

Turkey Point Fall Migration Count: 2022 Season Report

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Abstract: The Maryland Biodiversity Project conducted the second year of the Turkey Point Fall Migration Count in 2022 from 1 August through 30 November. This avian count aims to document population trends and determine species diversity through annual fall monitoring. With each passing season, the collected data become more valuable for assessing trends and correlations between dynamic variables such as weather and climate. Migratory birds are affected by environmental changes and by specific challenges at each stage of their migrations. The Turkey Point Fall Migration Count provides important quantitative insights into regional bird populations and the nature of their migrations (e.g., relative abundance, timing, and weather impacts). The value is compounded when compared to the results of the Cape May Bird Observatory Morning Flight Count and the new Dans Rock Fall Migration Count in Allegany County, Maryland. During the 2022 season, the Count documented 297,912 individuals of 196 species in southbound migration. A few highlights during the season included 4 Northern Goshawks and an incredible irruption of Red-bellied Woodpeckers which set the all-time high-count for the species' entire range.

Fall 2022 marked the second consecutive season of the Maryland Biodiversity Project's (MBP) avian monitoring at Turkey Point, Cecil County, Maryland. Turkey Point is located at the southern tip of a 20-mi (32-km) peninsula that projects out into the northern reaches of the Chesapeake Bay in the northeast corner of the state. Because of its unique geography, birds are concentrated at the Point and many strong passerine morning flights have been documented at this location, making it a top location to view the spectacle of morning flight in Maryland. After a successful and productive season in 2021 that showcased impressive flights and notable rarities, continuing the count to further our knowledge of migration in the Chesapeake Bay region was an easy decision. The focus of this count is to document passerines moving past Turkey Point in morning flight, however all birds observed actively migrating during the count period such as hawks and many species of waterfowl were also noted.

METHODS

Methods were consistent with those reported in the Turkey Point Fall Migration Count: 2021 Season Report (Irons 2023). However, the count was extended by 15 days through the end of November, in order to understand the movements of late-season migrants such as robins, waxwings, finches, and many species of waterfowl. Each morning the count began 15 minutes before sunrise and ran for

a minimum of three hours after sunrise. On days with increased migratory activity, the count was extended until migration activity ceased. Daily counts ended early or were suspended for continuous heavy rain that prevented flights. Migration data were collected and entered in the field using the Dutch software Trektellen (Trektellen 2023g), allowing the live stream of sightings to MBP's count page (Maryland Biodiversity Project 2022b) and to the Trektellen website. Flight direction, age and sex data (for species with dimorphic plumage), and time were recorded with each entry into the database. Daily reports were also filed with Cornell University's eBird application (eBird 2023a). Alternative counters covered the migration monitoring when the lead counter had the day off. All alternate counters had years of birding experience and were trained in monitoring protocols by the lead counter.

RESULTS

Between 1 August and 30 November 2022, the Turkey Point Fall Migration Count tallied 297,912 birds representing 196 species (Table 1). The count logged 445 hours during the 120 days of the count period, missing just one day in September due to inclement weather. As expected, August brought the fewest individuals with 17,000 individuals counted. A slight increase was noted in September when 26,000 were counted, followed by 64,000 in October. November brought more individuals than the three previous months combined with 190,000 individuals counted. During that month, 124,000 Common Grackles were counted. Without that species, October and November would have similar counts. Species totals were 120 in August, 133 in September, 133 in October, and 111 in November. Below are monthly summaries broken down into sections of several days that include highlights, notable movements, and new arrivals along with weather conditions.

Table. 1 2022 Turkey Point Fall Migration Count Results.

Species	AUG	SEP	OCT	NOV	Total	Max. Count (Date)	First Observed	Last Observed
Snow Goose	0	0	0	104	104	100 (12 Nov)	12 Nov	30 Nov
Brant	0	0	8	0	0	8 (28 Oct)	28 Oct	28 Oct
Cackling Goose	0	0	5	5	10	4 (14 Oct)	3 Oct	9 Nov
Canada Goose	0	274	1,824	2,041	4,139	463 (8 Nov)	21 Sep	29 Nov
Mute Swan	2	4	1	0	7	4 (15 Sep)	30 Aug	19 Oct
Tundra Swan	0	0	0	1,937	1,937	524 (19 Nov)	7 Nov	30 Nov
Wood Duck	2	5	18	3	28	7 (17 Oct)	15 Aug	3 Nov
Blue-winged Teal	7	2	0	0	9	7 (31 Aug)	31 Aug	16 Sep
Northern Shoveler	0	0	4	3	7	4 (17 Oct)	17 Oct	7 Nov
Gadwall	0	0	20	184	204	44 (7 Nov)	9 Oct	29 Nov
American Wigeon	0	1	77	103	181	34 (19 Nov)	21 Sep	26 Nov
Mallard	18	14	53	355	440	60 (21 Nov)	3 Aug	24 Nov
America Black Duck	0	8	102	187	297	51 (28 Oct)	7 Sep	30 Nov
Northern Pintail	0	8	46	222	276	79 (2 Nov)	21 Sep	29 Nov
Green-winged Teal	0	2	10	24	36	11 (7 Nov)	15 Sep	19 Nov
Canvasback	0	0	0	190	190	141 (23 Nov)	8 Nov	26 Nov
Redhead	0	0	5	19	24	11 (8 Nov)	21 Oct	23 Nov

