RAPTORS and WATERBIRDS

on the MAURICE RIVER

CUMBERLAND COUNTY, NEW JERSEY

The TWENTY-NINTH FIELD SEASON
of an Ongoing and Long-term Avian Use Study

FALL 2015 through SPRING 2016
and highlighting the CORE WINTER PERIOD 2015-2016

Research sponsored by

CITIZENS UNITED TO PROTECT THE MAURICE RIVER AND ITS TRIBUTARIES, INC.

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Above: A young **Bald Eagle** over the Maurice River on 18 March 2016. Except for Turkey Vulture and Black Vulture (not really birds of prey), Bald Eagle is now the most common winter raptor on the Maurice River and the greater Delaware Bayshore, surpassing both Northern Harrier and even Red-tailed Hawk. *photo by Clay Sutton*

On the cover: **Curlew Sandpiper** at Heislerville Wildlife Management Area on 18 May 2016. While it was just one of the many thousands of shorebirds present, as a true rarity it was the most sought-after. Heislerville is the best and most reliable spot to find this vagrant Eurasian shorebird in all of North America, and attracts hundreds of birders each spring, along with thousands of dollars in ecotourism spending. *photo by Clay Sutton*

RAPTORS and WATERBIRDS on the MAURICE RIVER

July 2015 through June 2016

The TWENTY-NINTH FIELD SEASON

of an Ongoing and Long-term Avian Use Study

Citizens United to Protect the Maurice River and its Tributaries, Inc.

INTRODUCTION AND OVERVIEW

Another year is in the books, or rather today, in the computer. The period from July 2015 through June 2016 marked the fantastic twenty-ninth field season of long-term avian use studies carried out on the Maurice River under the auspices of Citizens United to Protect the Maurice River and its Tributaries, Inc. Studies included the monitoring of fall migration in 2015, spring migration in 2016, anecdotal breeding bird studies, and the all-important core winter studies carried out from December 2015 through March 2016.

An in-depth review of long-term avian status and trends was prepared (at the twenty-five year milestone) early in 2013, and presented at the Partnership for the Delaware Estuary Science and Environmental Summit held in Cape May, NJ (27-30 January 2013). Because this landmark major report/paper, analyzing all twenty-five years of data, is now available (archived on the CU Maurice River website: www.cumauriceriver.org), this current single season report will only offer brief discussion of the 2015-2016 findings in relation to previous years. Note that the findings of the 26th, 27th, and 28th seasons of study (2012-2013, 2013-2014, and 2014-2015) are also available on the CU website as well.

Also, and again because all of the twenty-eight years of *individual* reports are available on-line, little discussion of methodology or techniques will be offered in this short-form yearly 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 45 minutes each during each survey. 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.

In-depth analysis of findings were prepared at the five-year, ten-year, fifteen-year, and twenty-year milestones of this long-term study; see "Literature Cited / For Further Reference" for a complete listing of these reports. These milestone reports are now joined by the in-depth twenty-five year look at the considerable avian resources of the Maurice River, one that included an analysis of status and trends in raptor and waterbird populations over the entire study period. This report, when viewed on the CU Maurice River website, can be seen in both a short-form illustrated summary (14 pages) and in its entirety (98 pages). A comprehensive 30 year analysis and report are planned at the conclusion of the 30th field season in June 2017.

FINDINGS

The results of the twenty-ninth annual Maurice River Raptor and Waterbird Survey for the period July 2015 through June 2016 are shown in **Table 1**. Eight full surveys were carried out during the important core winter period (4 December 2015 to 18 March 2016). Five surveys were conducted during the fall migration period of the study cycle, 22 July through 16 November 2015, and eight spring migration surveys were carried out between 5 April and 9 June 2016. In all, a total of 21 field days were expended in this year-long period. Spring and fall survey results are also shown in Table 1, but are not included in the core winter season *averages* for key species shown in the table. **Peak winter season daily high counts for raptor and waterbird species are shown in Bold Face**, although note that for a number of migratory species, spring and fall totals easily exceed the peak core winter season count. **Shorebird high counts for the migration seasons are also highlighted in Table 1.**

As in the past, comparative studies were conducted on Cumberland County's Cohansey River as an adjunct to the core winter Maurice River studies. The Cohansey River was sampled three times in winter 2015-2016. This marked the 26th consecutive winter season that the Cohansey River has been surveyed! The results of the Cohansey River winter raptor and waterbird survey are shown in **Table 2**. In recent decades, all Cohansey River surveys have been carried out on a *pro bono*/volunteer basis, at no cost to Citizens United. The Cohansey remains an important comparison river to the Maurice in terms of region-wide phenomena, status and trends, and seasonal phenology.

In the Maurice River drainage, as in past seasons, Canada Goose numbers on the Bayside State Prison grounds (adjacent to the Maurice) were again estimated; birds were counted from Route 47. Most, if not all, "Bayside geese" use the Maurice River for roosting and feeding, and these counts offer insight to regional goose populations and the potential for seasonal herbivory on Maurice River wild rice marshes. The numbers are shown below, but note that these "prison numbers" are <u>not</u> included in the river count totals shown in Table 1. These archived census numbers can be reviewed at some point in the future for the insight they may offer regarding weather conditions, seasonality, and goose population trends on the river.

