

RAPTORS AND WATERBIRDS ON THE MAURICE RIVER

CUMBERLAND COUNTY, NJ

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

**SPRING 2009 through SPRING 2010
and the Core Winter Period 2009-2010**

**and including a Summary of
SPRING and FALL SHOREBIRD USE
of the Maurice River 2000-2010**

**Research sponsored by
Citizens United to Protect the Maurice River and its Tributaries, Inc.**



By Clay Sutton and James Dowdell

July 2010

Prepared by:

Prepared for:

Citizens United
to Protect the Maurice River
and its Tributaries, Inc. (CU)
22 Brittany Lane
Millville, NJ 08332
www.cumauriceriver.org

Clay and Pat Sutton LLC
129 Bucks Avenue
Cape May Court House, NJ 08210
609-465-3397
claysutton@comcast.net



Above:

Near Heislerville, this **American Woodcock** probed for earthworms in a bare patch on 12 February 2010, one of eight seen that day. Normally, Woodcock are completely nocturnal, but were often forced to feed in daylight by the snow cover of winter 2009-2010.

– Photo by Clay Sutton, 12 February 2010

On the cover:

In a scene that evokes the snowiest winter on record, these eight **Northern Bobwhite** (quail) were photographed near Port Norris on 17 February 2010. Bobwhite have declined severely in

the region over several decades, and this “covey” is the first Sutton or Dowdell have encountered in years. Stressed by the heavy snow cover and not able to feed easily, they had gone into their “roost” in early afternoon, no doubt to conserve heat and energy. Bobwhite face outward when in their signature nighttime roosts to enable a fast flush and escape should they be discovered by a predator.

– Photo by Clay Sutton, 17 February 2010

WINTER RAPTORS AND WATERBIRDS ON THE MAURICE RIVER

April 2009 through June 2010

The TWENTY-THIRD FIELD SEASON

of an Ongoing and Long-term Avian Use Study

INTRODUCTION AND OVERVIEW

The period from April 2009 through June 2010 marked the twenty-third 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 spring migration in both 2009 and 2010, breeding bird studies, fall migration surveys in 2009, and the all important core winter studies carried out from December 2009 through March 2010.

Because an in-depth review of long-term status and trends was presented in 2007 (at the twenty-year milestone) and because a major report is planned for the twenty-five year mark (in 2012), this current report will only offer brief discussion of the 2009-2010 findings in relation to previous years.

Also, because all of the first twenty-two years of individual reports are available on-line (archived on the CU website: www.cumauriceriver.org) little discussion of methodology or techniques will be offered in this short-form year twenty-three report. The basic methodology has remained the same since 1987: nine sites / point counts are sampled for a period of 45 minutes each.

Visit the website for in-depth review of all methodologies and sampling locations, as well as the goals and objectives of this long-term project. In-depth analysis of findings have been 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.

FINDINGS

The results of the Maurice River Raptor and Waterbird Survey for the period April 2009 through June 2010 are shown in **Table 1**. Eight full surveys were carried out during the core winter period (8 December 2009 to 24 March 2010). An additional two to three planned winter surveys were thwarted by snow cover and blocked, unplowed roads. Spring survey results from both 2009 and 2010 are also shown in Table 1. In addition, four surveys were conducted during the fall period of the study cycle, August through November 2009. Spring and fall survey results are 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 key species** are shown in **Bold Face**, although for a number of species, spring and fall totals exceed the peak core winter season count.

As in the past, comparative studies were conducted on the Cohansey River and on the Salem River as an adjunct to the Maurice River studies. The Cohansey River was sampled three times and the Salem River was sampled two times in winter 2009-2010. Cohansey River and Salem River winter raptor and waterbird surveys are shown in **Table 2**. Data from these adjunct studies of Delaware Bayshore “comparison rivers” will be fully explored and analyzed in the upcoming planned twenty-five year in-depth report.

As in past seasons, Canada Goose numbers on the Bayside State Prison grounds (adjacent to the Maurice River) were again estimated; birds were counted from Route 47. Most if not all “Bayside geese” use the Maurice River for roosting and feeding as well, 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 (note that these “prison numbers” are not included in the river count totals shown in Table 1):

**2009-2010
Canada Geese Populations
Bayside State Prison Grounds**

Date	Number	Date	Number
04/16/09	300	01/27/10	1175
05/09/09	55	02/17/10	200
05/25/09	210	02/27/10	975
08/13/09	160	03/17/10	554
09/29/09	650	03/24/10	22
11/04/09	1050	04/20/10	375
11/16/09	925	05/04/10	32
12/08/09	1800	05/19/10	34
12/27/09	1500	06/04/10	55
01/12/10	650		

	SPRING 2009				FALL 2009				CORE WINTER PERIOD 2009-2010										SPRING 2010				
DATE	4/16	5/9	5/25	6/1	8/13	9/29	11/4	11/16	12/8	12/27	1/12	1/27	2/17	2/27	3/17	3/24	AVG	4/20	5/4	5/19	5/27	6/4	
		*	*				*	*											*	*	*	*	
WATERFOWL																							
Snow Goose	12								0	8900	144	12324	1424	4066	1500	300	3582						
Canada Goose	132	52	37	38	22	15		2	34	234	226	302	354	489	237	114	249	67	44	58	21	20	
Brant															2								
Mute Swan	16	10	13	16	14	7	11	11	10	15	5	8	1	10	6	6		7	9	10	4	9	
Wood Duck														8		5		2					
Gadwall	21	2							6	12		22	4	26	50	72							
American Wigeon															28	7							
Am Black Duck	221	26	34	32	36	89	84	68	521	333	334	411	473	1024	397	169	458	154	67	29	8	23	
Mallard	28	4	2	3	18	4			108	73	408	354	166	338	46	12	188	20	5	2	3	5	
Blue-winged Teal	10					10										2		6	4				
Northern Shoveler	15											1				2							
Northern Pintail	6					60			11	36	47	330	306	268	13	6	127						
Green-winged Teal	2131					442	53	618	421	5	4	97	4	1384	3727	2106	969	2168	316	1			
Common Teal															2	1	1						
Ring-necked Duck	8													24	68	1							
Greater Scaup							1	24	1	1	3		1	9	9	1							
Lesser Scaup	2						3				1	12		11	14	28							
Scaup (sp.)								4		5	80	237	260	332	52	26							
Surf Scoter								1		1													
Black Scoter									2							1							
Scoter (sp.)							4								4								
Long-tailed Duck									1						2								
Bufflehead	40						48	114	148	154	168	211	132	302	446	215							
Com. Goldeneye								2		1	223	68	44	9	1								
Hooded Merganser										2		2		24	8			8					
Com. Merganser	3										102	2	65	5	18	5							
Red-br Merganser	8									73	137	207	145	43	13	4							
Ruddy Duck							1	9	5	2					39	17					1		

	SPRING 2009				FALL 2009				CORE WINTER PERIOD 2009-2010										SPRING 2010				
DATE	4/16	5/9	5/25	6/1	8/13	9/29	11/4	11/16	12/8	12/27	1/12	1/27	2/17	2/27	3/17	3/24	AVG	4/20	5/4	5/19	5/27	6/4	
		*	*				*	*											*	*	*	*	
SHOREBIRDS																							
Black-bellied Plover	85	224	784	126	150	11	50	35								8		53	133	570	410		
Semipalmated Plover		1045	808	306	422	22													713	1410	752		
Killdeer	2	5	6	5	2					2	2		1	23	7	7		2	3	4	2	4	
Am Oystercatcher	2			3															2				
Greater Yellowlegs	625	149	4	4	60	30	31	12	5	12	5	5			4	35		125	252	44	3		
Lesser Yellowlegs	245	411			48	1		1	6	3						41		84	213	9			
Solitary Sandpiper																				1			
Willet	5	37	36	55	1													26	64	16	12	23	
"Western" Willet	1				1											1							
Spotted Sandpiper		1	1		3															3	1	2	
Ruddy Turnstone		40	192	29	6														5	138	20	20	
Red Knot		3	108	6															6	18	15	5	
Sanderling			200	1	1														1	14	20	1	
Semipalmated Sdp		3825	16587	6814	4940	82													2350	6390	28050	1152	
Western Sandpiper								1															
Least Sandpiper		95	13	4	39	2												12	168	40	21	1	
Wh-rump. Sandpiper			13	10	4														8	2	1	2	
Pectoral Sandpiper	1														1				6				
Dunlin	7390	6500	1724	151			1500	4365	252	363	185		145		40	226		9840	9350	2274	975	3	
Curlew Sandpiper	2		1																				
Sh-billed Dowitcher	197	6400	1662	87	625													10	3084	4556	665		
Lg-billed Dowitcher							2																
Dowitcher (sp.)								1															
Wilson's Snipe	1									3			2		1	1							
Am. Woodcock													8										
Red-necked Phalarope				1																			
unid. Shorebird		7000			250														1500	2000			
TOTAL SHOREBIRDS	8556	25735	22139	7602	6552	148	1583	4415										10152	17858	17489	30947	1213	
JAEGERS to ALCIDS																							
Laughing Gull	700	✓	✓	✓	✓	✓										1		✓	✓	✓	✓	✓	
Com. BI-headed Gull	2																						
Bonaparte's Gull	106	1												2	60								
Ring-billed Gull	✓	30	6	15	47	25	40	✓	✓	312	✓	✓	✓	✓	✓	✓		✓	✓	32	✓	✓	
Herring Gull	✓	✓	✓	✓	✓	✓	✓	✓	✓	266	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Lesser BI-backed Gull									2														
Glaucous Gull											1												
Gt BI-backed Gull	✓	✓	✓	✓	✓	✓	✓	✓	✓	53	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Caspian Tern				1	7	1																	
Royal Tern						12																	
Common Tern				1																			
Forster's Tern	89	88	95	57	202	199	26	15							1			86	117	74	37	42	
Least Tern		3	5	13	1														1	8	4	7	
Black Skimmer		213	246	281															12	54	11	15	
PIGEONS to WOODPECKERS																							
Great Horned Owl										4													
Belted Kingfisher	3				4	2	6	2	10	5	1	3		2		1		1					