Species	AUG	SEP	OCT	NOV	Total	Max. Count (Date)	First Observed	Last Observed
Ring-necked Duck	0	0	25	375	400	153 (8 Nov)	28 Oct	25 Nov
Greater Scaup	0	0	15	66	81	19 (19 Nov)	27 Oct	26 Nov
Lesser Scaup	0	1	24	91	116	45 (29 Nov)	16 Sep	29 Nov
scaup sp.	0	0	14	714	728	311 (21 Nov)	28 Oct	29 Nov
<i>Aythya</i> sp.	0	0	3	149	152	60 (8 Nov)	21 Oct	28 Nov
Surf Scoter	0	0	1	10	11	5 (7 Nov)	16 Oct	22 Nov
White-winged Scoter	0	0	0	1	1	1 (23 Nov)	23 Nov	23 Nov
Black Scoter	0	0	2	2	4	2 (30 Oct)	30 Oct	6 Nov
scoter sp.	0	0	6	7	13	7 (25 Nov)	30 Oct	25 Nov
Surf/Black Scoter	0	0	0	1	1	1 (7 Nov)	7 Nov	7 Nov
Bufflehead	0	0	0	426	426	166 (7 Nov)	2 Nov	26 Nov
Common Goldeneye	0	0	0	2	2	2 (30 Nov)	30 Nov	30 Nov
Hooded Merganser	0	0	0	11	11	4 (18 Nov)	8 Nov	24 Nov
Red-breasted Merganser	0	0	0	11	11	4 (21 Nov)	21 Nov	29 Nov
Ruddy Duck	0	0	15	139	154	117 (23 Nov)	9 Oct	29 Nov
duck sp.	0	0	96	161	257	43 (7 Nov)	1 Oct	28 Nov
Horned Grebe	0	0	0	10	10	6 (2 Nov)	2 Nov	22 Nov
Red-necked Grebe	0	0	0	3	3	3 (3 Nov)	3 Nov	3 Nov
Rock Pigeon	6	11	0	0	17	9 (15 Sep)	17 Aug	19 Sep
Mourning Dove	42	4	12	5	63	9 (25 Aug)	1 Aug	6 Nov
Yellow-billed Cuckoo	2	0	0	0	2	1 (2 Aug)	2 Aug	10 Aug
Chimney Swift	983	1,701	502	0	3,186	315 (16 Sep)	1 Aug	22 Oct
Ruby-throated Hummingbird	45	63	3	0	111	10 (22 Sep)	1 Aug	9 Oct
American Coot	0	0	57	0	57	57 (16 Oct)	16 Oct	16 Oct
Killdeer	7	0	8	0	15	6 (8 Oct)	4 Aug	10 Oct
Semipalmated Plover	0	1	0	0	1	1 (15 Sep)	15 Sep	15 Sep
Dunlin	0	0	1	0	1	1 (20 Oct)	20 Oct	20 Oct
Least Sandpiper	9	0	0	0	9	9 (14 Aug)	14 Aug	14 Aug
Pectoral Sandpiper	6	4	0	0	10	6 (19 Aug)	19 Aug	30 Sep
Semipalmated Sandpiper	11	0	0	0	11	9 (24 Aug)	14 Aug	24 Aug
Spotted Sandpiper	1	0	0	0	1	1 (19 Aug)	19 Aug	19 Aug
Solitary Sandpiper	0	1	0	0	1	1 (18 Sep)	18 Sep	18 Sep
Lesser Yellowlegs	5	5	0	0	10	5 (20 Aug)	20 Aug	9 Sep
Greater Yellowlegs	0	1	1	0	2	1 (12 Sep)	12 Sep	18 Oct
Red-necked Phalarope	1	0	0	0	1	1 (28 Aug)	28 Aug	28 Aug
shorebird sp.	0	6	0	0	6	6 (15 Sep)	15 Sep	15 Sep
peep sp.	11	20	0	0	31	10 (2 Sep)	5 Aug	15 Sep
Bonaparte's Gull	6	0	5	320	331	68 (20 Nov)	19 Aug	28 Nov
Laughing Gull	80	173	821	1,367	2,441	211 (7 Nov)	6 Aug	29 Nov
Franklin's Gull	0	0	1	0	1	1 (3 Oct)	3 Oct	3 Oct
Ring-billed Gull	160	75	234	3,668	4,137	705 (30 Nov)	2 Aug	30 Nov
Herring Gull	4	15	177	153	349	62 (2 Oct)	13 Aug	30 Nov
Lesser Black-backed Gull	0	0	0	1	1	1 (14 Nov)	14 Nov	14 Nov
Great Black-backed Gull	1	10	25	94	130	9 (18 Nov)	25 Aug	29 Nov
Least Tern	8	0	0	0	8	7 (8 Aug)	5 Aug	8 Aug
Caspian Tern	192	114	53	0	359	20 (14 Aug)	1 Aug	31 Oct
Black Tern	7	2	0	0	9	4 (23 Aug)	22 Aug	8 Sep
Forster's Tern	43	254	1,864	781	2,942	601 (19 Oct)	17 Aug	21 Nov
Royal Tern	0	1	1	0	2	1 (19 Sep)	19 Sep	6 Oct
Red-throated Loon	0	0	1	2	3	1 (29 Oct)	29 Oct	27 Nov
Common Loon	1	0	29	57	87	10 (8 Nov)	10 Aug	29 Nov
Brown Booby	0	2	0	0	2	1 (15 Sep)	15 Sep	16 Sep
Double-crested Cormorant	298	240	1,751	1,735	4,024	538 (28 Oct)	1 Aug	30 Nov
Great Blue Heron	8	8	2	3	21	2 (2 Aug)	2 Aug	29 Nov
Great Egret	6	4	0	1	11	3 (3 Sep)	1 Aug	10 Nov
Snowy Egret	5	0	0	0	5	5 (14 Aug)	14 Aug	14 Aug
Little Blue Heron	6	8	1	0	15	4 (Aug)	8 Aug	21 Oct
<i>Egretta</i> sp.	0	3	0	0	3	3 (3 Sep)	3 Sep	3 Sep
Cattle Egret	8	1	0	0	9	8 (25 Aug)	25 Aug	2 Sep
Green Heron	20	2	0	0	22	4 (4 Aug)	1 Aug	17 Sep

Species	AUG	SEP	OCT	NOV	Total	Max. Count (Date)	First Observed	Last Observed
White Ibis	1	0	0	0	1	1 (8 Aug)	8 Aug	8 Aug
Black Vulture	0	1	6	22	29	8 (9 Nov)	29 Sep	17 Nov
Turkey Vulture	0	17	912	390	1,319	322 (23 Oct)	11 Sep	28 Nov
Osprey	21	54	11	0	86	11 (8 Sep)	10 Aug	22 Oct
Golden Eagle	0	0	0	3	3	1 (2 Nov)	2 Nov	9 Nov
Northern Harrier	2	5	19	13	39	3 (5 Oct)	27 Aug	26 Nov
Sharp-shinned Hawk	0	284	468	46	798	92 (19 Oct)	13 Sep	30 Nov
Cooper's Hawk	4	71	166	22	263	24 (29 Sep)	18 Aug	26 Nov
Northern Goshawk	0	0	2	2	4	1 (9 Oct)	9 Oct	17 Nov
<i>Accipiter</i> sp.	0	1	3	0	4	3 (7 Oct)	17 Sep	7 Oct
Bald Eagle	5	21	45	68	139	18 (8 Nov)	13 Aug	28 Nov
Red-shouldered Hawk	0	1	86	95	182	38 (9 Nov)	29 Sep	23 Nov
Broad-winged Hawk	0	176	61	0	237	110 (15 Sep)	2 Sep	21 Oct
Red-tailed Hawk	0	9	144	154	307	61 (28 Oct)	8 Sep	29 Nov
Belted Kingfisher	1	1	3	20	25	4 (3 Nov)	31 Aug	29 Nov
Red-headed Woodpecker	0	70	19	2	91	10 (14 Sep)	1 Sep	9 Nov
Red-bellied Woodpecker	5	823	2,849	80	3757	641 (10 Oct)	10 Aug	30 Nov
Yellow-bellied Sapsucker	0	8	100	4	112	18 (10 Oct)	25 Sep	30 Nov
Downy Woodpecker	2	32	109	27	170	14 (10 Oct)	16 Aug	29 Nov
Hairy Woodpecker	18	12	43	10	83	7 (10 Oct)	10 Aug	29 Nov
Northern Flicker	33	433	969	77	1,512	160 (6 Oct)	3 Aug	30 Nov
Pileated Woodpecker	13	2	1	1	17	2 (3 Aug)	2 Aug	10 Nov
American Kestrel	1	27	46	1	75	13 (15 Oct)	24 Aug	4 Nov
Merlin	1	50	61	18	130	7 (14 Sep)	29 Aug	21 Nov
Peregrine Falcon	2	8	10	2	22	2 (15 Oct)	12 Aug	4 Nov
Great Crested Flycatcher	7	1	0	0	8	2 (13 Aug)	12 Aug	10 Sep
Eastern Kingbird	365	51	0	0	416	37 (24 Aug)	1 Aug	21 Sep
Eastern Wood-Pewee	29	29	1	0	59	5 (25 Aug)	2 Aug	1 Oct
Trail's Flycatcher	4	3	2	0	9	1 (2 Aug)	2 Aug	3 Oct
Least Flycatcher	2	0	0	0	2	1 (10 Aug)	10 Aug	27 Aug
<i>Empidonax</i> sp.	0	1	0	0	1	1 (8 Sep)	8 Sep	8 Sep
Eastern Phoebe	13	27	31	1	72	7 (30 Sep)	3 Aug	2 Nov
White-eyed Vireo	2	2	0	0	4	2 (25 Aug)	25 Aug	17 Sep
Blue-headed Vireo	0	1	10	0	11	3 (15 Oct)	29 Sep	27 Oct
Philadelphia Vireo	0	2	1	0	3	1 (14 Sep)	14 Sep	28 Oct
Warbling Vireo	5	5	0	0	10	4 (10 Sep)	16 Aug	15 Sep
Red-eyed Vireo	35	141	7	0	183	26 (16 Sep)	2 Aug	27 Oct
Blue Jay	66	6,589	11,743	64	18,462	2,284 (8 Oct)	3 Aug	15 Nov
American Crow	0	3	24	12	39	8 (23 Oct)	25 Sep	24 Nov
Fish Crow	161	20	16	135	332	139 (14 Aug)	9 Aug	27 Nov
Common Raven	3	2	0	10	15	2 (20 Sep)	6 Aug	23 Nov
Tufted Titmouse	0	0	88	8	96	25 (21 Oct)	10 Oct	23 Nov
Horned Lark	2	0	1	8	11	2 (14 Aug)	14 Aug	29 Nov
Bank Swallow	2,092	197	0	0	2,289	635 (1 Aug)	1 Aug	5 Sep
Tree Swallow	104	2,646	2,074	9	4,833	1,028 (22 Sep)	1 Aug	9 Nov
Northern Rough-winged Swallow	34	70	64	3	171	16 (11 Sep)	1 Aug	9 Nov
Purple Martin	4,877	698	0	0	5,575	1,468 (18 Aug)	1 Aug	16 Sep
Barn Swallow	891	300	3	0	1,194	173 (25 Aug)	1 Aug	12 Oct
Cliff Swallow	2	0	0	0	2	1 (17 Aug)	17 Aug	27 Aug
swallow sp.	0	8	0	0	8	8 (17 Sep)	17 Sep	17 Sep
Ruby-crowned Kinglet	0	1	65	17	83	6 (6 Oct)	29 Sep	29 Nov
Golden-crowned Kinglet	0	1	34	17	52	12 (8 Nov)	29 Sep	26 Nov
Cedar Waxwing	1,073	2,456	1,367	9,789	14,685	12,84 (7 Nov)	1 Aug	30 Nov
Red-breasted Nuthatch	24	180	209	28	441	34 (6 Oct)	6 Aug	23 Nov
White-breasted Nuthatch	6	36	1,038	42	1,122	122 (18 Oct)	3 Aug	14 Nov
Blue-gray Gnatcatcher	1,139	774	5	0	1,918	172 (12 Aug)	2 Aug	21 Oct
House Wren	2	3	0	0	5	2 (17 Sep)	4 Aug	17 Sep
Winter Wren	0	0	0	4	4	1 (2 Nov)	2 Nov	27 Nov
Gray Catbird	1	3	0	0	4	3 (17 Sep)	25 Aug	17 Sep
Brown Thrasher	0	1	0	0	1	1 (16 Sep)	16 Sep	16 Sep