2015 – 2016 Canada Goose Usage -- Bayside State Prison Grounds

Date	*Number*	*Date*	*Number*
07/22/15	48	02/12/16	855
08/12/15	240	02/22/16	970
10/30/15	225	03/09/16	786
11/16/15	880	03/18/16	364
12/04/15	1050	04/15/16	340
12/15/15	440	05/09/16	142
01/04/16	960	06/02/16	135
01/21/16	475	06/09/16	140

TABLE 1 (page 1)
Maurice River
Raptor and Waterbird Survey
July 2015 through June 2016

	FALL 2015					CORE WINTER PERIOD 2015-2016									SPRING 2016							
DATE	7/22	8/12	10/13	10/30	11/16	12/4	12/15	1/4	1/21	2/12	2/22	3/9	3/18	AVG.	4/5	4/15	5/9	5/14	5/19	5/25	6/2	6/9
			**	**	**									**N=8**	**	**	**	WSB	**	**	**	**
LOONS to CORMORANTS																						
Red-throated Loon				1		4	2	2		1	**10**	7										
Common Loon				1		**3**	1															
Pied-billed Grebe							1	1	1	**2**		1										
Horned Grebe											1	1										
Red-necked Grebe								1*														
Northern Gannet													64		2	40						
Dbl-cr Cormorant	485	391	118	109	67	9	1*					6	**16**		259	486	459	500	401	345	313	416
BITTERNS to VULTURES																						
Least Bittern		1																2			1	1
Great Blue Heron	2	4	1	2	4	**12**	7	9	7	6	10	5	1		2	3	5	5	1	1	3	2
Great Egret	92	31	18	13	4	2		1	1		1	1	**10**		9	78	68	20	84	94	54	90
Snowy Egret	93	42	10	13											36	44	28	40	23	43	28	89
Little Blue Heron																						
Tricolored Heron		1																				
Green Heron	1	1															1	1	1	1	1	2
Black-cr Night-Heron	28	1							1	1							68	50	100	121	118	64
Yellow-cr Night-Heron																		4				
Glossy Ibis	31	2														6	13	25	21	8	7	30
Black Vulture	13	20	3	4	56	45	30	30	18	8	**59**	51	27	33.5	3	13	4	8	6	7	6	16
Turkey Vulture	82	83	22	68	110	191	161	90	89	83	**196**	124	111	131	44	40	31	75	30	31	30	66
WATERFOWL																						
Snow Goose						0	263	800	500	**5050**	3020	2750	1090	1684								
Canada Goose	36	16	38	157	49	25	303	274	**515**	245	181	237	139	240	46	60	46	100	12	2	91	34
Mute Swan	8				2	6	**8**	6	6	4	4	7	8		6	3	6	4	4	3	4	4
Tundra Swan																						

Peak winter counts and peak spring shorebird counts
Shown in **BOLD FACE**

** Lower River Survey only
* Seen on date other than official survey date or by other observers
WSB = non-standard Survey (World Series of Birding)

TABLE 1 (page 2)
Maurice River
Raptor and Waterbird Survey
July 2015 through June 2016

	FALL 2015					CORE WINTER PERIOD 2015-2016									SPRING 2016							
DATE	7/22	8/12	10/13	10/30	11/16	12/4	12/15	1/4	1/21	2/12	2/22	3/9	3/18	AVG.	4/5	4/15	5/9	5/14	5/19	5/25	6/2	6/9
			**	**	**									**N=8**	**	**	**	WSB	**	**	**	**
WATERFOWL (continued)																						
Wood Duck									1									2*				2
Gadwall								4			54	**92**	48		20	41		2*				
Eurasian Wigeon															1*	1						
American Wigeon				1							8	**26**	10									
Am Black Duck	1		65	102	133	128	139	389	378	533	413	499	**721**	400	139	264	16	8	20	4	6	24
Mallard		7			76	165	89	169	**617**	427	482	201	169	290	4	2		3	1	2	1	2
Blue-winged Teal												4	**8**		14	16						
Northern Shoveler												7	**30**		59	39						
Northern Pintail					16	6	38	4	320	842	619	**898**	100	353								
Green-winged Teal			55	140	112	260	720	66	72	43	891	3041	**3352**	1056	1900	1322	168					
Common Teal													1		1 hybrid	1 hybrid						
Redhead													1									
Ring-necked Duck						240	120	4		2	**555**		89									
Greater Scaup								1	1													
Lesser Scaup										1		**2**										
Scaup (sp.)								3		41	48	**82**										
Surf Scoter					3		**2**	1									1					
Wh-winged Scoter																						
Black Scoter					1		1*															
Scoter (sp.)					1						6		**35**		2	18						
Long-tailed Duck							1	1		1	**37**	5										
Bufflehead				2	20	92	36	35	11	**173**	104	111	59	78	2			1*				
Com. Goldeneye								1	1	**57**	45	19										
Hooded Merganser					5			2		9	**56**	10										
Com. Merganser									4	2	1	**5**	1									
Red-br Merganser					4	6	5	8	12	48	**110**	63	9	33	40							
Ruddy Duck					4	4	1				**6**	3					1				3	5
unid. diving duck													25									

Peak winter counts and peak spring shorebird counts
Shown in **BOLD FACE**

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WSB = non-standard Survey (World Series of Birding)

TABLE 1 (page 3)
Maurice River
Raptor and Waterbird Survey
July 2015 through June 2016

