WINTERING RAPTORS and WATERFOWL

on the MAURICE RIVER

CUMBERLAND COUNTY, NEW JERSEY

The THIRTY-THIRD FIELD SEASON
of a Long-term Avian Use Study

Findings for the WINTER PERIOD: December 2019 through March 2020

Research sponsored by
CU Maurice River

Bald Eagles continue to increase in numbers on the Maurice River. Here is an adult Bald Eagle coming in from the Delaware Bay at East Point, carrying a Menhaden (Bunker).

Photo by Clay Sutton, February 2020.

Clay Sutton and James Dowdell
March 2020

I would like to dedicate this humble report to the memory of the late **Berwyn Kirby**, who passed away early in 2020. Berwyn was one of the co-founders of CU Maurice River, and one of the first, and most passionate, to recognize the importance of this great river and of the need to protect it. And this he did with great commitment and zeal. He was one of the first to support this study, and others, for their value in documenting the great natural resources of the river and the role such studies might play in preserving it. I well remember our early meetings on the banks of the river, and his great fervor and infectious advocacy. If you didn't love the river beforehand, you would after spending time on the water with Berwyn. Or else! With Berwyn, it was "Lead, follow, or get out of my way!" He was and remains one of my favorite characters, and I apply this term as a complement and with great fondness and respect. Thank you, Berwyn, for all you did, on so many fronts and over so many years.

-- Clay Sutton, March 2020.

Although Snow Goose counts on the Maurice River have declined somewhat in recent years due to the fact that many birds remain north of New Jersey in winter, Snow Goose continues as a hallmark winter species on the lower Maurice River and adjacent Delaware Bayshore wetlands.

Photo by Clay Sutton, January 2020.

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Following thirty-two years of in-depth, long-term winter raptor and waterfowl status and distribution studies on the Maurice River (a major Delaware Bay tributary), and following the landmark report in March of 2018 detailing the first thirty years of findings in regard to significant observed trends of the tidal river's substantial avian resources, this current report presents the results of a continuation of these unique studies: the 33rd consecutive winter-season of study of the birds of prey and waterfowl populations that spend the winter on the Maurice River.

The comprehensive 30-year report was finalized and presented to CU Maurice River in March of 2018, detailing the findings, and particularly the observed long-term trends, of the annual winter raptor and waterfowl population studies on the tidal Maurice River. This report is available on the CU Maurice River website at www.cumauriceriver.org/raptor-and-waterfowl-surveysstudies/ . Summary reports have also been completed at each five-year interval throughout these studies and over the years, and are also available at this website.

Because these reports, as well as all of the thirty-two years of *individual* season reports are available on-line, little discussion of methodology and techniques is offered in this short-form yearly single-season summary. The basic methodology of the core winter raptor and waterfowl studies *has remained the same since 1987*: nine established sites (point counts) on the tidal Maurice River between Millville and East Point were sampled by Sutton and Dowdell for a period of approximately 45 minutes each during each survey. Consistent monitoring has been conducted approximately every ten days between 1 December and 31 March each season. Visit the CU website for in-depth review of all methodologies and sampling locations, as well as the important goals and objectives of this long-term project.

Because the recent 30-year report detailed highly alarming downward trends in the winter numbers of both raptors and waterfowl on the Maurice River, it was decided by CU Maurice River to continue these long-term studies (and highly significant data set) into the current 33rd winter season. Without reiterating the extensive findings and reporting found in the March 2018 30-year summary report, suffice it to say that there are well-documented declines in both raptors and waterfowl on the river, with strong evidence suggesting that these downward trends are linked to sea level rise on the Maurice River and in the greater Delaware Bay region. It was this disturbing and compelling evidence – the hard facts of observed major declines in many key species – that prompted CU Maurice River to continue these studies and the highly important documentation of the local adverse impacts resulting from the international phenomenon of climate change on our hallmark avian resources. Changes on the Maurice have been rapid, significant, ongoing, and perhaps accelerating.