TABLE 2

	COHANSEY R.					SALEM R.		
DATE	1/11	2/18	3/4	AVG.		1/29	2/21	AVG.
				n = 3				n = 2
BITTERNs to VULTURES								
Great Blue Heron	12	5	4			1	6	
Black Vulture	6	22	21	16.3		25	33	29
Turkey Vulture	114	100	117	110.3		121	142	131.5
WATERFOWL								
Snow Goose	6300	2704	2250	3751		1252	1135	1194
Canada Goose	2335	1162	2690	2062		3245	2562	2904
Mute Swan		2	2			42	54	
Tundra Swan						52	44	
Gadwall							25	
American Wigeon		9	8				14	
Am Black Duck	168	188	316	224		52	132	92
Mallard	65	136	195	132		124	124	124
Northern Pintail	20	20		13.3		12	349	181
Green-winged Teal			87	29				
Canvasback	2							
Ring-necked Duck		1						
Bufflehead	8	17	12					
Hooded Merganser	4	4	5				4	
Com. Merganser	4	37	12			26	13	
Red-br Merganser		2						
Ruddy Duck			1					
DIURNAL RAPTORS								
Bald Eagle	34	38	40	37.33		17	38	27.5
Northern Harrier	24	22	10	19		10	18	14
Sharp-sh Hawk	3	1	1	1.7		1	1	1
Cooper's Hawk	3	3	2	2.7				
Red-sh Hawk	2	4	1	2.3				
Red-tailed Hawk	44	30	55	43		20	32	26
Rough-legged Hawk			1					
American Kestrel		1	1	0.67		1	2	1.5
Peregrine Falcon		1		0.33				
GROUSE to CRANES								
Wild Turkey		24				4	2	
Sandhill Crane	4	1					5	
Common Crane	1							
Crane hybrid	13	1						

	COHANSEY R.					SALEM R.		
DATE	1/11	2/18	3/4	AVG.		1/29	2/21	AVG.
				n = 3				n = 2
SHOREBIRDS								
Black-bellied Plover		1						
Killdeer	1		4			1		
Dunlin	52	400						
Wilson's Snipe	1							
JAEGERS to ALCIDS								
Ring-billed Gull	√	√	√			1000	√	
Herring Gull	√	√	√			500	√	
Gt BI-backed Gull	√	√	√			100	√	
PIGEONS to WOODPECKERS								
Great Horned Owl							2	
Belted Kingfisher	1	1					1	

COMPARISONS TO PREVIOUS WINTER SEASONS

Table 3 shows a comparison of Winter 2009-2010 key raptor and waterfowl species in relation to the five-year average for the Maurice River for the period 2002-2007 (Segment IV of the 20-year study), as well as winter 2007-2008 and winter 2008-2009 findings.

For waterfowl, results were mixed. Snow Goose numbers were up substantially in winter 2009-2010, while Canada Goose counts fell slightly below recent peaks and averages. American Black Ducks posted a modest gain over the previous season's peak, but the average number seen continued the downward trend observed over the long term. Mallards and Northern Pintail also showed bleak numbers when compared to the previous two seasons and the five-year average for 2002-2007. It is when Black Duck, Mallard, and Pintail numbers are compared to the early years of the Maurice River studies that the extent of their decline is realized; numbers of these three species are a mere shadow of the counts obtained in the 1980s (see discussion in 20-year summary report).

Most raptors fared far better than waterfowl during winter 2009-2010. Black Vulture and Turkey Vulture averages were well up. Northern Harrier and Red-tailed Hawk populations on the Maurice River were right on average. Sharp-shinned Hawks were seen in slightly below-average numbers, but Cooper's Hawks continued their increasing trend.

Pushed to the region by snow and ice (and augmented by a booming local Delaware Bayshore population), Bald Eagles set new records for peak count and average count. An amazing 48 Bald Eagles were carefully counted on the Maurice River on 12 January. In addition, 44 were counted on 17 February and again on 27 February. These high numbers led to a record average, by far, of 30.5 eagles per survey during winter 2009-2010.

The excitement over our growing eagle population was tempered by the plight of the American Kestrel. In winter 2009-2010, American Kestrel finally ended its downward spiral, but that is because it finally hit bottom.

No Kestrels were recorded on the river this winter season. Not one. While one would like to think that this is an anomaly, a temporary absence, our long-term studies have shown otherwise (see 20-year summary report). American Kestrel has exhibited a severe downward trend over the past 25 years. In the 1980s, peak daily counts were as high as 8, and daily averages as high as 2.9 birds per survey were achieved. They have declined ever since and bottomed in winter 2009-2010. They are absent as a wintering bird on the Maurice River, and we know too that they are absent as a breeding bird. They are now extirpated on the Maurice River, and virtually extirpated throughout southern New Jersey. (One wintered on the Cohansey River and two on the Salem River survey route.)

Today, American Kestrel are only seen as spring and fall migrants at places such as East Point, and even these migrant numbers have dropped precipitously. We urge the NJ DEP DFW ENSP to list American Kestrel as Endangered and begin a long-needed recovery plan. Even

now, it may be too late.

TABLE 3

Species	2002-2007 Segment IV			2007-2008		2008-2009		2009-2010	
	Best	Avg. Peak Count	Mean of Means	Peak	Avg.	Peak	Avg.	Peak	Avg.
Snow Goose	7150	5070	1992	5040	2105	7120	2220	12324	3582
Canada Goose	1520	910	412	987	329	692	254	489	249
Am. Black Duck	2858	2173	1079	1274	748	776	524	1024	458
Mallard	994	600	350	649	441	445	301	408	188
Northern Pintail	1495	1036	409	928	431	753	259	330	127
Green-winged Teal	3779	2060	557	5850	1525	3220	1196	3727	969

Species	2002-2007 Segment IV			2007-2008		2008-2009		2009-2010	
	Best	Avg. Peak Count	Mean of Means	Peak	Avg.	Peak	Avg.	Peak	Avg.
Black Vulture	75	53.4	19	27	13	26	10	57	38
Turkey Vulture	155	139.4	94	133	90	153	86	120	107
Osprey *	41			50		72		44	
Bald Eagle	31	27	14.92	25	16.9	24	18.25	48	30.5
Northern Harrier	40	36.6	26.4	40	28	37	29	39	26
Sharp-shinned Hawk	11	7	2.62	5	3	15	4.63	5	2.25
Cooper's Hawk	7	5	2.48	6	2.9	10	3.75	5	3.5
Northern Goshawk	1		(1 total)	1	(2 total)			1	(1 total)
Red-shouldered Hawk	8		(36 total)	4	(11 total)	3	(7 total)	4	(7 total)
Red-tailed Hawk	87	66	44.2	59	43	53	43	59	44
Rough-legged Hawk	2		(8 total)	1	(1 total)	1	(1 total)	1	(1 total)
Golden Eagle	1		(7 total)	1	(4 total)				
American Kestrel	4	2.2	0.696	3	1.7	10	1.75		
Merlin	2		(10 total)	1	(1 total)	1	(3 total)		
Peregrine Falcon	3		(25 total)	2	(6 total)	2	(11 total)	2	(9 total)

* Osprey is not a wintering species on the Maurice River.
Numbers shown represent spring arrivals during the last
few days of the winter count period.

SPRING AND FALL MIGRATION ON THE MAURICE RIVER

As in the past ten seasons of this on-going and long-term study (23 years to date), spring migration and fall migration on the Maurice River were monitored as an adjunct to the core winter season study. Use of the Maurice River by migratory birds in spring and fall is every bit as significant as the winter use of the region by raptors and waterfowl. And in these “shoulder seasons” the raptors and waterbirds are joined by many thousands of songbirds and shorebirds.