	FALL 2015					CORE WINTER PERIOD 2015-2016									SPRING 2016							
DATE	7/22	8/12	10/13	10/30	11/16	12/4	12/15	1/4	1/21	2/12	2/22	3/9	3/18	AVG.	4/5	4/15	5/9	5/14	5/19	5/25	6/2	6/9
			**	**	**									**N=8**	**	**	**	WSB	**	**	**	**
DIURNAL RAPTORS																						
Osprey	147	131	5	1	1	1	1	1*					**14**		18	74	48	75	34	54	67	74
Mississippi Kite	1																					
Bald Eagle	30	37	23	23	25	19	23	23	24	29	27	33	**43**	27.63	16	22	15	8	6	14	22	40
Northern Harrier	1		4	21	55	**30**	21	17	21	23	10	7	18	18.38	6	8	1	2	1		1	
Sharp-sh Hawk				13	15	2	3	0	3	1	**5**	3	2	2.375	2	1						
Cooper's Hawk	3		3	2	4	2	2	3	2	2	**4**	3	0	2.25		1		1	1			1
Red-sh Hawk					15	**4**	0	1	0	2	2	0	0	1.125								
Broad-winged Hawk	2																	2*				
Red-tailed Hawk	7	7	1	14	22	25	28	14	24	29	**38**	24	26	26	8	10	2	8	5	2	12	10
Rough-legged Hawk																						
Golden Eagle																						
American Kestrel		1	2	1	1	1	1	2	1	2	2	1	**3**	1.625	4	1						
Merlin						0	0	0	**1**	1	0	0	0	0.25								
Peregrine Falcon	1	2			2	0	**2**	2	0	2	1	1	1	1.125	1	1		2	1	1		
GROUSE to CRANES																						
Ring-nk Pheasant						2					5					2						
Wild Turkey	10	28	10								1	5			23	8	12		1		9	4
Northern Bobwhite																		1*				
Clapper Rail	16	24	1	1									1			8	45	250	26	24	18	21
Virginia Rail																		3				
American Coot																						
SHOREBIRDS																						
Black-bellied Plover	1	1	**216**	56	107	2	2						2		11	2	135	25	65	105	32	
Am Golden Plover			1*																			
Semipalmated Plover	26	114	2														705	750	**1150**	402	26	3
Killdeer	5				3	1			8	7	5	21	3		**9**	2	8	6	1	5	6	7
Am. Oystercatcher																		2*		**5**	1	

Peak winter counts and peak spring shorebird counts
Shown in BOLD FACE

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TABLE 1 (page 4)
Maurice River
Raptor and Waterbird Survey
July 2015 through June 2016

	FALL 2015					CORE WINTER PERIOD 2015-2016									SPRING 2016							
DATE	7/22	8/12	10/13	10/30	11/16	12/4	12/15	1/4	1/21	2/12	2/22	3/9	3/18	AVG.	4/5	4/15	5/9	5/14	5/19	5/25	6/2	6/9
			**	**	**									**N=8**	**	**	**	WSB	**	**	**	**
SHOREBIRDS (continued)																						
Black-necked Stilt																				1*		
American Avocet																						
Greater Yellowlegs	8	9	284	211	132	31	46	15	32		49	67	24		**406**	140	32	9	2	1		1
Lesser Yellowlegs	12	3	70	3	1							6	6		28	62	**157**	25	3	1		
Solitary Sandpiper		1																3*				
Willet	1		4		2 w		1w	1w	1w	1w	1w	1w*	1w*		1w	5e/1w	10e/1w	18	6	10	14	**26**
Spotted Sandpiper																	1	**4**				
Whimbrel																						
Hudsonian Godwit			1																			
Marbled Godwit			2																			
Ruddy Turnstone		6	1														5	60	**67**	9		
Red Knot																	13	50	**105**	4		
Sanderling							1*										18	**20**	17	6		
Semipalmated Sdp	1580	1410	100														**9230**	2000	7907	5089	1614	602
Western Sandpiper		2															1*					
Least Sandpiper	37	22	1	4													**139**	25	100	4		
Wh-rump. Sandpiper		2	1														**3**	1	2	1		
Dunlin			100	322	1120	616	52	606	111	350		73	292		6390	2325	**10850**	2500	2608	3602	3	2
Curlew Sandpiper																	1*	1*	1	1*		
Stilt Sandpiper																						
Sh-billed Dowitcher	1035	89	70												32	30	2606	1000	**3138**	2425	18	
Lg-billed Dowitcher			2					7*														
dowitcher sp.				10	6																	
Wilson's Snipe							**14**		1		12	2	13		2							
Am. Woodcock																		1*				
unid. shorebirds			225												200							
TOTAL SHOREBIRDS	2705	1659	1080	606	1371										7079	2567	**23914**	6493	15173	11671	1714	641

Peak winter counts and peak spring shorebird counts
Shown in BOLD FACE

** Lower River Survey only
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TABLE 1 (page 5)
Maurice River
Raptor and Waterbird Survey
July 2015 through June 2016

	FALL 2015					CORE WINTER PERIOD 2015-2016									SPRING 2016							
DATE	7/22	8/12	10/13	10/30	11/16	12/4	12/15	1/4	1/21	2/12	2/22	3/9	3/18	AVG.	4/5	4/15	5/9	5/14	5/19	5/25	6/2	6/9
			**	**	**									**N=8**	**	**	**	WSB	**	**	**	**
JAEGERS to ALCIDS																						
Laughing Gull	√	√	√	√								1	5		22	√	√	√	√	√	√	√
Bonaparte's Gull				8						1	3	44	5		**53**	51	3	3	1			
Ring-billed Gull	5	2	√	√	√	√	√	√	√	√	√	√	√		√	√	√	20	√	√	√	√
Herring Gull	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√
Lesser Bl-backed Gull																						
Gt Bl-backed Gull	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√
Gull-billed Tern		1*																				
Caspian Tern		3																				2
Royal Tern	1		4	1																		3
Forster's Tern	80	130	**280**	66	23	1	13					2			27	65	58	100	45	50	129	88
Least Tern	**37**	14															3	6	7	6	9	2
Black Tern																						
Black Skimmer			5														**151**	100	11		4	8
PIGEONS to WOODPECKERS																						
E. Screech Owl							2											1				
Great Horned Owl		1													1	1	1	1				
Barred Owl																		1				
Short-eared Owl																						
Belted Kingfisher			1	1		4	**5**	1	1	3	3	2	1				1*	1*				