Of note is that this 33rd winter season monitoring was unfortunately cut short due to the Coronavirus Pandemic and resultant travel restrictions put in place on or about March 22nd. Seven of the planned and contracted eight surveys were carried out prior to the "shelter-in-place/essential business only" restrictions, but the 8th and last survey could not be carried out. We do not feel that missing this last survey has impacted our data and findings to any great degree. With the record warm winter of 2019-2020, in large part, major winter concentrations of raptors and waterfowl simply did not occur, and those wintering birds that were on the river departed quite early for their breeding grounds to the north. Possibly only the Green-winged Teal winter peak and average numbers were substantially affected by missing the final late March sample date.

Also of interest during the winter of 2019-2020 is that we began work on a scientific paper detailing and analyzing all 33 years of winter raptor data. Working with Dr. Paul Kerlinger, a former Director of the Cape May Bird Observatory and more recently a consultant to the wind power industry (and now retired), we began the in-depth process of review and statistical analysis of our previous findings and preliminary conclusions, particularly those detailed and expressed in both the 25-year report and the 30-year report prepared for CU Maurice River. Having read these two reports, Paul Kerlinger described our long-term research and data as "a goldmine of information and insight." With CU Maurice River's approval, Sutton and Kerlinger began to review and analyze all 33 years of data as to what it may tell us regarding observed changes in Maurice River raptor numbers over time, and what this data may indicate in regards to climate change and sea level rise. See the introduction to the 30-year report for more information on the strong value of long-term monitoring, the need for further analyses of our data set, as well as possible theories and scenarios in regard to the potential impacts of sea level rise on the Maurice River.

This planned draft scientific paper is well underway as this seasonal report is written, and upon CU Maurice River's review and approval, will be submitted for consideration for publication to either the *Journal of Field Ornithology* or the *Journal of Raptor Research*. The possible publication of this peer-reviewed paper will be a milestone for our long-term Maurice River studies, one that will not only bring recognition to both the Maurice River and CU, but also strongly support and confirm the trends that we have discovered over time. Recent alarming trends, particularly the recent precipitous declines in Northern Harrier and Red-tailed Hawk wintering numbers, have galvanized us into the decision to publish at the 33-year mark. Ideally, we had always planned on preparing a major paper at the key (but subjective) 35-year mark, but the dire findings of the past nine years have dictated that these trends need to be documented and disseminated now. These findings are too significant, and frankly too disturbing, to wait even two more years.

Core winter raptor and waterfowl studies continued for the 33rd consecutive winter season. The Maurice River was sampled on seven dates between 19 December 2019 and 11 March 2020. These findings are presented in **Table 1**. Table 1 also shows winter 2019-2020 average counts for key species. The seven survey dates in this current season, the 33rd winter season of monitoring on the Maurice, bring our cumulative total of winter surveys to 296 over the 33 years, dating back to the study's inception in 1987. This gives us an unparalleled perspective on the changing avian resources of the Maurice River. (See 30-year report).

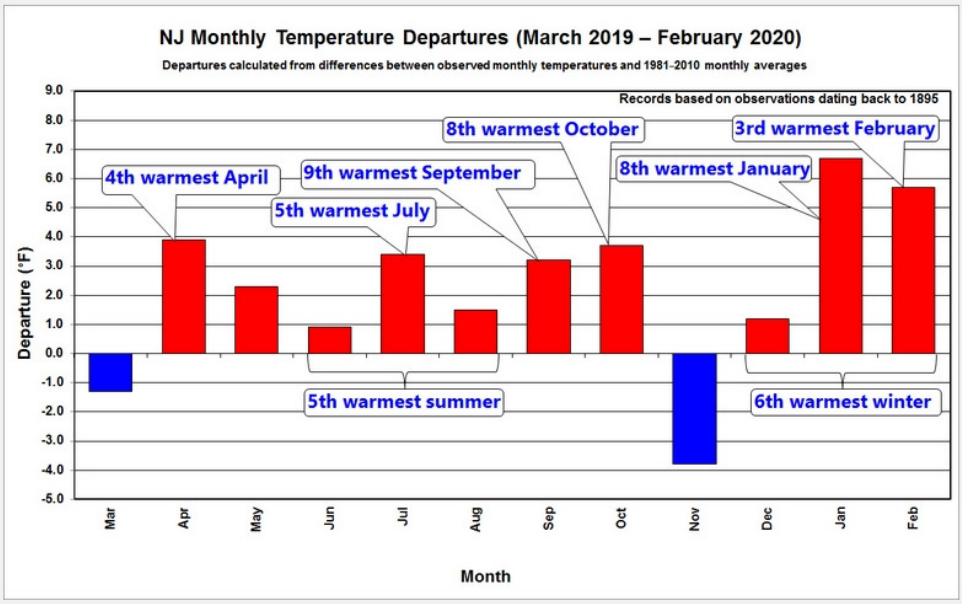
As in past seasons, Cumberland County's other major Delaware Bay tidal tributary, the Cohansey River, was again sampled (albeit on only three occasions) during the winter period. For 30 years the Cohansey has been monitored as a "comparison river" or "control" to ascertain whether findings on the Maurice are representative; that is, whether they are either localized or

