm 0.14
Study Site			Study Site		
Alaksen/Reifel	-0.23 \pm 0.21	0.01 \pm 0.10	Alaksen/Reifel	0.37 \pm 0.31	-0.13 \pm 0.16
Fleetwood	-0.63 \pm 0.27	-0.04 \pm 0.13	Fleetwood	-	-
Terra Nova	0.05 \pm 0.24	-0.05 \pm 0.12	Terra Nova	0.45 \pm 0.23	-0.15 \pm 0.12
Tynehead	-0.69 \pm 0.32	-0.24 \pm 0.15	Tynehead	-	-
Year			Year		
2022	-0.72 \pm 0.17	0.06 \pm 0.08	2022	0.22 \pm 0.26	0.11 \pm 0.13
2023	-0.04 \pm 0.21	-0.22 \pm 0.10	2023	0.90 \pm 0.31	-0.19 \pm 0.16
2024	-	-	2024	0.10 \pm 0.38	-0.36 \pm 0.19

Table S4. Post-hoc pairwise comparison of estimate marginal mean iris color principal component 1 (PC1) values for Spotted Towhees of varying age-sex categories captured across different sites within the lower mainland of British Columbia, Canada during the 2022-2024 non-breeding seasons. SE = standard errors. CI = confidence intervals.

Contrast	Estimate \pm SE	t.ratio	p-value	CI	
				2.5%	97.5%
AHY Female – HY Female	-0.04 \pm 0.34	-0.13	1.00	-0.94	0.86
AHY Female – AHY Male	-0.41 \pm 0.29	-1.39	0.51	-1.18	0.37
AHY Female – HY Male	0.38 \pm 0.29	1.31	0.56	-0.39	1.14
HY Female – AHY Male	-0.37 \pm 0.25	-1.48	0.46	-1.02	0.29
HY Female – HY Male	0.42 \pm 0.25	1.68	0.34	-0.24	1.08
AHY Male – HY Male	0.79 \pm 0.19	4.07	0.0007	0.28	1.30