Peak winter counts and peak spring shorebird counts
Shown in BOLD FACE

** Lower River Survey only
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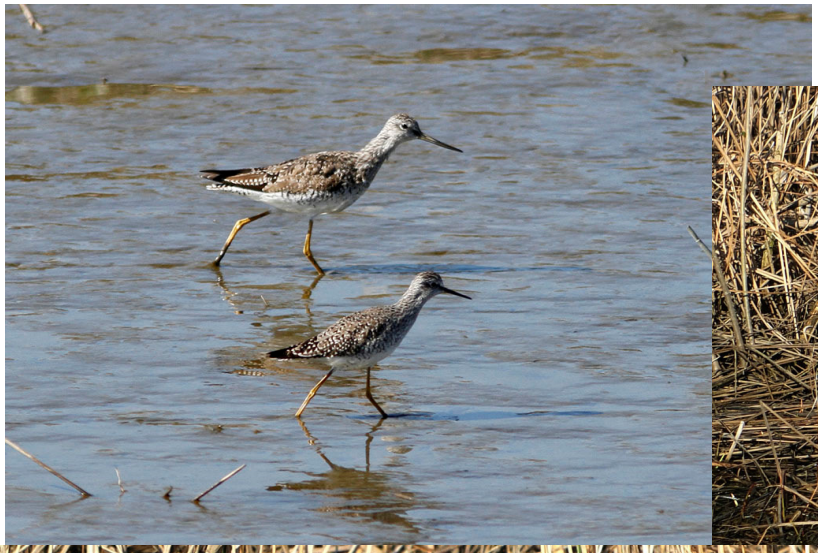
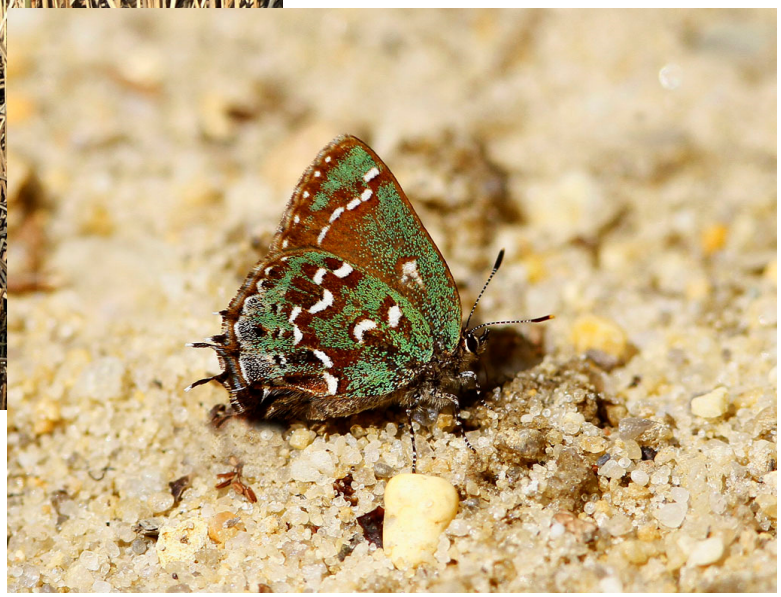
WSB = non-standard Survey (World Series of Birding)

TABLE 2
Cohansey River
Winter Raptor and Waterbird Survey
2015 – 2016

DATE	1/14/16	2/18/16	3/17/16	AVG.
				n = 3
LOONS to CORMORANTS				
Pied-billed Grebe				
Double-cr Cormorant	2		1	
BITTERNS to VULTURES				
Great Blue Heron	9	7	3	
Great Egret				
Black Vulture	15	20	21	18.667
Turkey Vulture	89	92	104	95
WATERFOWL				
Snow Goose	6000	2920	52	2991
Canada Goose	2033	1528	404	1322
Mute Swan	2	3	6	
Tundra Swan		3		
Wood Duck				
Gadwall		20		
American Wigeon		30		
Am Black Duck	188	111	40	113
Mallard	100	161	8	90
Blue-winged Teal				
Northern Shoveler		2		
Northern Pintail	40	26	0	22
Green-winged Teal	21	0	60	27
Canvasback				
Ring-necked Duck				
Lesser Scaup				
Scaup (sp.)			1	
Bufflehead	55	51	52	53
Common Goldeneye	2			
Hooded Merganser	2	2		
Common Merganser	15	10		
Red-breasted Merganser	0	0	1	na
Ruddy Duck				
DIURNAL RAPTORS				
Osprey			1	
Bald Eagle	25	41	25	30.333
Northern Harrier	19	17	7	14.333
Sharp-sh Hawk				
Cooper's Hawk	1			
Red-sh Hawk	1			
Red-tailed Hawk	27	23	21	24
American Kestrel			1	
Merlin	2			
GROUSE to CRANES				
Wild Turkey		1	34	
Am. Coot	1			
Sandhill Crane	2			
SHOREBIRDS				
Killdeer			1	
Greater Yellowlegs	3		5	
Dunlin		30		
Wilson's Snipe	2		1	
JAEGERS to ALCIDS				
Ring-billed Gull	√	√	1000	
Herring Gull	√	√	√	
Great Black-backed Gull	√	√	√	
PIGEONS to WOODPECKERS				
Great Horned Owl	1			
Belted Kingfisher	1			