Species	AUG	SEP	OCT	NOV	Total	Max. Count (Date)	First Observed	Last Observed
Northern Mockingbird	5	5	10	2	22	3 (10 Oct)	8 Aug	21 Nov
European Starling	102	43	362	629	1,136	174 (3 Nov)	2 Aug	24 Nov
Eastern Bluebird	5	2	424	770	1,201	153 (27 Oct)	2 Aug	30 Nov
Veery	25	3	0	0	28	25 (28 Aug)	28 Aug	16 Sep
Hermit Thrush	0	0	1	1	2	1 (30 Oct)	30 Oct	10 Nov
Wood Thrush	0	1	0	0	1	1 (10 Sep)	10 Sep	10 Sep
American Robin	256	36	8,408	16,326	25,026	3,545 (24 Oct)	1 Aug	30 Nov
House Sparrow	55	46	63	32	196	18 (17 Aug)	3 Aug	22 Nov
American Pipit	0	2	25	56	83	11 (8 Nov)	26 Sep	29 Nov
Evening Grosbeak	0	0	1	4	5	2 (27 Nov)	30 Oct	27 Nov
House Finch	33	17	2,393	1,171	3,614	565 (22 Oct)	2 Aug	30 Nov
Purple Finch	0	43	922	534	1,499	149 (31 Oct)	21 Sep	30 Nov
Red Crossbill	0	0	0	13	13	7 (18 Nov)	4 Nov	18 Nov
Pine Siskin	0	0	45	163	208	37 (4 Nov)	9 Oct	30 Nov
American Goldfinch	113	888	4,642	9,374	15,017	1,634 (11 Nov)	3 Aug	30 Nov
Lapland Longspur	0	0	0	1	1	1 (26 Nov)	26 Nov	26 Nov
Chipping Sparrow	14	9	94	29	146	23 (22 Oct)	1 Aug	26 Nov
Field Sparrow	1	0	4	4	9	2 (26 Oct)	5 Aug	23 Nov
Dark-eyed Junco	0	0	21	118	139	42 (4 Nov)	12 Oct	30 Nov
White-throated Sparrow	0	0	10	1	11	7 (12 Oct)	7 Oct	20 Nov
Savannah Sparrow	0	8	15	5	28	4 (21 Oct)	9 Sep	9 Nov
Song Sparrow	0	0	16	5	21	7 (30 Oct)	3 Oct	19 Nov
Lincoln's Sparrow	0	0	1	0	1	1 (3 Oct)	3 Oct	3 Oct
Swamp Sparrow	0	0	3	0	3	1 (3 Oct)	3 Oct	28 Oct
Eastern Towhee	1	0	0	0	1	1 (3 Aug)	3 Aug	3 Aug
Bobolink	218	357	4	0	579	66 (8 Sep)	8 Aug	6 Oct
Eastern Meadowlark	0	0	57	18	75	18 (18 Oct)	8 Oct	29 Nov
Orchard Oriole	370	10	0	0	380	38 (19 Aug)	1 Aug	19 Sep
Baltimore Oriole	195	34	5	7	241	54 (29 Aug)	3 Aug	23 Nov
Red-winged Blackbird	1,728	1,138	2,727	9,039	14,632	1,116 (10 Nov)	1 Aug	30 Nov
Brown-headed Cowbird	138	38	59	279	514	77 (13 Aug)	2 Aug	29 Nov
Rusty Blackbird	0	3	55	157	215	64 (23 Nov)	29 Sep	29 Nov
Common Grackle	13	2	3,598	124,568	128,181	36,200 (2 Nov)	12 Aug	30 Nov
blackbird sp.	0	0	2	0	2	2 (30 Oct)	30 Oct	30 Oct
Ovenbird	1	0	0	0	1	1 (27 Aug)	27 Aug	27 Aug
Worm-eating Warbler	4	2	0	0	6	2 (10 Aug)	10 Aug	9 Sep
Louisiana Waterthrush	2	0	0	0	2	1 (2 Aug)	2 Aug	17 Aug
Northern Waterthrush	60	68	0	0	128	22 (2 Sep)	2 Aug	30 Sep
Louisiana/Northern Waterthrush	6	0	0	0	6	2 (10 Aug)	10 Aug	17 Aug
Golden-winged Warbler	0	1	0	0	1	1 (9 Sep)	9 Sep	9 Sep
Blue-winged Warbler	3	1	0	0	4	1 (18 Aug)	18 Aug	16 Sep
Black-and-white Warbler	24	47	4	0	75	12 (2 Sep)	11 Aug	3 Oct
Prothonotary Warbler	3	0	0	0	3	2 (2 Aug)	2 Aug	4 Aug
Tennessee Warbler	19	214	92	0	325	41 (24 Sep)	4 Aug	27 Oct
Orange-crowned Warbler	0	0	0	1	1	1 (8 Nov)	8 Nov	8 Nov
Nashville Warbler	1	13	24	0	38	5 (29 Sep)	2 Aug	27 Oct
Connecticut Warbler	0	0	1	0	1	1 (8 Oct)	8 Oct	8 Oct
Common Yellowthroat	2	9	6	0	17	2 (10 Sep)	11 Aug	24 Oct
American Redstart	85	287	2	0	374	82 (9 Sep)	2 Aug	14 Oct
Cape May Warbler	52	1,164	340	2	1,558	201 (16 Sep)	17 Aug	6 Nov
Northern Parula	29	231	45	0	305	31 (16 Sep)	1 Aug	30 Oct
Magnolia Warbler	6	53	2	0	61	12 (17 Sep)	13 Aug	8 Oct
Bay-breasted Warbler	1	39	0	0	40	6 (16 Sep)	25 Aug	30 Sep
Bay-breasted/Blackpoll Warbler	0	16	1	0	17	6 (21 Sep)	5 Sep	3 Oct
Blackburnian Warbler	24	28	6	0	58	9 (8 Sep)	16 Aug	8 Oct
Yellow Warbler	113	16	1	0	130	24 (2 Aug)	1 Aug	6 Oct
Chestnut-sided Warbler	10	13	1	0	24	3 (25 Aug)	18 Aug	7 Oct
Blackpoll Warbler	0	339	394	5	738	62 (29 Sep)	10 Sep	5 Nov
Black-throated Blue Warbler	1	37	11	0	49	8 (9 Sep)	29 Aug	19 Oct
Palm Warbler	0	99	423	32	554	60 (15 Oct)	10 Sep	23 Nov