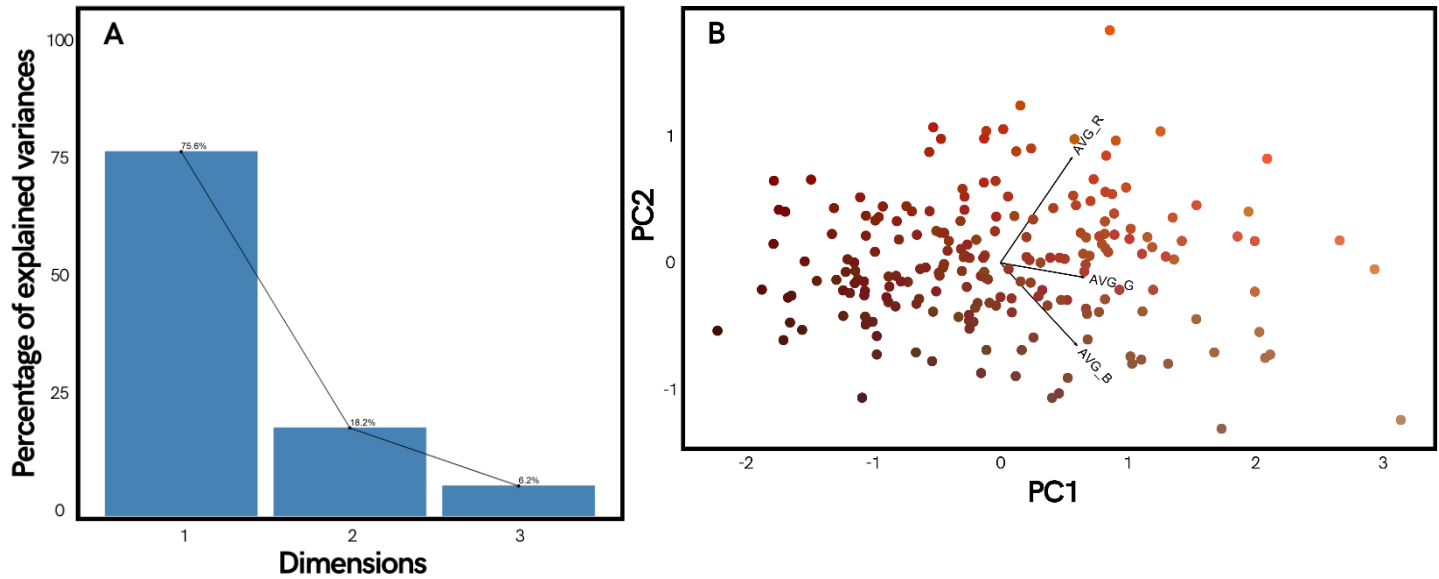


Figure S1. Iris color RGB principal component analysis (A) scree plot and (B) biplot for Spotted Towhees captured during the 2022-2023 breeding and 2022-2024 non-breeding seasons in urban greenspaces in the lower mainland region of British Columbia, Canada. In (B) each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual.

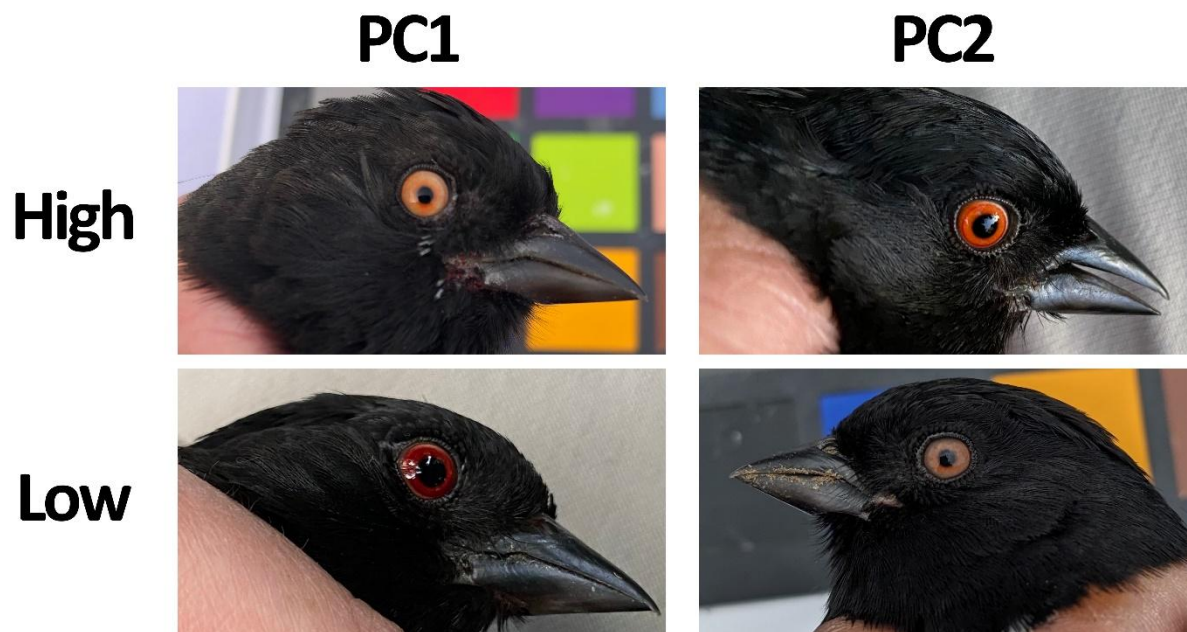


Figure S2. Photograph examples of high and low PC1 and PC2 iris colors for Spotted Towhees captured during the 2022-2023 breeding and 2022-2024 non-breeding seasons in the lower mainland region of British Columbia, Canada. All individuals in this figure are males.