SOME HIGHLIGHTS OF THE SEASON





Top: Looking as if they are posing for a field guide photograph, here a **Greater Yellowlegs** (top bird) and a **Lesser Yellowlegs** feed side by side at Heislerville WMA on 15 April 2016. Significant numbers of both species were present in early spring.
photo by Clay Sutton

Middle: Sometimes the *"Bird of the Day"* is not a bird! Here are two images of the **Mink** that we enjoyed along East Point Road on 15 April 2016. Mink are a fairly common, yet secretive and rarely seen, predator on the Delaware Bay salt marshes.
photos by Jim Dowdell

Bottom: Another non-avian highlight, this **Hessel's Hairstreak** was found on 25 April 2016 on the upper Manumuskin River by Clay Sutton and Jack Miller while scouting for the CU *World Series of Birding* team. This New Jersey-listed "species of special concern" is a uncommon and highly localized Atlantic white cedar specialist. *photo by Clay Sutton*

DISCUSSION: CORE WINTER SURVEYS

Winter raptor and waterfowl surveys, the core effort of CU-sponsored ornithological studies, were conducted for the twenty-ninth consecutive winter season. Eight full river surveys were carried out between 4 December 2015 and 18 March 2016. Table 1 presents the findings for the core winter studies (as well as for all seasons). For winter surveys, peak counts for all species are shown in Bold Face. The winter average for key species is also shown in Table 1. Based on these findings, once again the Maurice River was proven to host regionally significant numbers of raptors and waterfowl in winter.

As in every past winter season, winter raptor and waterfowl numbers were largely determined by the weather, both local weather and weather patterns over the eastern half of North America. The yearly study cycle first saw a wet summer and fall, and temperatures that were above average. The very mild fall was followed by a warm winter. The winter of 2015-2016 was the fifth-warmest winter on record, and it was the warmest December ever recorded. Even by mid-February, there was only 5% ice cover on the Great Lakes – in stark contrast to the previous two winters. Spring 2016 was cool and wet. (All weather information from Dan Skeldon/*The Press of Atlantic City*).

The mild fall resulted in a mediocre fall raptor migration, with below average totals counted at both Cape May and Hawk Mountain, Pennsylvania (and in our own work on the Maurice). Hawk Mountain Sanctuary reported that short-distance migrants (as expected) showed the largest decreases. In these venerable Kittatinny Ridge counts, Cooper's Hawks were 41% below average, Red-shouldered Hawks 42% below average, Red-tailed Hawks 49% below average, and American Kestrel 44% below average. Cape May raptor totals were well below average as well, with only about half of the expected numbers seen. Autumn raptor migration plays a large role in determining winter raptor numbers. The "poor" fall migration, wherein many hawks simply decided to stay farther north, and not come this far south, resulted in below-average numbers of hawks on the Maurice River in winter 2015-2016. The same can be said for our comparison river, the Cohansey.

Likewise, waterfowl numbers were low in winter 2015-2016 as well. With little in the way of ice cover and snow cover to our north, many or even most waterfowl had little reason to move this far south. It was the general opinion of birders throughout South Jersey that this past winter was the poorest season for waterfowl in recent memory, if not ever. Particularly absent were diving ducks. Maurice River Bufflehead and Red-breasted Merganser averages were the lowest in the years for which we have been averaging them (therefore in at least the last decade). Wintering goose numbers were well below the long-term average but this was not a surprise; the migratory goose numbers recorded at the Cape May Bird Observatory's Avalon Seawatch were the lowest in the 23 years of the count. On the Maurice River, among dabbling ducks, only Green-winged Teal was above recent winter averages.

Table 3 shows our findings on key species of winter raptors and waterfowl on the Maurice River. Here we show 2015-2016 data (Year 29) in relation to not only the three previous winters (Years 26, 27, and 28), but also compared to the peaks and averages of Segment V (of the 25 year study) – the five year pooled results from 2007-2012. The results seen in Table 3 are largely self-explanatory, showing waterfowl in below-average numbers almost across the board.

Among raptors, Turkey Vulture and Black Vulture numbers continue to increase, with both peak and average numbers above the long-term and recent averages. Bald Eagles were average or slightly above average. Wintering eagles pushed here from farther north were probably fewer than would normally be expected (because ice cover to the north was minimal), but Maurice River eagles were augmented by the burgeoning number of local South Jersey breeding Bald Eagles. In the early years of study, most eagles came from the north; today, many are indeed local breeders!

On a (slightly) bright note, American Kestrel was above average for the first time in many years. Two or possibly 3 individuals seemed to successfully winter in the study area, reversing (slightly) the recent inexorable downward trend. Peregrines were up too, augmented by the easily seen pair in residence at their artificial eyrie on the Bayside State Prison water tower.

Cooper's Hawks were found in below average numbers, continuing a recent trend. This is a trend that has been mentioned anecdotally by a number of birders, but one that is beginning to be seen in data sets as well. As mentioned, Hawk Mountain migrant Cooper's were 41% below average in fall 2015. It is possible that many Cooper's Hawks are merely staying north of our region, "short-stopped" at bird feeders to our north. But it also may be possible that we may be seeing, if not a real decline, a cyclical nature to Cooper's Hawk populations. Cycles in response to prey availability are well-known in Northern Goshawk, and there may possibly be a similar situation for Cooper's as well. In the past, such a cycle could have easily been masked by DDT impacts, shooting, and persecution. But with protection and a well-known come-back, it may be possible to discern a cycle that was largely hidden before. It is all great food for thought – and additional study.