Species	AUG	SEP	OCT	NOV	Total	Max. Count (Date)	First Observed	Last Observed
Pine Warbler	1	14	12	2	29	5 (29 Sep)	8 Aug	23 Nov
Yellow-rumped Warbler	6	247	6,698	285	7,236	2,026 (24 Oct)	12 Aug	30 Nov
Yellow-throated Warbler	1	0	0	0	1	1 (4 Aug)	4 Aug	4 Aug
Prairie Warbler	2	10	1	0	13	3 (2 Sep)	17 Aug	22 Oct
Black-throated Green Warbler	2	101	20	0	123	26 (28 Sep)	25 Aug	24 Oct
Canada Warbler	1	1	0	0	2	1 (20 Aug)	20 Aug	10 Sep
warbler sp.	86	693	1,225	1	2,005	800 (15 Oct)	2 Aug	3 Nov
Summer Tanager	0	2	0	0	2	1 (4 Sep)	4 Sep	19 Sep
Scarlet Tanager	12	124	12	0	148	19 (14 Sep)	1 Aug	15 Oct
Northern Cardinal	0	0	0	6	6	4 (23 Nov)	8 Nov	23 Nov
Rose-breasted Grosbeak	1	82	4	0	87	21 (21 Sep)	25 Aug	7 Oct
Blue Grosbeak	16	15	1	1	33	5 (3 Sep)	18 Aug	14 Nov
Indigo Bunting	66	93	48	0	207	17 (29 Sep)	1 Aug	27 Oct
Dickcissel	2	6	9	2	19	3 (21 Oct)	23 Aug	19 Nov
passerine sp.	5	0	0	0	5	5 (6 Aug)	6 Aug	6 Aug

MONTHLY SUMMARIES

August

The first day of the season began cloudy and misty. Although diversity was low, it brought a strong flight of 635 Bank Swallows and 448 Purple Martins. That system cleared out nicely, leading to an impressive flight the following day. Although relatively warm and with south-southwest winds, seven species of warblers were counted, including an early Nashville Warbler, 2 Prothonotary Warblers, 2 Northern Parulas, and 24 Yellow Warblers. A count of 23 Orchard Orioles was also noteworthy. The next two days were clear and warm with light north or east winds and were marked by high diversity. The season's first Tennessee Warbler was a highlight. Moderate south winds and warm temps took hold on 4 AUG and persisted for another five days. Both Red-breasted Nuthatches and White-breasted Nuthatches arrived, marking the beginning of their southward irruption. The season's first rarity came on 8 AUG with an immature White Ibis heading northeast up the Elk River. Although the days remained warm, the winds switched to the northwest on 10 AUG and brought an uptick in Blue-gray Gnatcatchers (55 counted) and a Common Loon moving over the Point. Orchard Orioles continued in good numbers with 37 on these same northwest winds. Baltimore Orioles showed an increase with 21 individuals counted. A strong front blew through two days later on 12 AUG, bringing 172 Blue-gray Gnatcatchers and the first Yellow-rumped "Myrtle" Warbler. The season's first Magnolia Warbler was noted on 13 AUG with the clear, calm, and cool conditions that followed the front. A small front on 16 and 17 AUG brought a nice influx of warblers with the season's first Blackburnian Warbler on 16 AUG and the first Cape May Warbler along with 10 other warbler species and a Cliff Swallow on 17 AUG. A light northwest wind and clear and cool conditions the next day brought an incredible flight of Purple Martins with 1,468 counted. This was rather unexpected as there had been many days with the same conditions and very few Purple Martins noted. Conditions the following day were similar and netted another 433 Purple Martins. On 19

AUG, the first Bonaparte's Gull and another good flight of orioles (32 Baltimore and 38 Orchard) were observed. The next three days were dominated by light winds from the south and east, which did not bring much new besides the season's first Canada Warbler on 20 AUG and 3 Black Terns on 22 AUG. The winds finally switched on 23 AUG and brought down a few warblers, the season's first Dickcissel, and four more Black Terns. Light north winds and clear conditions continued for the next few days and brought several new species to the Point. These included the first Chestnut-sided Warbler and Black-throated Green Warbler on 24 AUG, as well as Bay-breasted Warbler and Rose-breasted Grosbeak on 25 AUG. The swallow flight on 25 AUG was impressive with 340 Purple Martins, 173 Barn Swallows as well as 158 Chimney Swifts. The conditions perfectly matched those of 18 AUG: dead calm, clear and cool. The last few days of the month were fairly quiet. Foggy conditions on 28 AUG brought a disoriented Red-necked Phalarope over the Point. A nice flight of Baltimore Orioles was noted on 29 AUG with a total of 54 counted.

September

The month began with moderate winds from the west-north west and fueled a nice flight of 41 Cape May Warblers and good diversity of species. Strong winds from the northeast on 2 SEP turned out to be surprisingly productive. A nice flight of 25 Red-breasted Nuthatches, 22 Northern Waterthrushes, and 14 total species of warblers were counted. The next week was dominated by easterly winds, clouds, and eventually heavy rain on 6 SEP. Passerine movement was slow besides a Summer Tanager on 4 SEP. A front finally pushed out the dreary conditions, which set up a nice flight on 9 SEP with the season's only Golden-winged Warbler, 83 American Redstarts, and a total of 15 warbler species.

Mid-September brought some of the best warbler flights of the season with Cape May Warblers being particularly numerous. On 14 SEP 132 were counted and the season's high count of 201 was tallied on 16 SEP. A few hawks also began to move, with a handful of Sharp-shinned Hawks counted daily and good numbers of Broad-winged Hawks on days with northwest winds. The season's high of 110 Broad-winged Hawks was noted on 15 SEP, with good numbers holding to the end of the month, including 50 on 29 SEP. Other highlights include an adult Brown Booby that made an appearance on 15 SEP, as well as 2 Philadelphia Vireos. Light southwest winds on 19 SEP pushed up a Royal Tern and another Summer Tanager. A cold front on 20 SEP brought northwest winds and plenty of migrants, including the season's first Purple Finches. Strong winds from the southwest quickly took over for the next few days and affected the passerine flights. It did provide a good flight of Tree Swallows on 22 SEP with 1,028, the highest count for that species for the season.

The last week in September brought favorable winds from the west and north and produced some strong flights. The season's high count of 41 Tennessee

Warblers was tallied on 24 SEP, with numbers of later migrants such as Blackpoll Warblers, and Black-throated Green Warblers on the rise. Blackpolls peaked at 62 on 29 SEP, and Black-throated Greens peaked on 28 SEP with 26. This year's extraordinary irruption of Red-bellied Woodpeckers was first noticed in the last week of the month. Their numbers increased from 24 SEP through 27 SEP, but a west wind and cool temperatures brought an incredible 406 past the Point in a matter of hours on 28 SEP. This phenomenon continued into mid-October. Another hardwood species that showed tremendous numbers this year was White-breasted Nuthatches; 12 were counted on 29 SEP, but much higher numbers would arrive in October. Other species on the move were Northern "Yellow-shafted" Flickers, with 101 counted on 29 SEP, and Cedar Waxwings, with over 200 counted most days. The last few days of the month also brought good numbers of Blue Jays to the Point, with 1,100 counted on 30 SEP. Good numbers of Yellow-rumped "Myrtle" Warblers also began to arrive, with 117 counted on 30 SEP. Species diversity was also the highest in this last week, with many days tallying more than 60 species observed in active migration.