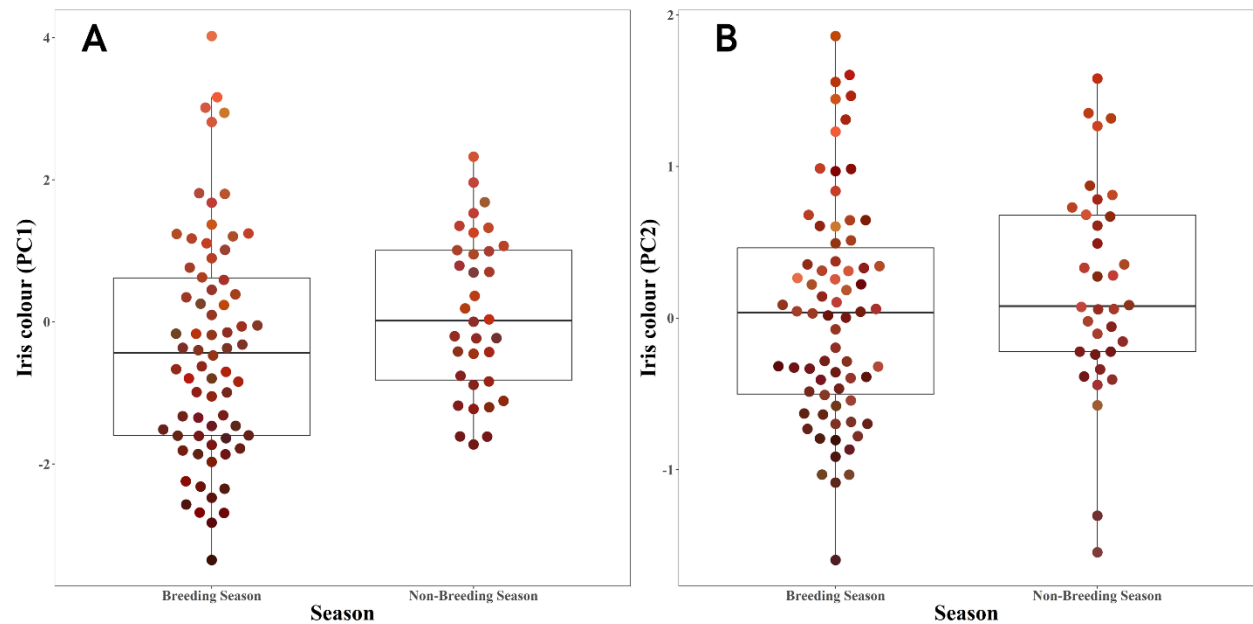


Figure S3. Iris color (A) PC1 and (B) PC2 values of adult Spotted Towhees captured during the 2022-2023 breeding (ASY birds) and 2022-2024 non-breeding seasons (AHY birds) in urban greenspaces in the lower mainland regional of British Columbia, Canada. Each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual. Red text, border, and labels are used to highlight factors for which iris color showed significant variation between given categories.