The picture was, once again, not good for two of our common Maurice River signature raptor species. For Northern Harrier, the winter of 2013-2014 was the worst winter ever, and the winter of 2014-2015 was not much better. In the current season, 2015-2016, although peaks and averages rose a bit, Harriers remained well below both the recent and over-all long-term averages. And the average would have been even lower except for the 30 individuals counted during the very first (4 December) survey. This count no doubt included a number of late migrants (again, the mild fall….) that did not stick around for the winter. Winter Harrier numbers are continuing to decline over time.

For Red-tailed Hawk, the findings were even grimmer: both the 2015-2016 peak (38) and average (26) for Red-tail were our lowest-ever in the 29 years of study. Previously, the 2014-2015 average of 30.63 was our lowest average ever. Before that, our lowest average ever was 31.13 in 2012-2013. This means that in 29 years, our five lowest-ever average Red-tail counts have occurred in the last five winters, although the 33 averages of Years 25 and 27 tie the 33 averages of Years 1 and 2 (1987-1988 and 1988-1989).

(Caveat: Note however that although the data is comparable, these early years counts were taken at a time when access to the river [and resultant viewability and countability] was far more limited than today due to posted private property. Remember too that the first two years of these counts were indeed somewhat exploratory as we established consistent methodology and protocols. At that time, today's well-established approach and techniques were yet to be fully developed, refined, and sharpened to the degree enjoyed currently – an efficiency that follows nearly three decades of mostly subconscious yet likely fine-tuning. In short, there were very probably at least a few more Red-tails present than were counted in the earlier years of the count, leaving our statement that "the past five years have been the five worst years for Red-tails ever" undoubtedly true. For one thing, in those earliest years, we were primarily searching hard for, and studying and enjoying, the one or two [rare!] Bald Eagles found on each survey. Such have been the changes on the Maurice over time).

But the point is, when we see that the Red-tail *peaks* of the past five years were generally the same as, or below, the *average* number seen for the twenty-five years before, we can readily determine that these are not good trends for Red-tailed Hawks (or Harriers). Quite probably a lack of prey is a major factor. We continue to strongly suspect that marsh rodent numbers (Meadow Voles, Rice Rats and Muskrats) on the Maurice River have not yet recovered from the combined impacts of Hurricane Irene and Superstorm Sandy. The NJDEP noted that the Muskrat harvest was cut in half in the winter following Sandy. Even though rodents have been reported as "starting to recover by late summer 2013" at Forsythe NWR (Source: personal communication by Becky Kern, US Fish and Wildlife Service), this may not be the case on the Maurice River and perhaps the wider Delaware Bayshore. And, as we discussed at length in the 25 year report and subsequent yearly reports, frequent coastal storms are not the only problem; ongoing sea level rise and continued loss of the high marsh are a factor too. (See these reports for much greater discussion and analyses).

In corroboration of the above speculation, we noted the following in last year's report, and will reiterate here: While Hurricane Irene (28 August, 2011) and Hurricane/Superstorm Sandy (29 October 2012) may have had the far greatest impacts on marsh rodents, monthly tidal cycles may be playing a real role in preventing a significant comeback or recovery of Meadow Voles, Rice Rats, and other prey items. *The Press of Atlantic City*, on 19 August, 2014 reported on the number of flood days that exceeded "nuisance" flood level elevation, and stated that Atlantic City and much of southern New Jersey are among the worst places in the US to experience routine flooding. Days of high tide tidal flooding per year averaged about 10 in the1980s-1990s, but today it is about 35 days per year. Virtually every full moon, and even rather moderate northeast storms, flood the tidal wetlands to a degree that no doubt continues to drown marsh rodents.

Although some of this is admittedly speculation, in short and in summary, we strongly believe that tidal flooding associated with sea level rise is beginning to adversely impact both prey – and predator – populations on the Maurice River. We note too that Cohansey River comparative counts (see Table 2) confirm and corroborate Maurice findings. Rough-legged Hawks and Short-eared Owls were the first raptors to disappear from Delaware Bayshore wetlands, and we now have some evidence that the same may now be occurring with both Red-tailed Hawks and Northern Harriers.

The ongoing loss of farmland may be playing a role in these declines too, particularly with Red-tailed Hawks and male Northern Harriers (male Harriers hunt the uplands to a much greater degree than the females; smaller and more agile males hunt birds to a greater extent than the larger females that are more rodent and salt marsh-dependant). Cumberland County has seen a 9% loss of farmland between 2002 and 2012. (Source: USDA 5-Year Census of Agriculture, as reported in *The Press of Atlantic City*). And even this figure does not factor in the amount/acreage of farmland that has been converted to commercial nurseries – land that is often quite barren in regards to rodents and raptors. The decline seen in Red-tails probably applies mostly to those individuals that use the rivers and salt marshes as their feeding territories, but may well also include those birds that primarily frequent farmlands.

At least for Red-tails, there is no great cause for concern, as they appear to remain rather common throughout most of New Jersey and the Northeast. They are well known to adapt to a wide variety of habitats, including suburban and even urban habitats. The problem though, for a very common species, is that you can lose half the population without noticing. It does bear mentioning that migrant Red-tails counted at Cape May today are far fewer than those tallied twenty and thirty years ago (although no trend data or trend lines are readily available to us). Red-tailed Hawks and Northern Harriers require our due diligence and monitoring, on the Maurice River, the Delaware Bayshore and elsewhere. It is not a cliché to repeat the well-known saying, "The time to save an endangered species is when it is still common."