Four surveys were conducted in Spring 2009 and five surveys were carried out in Spring 2010. These were supplemented by four fall surveys in 2009. Spring and fall findings are shown in Table 1 (shown in addition to the core season winter survey findings).

Waterbird use of the river’s habitats was substantial and significant. Herons and egrets use the area in large numbers in spring, summer, and fall. Use of the river by waterfowl (ducks and geese) is significant in fall and early spring. Fall migrant raptors are a hallmark of the Maurice River, and good numbers were counted on the lower river August through November 2009. (That said, several anticipated raptor flights never materialized on the day of the survey due to stalled or weak fronts; raptor migration was down throughout New Jersey in Fall 2009.) Most of the 36 Bald Eagles tallied on 29 September were migrants, and 2 Golden Eagles were seen together near Bivalve on 16 November 2009. The 10 Peregrines and 4 Merlin counted on 29 September were good totals, and the 5 spring migrant Peregrines counted on 4 May 2010 were a very good spring total.

Spring (and fall) shorebird migration is so significant on the Maurice River that this is covered as a separate discussion in a stand alone report, included at the end of this report as **Appendix 1**.

HIGHLIGHTS AND OTHER SIGHTINGS OF NOTE

As in past seasons, survey efforts on the Maurice River discovered a number of unusual and significant bird species and numbers. Also, several significant sightings were reported to us by others and are here noted.

6 April 2009 – Cooper’s Hawk – 2 pairs flying display flights at Leesburg and 2 pairs displaying at Galetto dock, offered solid evidence of breeding by multiple pairs.

27 April 2009 – Swallow-tailed Kite (fide Sandra Keller) – over Route 55 near Garden Road in Vineland. One of very few Cumberland County records.

12 May 2009 – American Avocet – Heislerville (fide CMBO)

16 May 2009 – Curlew Sandpiper (2) – Heislerville (fide CMBO / many observers)

16 May 2009 – American Oystercatcher (9) – Heislerville (fide Brian Johnson). A new high count for the Maurice River region. (Only 2 seen during that day's CU survey.)

18 May 2009 – American Golden Plover – Heislerville (fide CMBO / many observers)

30 May 2009 – Black-necked Stilt – Heislerville (fide *Records of NJ Birds*)

3 June 2009 – Warbling Vireo – singing as if on territory, a possible breeder – Peek Preserve (fide Brian Johnson)

11 June 2009 – Gull-billed Tern – Heislerville (fide Sandra Keller)

13 August 2009 – Black-crowned Night Heron (9 juveniles) – evidence of breeding success at the Heislerville rookery (on island in northern impoundment). A juvenile Great Blue Heron was seen on this date / site as well.

15 November 2009 – Common Eider (female) – East Point (fide Karen Johnson)

12 January 2010 – Glaucous Gull – East Point

12 January 2010 – White-crowned Sparrow (4) – Bivalve

18 January 2010 – Rough-legged Hawk (dark morph) – Glades Road (fide CMBO) – the one we recorded on 24 March 2010 was a light morph individual.

12 February 2010 – American Woodcock (10) – Heislerville area – on bare patches due to heavy snow cover

17 February 2010 – Northern Bobwhite (8) – Bivalve. See COVER photo. Also 2 individuals were heard calling ("Bob-white" call) near here on 19 May 2010.

17 February 2010 – Northern Harrier (8 adult males – a record count of adult males) – length of Maurice River – perhaps pushed from inland areas to coast by snow cover

27 February 2010 – Cooper's Hawk (display flight) – Muskee Creek

25 April 2010 – White-faced Ibis – Heislerville – up to 3 individuals known to be present that week (fide Chris Vogel)

25 April 2010 – American Golden Plover – Heislerville (fide Chris Vogel)

25 April 2010 – Merlin (5) – East Point (fide Chris Vogel), a very good spring total.

4 May 2010 – Northern Harrier (adult male) – watched "skydancing" display flight for nearly 10

minutes from Bivalve Wetlands Restoration Site dike / boardwalk

4 May 2010 – Diamond-backed Terrapin (304) – an amazing 304 adult terrapins were seen at once at Bivalve Wetlands Restoration Site. A total of 317 were counted in total that day, by far the largest number ever seen by Sutton & Dowdell.

4 May 2010 – Eastern Kingsnake (5 foot individual, DOR – “dead on the road”) –intersection of Mauricetown Causeway and Route 47. A sad loss of one of the largest we have ever seen – a declining species in NJ.

12 May 2010 – Yellow-crowned Night Heron – Heislerville impoundment colony (fide Sandra Keller). Up to 62 individual Black-crowned Night Herons present in spring 2010.

14 May 2010 – Wilson’s Phalarope – Heislerville (fide CMBO)

14 May 2010 – Curlew Sandpiper (female) – Heislerville (fide CMBO)

26 May 2010 – Curlew Sandpiper (male) – Heislerville (fide CMBO) – therefore at least two individuals present in Spring 2010. Three individuals were present in Spring 2009. See Discussion.

26 May 2010 – Ruff – Heislerville (fide CMBO)

27 May 2010 – Northern Harrier successfully caught a shorebird after a short “stoop” into a large flock at Heislerville. This might be expected of an experienced adult male, yet this was a “brown” Northern Harrier (either a female or young male).

Of final note is the appearance of Mississippi Kites on the Maurice River in Spring 2009 and Spring 2010. On 8 May 2009, Clay Sutton watched two Mississippi Kites north of the Heislerville impoundments for about 15 minutes. On 2 June 2009, Brian Johnson saw a Mississippi Kite over the Peek Preserve.

In 2010, on 4 June, Sutton watched probably at least 4 Mississippi Kites on various occasions. Two were seen from East Point early in the day, and two more were seen over Bivalve at Noon, and one additional sighting was noted near Robbinstown Road. As Mississippi Kites continue to rapidly expand their breeding range to the north, Cumberland County, and particularly the Maurice River, might be a very likely spot for them to nest.

DISCUSSION

The 2009-2010 field season marked the twenty-third consecutive year of ornithological studies on Cumberland County's Wild and Scenic Maurice River. The long-term data set, and resultant insight into the changing status and trends of the Maurice River bird life is unique in New Jersey if not the entire mid-Atlantic Region.

For birds, few if any rivers have been studied with such consistency and depth as the Maurice River. The avian ecovalues of the Maurice River have been documented over time, and as we near the 25 year landmark, any potential ecorisks can be evaluated against an in-depth understanding of the exceptional resources present. The particular value of ongoing long-term studies is that each field season can be reviewed in relation to long-term knowledge and findings, and this becomes particularly important when a field season presents very different or abnormal circumstances.

Fall, winter, and spring of 2009-2010 constituted such a year, when meteorological conditions presented many obstacles to both birds and bird survey efforts. A relatively warm fall was followed by a winter that was slightly above average in temperature. December was 0.1 degrees above normal; January was 0.9 degrees above normal; February was 2 degrees below normal; and 1-18 March was 5 degrees above normal in southern New Jersey (source: National Weather Service). In addition, May 2010 was 4 degrees above normal, and as this report is written, it appears that summer 2010 may well be the hottest ever recorded in New Jersey.

More importantly, record rainfall and record snowfall occurred in winter (and spring) 2009-2010. Winter 2009-2010 produced more snowfall in southern New Jersey than any winter since records have been kept. February 2010 was the snowiest month on record ever (source: National Weather Service – data for Atlantic City International Airport). Over the winter, 58.1 inches of snow fell at Atlantic City International Airport, by far eclipsing the previous record of 46.9 inches set in winter 1966-1967. February alone had 36.6 inches of snow.

Snow melt, followed by heavy rainfall in March, combined to create the wettest spring on record in southern New Jersey. At Atlantic City International Airport, February precipitation measured 6.5 inches compared to the average of 2.85. In March 8.62 inches of rain fell, compared to the average of 3.93 (source: National Weather Service). Both officials and South Jersey residents readily agreed that it was easily the wettest spring in 100 years, with many area streets, roads, and homes flooded.

One aspect of the winter and spring was that our winter raptor and waterfowl surveys were regularly impeded by weather conditions. While we managed to carry out the Maurice River surveys on a regular basis (only 2 or 3 surveys were cancelled), our route was often blocked and regular survey sites often inaccessible (as a result, protocol had to be altered on several occasions). The few comparative Cohansey River surveys (3) and Salem River surveys (2), carried out as an adjunct to the core Maurice River studies, were fewer than planned simply because these study areas were snowed in, with few roads plowed, on scheduled survey dates.