more widespread on the Delaware Bayshore. Cohansey River results for winter 2019-2020 are shown in **Table 2**. *(Note that the Cohansey River survey was conducted on a volunteer basis at no cost to CU Maurice River. Also note that three additional volunteer/pro bono days were donated in the preparation of this short-form summary report on the winter 2019-2020 effort).* The three survey dates on the Cohansey River during the current season bring our cumulative total to 51 winter surveys over the 30 years of this comparative study dating back to 1990. The depth of this effort and data allow for strong comparisons and contrasts.

Table 3 shows peak and average numbers of winter raptors and key waterfowl species on the Maurice River during winter 2019-2020. For comparison purposes, these numbers are shown in relation to both Segment V (2007-2012) and Segment VI (2012-2017) of this long-term study, as well as the individual single-season results from Year 31 and Year 32. The findings are straight-forward and self-explanatory, particularly when viewed with and against the findings and extensive discussion in the 30-year report presented in March 2018.

As with every winter season, the relative abundance and phenology of wintering raptors and waterfowl found on the Maurice River were in large part dictated by the weather. The autumn migration period (that functions to bring migrant waterfowl and raptors that will eventually winter in the region) saw extremely warm temperatures in September and October, with only November showing (slightly) below average temperatures. It was a fairly unremarkable fall migration region-wide, and many birds no doubt remained well to the north of South Jersey due to the mild conditions. A very mild winter followed. The chart shown below shows monthly temperatures for March 2019 to February 2020 (source: New Jersey Office of Climatology). December was slightly warmer than average, and January was the 8th warmest January in 125 years of record-keeping dating back to 1895. It was the 3rd warmest February ever recorded, leading to the 6th warmest winter overall ever recorded. There was virtually no snow, snow cover, or prolonged or widespread ice during the winter of 2019-2020. It was however a fairly wet winter, with rainfall above average and following the previous very wet winter of 2018-2019.

The latest chart from the New Jersey Climatologist's Office:



All but two of the past twelve months have been warmer than average. February 2020 was the third warmest February since 1895, when NJ record-keeping began.

After 32 years of previous studies, we believe that the findings on the Maurice for winter 2019-2020 (Year 33) were about what we have come to expect for a very mild winter without lengthy or deep freeze-ups. Snow Geese were present, yet itinerant as usual, with most regional geese remaining west and north of the Maurice River region. The numbers of Snow Geese were well below long-term average. Canada Goose numbers were modest as well, as many remained north of the Delaware Bayshore due to the lack of Northeast Region snow cover and frozen conditions early in the winter. American Black Duck, Mallard, and Northern Pintail numbers were once again very low compared to long-term averages. For all three species, their absence was presumably due to both the mild weather and to the long-term and on-going diminishing of quality brackish wild rice habitat. This degradation of habitat is anecdotally observed to be continuing and accelerating. The crucial wild rice acreage that was once prevalent on the brackish tidal upper river (a habitat that supported large numbers of ducks) has been rapidly disappearing due to sea level rise (see 30-year report). *Phragmites* encroachment continues along much of the Maurice River as well. Finally, the warm winter and early spring led to early departures of ducks for their northern breeding areas, and this too was a factor in very low average numbers for Black Duck, Mallard and Pintail in our 2019-2020 study.