October

The first five days of October were cloudy, cool, and dominated by strong northeast winds from the remnants of Hurricane Ian pushing inland. A light drizzle persisted for several days and slowed most passerine migration, but strong north winds that occurred during this system kept a few species moving. A host of new species arrived on 3 OCT, and some significant numbers after a slow start to the month. Highlights included an adult Franklin's Gull moving south out of the Elk River, a Lincoln's Sparrow working along the cliff edge, and the season's first Cackling Goose. Warblers increased in numbers and diversity compared to the previous two days, probably related to a slight decrease in wind. The northeast winds increased to 25 mph (40 km/h) on 4 OCT with steady rain, and very few birds moved. The following day, the winds dropped to 10 mph (16 km/h) and the weather became misty, but conditions proved to be quite productive. A good flight of 67 Cape May Warblers and an incredible uptick of 722 American Goldfinches were noted. Typical daily goldfinch numbers had previously been at or below 30 per day. Goldfinches seemed to favor movement during moderate north winds and dreary weather, as similar numbers occurred several times later in the season with such conditions. The gray weather finally cleared on 6 OCT, and light northwest winds led to an excellent flight including 278 Red-bellied Woodpeckers, 160 Northern "Yellow-shafted" Flickers, 51 White-breasted Nuthatches, and a Royal Tern. The next few days stayed clear and provided favorable winds from the northwest. Another excellent flight of Red-bellied Woodpeckers occurred on 7 OCT with 452 counted, and the season's only Connecticut Warbler passed overhead on 8 OCT as noted by alternate counter Mikey Lutmerding. Large flocks of Blue Jays continued to circle the Point leading to daily counts in the thousands.

Dickcissels were also on the move on most clear mornings with north winds. Crisp weather with a stiff west wind arrived on 9 OCT and brought three new species for the season. Early in the day, 7 Gadwalls moved down the Bay and a Pine Siskin flew by high overhead in morning flight. The real highlight of the day came when an immature Northern Goshawk glided overhead to the awe of the counter and several lucky birders. Perfect conditions continued the following day and brought the season's amazing high count of 641 Red-bellied Woodpeckers as well as 81 White-breasted Nuthatches. The seasonal highs of 18 Yellow-bellied Sapsuckers, 14 Downy Woodpeckers, and 7 Hairy Woodpeckers, also were noted on the same day. It was a day for the record books as the Red-bellied Woodpecker count was a new all-time world high count!

The prevailing high pressure system eventually faded, leading to rain and 12 mph (19 km/h) south winds on 13 OCT. Although diversity slumped, a few late warblers powered through the wind and rain. A nice flight that morning included 44 Cape May Warblers, 24 Blackpoll Warblers, 27 Palm Warblers, and a stunning flight of 729 Yellow-rumped "Myrtle" Warblers. The most interesting observation of the day was that a majority of the Myrtles pushed straight south into the wind and, to the best of the counter's abilities, appeared to cross to the mainland without hesitation and never came back. This is fascinating because it illustrates that some warblers appear to be more comfortable crossing large bodies of water with a headwind as compared to winds at their back. Light winds from the northwest followed and brought a few more large flights of Red-bellied Woodpeckers, another strong flight of Yellow-rumped "Myrtle" Warblers with 1,100 on 15 OCT and another 398 on 17 OCT. Although there was no rain the previous day, gusty west winds kicked up on 18 OCT and brought the season's high counts of White-breasted Nuthatches (122) and Eastern Meadowlarks (18). The next day, the westerly winds drew more southerly and brought surprisingly good numbers for the day. Although the wind gusted over 20 mph (32 km/h), 601 Forster's Terns were tallied moving south down the Bay in loose flocks of 30–40. This strange southwesterly cold front also set up an excellent hawk flight with 98 Sharp-shinned Hawks, 13 Cooper's Hawks, and 11 American Kestrels. The winds continued from the southwest the next day, and very little was noted as this is not the preferred wind direction for nocturnal migration (Van Doren et al. 2016). However, the count's only Dunlin was observed moving south high overhead. Winds dropped to merely a breath on 21 OCT and came around from the north. An uptick in individuals was evident, with nearly double the previous day's count. Species of note included 5 Redheads, 3 Dickcissels, a Little Blue Heron, and the seasonal high of 25 Tufted Titmice in active morning flight. The following day was equally productive. Building daily counts of House Finches capped at 565, as well as the first good flight of American Robins with 535. American Goldfinches were also on the rise with 476. Aside from the spike early in the month, they slowly increased with

the passing days. Slightly more east in an otherwise north wind on 23 OCT produced the season's high of 322 Turkey Vultures and over 800 American Robins were noteworthy. The slightly easterly component of the wind roped in clouds and fog from the coast and set up an interesting morning on 24 OCT. At least 3,545 American Robins passed overhead, the high count for the season, and 2,026 Yellow-rumped "Myrtle" Warblers were counted working northwest around the Point, also that species' high count. Other species of note were 607 Tree Swallows and 707 Red-winged Blackbirds. Fog continued for the next two days. Interestingly, very few birds moved compared to 24 OCT. Wind was probably a factor as it was northerly at 12 mph (19 km/h) on 24 OCT but died down and switched to the east for the following two days.

The last few days of the month began with a strong cold front on 27 OCT that brought 153 Eastern Bluebirds, a late Red-eyed Vireo, and a nice hawk flight. The season's second Northern Goshawk, 54 Red-tailed Hawks, 23 Red-shouldered Hawks, and 20 Cooper's Hawks were tallied. Winds turned more northeast on 28 OCT and blew in a flock of 8 Brant, a late Philadelphia Vireo, and another solid Buteo flight. Northeasterly winds continued and provided the season's first Red-throated Loon on 29 OCT, an Evening Grosbeak and 2 Black Scoters on 30 OCT, and the season's high of 149 Purple Finches on 31 OCT.

November

The last month of this year's count began fairly slowly, with light south winds on the first day. A small cold front slipped in the following day, which brought a diverse flight on 2 NOV. The season's first Golden Eagle and a third Northern Goshawk drifted past the Point with a total of 71 species. The anticipated flocks of Common Grackles also arrived on 2 NOV with 36,200 estimated throughout the morning, most of them just before sunrise. The next four days consisted of mostly east winds, some fog, and eventually rain on 6 NOV. There were several fairly strong passerine and waterbird flights, turning up 3 Red-necked Grebes on 3 NOV, the only ones for the season. Other notables include the second Evening Grosbeak and 6 Red Crossbills on a foggy 4 NOV. Also noted that day was the season's high count of 37 Pine Siskins. Ducks of all types showed a sharp increase in November. Ring-necked Ducks had been on the increase since arriving on 28 OCT and reached their peak on 8 NOV with 153. All species of the diving duck genus *Aythya* showed good numbers throughout the month. Numbers of Cedar Waxwings peaked in November, A total of 1,284 on 7 NOV marked the season's high, but daily counts around 1,000 were tallied on and off throughout the month. Although rather scarce this far into the Chesapeake Bay, all three species of scoter were seen during the month. A powerful cold front on 8 NOV featuring 20 mph (32 km/h) winds straight out of the north brought the season's third Golden Eagle over the Point as well as the season's only Orange-crowned Warbler. Another Golden Eagle was counted on 9 NOV as well. The winds eventually came around from the east and brought seasonally warm

temperatures with morning lows in the 60s °F. Both passerine and waterfowl numbers were low in these several days; however, dreary conditions on 11 NOV brought the season's high for American Goldfinches (1,634). The following day was rather slow besides the first flock of Snow Geese moving south high overhead.