More importantly, the aberrant weather conditions of 2009-2010 had many resultant impacts on wildlife and birds. In some cases, and for a few species, conditions were beneficial. We joked in March that, “Most of South Jersey is Wood Duck habitat” and indeed Wood Duck habitat was increased many hundreds of percent over normal as woodlands and swamps flooded. The snow cover impacted many birds severely (see cover photo and inside cover photo and captions, as well as the attached article from the *Press of Atlantic City*, dated 15 February 2010).

The combination of cold weather to the north, as well as heavy snow cover, sent record numbers of Bald Eagles south in January and February. A new record by far (previous peak count was 31), 48 Bald Eagles were carefully counted on 12 January 2010, followed by counts of 44 on both 17 February 2010 and 27 February 2010. See the attached article dated 26 January 2010, from the *Press of Atlantic City* for further discussion of these record numbers.

Of interest, and documenting the value of long-term studies, we can compare 2009-2010's peak of 48 Bald Eagles and average of 30.5 to 1988-1989's (the inaugural year of Maurice River studies) peak of 4 Bald Eagles and average of 2.6.

Highlighting the amazing comeback of the Bald Eagle, in February Sutton surveyed all five major South Jersey rivers in five successive days. On the Maurice River he counted 44 Bald Eagles; on the Cohansey River he counted 38; on the Salem River he counted 38. On the Great Egg Harbor River he tallied 19; and on the Mullica River 16 were found, for a five-day total of 155 Bald Eagles in South Jersey!

Because temperatures were slightly above normal, despite the snow, South Jersey rivers never experienced severe icing in winter 2009-2010. Waterfowl were never really concentrated, nor did they linger. Late February saw major migration as American Black Ducks, Mallards, and Northern Pintails left the region heading north (and Green-winged Teal came in). This relatively short stay in New Jersey meant that expected build ups never occurred, and kept averages for these key species low. Only Green-winged Teal and Snow Geese were counted in above average numbers in winter and spring 2009-2010.

Once again, at least two “Common Teal,” the Eurasian subspecies of Green-winged Teal, were present at Bivalve, as they have been in most recent winters. The record incursion of Common Eider in Atlantic Coastal New Jersey and the Mid-Atlantic barely made it to the Maurice River; a single female Common Eider was seen by Karen Johnson at East Point on 15 November 2009 for only the second known record for Cumberland County.

As always, there were many highlights on the Maurice River in 2009-2010 for those who seek the visions of abundant raptors and waterbirds. 2009-2010 findings again confirmed, corroborated, and bolstered previous long-term findings that the Maurice River continues to host highly significant concentrations of raptors, waterbirds, and shorebirds – numbers significant for the Delaware Bayshore, all of New Jersey, and the Mid-Atlantic Region.

Blizzards wreck habitat for birds braving winter

Press of AC

2/15/10

Frozen ground, broken trees limit food, shelter

By RICHARD DEGENER
Staff Writer

You think you've got it bad? Try finding a worm right about now.

As bad as the dual blizzards of 2010 were for people in southern New Jersey, it's a lot worse for the American woodcock. The rusty brown bird, a rare inland shorebird, has to eat its weight each day in earthworms.

While people struggle with power outages, dead cell phones and impassible streets, woodcocks are trying to find dinner under several feet of snow. The birds can be seen probing with their long bills on the few bare spots uncovered by snowplows on the side of the road.

The woodcocks that stay this far north in the winter gamble that the weather will not be that bad and that they will have the habitat to themselves, experts say — and this year the gamble did not pay off.

"A lot of birds are dying. It's a tradeoff, and a lot of times it works," said Don Freiday, a naturalist at the Cape May Bird Observatory.

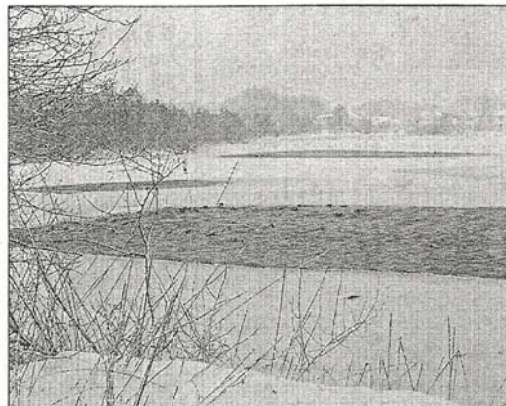
It isn't just the woodcocks dying. Freiday said the frozen salt marshes are killing the birds, such as rails, that winter there — and there isn't one in sight.

"I look out at the marshes of Cape May County and I don't see a sign of life," Freiday said.

Birds that rely on evergreens, such as the Eastern red cedar, also are affected. The wet snow Friday stuck to the foliage of the evergreens, and high winds sheared the tops off or stripped their branches. Cedars tend to be very brittle.

"I hate to lose them because they're habitat for tree birds in the winter," said Jay Schatz, who chairs the Cape May Shade Tree Commission.

The red cedar is arguably the single most important tree in this region during the winter for birds. The blue berries on the female trees provide food. The green awl-shaped



Press photo by Richard Degener

Waterfowl swim in Lake Lily in Cape May Point during Wednesday's snowstorm. The birds stayed in the open water, hugging the side of the lake where the wind was less severe.

leaves, or needles, provide cover. A dense cedar can even prevent snow from getting to the ground under it, giving birds that eat worms a chance at dinner.

"A lot of cedars got killed and that impact is strong and bad. It will affect roosting of owls that like that cover in front of them. Yellow-rumped warbler is a main winter eater of cedars. Cedar waxwings and robins also eat the berries," Freiday said.

The good news is the berries produced last summer are still on the broken trees and they will continue feeding birds. The cedars that survived may take on a more bush-like appearance this year.

Cedars, actually members of the juniper family, are an old tree found all over the world. The Eastern United States is one of its major strongholds and Freiday expects the trees to bounce back. Tree experts in the region give the red cedar the tree version of a four-star rating, which includes D (drought tolerant), S (salt tolerant), N (native) and W (flood tolerant). It's one of the few trees at the shore to be rated at D, S, N and W.

"I don't think it will affect berry production. I think we'll have the same number of

trees, but they'll be shaped differently," Freiday said.

The weather has also led to some strange animal behavior. A bat, which probably decided to migrate too late, came down the chimney into a Lower Township home. Field mice are moving into houses. People with bird feeders are seeing unusual visitors.

"I'm hearing people have meadowlarks at their bird feeder, which is crazy," said Freiday.

Schatz said deciduous trees are faring better than cedars and pines unless they are covered in vines. Trees along New England Road in Lower Township were devastated for this reason.

"The vines held the snow," Schatz said.

Bushes in Cape May, many planted to benefit birds and butterflies, were also flattened by the snow load.

The state Department of Environmental Protection is not worried about the impact of the blizzards on wildlife because nature always bounces back.

"It's all part of nature's cycle, as devastating as it seems," DEP spokeswoman Elaine Makatura said.

Contact Richard Degener:
609-463-6711
RDegener@pressofac.com

Survey finds ^{1/26/10} record number ^{Press of A.C.} of bald eagles

■ Preservationists say many of the 82 spotted along the river have flown there from colder climes.

By EDWARD VAN EMBDEN
Staff Writer

After two decades of sponsoring surveys, Citizens United to Protect the Maurice River and its Tributaries has found something new: record-breaking numbers of American bald eagles in Cumberland County.

In the county, 82 bald eagles have been spotted, with a higher estimate of about 88. Just 12 years ago in 1988, only 17 bald eagles were observed in a survey of Cape May, Cumberland, Salem, Atlantic, Burlington and Ocean counties, Press archives show.

"That number is really quite outstanding for the 10 spots they count," Citizens United President Jane Galetto said. "And they feel confident that they were not duplicative. They look at nests, plumage, whether they're adult or immature, and the directions they fly in. It's a pretty substantial report."

She also offered an explanation for the high count. Cold, harsh winters such as this year's push eagles from northern regions such as New England south. Ice, snow cover and diminished food resources prompt the move, she said, and the Delaware bayshore's resources are plentiful.

"This is undoubtedly related to the cold temperatures this winter," agreed wild life biologist and researcher Clay Sutton. "They travel south until they find open water and feeding opportunities."

Raptors can feed on muskrat and waterfowl in Cumberland County, Galetto said. Muskrats are especially meaty, she said.

Sutton and his colleague Jim Dowdell counted a record 48 eagles on Jan. 12 along the Maurice River between Millville and the East Point lighthouse. According to Sutton, 14 eagles were in sight at one time, some in flight and some perched. Many, he said, were squabbling over food and chasing each other.

A day earlier, the crew counted 34 bald eagles on the Cohansey River.

But don't expect numbers to stay high, Galetto said. A lot of the bald eagles counted as part of the survey belong to a transient population. But as long as things remain cold this winter, the number of bald eagles spotted should stay the same, or even increase.

The increase in numbers means the population is spreading out. The bald eagles might even be seen where you would least expect them.