A highlight of the previous winter (2018-2019) had been the major concentration of diving ducks on the lower Maurice River. Beginning in early February 2019, a brief spell of cold weather and partial freeze-up pushed regionally substantial numbers of scaup, scoter, Long-tailed Ducks, Bufflehead, and Common Goldeneye to the lower river near Port Norris. This concentration of divers was judged unusual but significant and welcome, and deemed at that time to be part of a continuing trend of increasing diving duck use of the lower Maurice River and adjacent Delaware Bay. It is notable that this trend did continue in winter 2019-2020, but to a much lesser degree. Long-tailed Ducks, Bufflehead, and Common Goldeneye were present in fair numbers (but fewer than during the previous season), but scaup were almost absent. Winter scaup in our region seem to be particularly linked to cold weather and frigid conditions to our north.

Maurice River Northern Harrier and Red-tailed Hawk numbers continued to be unremarkable compared to the earlier segments of the study, and well below long-term peaks and averages. In Year 33, the downward trend continued for these two Maurice River and Delaware Bay signature raptors. The average of 14.57 Northern Harriers is the second lowest-ever in 33 years of monitoring, just slightly above the (previous) Year 32 average of 13.13 birds per survey that was the lowest-ever average in 32 winter seasons of study. The 2019-2020 Red-tailed Hawk average of 13.57 is by far the lowest average seen in all 33 years of study. These low numbers were possibly in-part due to the mild winter; over time the higher numbers of raptors have normally occurred during colder winters, when raptors are pushed to our region from farther north. But although winter 2019-2020 was very mild, other causal factors clearly seem to be at work here. Long-term downward trends for N. Harriers and Red-tailed Hawks continue to be significant, dramatic, and disturbing. The recent downward trends in Northern Harrier and Red-tailed Hawk are shown below. When viewed in relation to the findings of the previous years, the entire 30 years of study, it is clear that things have changed drastically for these two hallmark raptors of the Maurice River. As charted below, the numbers speak for themselves. Harriers and Red-tailed Hawks have crashed on the Maurice River.

Northern Harrier Seasonal Average (birds per survey)

Year 27	15.25	3rd lowest
Year 30	15.88	5th lowest
Year 31	15.57	4th lowest
Year 32	13.13	lowest
Year 33	14.57	2nd lowest

Red-tailed Hawk Seasonal Average (birds per survey)

Year 29	26	3rd lowest
Year 30	28	5th lowest
Year 31	23.14	2nd lowest
Year 32	27.88	4th lowest
Year 33	13.57	lowest (by far…..)

As extensively reviewed and discussed in the 30-year report and subsequently, we strongly believe that the cause for these distressing downward trends is the lack of marsh rodent prey availability. As we have explored previously, we believe that the frequent and persistent tidal flooding from winter storms, as well as from monthly Full Moon and New Moon high tides, has no doubt severely impacted (eliminated?) marsh rodents from much of the formerly productive Maurice River marshes. The findings from winter 2019-2020 again show that this trend is continuing and most probably accelerating.

Note that the comparatively limited (three surveys) Cohansey River data for winter 2019-2020 (Table 2) shows the exact same picture: Northern Harrier and Red-tailed Hawk numbers continue to be very low, and well below the long-term averages on the Cohansey River as well. The N. Harrier average of 15 tied the 3rd lowest-ever number; the Red-tailed Hawk average of 16.67 was by far the lowest average in 30 years of study (previous low: 20 in Year 31). Importantly, see our discussion in the 30-year report to further understand how Cohansey River findings support and confirm Maurice River findings over time. Simply put, whatever is happening with N. Harriers and Red-tailed Hawks on the Maurice River is happening on the Cohansey River as well.

Bald Eagle numbers continue to soar on the Maurice River. The winter of 2019-2020 saw the second-highest average ever achieved in our 33 years of monitoring (following Year 31's record, and besting Year 32's previous second-highest average). The peak of 53 individual Bald Eagles carefully counted on 14 February 2020 again ties our second highest peak daily counts (in both Years 30 and 32), and is second only to the Year 31 daily record of 59 eagles. Today, Bald Eagles are in sight at virtually all times during our surveys, and very heartening in light of those declining species we have discussed above.