TABLE 3

Wintering Waterfowl and Raptors on the Maurice River 2007-2016; Comparisons of Most Recent Four Winters to Segment V (2007-2012)

	2007-2012 Segment V			Year 26 2012 - 2013		Year 27 2013 - 2014		Year 28 2014 - 2015		Year 29 2015 - 2016	
	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg	Best	Avg	Best	Avg	Best	Avg
Snow Goose	12,324	6,605	2,309	13,000	2,712	5,150	1,342	5,050	1,326	5,050	1,684
Canada Goose	1538	796	268	507	260	1270	522	888	440	515	240
Am. Black Duck	1,274	829	487	458	276	1,585	938	955	459	721	400
Mallard	649	463	256	262	142	952	431	676	313	617	290
Northern Pintail	928	628	281	764	423	1,621	760	548	185	898	353
Green-winged Teal	5,850	3,270	988	4,182	1,807	2,966	1,119	2,265	660	3,352	1,056
Bufflehead	446	316	na	220	111	330	196	258	131	173	78
Red-br. Merganser	207	133	na	174	82	320	123	201	80	110	33

	2007-2012 Segment V			Year 26 2012 - 2013		Year 27 2013 - 2014		Year 28 2014 - 2015		Year 29 2015 - 2016	
	Best	Avg. Peak Count	Avg of Average Counts	Best	Avg	Best	Avg	Best	Avg	Best	Avg
Black Vulture	57	38.2	22.4	25	15.38	35	19.44	44	27.88	59	33.50
Turkey Vulture	162	143	99	124	96	126	102	166	140	196	131
Bald Eagle	48	34.6	24.15	34	25.13	50	30.38	42	27.75	43	27.63
Northern Harrier	43	38	25.8	22	17.63	18	15.25	24	20.13	30	18.38
Sharp-shinned Hawk	18	9.4	3.04	4	1.38	6	2.75	5	3.13	5	2.38
Cooper's Hawk	10	6.8	3.21	6	3.5	4	2.13	4	1.38	4	1.13
Northern Goshawk	1										
Red-shouldered Hawk	26	8.4	1.62	2	0.75	4	1.38	7	2.63	4	1.13
Red-tailed Hawk	64	59.4	42	43	31.13	57	33	44	30.63	38	26
Rough-legged Hawk	1	0.6	0.07			1	0.38	1	0.13		
Golden Eagle	2			1		1		1			
American Kestrel	10	3	0.77	1	0.5	1	0.13	1	0.25	3	1.63
Merlin	2			1		1		1		1	
Peregrine Falcon	4	2.4	0.98	2	0.88	4	1.13	2	1	2	1.13

DISCUSSION: SPRING, SUMMER, AND FALL SURVEY EFFORTS

Principal Citizens United Maurice River studies in 2015-2016 -- as in all previous seasons -- have focused primarily on winter raptors and waterfowl. In recent years however, a greater emphasis has been placed on spring and fall migration. Also over time, comparatively little effort has been focused on the breeding birds of the Maurice River watershed. However, because much of spring migration through the region is virtually concurrent with the local breeding season for many species, and because "fall" (southbound) migration for many shorebirds occurs in mid-summer, current survey efforts and protocol have allowed for a significant (if not in-depth) look at the breeding birds of the Maurice River. Findings from spring and fall sampling dates are also shown in Table 1.

As an example, during survey efforts we continue to see ample evidence of the continuing and booming resurgence of Osprey and Bald Eagles on the Maurice River, but these are well documented and reported elsewhere by CU and the ENSP, and will not be elaborated on here. Suffice it to say that Osprey and Bald Eagle have made a truly remarkable recovery in the Bayshore region and numbers continue to soar. Presumptive breeding Northern Harriers were again noted in the watershed in 2016, with a number of breeding season sightings on the lower river, both near Bivalve and East Point. Peregrines successfully bred on the Bayside State Prison Tower in 2015. Least Bittern, an NJ-listed "species of special concern," is an uncommon breeder in the region, but two sightings at Heislerville in late spring of 2016 no doubt confirm breeding there, a new location and a significant finding. Horned Lark courtship was noted along Strawberry Avenue, north of Port Norris, on 9 June; Horned Lark is listed as "threatened" in New Jersey.

Migratory shorebird use of the lower Maurice River impoundments and mudflats remains one of the key avian ecovalues of the region. Shorebird use of the Maurice River was explored in depth in the 2009–2010 seasonal report, and again in the recent 25 year summary report, and therefore will not be elaborated upon here. However, as Table 1 will readily attest, the Maurice River in both spring and fall continues to host globally significant numbers of migratory shorebirds. The fall 2015 season saw counts of up to 2,705 total shorebirds, and spring 2016 produced a high count of 23,914 total shorebirds on 9 May, primarily at East Point, Heislerville WMA, and the Bivalve EEP site. See Table 1 for numbers and phenology of migratory shorebird use of the Maurice. It was a very good year for Horseshoe Crabs and shorebirds on Delaware Bay beaches in spring 2016, and while this will be widely reported and documented by others, it is significant that Maurice River findings reflected this known recovery trend.