"Millville downtown," she said. "It's so surprising how many eagles can be seen right there. People don't usually bird watch when they're standing on concrete, but Millville City Hall, in fact, is a great place to bird watch if you just stop and pay attention."

Because City Hall is nearby to the Maurice River, Galetto said, the eagles have been spotted perched on the tall building. Mostly, however, the eagles can be seen near waterways, the farther from humans the better.

Contact Edward Van Embden:
856-649-2072
EVanEmbden@pressofac.com

SUMMARY AND ACKNOWLEDGMENTS

Winter 2009-2010 marked the twenty-third year of study of wintering raptors and waterfowl on the Maurice River and the seventh year of focused spring and fall counts. See Appendix 1 for an in-depth review of the use of the Maurice River by shorebirds in spring and fall. 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. 2009-2010 efforts augmented and supplemented the findings of the first twenty-two 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.

Greater in-depth discussion, as well as recommendations, were offered in the twenty-year summary report (see: "Wintering Raptors and Waterfowl on the Maurice River, Cumberland County, New Jersey – A Twenty-Year Summary of Observed Status and Trends, 1987-2007"). Subsequently, "year twenty-one," "year twenty-two," and "year twenty-three" have substantially underpinned and supported the findings of the previous seasons and continued to document the Maurice River as an important bird area by any standard applied.

We thank the members, supporters, and friends of CU for allowing us to be a part of these significant discoveries on this great South Jersey river. Thank you for all of your important work in Southern New Jersey, and for your ongoing vision of a wild and scenic Maurice River. We particularly thank Jane Galetto for her vision of what role these long-term studies might play in the protection of these valuable avian resources. We thank Renee Brecht for her uncommon and committed interest in protecting the Maurice River and its resources, and particularly for her botanical studies on the river and its tributaries. Botanical findings can only bookend with ornithological knowledge in documenting and protecting the wonders of the Maurice River.

We thank Brian and Karen Johnson, Janet Crawford, and Sandra Keller for shared sightings and insights, and for their continuing interest in the Maurice River and Delaware Bayshore. Leslie and Tony Ficaglia have been wonderful supporters of all conservation efforts on the Maurice River, as well as great comparisons on river surveys. We thank Ward Dasey and Pat Sutton for their support and assistance during the Cohansey River and Salem River comparative surveys.

Lastly, but also first and foremost, we sincerely thank Yvonne Ter Haar Grant and James Grayson Grant for their interest in all of the natural world and for their interest in and support of this project and the many wonders of the Maurice River.

Clay Sutton
July 2010

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 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:

Sutton, C. and J. Dowdell. 1987. An Inventory and Habitat Assessment of the Birds of the Manumuskin River Drainage System and Portions of the Adjacent Maurice River, Cumberland County, N.J. Herpetological Associates, Inc.

Sutton, C., 1988. "Wintering Raptors and Waterfowl on the Maurice River." *Records of New Jersey Birds*, 14(3): 42-51. New Jersey Audubon Society.

Sutton, C., J. Dowdell, et al. 1988-2009. "Wintering Raptors and Waterfowl on the Maurice River." Yearly progress and summary reports prepared for Citizens United to Protect the Maurice River and its Tributaries. (Twenty-two Individual Seasonal Reports.)

Sutton, C., C. Schultz, and P. Kerlinger. 1991. "Autumn Raptor Migration Along New Jersey's Delaware Bayshore - A Hawk Migration Study at East Point, New Jersey." *Hawk Migration Studies*, 17(1): 58-64. Hawk Migration Association of North America.

Sutton, C. and K. Williams. 1992. Comparative Raptor and Waterfowl Use of Specific Sections of the Maurice River. Report prepared for the Natural Lands Trust, Inc., by Herpetological Assoc., Inc.

Niles, L. and C. Sutton. 1995. Migratory Raptors. Pages 433-440 in L.E. Dove and R.M. Nyman, Editors. *Living Resources of the Delaware Estuary*. Delaware Estuary Program, USEPA.

Sutton, C. and P. Kerlinger. 1997. "The Delaware Bayshore of New Jersey: A Raptor Migration and Wintering Site of Hemispheric Significance." *The Journal of Raptor Research*, 31(1): 54-58. The Raptor Research Foundation.

Sutton, C., V. Elia, and J. Dowdell. 1998. "Status and Trends in Wintering Raptors and Waterfowl on the Maurice River: A Ten Year Study." *Records of New Jersey Birds*, 24(2): 26-35. New Jersey Audubon Society.

Sutton, C. and J. Dowdell. 2002. "Wintering Raptors and Waterfowl on the Maurice River – The Fifteenth Year of an on-going and long-term study. Observed Status and Trends: A Fifteen Year Review 1987-2002." Prepared for Citizens United to Protect the Maurice River and its Tributaries, Inc.

Sutton, C. and J. Dowdell. 2007. "Wintering Raptors and Waterfowl on the Maurice River – A Twenty-Year Summary of Observed Status and Trends, 1987-2007." Prepared for Citizens United to Protect the Maurice River and its Tributaries, Inc. May 2009.



Above:

The winter “Cumberland Crane” flock continues to grow – numbering now up to 18 cranes. Included here are a Common Crane (a Eurasian species, presumably escaped), 4 (pure) Sandhill Cranes, and 13 hybrid cranes. See previous reports for discussions of this unique group.

Photographed at Husted’s Landing (near the Cohansey River) on 11 Jan. 2010, by Clay Sutton.

APPENDIX 1

MAURICE RIVER SHOREBIRDS

CUMBERLAND COUNTY, NJ

A Ten Year Summary of
Spring and Fall Migrant Shorebird Use
of the Lower Maurice River

2000-2010

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



**By Clay Sutton and James Dowdell
July 2010**

Prepared for:

Citizens United
to Protect the Maurice River
and its Tributaries, Inc. (CU)
22 Brittany Lane
Millville, NJ 08332
www.cumauriceriver.org

Prepared by:

Clay and Pat Sutton LLC
129 Bucks Avenue
Cape May Court House, NJ
08210
609-465-3397
claysutton@comcast.net



Above:

The annual spring drawdown at Heislerville Wildlife Management Area attracts tens of thousands of shorebirds each season.

– Photo by Clay and Pat Sutton, 17 May 2008

On the cover:

Spring shorebirds at Heislerville Wildlife Management Area, principally Semipalmated Sandpipers, Dunlin, and Short-billed Dowitchers.

– Photo by Clay and Pat Sutton, 17 May 2008

MAURICE RIVER SHOREBIRDS

CUMBERLAND COUNTY, NJ

**A Ten Year Summary of
Spring and Fall Migrant Shorebird Use
of the Lower Maurice River, 2000-2010**

INTRODUCTION AND OVERVIEW

Sponsored by Citizens United to Protect the Maurice River and its Tributaries, Inc., ornithological studies on Cumberland County's Maurice River are now in their 24th year. Beginning in 1987, long-term and ongoing bird use surveys have yielded an in-depth understanding of avian status and trends on the Maurice River. Originally, bird studies focused primarily on wintering raptors and waterfowl, and these core winter season surveys are still ongoing. Other efforts have focused on breeding birds and the now well-known autumn raptor migration at East Point. A listing of reports covering these surveys is included at the end of this report.

In recent years, core winter studies have been expanded to include both the spring and fall migration seasons. Beginning in 2000, we began to focus specifically on migratory shorebird use of the Maurice River, and in fall 2003 and spring 2004, systematic counts were begun and continue to the current time. For a number of years, Citizens United (CU) has been a partner and stakeholder in both the New Jersey Division of Fish and Wildlife Endangered and Nongame Species Program (NJ DFW ENSP) and in international efforts and programs to protect migratory shorebirds on Delaware Bay. Therefore, it was deemed appropriate and timely to focus CU inventory and monitoring resources on gaining valuable data on shorebird use of the Maurice River itself. This concern and focus led to these current and ongoing shorebird studies.

The Delaware Bay is well known as a migratory shorebird staging area of international significance, as shorebirds gather to feed on the eggs of Horseshoe Crabs. The Maurice River has long been known to support significant numbers of migratory shorebirds. Both anecdotal data from birders and NJ DFW ENSP aerial surveys have shown the Delaware bay beaches of the lower Maurice River, at and near East Point, to support high numbers of shorebirds in spring. What is less known and understood is the extent of shorebird use of other tidal portions of the

Maurice River Basin – those areas away from the immediate Delaware Bay beaches.

Heislerville Wildlife Management Area (WMA) has long been known to attract numerous shorebirds in spring (and fall), primarily on the Basket Flats mudflats south of the wildlife drive at low tide. However, beginning in 2006, the DFW began drawing down one or more of the tidal impoundments each May. This enlightened management technique, which provides rich mudflats at all tide stages, quickly attracted highly significant numbers (and variety) of shorebirds, birds that both roost and feed at the site.