There were a number of other interesting and significant sightings during the 2019-2020 survey period. A Common Eider was reported by others at East Point on 22 December, one of very few records for the Delaware Bay or Cumberland County. We saw what was apparently a

"Blue Goose" x White-fronted Goose hybrid near Bivalve on 2 January, both a strange-looking and unusual hybrid to say the least. We have never recorded a pure White-fronted Goose on our surveys, but now we can at least say we have (probably) seen half of one! 51 Wilson's Snipe counted on 11 March was a very good total for the region. A 1st winter-plumaged Glaucous Gull was recorded on three dates at Bivalve over the winter; this distinctive and attractive gull was a visitor from the far north, and one of very few that we have recorded over our 33 years of study.

Finally, an unprecedented high count of an amazing 7,500 Northern Gannets was estimated in Delaware Bay off of East Point on the morning of 11 March. While most were well offshore in the bay, beyond Maurice River Cove, this feeding aggregation showed how early Menhaden (Bunker) return to the Delaware Bay in spring. Anecdotally, fishermen tell us that in the past several years Bunker have strongly rebounded from over-fishing, and are now once again found in the bay in huge numbers. This is excellent news for birds as diverse as N. Gannets, Osprey, Bald Eagles, and many others (not to mention fisheries – game fish). Also of interest is how early in spring this N. Gannet/Menhaden aggregation occurred. Spring comes earlier and earlier to the Delaware Bay and Maurice River in this age of warming climate and warming waters.

The results of our 33rd winter season of raptor and waterfowl studies on the Maurice River have again confirmed and corroborated not only most of our observed long-term trends over the many years, but also have strongly supported and substantiated the alarming results from the most recent nine seasons. There is now little doubt that the cumulative effects of climate change and resultant sea level rise continue to accelerate and negatively impact the raptor and waterfowl populations of the river and the region.

To continue to document these disturbing changes and unsettling downward trends is today an important goal of this long-term project, even though this was not something even remotely considered at the outset of these studies 33 years ago, way back in 1987. Such documentation is why long-term studies are so highly important as we continue to monitor raptor and waterfowl populations in these times of great and rapid change. Much of what we have reported in recent years is not good news, but it is critical news that needs to be reported.

We commend and thank CU Maurice River for sharing these concerns and continuing to support this important work. We thank the officers, staff, and all the members of CU Maurice River for their continuing vision and belief in the innate and deep values of this long-term research effort. We continue to be proud to represent CU Maurice River as we all learn together.

The Maurice River continues to be an important regional bird area by all standards and barometers, but the documented declines in birds and the habitats on which they depend are real and need to be acknowledged and addressed. The findings of these CU Maurice River long-term studies join those region-wide, nation-wide, and indeed world-wide efforts, in focusing us on the immediacy of the issues and the urgent need for real and comprehensive actions on sea level rise on both the Delaware Bayshore and beyond.

TABLE 1
Maurice River: Raptor and Waterbird Survey
December 2019 through March 2020

	CORE WINTER PERIOD 2019-2020							
DATE	12/19	1/2	1/16	1/28	2/14	2/22	3/11	AVG.
								N=7
LOONS to CORMORANTS								
Red-throated Loon		1				4	**8**	
Common Loon								
Horned Grebe				1				
Northern Gannet			1	8		2	**7500**	
Great Cormorant								
Dbl-cr Cormorant	1				2	1	**43**	
BITTERNS to VULTURES								
Great Blue Heron	6	4	1	**7**	3	7	3	
Great Egret								
Snowy Egret								
Little Blue Heron								
Black-cr Night-Heron				1				
Glossy Ibis								
White-faced Ibis								
Black Vulture	29	**61**	46	46	46	33	40	43
Turkey Vulture	81	157	**216**	163	125	148	193	155
WATERFOWL								
Snow Goose	0	**3100**	2100	480	0	150	150	854
Canada Goose	209	189	144	**361**	237	326	236	243
Mute Swan	2	**5**	2	4	4	4	3	
Wood Duck								
Gadwall				16	6	**34**	8	
American Wigeon						**14**	14	
Am Black Duck	251	171	195	391	**400**	256	175	263
Mallard	85	199	132	166	**427**	194	178	197
Blue-winged Teal								
Northern Shoveler							8	
Northern Pintail	8	7	48	32	**320**	170	24	87
Green-winged Teal	0	2	72	140	499	**569**	535	260
Common Teal								
Canvasback								
Ring-necked Duck			122	**304**	22	79	262	
Greater Scaup		1	3				**7**	
Lesser Scaup	2		4		**32**		10	
Scaup (sp.)		9	6	24	2	62	**73**	
Surf Scoter		21	1	30	14	24	**74**	
White-winged Scoter								
Black Scoter	1	12				1	**14**	
Scoter (sp.)		60	21	36	6	30	**65**	