Mid-November showed a decrease in numbers and species and was dominated by crisp winds from the northwest. It did offer a few notable species, including an incredibly late Blue Grosbeak on 14 NOV, the season's fourth Northern Goshawk on 17 NOV, and 7 Red Crossbills on 18 NOV. A westerly gale on 17 NOV also brought an influx of Tundra Swans past the Point with 236. Several other massive flights of swans were tallied over the next five days, including the season high count of 524 on 19 NOV. Calm winds and very cold temperatures prevailed in the third week of the month. Ducks continued to arrive, with the first Red-breasted Mergansers of the season counted on 21 NOV, and the first White-winged Scoter on 23 NOV. Also of note on 23 NOV was a strong movement of 141 Canvasbacks powering south high over the Bay. This flight made up most of their numbers for the season, and only a handful were counted on the other days they were present. Evening Grosbeaks continued their southward irruption after the first was spotted on 30 OCT. One was counted on 23 NOV and 2 were seen on 27 NOV. A Red-throated Loon was noted on 23 NOV, as well as an influx of 64 Rusty Blackbirds. The last few days of the count were cold with gusty winds from the northwest. Passerine migration was nearly over, but species such as American Robin, Cedar Waxwing, and American Goldfinch showed consistent numbers up to the end of the count. Light westerly winds on 26 NOV brought the count's only Lapland Longspur, which vocalized as it flew south high overhead. The last day of MBP's Turkey Point Bird Count was 30 NOV. A steady rain began immediately after sunrise, and movement was very slow besides 2 Common Goldeneyes moving south, the only ones for the season.

All the data for this season are publicly available via Trektellen at the Maryland Biodiversity Project - Turkey Pt. morning flight page (Trektellen 2023f), and through eBird (2023b). Highlights and photos of the 2022 morning flight count can be found at the MBP's Turkey Point blog (Maryland Biodiversity Project 2022a).

Species Accounts – The Season's Notable Five

Red-bellied Woodpecker

The fall of 2022 was highlighted by the greatest flights of Red-bellied Woodpeckers ever documented on the East Coast. In addition to the incredible numbers at Turkey Point, the morning flight count in Cape May, New Jersey also recorded its highest count since recording their data in Trektellen in 2016 (Trektellen 2023c). Other observers recorded the New Jersey state high count at Delaware Avenue, another morning flight location in Cape May (eBird 2023d).

At Turkey Point, their irruption began as an unnoticeable trickle of a few individuals in August and most of September. They began to spike in the last week of the month with an uptick of 21 individuals counted on 21 SEP. For the next six days, they continued to increase with a count of 78 on the 27 SEP (Figure 1). During this fourth week in September, there was a stiff west or southwest wind at 15–20 mph (24–32 km/h), which likely kept most birds from moving. However, the wind calmed significantly and lost its southward component on 28 SEP, which opened the floodgates for them. During a span of four hours, 406 Red-bellied Woodpeckers were counted as they moved past the Point, a stunning number for this species. The next week was dominated by northeasterly winds, clouds, and intermittent precipitation. These conditions proved to be the least favorable, as some days no Red-bellied Woodpeckers were noted even while solid flights of passerines were underway. The weeklong stretch of dreary conditions finally broke on 6 OCT when 278 Red-bellied Woodpeckers were counted that day, compared to just one the previous day. What was the difference between the two days? Cloud cover. Dreary and cloudy conditions dominated on 5 OCT with a northwest wind; 6 OCT noted similar winds but was perfectly clear. Favorable conditions continued for the next few days and brought truly incredible numbers. Over 450 birds were tallied on 7 OCT, and 10 OCT brought the season's incredible high count of 641. After the record flight on 10 OCT, numbers quickly dropped, but migration continued through the end of the count, gradually declining as the season progressed. The 2021 season at Turkey Point netted a total of only 126 Red-bellied Woodpeckers (Trekellen 2023e), compared with 3,757 during the fall of 2022. Though generally considered non-migratory, small numbers of that species have been noted migrating past Cape Island, New Jersey (Sibley 1997). Their irruptive behavior could be related to the acorn crops of various oaks (*Quercus* spp.), a staple in the northern hardwoods during winter. (Acorn crops vary from year to year in a boom or bust cycle. If the bust years for most of the oak species fall in the same year, massive food shortages occur, leading to Red-bellied Woodpeckers, as well as Blue Jays and White-breasted Nuthatches pushing south [Dunn et al. 2022]). Those other species showcased large numbers during the fall of 2022 as well.

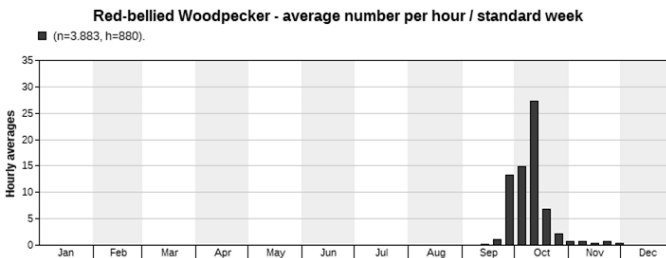


Figure 1. Red-bellied Woodpecker fall migration at Turkey Point, Cecil County, Maryland in 2022.

White-breasted Nuthatch

Although a fairly common, year-round species in Maryland and throughout much of the East Coast, White-breasted Nuthatches show noticeable irruptive behavior (Dunn et al. 2022). Like Red-bellied Woodpeckers, they rely on food provided by hardwood trees further north. eBird and Christmas Bird Count data show how numbers of White-breasted Nuthatches vary from year to year, usually alternating every year (Dunn et al. 2022). This is especially noticeable in the extreme coastal eastern United States and especially Delmarva, where few nest (Robbins and Blom 1996). Some winters they are almost impossible to find away from large stands of hardwoods and other years they are abundant across a variety of habitats; those in the large stands of deciduous forests are likely local, non-migratory breeders as that is their preferred habitat (Grubb and Pravosudov 2020). The first migrants were noted at Turkey Point on 3 AUG, with a total of six counted that month. September brought an increase to 36, with most seen in the last week of the month. October produced the peak of their southward irruption with a total of 1,038 counted. On 18 OCT, the highest daily count occurred with 122 individuals moving around the Point (Figure 2). Like most bird species migrating past Turkey Point, White-breasted Nuthatches preferred to move on days with clear and cool weather with west or northwest winds. Upon reaching the Point during the morning, they would typically circle back northwest into the wind. Numbers decreased significantly in November with only 42 counted. The last migrant was noted on 14 NOV.

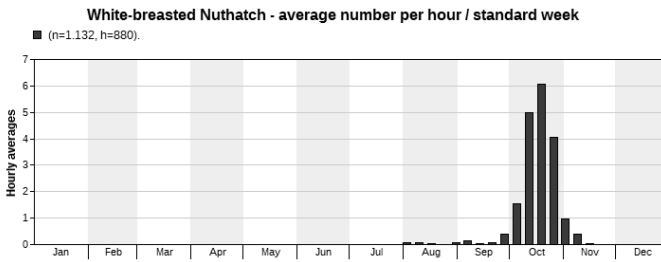


Figure 2. White-breasted Nuthatch fall migration at Turkey Point, Cecil County, Maryland in 2022.

American Goldfinch

Based on numbers at Turkey Point and other monitoring stations, the fall of 2022 was an irruption year for many species such as Purple Finch, Red-breasted Nuthatch, Pine Siskin, and Evening Grosbeak. One of the lesser-known members of this irruptive species list is the American Goldfinch. The first migrants were seen at Turkey Point on 3 AUG and steadily increased throughout the count period. A modest 113 were tallied in August, but the count jumped to 888 in September. October recorded 4,642 birds and double that number in November (9,374) (Figure 3). Goldfinches moved under just about every

weather condition and flew surprisingly well in rain and dreary conditions. They appeared to prefer cloudy and dreary weather; many of the top daily counts were noted in such conditions. The highest daily count occurred on 11 NOV with 1,634 and a total of 15,017 were counted during the fall. Most of the community attention in an irruption year goes to the rarer species like Evening Grosbeak, which can leave the more familiar species unnoticed. Morning flight counts are excellent for picking up on otherwise less detectable hills and valleys in species' migration numbers. This was only the second year of the Turkey Point morning flight count, but comparing it to 2021 provides a small but valuable window into the extent of the migration of American Goldfinches. During the fall of 2021, only 364 were counted in the entire season (Trekellen 2023d to be e), compared to 15,017 during the fall of 2022. Although this represents an incredible increase, it will take multiple years to detect trends.