As in previous seasons, the intense focus on the birds of the Maurice River led to many interesting finds and significant sightings, and as ecotourism continues to increase, many "good birds" were reported by others as well. A Sedge Wren was found by Sutton at Bivalve on 13 October. Dowdell found a Cave Swallow at Heislerville on 4 December, and another was seen by Linda Widdop and Harvey Tomlinson on 15 November. For only the second time we know of, a "Western" Willet successfully wintered on the river; it was seen from Heislerville to Bivalve and north to the Galetto dock over the course of the winter. A Merlin was seen feeding

on a Killdeer (large prey for a Merlin) near Robbinstown Road on 12 February. A River Otter was in the river at Heislerville, WMA on 22 February. A Piping Plover was recorded by Harvey Tomlinson at Heislerville WMA on 21 April, only the third known record for Cumberland County. A Ruff, a Eurasian shorebird, was seen by many at Heislerville on 29-30, but was not recorded on our official survey efforts.

Above: A **Rice Rat,** a fairly common – yet assumed to be declining – marsh rodent, is here pushed to the higher elevation of a Delaware Bayshore roadside by severe tidal flooding of its habitat. Jake's Landing, 25 January 2016. Coastal storms and the higher tides resulting from sea level rise are thought to be greatly impacting marsh rodents and the raptors that depend on them.

photo by Clay Sutton

SUMMARY AND ACKNOWLEDGMENTS

Winter 2015-2016 marked the remarkable twenty-ninth year of study of the wintering raptors and waterfowl on the Maurice River and the thirteenth year of focused spring and fall counts. Studies conducted for Citizens United to Protect the Maurice River and its Tributaries, Inc. again documented an amazing array of avian use of this key South Jersey river. 2015-2016 efforts augmented and supplemented the findings of the first twenty-eight seasons of study and documented and substantiated the Maurice River as a premier avian resource area of not only New Jersey, but of the entire Mid-Atlantic Region.

These 29 years of long-term study have continued to document the Maurice River as an important bird area at all seasons and by any standard applied. After twenty-nine years of study, we now firmly know the depth and diversity of the substantial birdlife of the Maurice River. Long-term studies have created a baseline of avian resource data rarely equaled for the Delaware Bayshore and the Mid-Atlantic region, and allow a better and exceptional understanding of true distribution, status, and trends of the amazing -- and dare we say unique -- birdlife of the Maurice River.

Much greater in-depth discussion and recommendations were offered in the twenty-five year summary report that was presented in January 2013 at the Partnership for the Delaware Estuary Conference, and subsequently placed on the CU Maurice River website. A comprehensive 30 year report is envisioned at the conclusion of the thirtieth season of studies, sometime around July 2017. At this time, many of the issues and findings referenced herein in this Year 29 short-form report will be fully explored, analyzed and discussed.

As we near the proverbial finish line of our collective goal of 30 years of study, and a resultant in-depth long-term understanding of the Maurice over time, I was taken by these recent words. They were penned by a friend, Denver Holt, in the November 2015 (Vol. 19) issue of the *"The Roost,"* the newsletter of the Owl Research Institute and Ninepipes Center for Wildlife Research and Education based in Charlo, Montana. They were written about Long-eared Owl studies now in their 30th year, and Snowy Owl research now in its 25th year. They could easily have been written referencing our Maurice River studies, and the goals and objectives that have guided us over these long 29 years.

> *"Our philosophy is that we believe the most reliable data in wildlife research is usually generated from long-term studies conducted by the same individuals. I have realized that long-term research and monitoring is the only way to track population changes, and assess the overall health of wildlife populations regionally, nationally, and globally. And I have also realized that presentation of research results to a diverse audience is essential to generate public interest for wildlife and habitat conservation."*
>
> -- Denver Holt, President of ORI. November 2015

In conclusion, we once again thank Brian and Karen Johnson, Tony Klock, Mary Watkins, Kathy Michel, Janet Crawford, Tom Reed, Bob Fogg, Sam Galick, Steve Glynn, Pete Dunne, Leslie Ficcaglia, Vince Elia, Harvey Tomlinson, Linda Widdop, Chris Herz, and Sandra Keller for shared sightings and insights, and for their continuing deep interest in the Maurice River and the Delaware Bayshore. Clay thanks Ward Dasey, Josh Nemeth, and Pat Sutton for their support and assistance during the ongoing and long-term volunteer Cohansey River comparative surveys.

We thank the many members, supporters, and friends of Citizens United for allowing us to be a long-term part of your continuing significant work on this great South Jersey river. Thank you for all of your important conservation efforts in Southern New Jersey, and for your ongoing vision of a wild, healthy, and protected Maurice River. Thank you too for supporting this and other avian projects through your generous support of the CU team, *"The Fish Hawks"* in the important World Series of Birding conservation fundraiser. As always, we sincerely thank Jane Galetto, the staff, and the officers of CU for your vision of what role these long-term studies might play in the protection of these valuable avian resources and the wonderful river upon which they so depend.

Finally, we sincerely thank the U.S. Department of the Interior's National Park Service, Wild and Scenic Rivers Program, for continuing assistance to Citizens United. The award of a Wild and Scenic Rivers Partnership Grant to CU supported this project and enabled these surveys to be conducted. We recognize and thank the NPS for their continuing interest in this study and in the wildlife resources of the Maurice River.

Until next year (Year 30 !),

Clay Sutton

Clay Sutton June 2016

LITERATURE CITED / FOR FURTHER REFERENCE

All comparative Maurice River ornithological studies discussed and / or referenced in this report have been directed and co-authored by Clay Sutton, either as an independent contractor or formerly as staff ornithologist, Southern Regional Manager and Vice President of Herpetological Associates, Inc., Plant and Wildlife Consultants. (Comparative Cohansey River studies are embedded within the Maurice River annual reports). Principal reports and publications resulting (either wholly or in part) from these studies (and funded or co-funded by Citizens United to Project the Maurice River and its Tributaries, Inc.) are as follows:

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