Peak counts shown in **Bold Face**

* Seen on date other than official survey date or by other observers

TABLE 1 (page two)
Maurice River: Raptor and Waterbird Survey
December 2019 through March 2020

	CORE WINTER PERIOD 2019-2020							
DATE	12/19	1/2	1/16	1/28	2/14	2/22	3/11	AVG.
								N=7
WATERFOWL (continued)								
Long-tailed Duck	6	28	**84**	30	34	11	23	
Bufflehead	184	172	184	188	**198**	162	148	177
Com. Goldeneye	20	1	10	15	**26**	10	5	
Hooded Merganser	14	1	2	14	2	**20**	6	
Com. Merganser				1	2	**8**	3	
Red-br Merganser	14	16	14	16	**22**	13	22	17
Ruddy Duck	1						4	
DIURNAL RAPTORS								
Osprey								
Bald Eagle	47	44	31	36	**53**	40	43	42
Northern Harrier	12	19	17	**25**	12	9	8	14.57
Sharp-shinned Hawk	2	**6**	1	1	1	0	1	1.71
Cooper's Hawk	0	2	2	0	**4**	0	4	1.71
Northern Goshawk								
Red-shouldered Hawk	0	0	0	0	0	0	1	0.14
Rough-legged Hawk							1*	(3/12)
Red-tailed Hawk	11	4	11	3	12	**27**	27	13.57
Golden Eagle								
American Kestrel	0	0	0	**1**	0	1	0	0.29
Merlin	0	0	0	**1**	0	0	0	0.14
Peregrine Falcon	1	1	0	1	1	**2**	2	1.14
GROUSE to CRANES								
Wild Turkey				**12**	10			
Clapper Rail		3						
Sandhill Crane								
SHOREBIRDS								
Black-bellied Plover								
Killdeer	1		2		**25**	13	19	
Am. Oystercatcher								
Greater Yellowlegs	11	2			4	1	**55**	
Lesser Yellowlegs							1	
Pectoral Sandpiper							2	
Willet								
Dunlin		**25**		25				
Sh-billed Dowitcher								
Wilson's Snipe	14	22		2	3	7	**51**	
American Woodcock	**1**			1				

Peak counts shown in **Bold Face**

* Seen on date other than official survey date or by other observers

TABLE 1 (page three)
Maurice River: Raptor and Waterbird Survey
December 2019 through March 2020

	CORE WINTER PERIOD 2019-2020							
DATE	12/19	1/2	1/16	1/28	2/14	2/22	3/11	AVG.
								N=7
JAEGERS to ALCIDS								
Laughing Gull								
Bonaparte's Gull			34	52	**54**	14	30	
Ring-billed Gull	√	√	√	√	√	√	√	
Herring Gull	√	√	√	√	√	√	√	
Glaucous Gull				**1**	1	1		
Lesser Bl-backed Gull						1*		
Gt Bl-backed Gull	√	√	√	√	√	√	√	
Forster's Tern								
Black Skimmer								
PIGEONS to WOODPECKERS								
E. Screech Owl								
Great Horned Owl								
Short-eared Owl								
Belted Kingfisher	2	**8**	2	3	3	2	3	