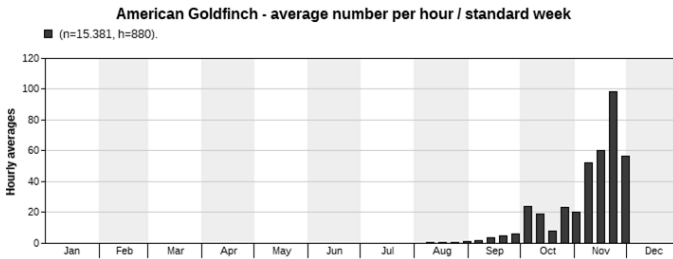


Figure 3. American Goldfinch fall migration at Turkey Point, Cecil County, Maryland in 2022.

Tundra Swan

Tundra Swan migration stood out as the most impressive among waterfowl species this season. They leave their high-Arctic breeding grounds and arrive in the Mid-Atlantic in early November, where their wintering range is surprisingly limited, most residing around the Chesapeake Bay and Pamlico Sound, North Carolina (Limpert et al. 2020). The species arrived on 7 NOV when a flock of 6 passed high overhead, with several other small flocks seen over the next ten days. Gusty west-northwest winds on 17 NOV brought large skeins totaling 236 streaming by the Point. Between 17 and 22 NOV, the majority of Tundra Swans for the season were counted with 524 on 19 NOV marking the high count. The height of their migration lasted less than a week with numbers trailing off after 22 NOV (Figure 4). This makes their migration one of the shortest of any species regularly seen at Turkey Point. The total for the season was 1,937 individuals while last year's count tallied just 23 (Trekellen 2023e). The fall 2021 count ended on 15 NOV, and if Tundra Swans moved on similar dates as in 2022, their peak movements may have been missed, which could explain the much lower number, but more years of data will provide a better understanding of the timing of their movements here.

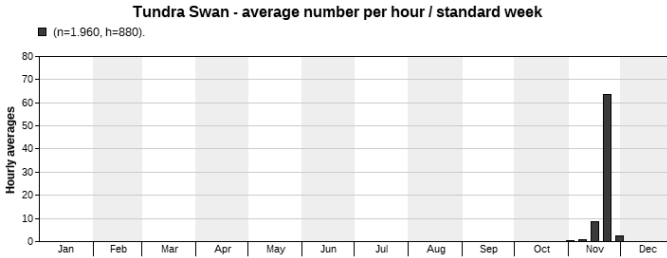


Figure 4. Tundra Swan fall migration at Turkey Point, Cecil County, Maryland in 2022.

Northern Goshawk

Northern Goshawks are one of the most sought-after raptors on the East Coast. These impressive hawks trickle south in small numbers from their high-elevation breeding grounds in the far north (Squires et al. 2020). Historically, Turkey Point was known as one of the best places in Maryland to spot this elusive *Accipiter*, but none had been reported here since 2016 (HawkCount 2023a). That all changed on a brisk 9 OCT, when one circled low over the Point to the amazement of the counter and several lucky birders. An additional 3 Northern Goshawks were spotted over the course of the season, one each on 27 OCT, 2 NOV, and 17 NOV (Figure 5). Surprisingly, last year’s count did not document the species, which raises some questions about this season. An increase in goshawk numbers was also noticed at both the hawk watch and morning flight count in Cape May, New Jersey (Trekellen 2023d). The fall 2022 spike in goshawk numbers pales in comparison with numbers observed at locations across the northeast in the later 1990s and early 2000s (HawkCount 2023b) when several hundred were counted during each fall. It is likely a small influx of dispersing first-year birds riding strong cold fronts from the northwest, following a semi-productive breeding season somewhere in the north (Brinker, in litt., 22 January 2023) The weather conditions that provided the goshawks were nearly identical: cold, clear days with strong north or westerly winds after a powerful cold front. None were seen under any other weather condition during the 2022 count.

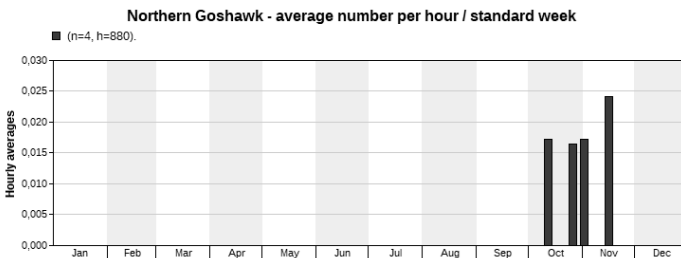


Figure 5. Northern Goshawk fall migration at Turkey Point, Cecil County, Maryland in 2022.

DISCUSSION

This section examines the variables that affect bird migration at Turkey Point and summarizes selected behaviors of different species noted during the season. Among these are weather patterns, flight directions of certain species and taxonomic families, and notes on methods of counting. Several unique trends documented during four months spent at Turkey Point are outlined as well.

Weather conditions and seasonal trends

Weather conditions have a major impact on day-to-day migration activity at Turkey Point, especially wind direction, cloud cover, and precipitation (Irons 2023). Even a seemingly insignificant change from cloudy to clear or a wind change from south to north will drastically affect the totals and species diversity from one day to the next. This inconsistent weather cycle of clear and cool to cloudy and eventually rain also makes tracking arrival and departure dates difficult and variable. Many species first arrive with a cold front, so a prolonged stretch of southerly winds or a period of clouds and rain might drastically delay the arrival of a species. For a species with a short migration window such as Tundra Swan, a prolonged stretch of unfavorable conditions (e.g., fog and south wind) might change its entire migration window for the year. Documenting this range of dates and correlation with weather variables will require multiple years of monitoring.

One of the most notable and unusual weather patterns observed throughout the season was the wind associated with strong fronts from the west. Although every season in this area features cold fronts with north and northwest winds, the fall of 2022 was unique and possibly affected totals and diversity. This abnormality was the wind direction during, and especially a few days after, a strong cold front. In recent years, winds after a fall rain event and cold front start somewhere between due north and west-northwest. By the second or third day afterward, the winds often drift more north and east (pers. obs.) before coming around to the south before the next rain storm. During the fall of 2022, winds started out more westerly and often turned in a southwest direction instead of more north or east in the few days after a front. These were not warm fronts pushing up, as the mornings with this strange southwest or west-southwest wind were cold and blustery. This pattern of more southwesterly winds after a cold front seemed to be caused by two things, the route of low pressure systems and the location of where high pressure holds following a storm and cold front, mostly the latter. Wind stream maps were analyzed throughout the fall provided by the smartphone and internet application, Windy (Windy 2023), and it appeared that these high pressure systems, indicated by isobars, held over the interior Southeast, instead of further north. Winds move clockwise around areas of high pressure (UCAR 2023), and if the systems are to our south, the rotating winds will hit Maryland from a southwesterly direction following a front. Of course, this was not the case with every front, but this pattern seemed to occur in

a higher percentage than in the last few years based on personal observations of weather systems during fall in eastern Maryland. The main effect this trend had on numbers at Turkey Point was that although birds moved during and after these fronts, they were blown to the coastline, likely skipping over Turkey Point. Many of the largest recorded warbler flights at coastal sites like Cape May, New Jersey, occurred during the fall of 2022 (Trekellen 2023b). With fewer days of northeast winds, passerines continued south closer to the coast and were never blown back inland. Although there were notable warbler flights at Turkey Point this year, overall numbers for the season were perhaps lower compared with 2021 Turkey Point numbers, and relative to the record flights at coastal monitoring locations.

One species that was observed almost entirely during northeast winds during the fall of 2022 and 2021 (Trekellen 2023e) were Double-crested Cormorants and the highest counts for them occur on such winds. Avalon Seawatch in Avalon, New Jersey also noted the highest numbers on northeast winds (Trekellen 2023a) and it is possible that these onshore winds push large flocks inland, where they then pass by Turkey Point. Although there were a few moderate flights of around 500 individuals, there were none to the extent of last year, where the top daily count totaled over 2,000 (Trekellen 2023e).