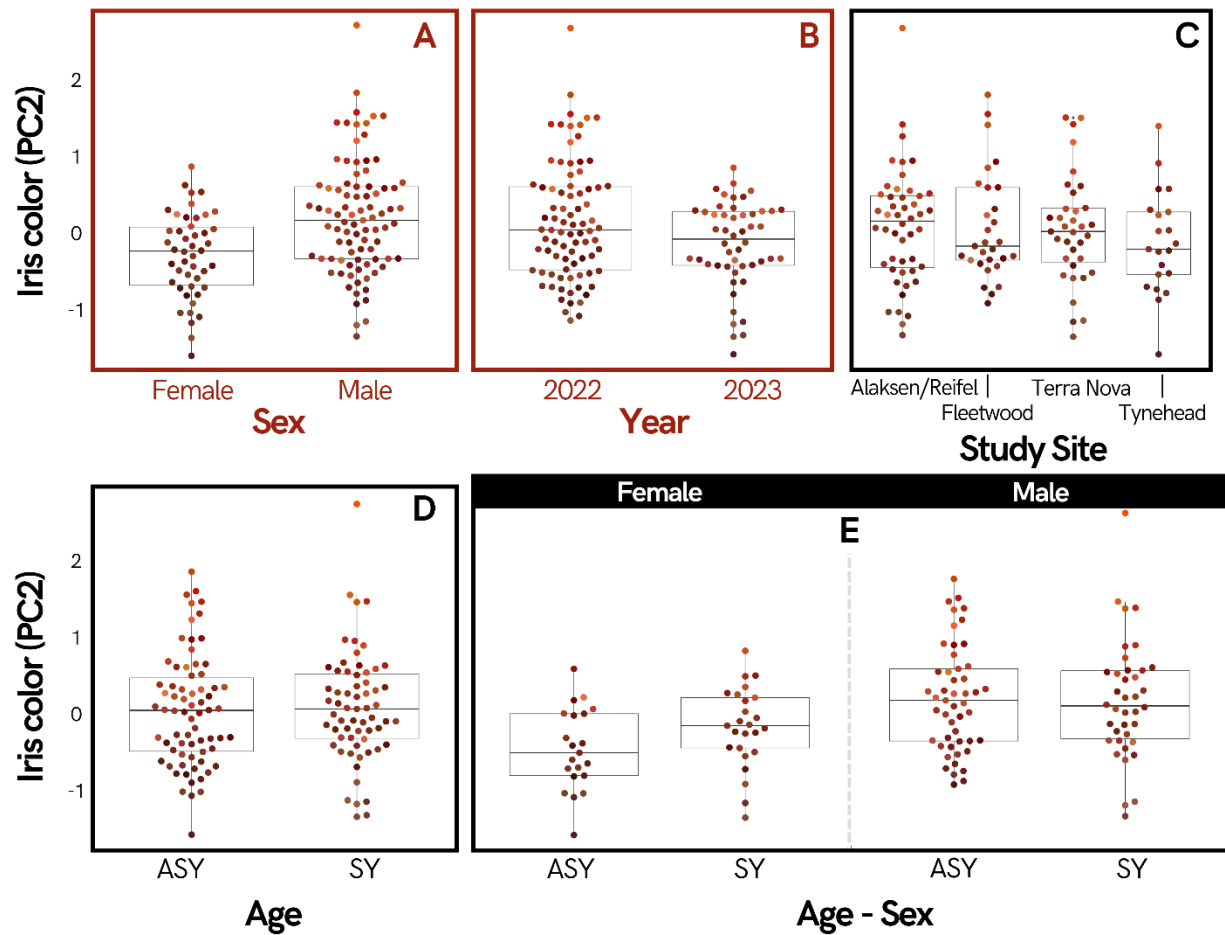


Figure S4. Iris color (PC2) of Spotted Towhees captured during the 2022-2023 breeding seasons in urban greenspaces in the lower mainland regional of British Columbia, Canada across different (A) sex classes, (B) years, (C), study sites, (D) age classes, and (E) age-sex classes. Each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual. Red text, border, and labels are used to highlight factors for which iris color showed significant variation between given categories. ASY = After Second Year. SY = Second Year.

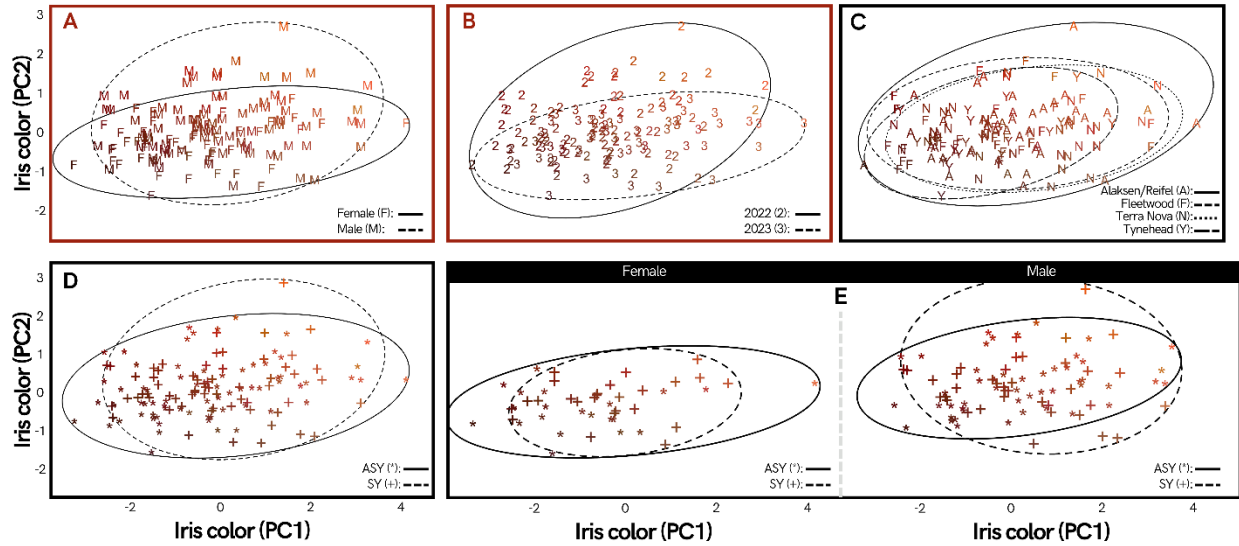


Figure S5. Iris color (PC2 vs. PC1) of Spotted Towhees captured during the 2022-2023 breeding seasons in urban greenspaces in the lower mainland region of British Columbia, Canada across different (A) sex classes, (B) years, (C), study sites, (D) age classes, and (E) age-sex classes. Each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual. Ellipses enclose all points corresponding to unique categories for each factor. Each figure includes a legend indicating which category correspond to which symbol and line type combinations. Red text, border, and labels are used to highlight factors for which iris color showed significant variation between given categories. ASY = After Second Year. SY = Second Year.