In addition to East Point and Heislerville WMA, the 4,200-acre Commercial Township Wetlands Restoration Site at Bivalve attracts large numbers of shorebirds in spring and fall. Beginning in about 1995, when these tidal impoundments were first created by Public Service Electric and Gas (PSE&G) as a mitigation project (the Estuary Enhancement Program – said to be the world's largest salt marsh restoration project), the vast mudflats at Bivalve began to attract many thousands of shorebirds annually.

It is against this backdrop, beginning in fall 2003, that Citizens United has supported systematic and targeted shorebird surveys in spring and fall on the lower Maurice River. This report summarizes ten spring seasons and ten fall seasons of Maurice River shorebird surveys.

METHODOLOGY

This report details shorebird numbers recorded on the lower Maurice River dating back to 2000. Beginning in Fall 2003 and Spring 2004, study efforts have included focused, targeted, and systematic surveys of Maurice River shorebird numbers and variety.

Point counts are conducted at three primary locations on the lower Maurice River: East Point, Heislerville WMA, and Bivalve.

- At East Point, a composite count is done from three vantage points: the boat ramp at the end of Lighthouse Avenue by the East Point Lighthouse; the seawall at the end of East Point Road; and the road end at the eastern end of Bay Avenue (see **MAP 1**).
- At Heislerville, all three impoundments are counted, as well as the mudflats south of the wildlife drive dike (if exposed at lower tide levels) (see **MAP 2**).
- At Bivalve, counts are taken from the Wetlands Restoration Site boardwalk / observation platform accessible from Shell Road (adjacent to / across from the Bayshore Discovery Project office); the boardwalk / observation platform at the southern end of Strawberry Avenue in Port Norris; and the dike overlook at the southern end of Berrytown Road. On a few occasions in spring, usually at high tide, shorebirds have packed the freshly plowed fields at Robbinstown Road, and on these occasions these roosting and feeding birds are added to the Bivalve composite total (see **MAP 3**).

In summary, there are three primary count locations, but three individual count stations are found at each location; therefore nine point counts are taken during each shorebird survey.

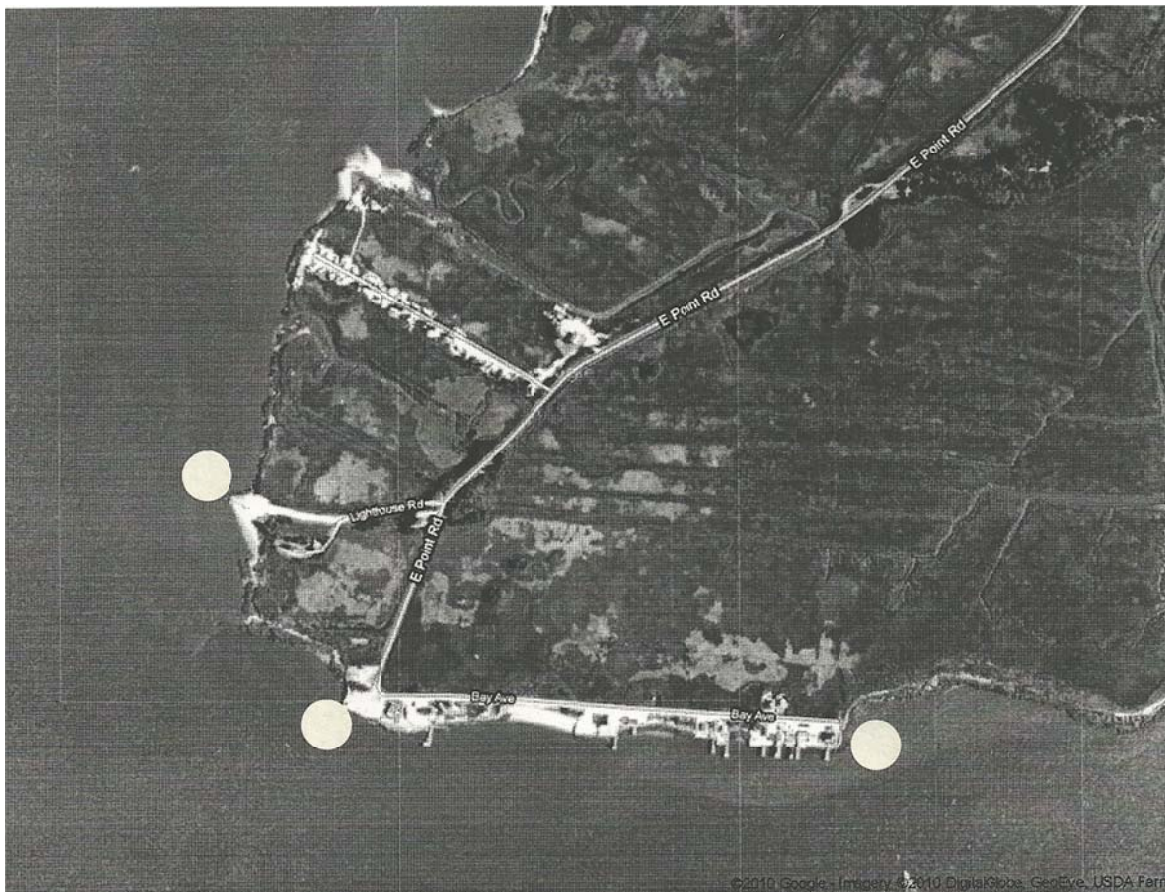
Two observers, Dowdell and Sutton, count shorebirds as quickly and efficiently as possible. Counts are conducted both by binocular and spotting scope, depending on the distance of the flocks. Normally different species are tallied by each observer in order to get through the vast flocks before they flush or move around. Birds on the mudflats are tallied individually as far as is possible, although many groups must be counted in blocks of ten. Flying flocks, if not previously counted on the ground, are estimated by each observer and if totals differ, they are averaged. All waterbirds and raptors are tallied, but only shorebirds are reported on herein.

Point counts are not timed; birds are counted until all present are counted; observers then move quickly to the next point in order to hopefully get there before birds possibly move into or out of the area. The nine point counts at the three locations usually take about five hours to carry out. Counts are conducted only in good weather and good visibility. Tidal stage and water levels are recorded. As far as is practicable, observers attempt to count Heislerville at high tide (when shorebirds have been pushed off most other feeding sites and are roosting or feeding in the drawn-down impoundments) and Bivalve at lower stages of the tide (since a high tide normally fills the impoundments at Bivalve, leaving no mudflats to attract shorebirds).