Behaviors of different species in morning flight

A common misconception is that passerines in morning flight reaching a peninsula surrounded by water, will simply cross directly to the mainland. This is not the case at Turkey Point or similar Mid-Atlantic locations (Van Doren et al. 2016). Out of the thousands of passerines counted in morning flight, incredibly few were observed crossing the Elk River to the mainland. Oddly, the few that did so were flying into a stiff headwind and often rain. One of the few species that were observed crossing was the Yellow-rumped “Myrtle” Warbler. A prime example was 13 OCT, when 729 were counted streaming south across the Elk River into a 12-mph (19-km/h) headwind and steady rain. Several other days with similar conditions provided the same results. Practically no warblers in morning flight were observed crossing on a north or west wind or during clear conditions. Woodpeckers often tried to cross, and although some made it far out over the river, all eventually returned, several getting picked off by hungry falcons that regularly patrolled the waters off the Point. Blue Jays also made serious attempts at crossing, but few flocks ever succeeded. Most circled high above the Point before giving up and either looping back north or dropping down into the trees around the Point.

A few species had no problem making the jump. Interestingly, Ruby-throated Hummingbirds seemed eager to cross, preferring a moderate headwind, but some crossed in other conditions as well. All expected species of swallow crossed both the Chesapeake Bay and Elk River without hesitation. Most swallow numbers early in the season appeared to be coming from a nearby roost.

They would cut across the Point heading east, most often from the vicinity of Aberdeen Proving Grounds, although small flights came from almost every direction depending on the day. Either way, swallows migrating or coming from roosts were not fazed by water.

Generally, in a morning flight scenario similar to Turkey Point, birds move around the tip of a peninsula into the wind (Van Doren et al. 2016). As expected, this is the case at Turkey Point as well, with most small passerines following that pattern. During winds with any westerly component, a significant majority of passerines in morning flight favored moving around the point into the wind in a northwest direction. Interestingly, during any easterly wind, passerines still favored moving northwest. While not the overwhelming majority that move northwest in a westerly wind, far more birds moved westward on easterly winds than the number that looped eastward on a westerly wind. This observation aligns with the wind drift hypothesis outlined in Van Doren et al. (2016), suggesting that wind direction is not the sole factor in determining flight direction. The wind drift hypothesis states that passerines engage in morning flight to reorient inland (west), and avoid the danger of being blown over the ocean by a strong cold front and westerly winds while migrating nocturnally. This hypothesis could explain the general preference among passerines to move west regardless of wind. Winds from the south or southeast caused irregular movements among small passerines with individuals going all different directions, but with a slight preference of heading into the wind and looping around the Point counter-clockwise. Exceptionally light winds from directions besides north and west amplified this confusion, and on such mornings, birds were observed moving in every direction with little preference.

All raptors shared similar flight patterns but were more simplified and direct compared to passerines. Most hawks moved with winds of northerly or westerly components. With these favorable conditions, many cross the Elk River without hesitation, whether right off the end of the Point, or off the southeast corner. However, sometimes both small and large hawks would loop around the Point and head back north, similar to the movements of small passerines. On days with south or east winds, hawk movements declined significantly. However, cloudy days with winds from the northeast brought the highest numbers of Turkey Vultures. Even with the preferred northwest winds for most other hawks, Turkey Vulture numbers were much lower as compared to days with winds with an easterly component.

Waterfowl of many species were very prominent at Turkey Point, especially later in the season. Dabblers, divers, geese, and swans used very simple flight paths when moving past Turkey Point and were rarely fazed by land or water. Most puddle ducks like American Wigeons, Northern Pintails, Blue-winged and Green Winged Teal, Mallards, and American Black Ducks were seen fairly high above the Point or high over the Bay. Few moved low along the water (although

a higher number were observed doing so in inclement weather). The vast majority of puddle ducks moved south, often in flocks of a dozen or so, with a few stragglers moving other directions and not actively migrating. Diving ducks like scaup, Canvasbacks, scoters, and mergansers followed a similar southward pattern but moved lower over the Bay, often right over the water. Very few moved over land like puddle ducks. Geese and Tundra Swans again followed similar flight lines as other waterfowl but would be much higher, especially on days with strong north or west winds, and were not fazed by land or water. Most of the waterfowl seen at Turkey Point seemed to be coming from the Susquehanna Flats, a staging and feeding area north of the Point at the very top of the Chesapeake Bay. Thousands of waterfowl of all species can be seen there in late fall feeding on submerged and floating aquatic vegetation. (eBird 2023c) On days with north winds, rafts of this vegetation drift south where it is in view from the Point. On such days, sizable flocks of ducks would be seen feeding around these floating mats early in the morning before taking off and moving south down the Bay. The large concentration of this food source may draw ducks moving south nocturnally or during the day and hold them for a few days before they pick up and continue south past Turkey Point.

What passerines at Turkey Point and any other location do once circling the Point is a great unknown. One certainty is that they end up further north on the peninsula, as noted in last season's report (Irons 2023), the Point is very quiet later in the day, and areas around the parking lot (1-mi [1.6-km] north) are much more active than the Point. How far north passerines make it before landing is also unknown as well as if they continue bush-hopping after their initial flight in the morning. Most probably work north a few miles up the edge of the peninsula and disperse into the vast areas of Elk Neck State Park and State Forest. How far north these passerines continue after passing over the Point is only a guess and all speculation is based solely on personal birding observations in the areas north of the Point later in the day after the count ended.

Standardizing Counting Techniques

A pressing question for a morning flight count is how to standardize the differences in counting styles from counter to counter each season. Choosing which species to count, estimating large flocks, and counting birds circling the Point more than once are worth discussing. Deciding which species and individuals to count on a given day is subjective, and counters may have different abilities and preferences. This is especially true with species that hang around the Point and are not actively migrating and for species that are residents but migrants also move through. The migratory status of gulls, woodpeckers, some hawks, swallows, and any other local species can be uncertain.

On some days with high numbers of total individuals moving over the Point, estimation is required, especially for exceptionally large flocks. Blue Jays and Common Grackles are the most frequent species to be estimated. In early

November, incredible waves of Common Grackles streamed by the Point at dawn, and for a week or so, over 10,000 were estimated most mornings. The question is how accurate are these estimations? These massive flocks move through in sometimes less than 15 minutes and it is not only impossible to count them but there is no way of knowing how accurate the estimations are. Some days, I contemplated whether there were 10,000, 50,000, or maybe even 100,000. Methods for estimating and results vary greatly between each counter which makes it difficult to pin down actual population trends for species like Common Grackle and Blue Jay, when the majority of their numbers are estimated. Hopefully, years of continuous monitoring will help.

Another area where numbers could vary between counters is how potential repeats are treated. Every day there are a few individuals and flocks that are suspected to be repeats and may or may not be counted again depending on the counter and circumstance. How to deal with repeats is another issue in itself as there were many instances where an individual bird with unique characteristics is seen more than once in a day or multiple times over several days. This season, several Blue Jays with leucism were seen with the massive flocks that circled the Point making them perfect subjects for which to keep an eye out. Sure enough, all of the Blue Jays with distinct plumage characteristics were seen several times every day, and for up to a week before moving on. A Blue-gray Gnatcatcher with a missing tail was also noted moving around the Point twice in a morning. These observations raise questions as to how many birds move around the Point more than once. If a high percentage of the unique individuals were seen again, repeats may be occurring on a more regular basis than previously thought. Accidentally counting a few repeats should not affect the overall totals for many species but large flocks could cause a significant difference. For example, if a few of the most prominent Blue Jay flocks for a given day head north after making a pass, then return, totals could be swayed significantly. To ensure consistency over many years, it is probably ideal to count everything besides the few individuals or flocks that are either seen doubling back or are positively repeats based on unique plumage or other factors.

The second season of MBP's Turkey Point morning flight count expanded our previous understanding of morning flight on Maryland's inland coastal plain transition zone. With the establishment of a morning flight count at Dans Rock in western Maryland in fall 2022 and with continued effort in Cape May, New Jersey, even more comparisons can be made, not only in numbers of birds seen, but also migration routes and preferences of different species between three sites. Each location offers a unique perspective on morning flight and over the next several years, more counts will hopefully pop up, filling in the puzzle of East Coast morning flight.

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