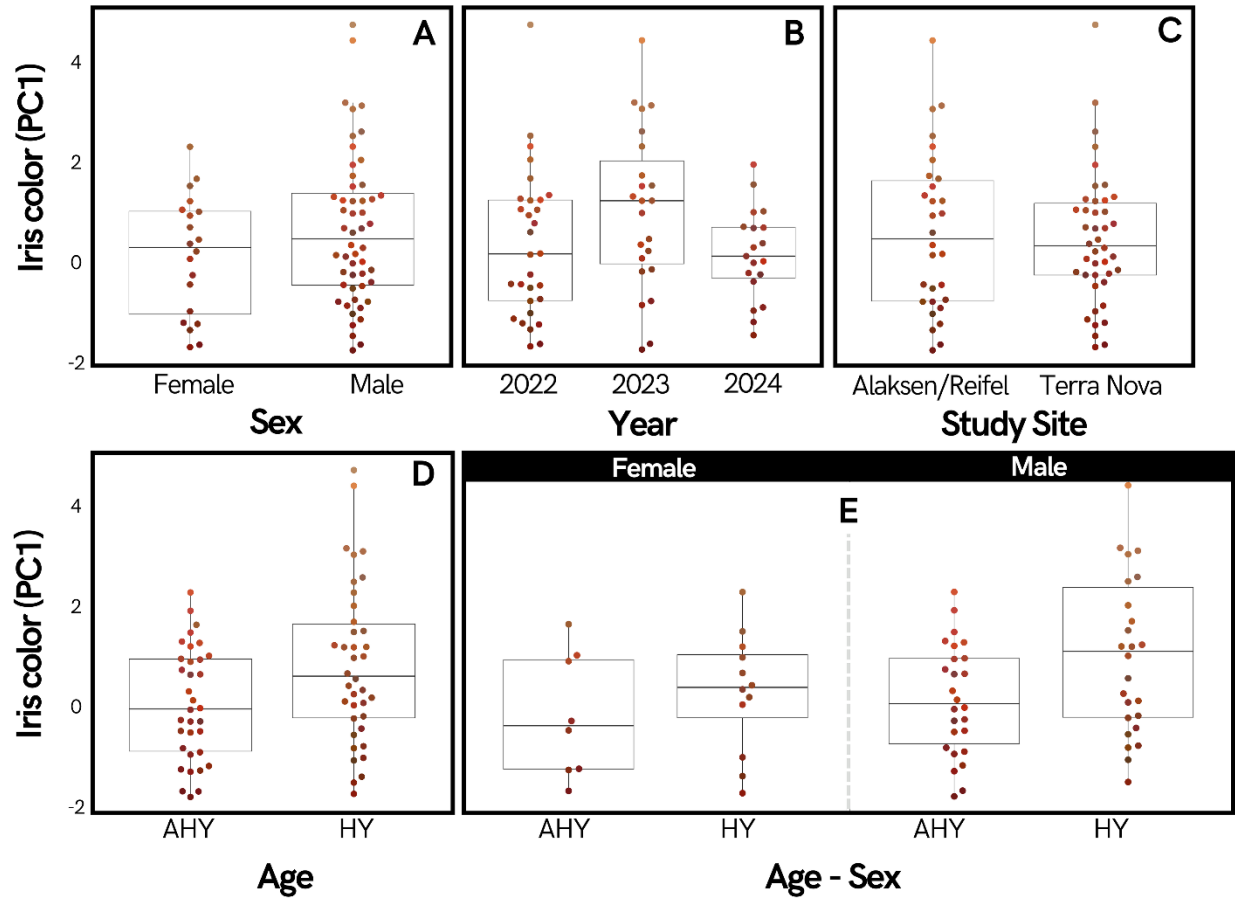


Figure S6. Iris color (PC1) of Spotted Towhees captured during the 2022-2024 non-breeding seasons in urban greenspaces in the lower mainland regional of British Columbia, Canada across different (A) sex classes, (B) years, (C), study sites, (D) age classes, and (E) age-sex classes. Each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual. Red text, border, and labels are used to highlight factors for which iris color showed significant variation between given categories. AHY = After Hatch Year. HY = Hatch Year.