MAP 1

EAST POINT

SHOREBIRD POINT COUNT LOCATIONS

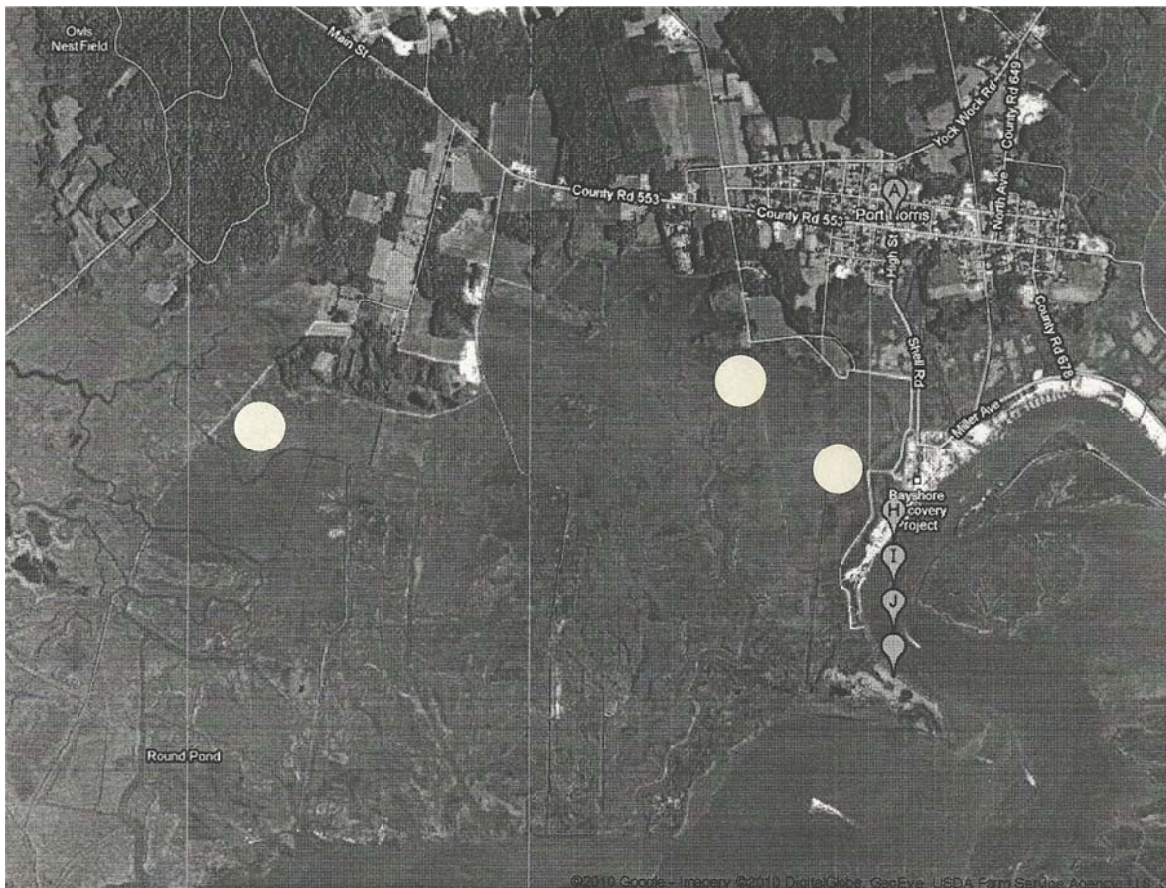


MAP 3

BIVALVE

WETLANDS RESTORATION SITE

SHOREBIRD POINT COUNT LOCATIONS



FINDINGS

Ten spring seasons of Maurice River shorebird counts, 2000-2010 (no counts were conducted in Spring 2003), are shown in **Table 1**. Thirty-five data sets are shown for the spring (northbound) migration period. Nine fall seasons of Maurice River shorebird counts, 2000-2009 (no counts were conducted in 2002), are shown in **Table 2**. Forty-five data sets are shown for the fall (southbound) migration period. In Tables 1 and 2, **all-time peak seasonal shorebird counts** for the lower Maurice River study area are shown in **boldface**.

In the ten years of study, 34 species of shorebirds have been recorded on the Maurice River, some in small numbers and some in very high numbers. One additional subspecies has been recorded, the “Western” Willet. Recorded on several occasions, the “Western” Willet breeds on the Great Plains, and is reportedly a candidate for “splitting” – that is, to gain full species status. Because of the ephemeral nature of shorebird migration, we make no attempt here to compare data from year to year. Average numbers would mean little since we make every effort to survey when peak numbers for each species occur during their sometimes short seasonal stay on the Maurice River.

Tables 1 and 2 on a few occasions show unusual shorebirds that were known present on count day, but that were recorded by other reliable observers. Heislerville WMA and the Bivalve EEP site are now heavily birded in spring, and inevitably other rarer species have been seen by the multiple observers present. (In short, it is hard to search for a Curlew Sandpiper hidden among 15,000 other shorebirds, especially when you are tasked with accurately counting the 15,000 others!) Unusual shorebirds seen by other observers (but not recorded by the official point counts) are noted with an asterisk in Tables 1 and 2.

Two shorebird species are greatly under reported in Tables 1 and 2. Wilson’s Snipe is a very early migrant through our region and numbers peak long before the normal “spring” survey period. For example, up to 107 Wilson’s Snipe have been counted on the Maurice River during winter raptor and waterbird surveys (seen on 28 March 2006, 107 Wilson’s Snipe is the second highest maxima “one spot total” ever recorded in New Jersey), as well as 75 on 14 March 2002, and 51 on 20 March 2007. Likewise, American Woodcock is a numerous migrant through the South Jersey region in spring and particularly in fall. Nocturnal and secretive, this “upland” shorebird is rarely detected on standard surveys. Nonetheless, up to 14 American Woodcock have been counted on a winter raptor / waterbird survey (28 December 2000) and 10 were counted on 12 February 2010, all pushed to roadsides by heavy snow cover. It is important to remember that these two shorebirds are also a key part of the Maurice River shorebird group.

Finally, one additional shorebird species not in Tables 1 and 2 is known to have occurred on the lower Maurice River, a Spotted Redshank (a Eurasian shorebird), that was well seen and photographed at Heislerville WMA on 27 March 1977 by Clay Sutton and Alfred Nicholson.

TABLE 1

	2000	2001	2002	2004					2005			2006			2007						
DATE	4/20	4/27	5/2	3/22	4/26	4/6	4/20	5/5	5/27	6/3	4/12	5/11	5/25	4/14	5/10	5/30	4/7	4/10	5/9	5/17	6/1
Black-bellied Plover	50	40	300	215	150	25	211	860	303	144	37	580	386	111	170	243	15	18	271	525	100
Am. Golden Plover	1							1													
Semipalmated Plover		3	2					468	74	192		1903	3494		630	459			415	5075	222
Killdeer	5	9		3	1	20	1	2	3	5	3	6	5	6	7	7	2	6	13	7	3
Am Oystercatcher							2						1	1	4			2			
Black-necked Stilt																			2*		
American Avocet																					
Greater Yellowlegs	25	815	3	155	1	78	269	213		5	157	335	12	246	65	1	40	106	58	42	1
Lesser Yellowlegs	250	125		15		104	238	427			132	194	1	40	34		150	58	3	3	
Solitary Sandpiper								1													
Willet	10	8	25		12		36	31	34	21	1	26	53	7	38	24			22	24	21
"Western" Willet							1								1						
Spotted Sandpiper							1	1				3	1						1	6	
Upland Sandpiper																					
Whimbrel								1				1			1						
Hudsonian Godwit																					
Marbled Godwit																					
Ruddy Turnstone								6	35	2		1	59		35	27			13	50	1
Red Knot						1		260	65			190	625		152	23			25		
Sanderling								100	450			13	125		26	30			10	320	1
Semipalmated Sdp		15	20				2	360	6900	2750		2600	17965		2900	5960			270	7700	3240
Western Sandpiper																					
Least Sandpiper						10	39	932	92		13	795	94		188	16			20	18	
Wh-rump. Sandpiper								4	2			1	7		7	9			2	3	
Pectoral Sandpiper						2								5							
Dunlin	10000	6300	1000	1520	400	425	7800	6700	31		4053	2666	792	5336	4630	12	13000	13300	5600	1120	20
Curlew Sandpiper															2				1	1	
Stilt Sandpiper	2 *										2								2		
Ruff	1 *	1 *						1													
Sh-billed Dowitcher		241	1500		50	6	245	1525	45	10	2	1619	573	17	2600	48	5	4	8900	6035	36
Lg-billed Dowitcher			1								1							1			
Dowitcher (sp.)																					
Wilson's Snipe				9		18					1			3			1				
Am. Woodcock																			1		
Wilson's Phalarope								1 *				1 *									
Red-necked Phalarope																					
unid. Shorebird													775							20000	
TOTAL SHOREBIRDS	10344	7557	2851	1917	614	689	8843	11894	8036	3129	4402	10934	24968	5772	11490	6859	13213	13495	15627	40929	3645

TABLE 1 (continued)

	2000					2001					2003					2004				
DATE	8/4	8/10	8/25	9/14	10/15	7/28	8/8	8/24	9/21	10/23	7/5	8/7	8/15	9/5	9/24	10/13	7/29	8/7	8/26	10/17
Black-bellied Plover	2	1	20	35	500	1	5	150	200	500		1	33	218	149	291	2	90	79	252
Am. Golden Plover																				
Semipalmated Plover	250	250	250	150		50	300	10	5		76	170	324	750		1	4	510	323	4
Killdeer	4	3	1	2				6			6	2	24			2	3		2	2
Am Oystercatcher								4			1									
Black-necked Stilt																				
American Avocet										2					1 *					
Greater Yellowlegs	400	200	100	50		15	300	20	200		7	19	86	6	67	18	12	64	20	24
Lesser Yellowlegs	200	150	100	25		50	100	200	20		40	58	64	60	70	71	56	72	27	24
Solitary Sandpiper	2	1																		
Willet	2	2	2	1						6	14	5	1	3	1		14	1		
"Western" Willet																				
Spotted Sandpiper								1			4	1			1	1	1	1		
Upland Sandpiper		1																		
Whimbrel																				
Hudsonian Godwit										3										
Marbled Godwit										2										
Ruddy Turnstone	4			20		25	35										3	4	8	
Red Knot				15						1				4	8	3				
Sanderling															1		32	22		
Semipalmated Sdp	10000	10000	5000	1000		3000	8000	8500	750	1	2475	6245	4300	2000	12	2	2747	4020	3061	6
Western Sandpiper	20	20	4	2	2	5	2		1		1	2		25		1		6	59	8
Least Sandpiper						10	35	30	50	162	109	260	300	6	3		82	87	47	34
Wh-rump. Sandpiper	4	1		3						2			2	25				1	1	
Pectoral Sandpiper								2												7
Dunlin					12000					10000					6	1810				3420
Curlew Sandpiper																				
Stilt Sandpiper												3	1				1		1	
Ruff																				
Sh-billed Dowitcher	1000	2000	150	50		3000	3000	150	25	1	150	297	624	100	20		1303	1401	337	6
Lg-billed Dowitcher		3												1						2
Dowitcher (sp.)																8				
Wilson's Snipe																2				
Am. Woodcock																				
Wilson's Phalarope																				
Red-necked Phalarope																				
und. Shorebird																	2000			
TOTAL SHOREBIRDS	11888	12632	5627	1353	12502	6056	11407	9287	1237	10788	2936	6912	5719	3492	341	2213	6260	6279	3965	3789

DISCUSSION – SPRING SHOREBIRDS ON THE MAURICE RIVER

Since the late 1970s it has been well known that the Delaware Bayshore hosts globally significant numbers of shorebirds in spring. It is also known that the Delaware Bay beaches near East Point support large numbers of shorebirds at that time, principally Red Knot, Sanderling, Ruddy Turnstone, Dunlin, and Semipalmated Sandpiper. Now, ten years of focused and targeted shorebird counts on key lower Maurice River areas – Heislerville WMA and Bivalve – have documented large numbers of shorebirds using Maurice River mudflats and impoundments as well.