Peak counts shown in **Bold Face**

* Seen on date other than official survey date or by other observers

TABLE 2
Cohansey River
Winter Raptor and Waterfowl Survey
2019–2020

COHANSEY RIVER 2019-2020				
DATE	1/2/20	2/23/20	3/18/20	AVG.
BITTERNS to VULTURES				
Great Blue Heron	2	3	1	
Black Vulture	**46**	26	9	27
Turkey Vulture	114	**140**	100	118
WATERFOWL				
Snow Goose	**15100**	4050	200	6450
Ross's Goose	1			
Cackling Goose				
Canada Goose	1420	**1860**	88	1123
Mute Swan	2	2		
Gadwall		2		
American Wigeon		2		
Am. Black Duck	**54**	48	8	37
Mallard	**24**	0	3	9
Northern Pintail	2	0	0	0.67
Green-winged Teal	1	40	**200**	80
Scaup sp.		15		
Bufflehead	1	6	1	
Hooded Merganser	7		2	
DIURNAL RAPTORS				
Osprey			1	
Bald Eagle	39	33	**40**	37.33
Northern Harrier	**18**	17	10	15
Sharp-shinned Hawk	1	1	0	0.67
Cooper's Hawk	1	1	**4**	2
N. Goshawk				
Red-shouldered Hawk	**3**	0	1	1.33
Red-tailed Hawk	9	**21**	20	16.67
Golden Eagle				
American Kestrel	0	**2**	1	1
Merlin	1	1	0	0.67
Peregrine Falcon	1	1	0	0.67
GROUSE to CRANES				
Wild Turkey				
Sandhill Crane	1	1	1	
Greater Yellowlegs		2	**48**	
Wilson's Snipe	5		1	
JAEGERS to ALCIDS				
Ring-billed Gull	√	√	√	
Herring Gull	√	√	√	
Great Black-backed Gull	√	√	√	
E. Screech Owl		1		
Great Horned Owl		**2**	1	
Belted Kingfisher				

TABLE 3
Wintering Waterfowl and Raptors on the Maurice River 2007–2020
Comparison of Year 33 to Segment V (2007–2012), Segment VI (2012-2017), and Years 31 & 32

	2007-2012 Segment V			2012-2017 Segment VI			Year 31 2017 - 2018		Year 32 2018 - 2019		Year 33 2019 - 2020	
	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg	Best	Avg	Best	Avg
Snow Goose	12,324	6,605	2,309	13,000	6,051	1,499	3,800	1,053	3,000	1,410	3,100	854
Canada Goose	1538	796	268	1,270	764	346	1256	498	291	215	361	243
Am. Black Duck	1,274	829	487	1,585	887	500	635	440	357	209	400	263
Mallard	649	463	256	952	579	289	509	266	311	142	427	197
Northern Pintail	928	628	281	1,621	826	364	300	90	324	130	320	87
Green-winged Teal	5,850	3,270	988	4,182	2,809	1,021	2,317	890	1,426	405	569	260
Bufflehead	446	316	na	330	238	125	265	174	323	234	198	177
Red-breasted Merganser	207	133	na	320	180	69	154	66	69	46	22	17

	2007-2012 Segment V			2012-2017 Segment VI			Year 31 2017 - 2018		Year 32 2018 - 2019		Year 33 2019 - 2020	
	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg	Best	Avg	Best	Avg
Black Vulture	57	38.2	22.4	60	44.6	26.24	57	31.71	73	53.75	61	43
Turkey Vulture	162	143	99	196	156	123	196	135	185	159	216	155
Bald Eagle	48	34.6	24.15	53	44.4	29.15	59	44.14	53	38.88	53	42
Northern Harrier	43	38	25.8	30	22.8	17.45	21	15.57	18	13.13	25	14.57
Sharp-shinned Hawk	18	9.4	3.04	6	5	2.28	6	2.71	4	1.63	6	1.71
Cooper's Hawk	10	6.8	3.21	6	4.4	2	7	2.71	4	2.00	4	1.71
Northern Goshawk	1			2								
Red-shouldered Hawk	26	8.4	1.62	7	3.8	1.25	7	2.00	5	1.75	1	0.14
Red-tailed Hawk	64	59.4	42	57	45.2	29.75	40	23.14	41	27.88	27	13.57
Rough-legged Hawk	1	0.6	0.07	1			1	0.14				
Golden Eagle	2			1			1					
American Kestrel	10	3	0.77	3	1.6	0.7	1	0.71	1	0.25	1	0.29
Merlin	2			1					1	0.25	1	0.14
Peregrine Falcon	4	2.4	0.98	4	2.8	1.13	2	1.14	3	1.25	2	1.14

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