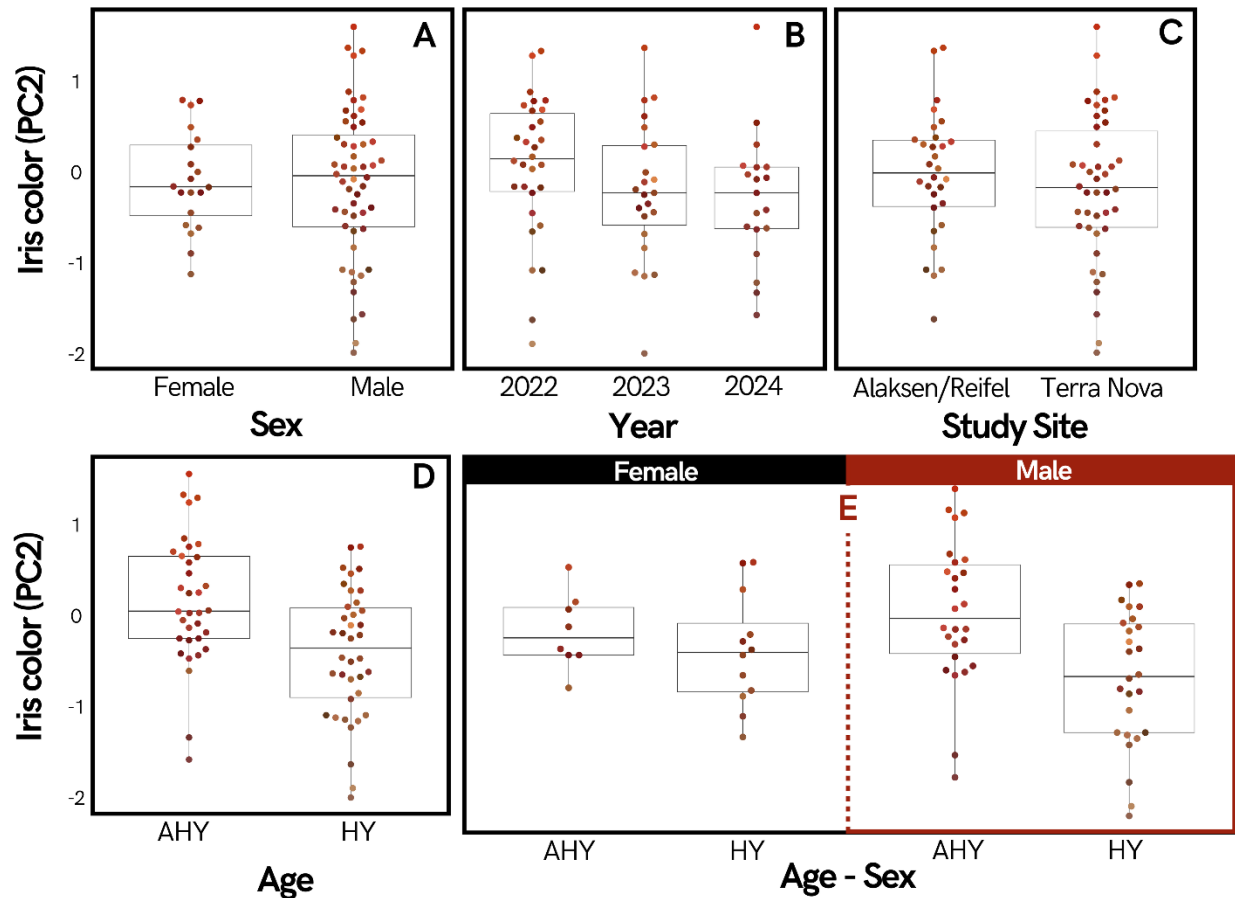


Figure S7. Iris color (PC2) of Spotted Towhees captured during the 2022-2024 non-breeding seasons in urban greenspaces in the lower mainland regional of British Columbia, Canada across different (A) sex classes, (B) years, (C), study sites, (D) age classes, and (E) age-sex classes. Each point is colored according to the hex code corresponding with the average extracted iris RGB values for that individual. Red text, border, and labels are used to highlight factors for which iris color showed significant variation between given categories. AHY = After Hatch Year. HY = Hatch Year.