Large numbers of Black-bellied Plover, Semipalmated Plover, Greater Yellowlegs, Lesser Yellowlegs, Semipalmated Sandpiper, Dunlin, and Short-billed Dowitcher are found each spring on the Maurice River, mixed between Heislerville WMA and Bivalve depending on the tide stage and resultant water levels.

Because conservation, greater awareness, and recognition of Maurice River shorebird resources were the principal goals of these shorebird studies, every effort was made to maximize the limited time (the number of survey dates available), as well as find the best route that would allow counters to “work the tide” to find the true number of birds present.

As shorebirds move around a great deal in relation to tide and water depth, there was some concern with the possibility of double counting, and on a number of occasions the observers backtracked to recheck numbers. For example, on 17 May 2007 an amazing 40,929 shorebirds were carefully counted, by far a new record at that time for “total shorebirds” on the Maurice River. On that day the Heislerville WMA impoundments held over 17,000 shorebirds. We immediately went to Bivalve, where the EEP held 22,000 additional shorebirds (due to distance, haze, and heat waves, 20,000 of these were recorded as “unidentified shorebirds”). For clarification, we then immediately went back to Heislerville where 17,000 shorebirds were still present – eliminating the issue of possible double-counting due to shorebird movements in relation to the stage of the tide. These astounding numbers occurred on a day that we were truly able to “hit the peak” of shorebird spring migration staging. (It is important to again note that the now annual spring drawdown of Heislerville WMA’s impoundments is highly beneficial to shorebirds. The Division of Fish and Wildlife should be highly commended for this enlightened management strategy.)

Also on several occasions our counts were corroborated by researchers from the New Jersey Audubon Society (NJAS) in the area to study Semipalmated Sandpipers. For example, on 19 May 2010 we counted 17,489 shorebirds using our standard protocol. On the same day NJAS researcher Vince Elia had established 15,000+ shorebirds to be present, a remarkably similar count when dealing with such large (and mobile) numbers. Likewise, in 2008, when we estimated 45,487 shorebirds to be present, our peak “total shorebird” count, Vince Elia said he believed “at least” 40,000 shorebirds were present.

There have been days when counts were more difficult and problematical. At high tide on some days, many shorebirds depart Bivalve to fly to the drawn down impoundments at Heislerville WMA to roost and feed. Conversely at low tide, many depart Heislerville to feed on Basket Flats, the beaches, and at Bivalve. On the day discussed above, that did not happen, but on a number of surveys we first counted Bivalve, then watched many leave for Heislerville as water levels rose. On these days few if any additional shorebirds were added to the count at Heislerville WMA.

Despite repeatable methodology, on some days numbers were, to some degree, the observers' best guess at true numbers present. Nonetheless, we make every attempt to err on the side of caution, and often numbers recorded are conservative.

An additional reason to believe that numbers are largely conservative is based on the very size of the Bivalve Wetlands Restoration Site. At 4,200 acres, much of it is inaccessible, and vast areas of mudflats remain unseen by counters at the three point count sites. Perhaps hunting Peregrines may flush distant, previously unseen flocks so they may be counted in flight (as happened in part on the day recounted above), but short of this scenario, many birds often remain unseen and uncounted.

We believe that the shorebird numbers reported herein are a reliable, yet conservative estimate of the shorebird numbers on the lower Maurice River. Such numbers are significant for the Delaware Bayshore, New Jersey, and the entire flyway.

DISCUSSION – FALL SHOREBIRDS ON THE MAURICE RIVER

While we have long recognized the value of Delaware Bay to shorebirds in spring, far less information was available regarding potential shorebird use in fall. Excepting Delaware's remarkable refuges (Bombay Hook NWR, Little Creek WMA, Ted Harvey Conservation Area, etc.), in the recent past few associated the Delaware Bay with shorebirds in fall.

Delaware Bay beaches receive relatively little use by shorebirds during fall migration. However, the mudflats and impoundments at Heislerville WMA and Bivalve see heavy use by migrant shorebirds during fall migration. We use the term "fall migration" for southbound shorebirds, even though most of the northern and Arctic breeders that pass through our area do so in July, August, and early September. (While we say "relatively little use," it is important to note that, on occasion, bay beaches are extensively used by southbound migrant shorebirds. For example, on 3 August 2010, Sutton counted over 2,000 shorebirds, mostly Semipalmated Sandpipers and Sanderling, on the beach at Reeds Beach in Cape May County – all feeding on Horseshoe Crab eggs and larvae made available by crabs that had nested during July's moon tides. Southbound shorebirds eat Horseshoe Crab eggs too!)

While 2000 and 2001 studies discovered considerable use and the potential for targeted surveys, from 2003 through 2009 focused efforts documented substantial use of the lower Maurice River by southbound shorebirds. While total shorebird numbers are nowhere near what they are in spring (plus Heislerville WMA is usually not drawn down for shorebirds in fall), shorebird use in fall is still highly significant for the region. Up to 12,632 shorebirds have been recorded (10 August 2000) on the lower Maurice River, numbers undocumented elsewhere on New Jersey's Delaware Bayshore. In New Jersey, only Forsythe NWR regularly records higher shorebird numbers than those we have documented for the lower Maurice River.

In a careful review of Table 2, it appears that in recent years shorebird numbers have dropped substantially from those recorded in 2000 and 2001, possibly calling into question the numbers estimated in those years. It is true that 2000 and 2001 saw exploratory surveys and were prior to current protocol; numbers were largely estimated rather than systematically counted (2000 and 2001 shorebird counts were ancillary and adjunct to other raptor and waterbird survey efforts). Data from 2003 to the present has been much more systematically gathered, with careful counts rather than any estimates.

Yet it needs to be remembered that the Bivalve Wetlands Restoration Site is not what it was in 2000. The area is growing up (growing "in") with *Spartina alterniflora*, and each year mudflat area is substantially less than the prior year. This is particularly true in fall – following a growing season that has produced lush growth; this impacts not only the acreage of mudflats available to shorebirds, but also their visibility to observers – their detectability. A major goal of PSE&G management and mitigation efforts is fish production – not the creation of shorebird habitat. The goal of the wetlands management is for the area to largely fill in with *Spartina*, and this effort seems to be working. The Thompson's Beach PSE&G site a decade ago was prime shorebird mudflats, yet has today substantially filled in with *Spartina*, providing far less

shorebird habitat. In the 1970s, Moore's Beach was a prime shorebird-use area (and a birder's mecca), yet today virtually no mudflat remains as *Spartina* has reclaimed once vast mudflats.

The point is, despite different survey protocols, we really believe that shorebird habitat and shorebird numbers have declined at Bivalve, an alarming trend that should be a focus point for shorebird managers. Nonetheless, Maurice River fall shorebird surveys have shown that the lower river still supports regionally significant numbers and variety of shorebirds during their southbound migration, numbers that should compel recognition, protection efforts, and management priorities.

SUMMARY AND CONCLUSIONS

Citizens United-sponsored shorebird surveys on the Maurice River have documented substantial and significant shorebird use in spring and fall. Ten years of point counts during both spring (northbound) and fall (southbound) shorebird migration have shown the lower Maurice River – particularly the East Point, Heislerville WMA, and Bivalve Wetlands Restoration Site – to host large numbers and a wide variety of shorebirds.

Importantly, studies have shown that Delaware Bay shorebirds use far more area / habitat than the beaches and flats at the edge of the bay. Large numbers occur both on natural mudflats (Basket Flats) and in tidal impoundments as well.

These ten years of shorebird counts should augment DFW ENSP aerial censuses of the Delaware Bayshore and further substantiate the need to protect the resources of the lower Maurice River. The presence of such numbers of migratory shorebirds on the river's mudflats and tidal impoundments should call for management of resources and habitats that will promote the long-term protection and conservation of these long-distance migrants.

Migratory shorebirds are one more among many documented and proven ecovalues of the Wild and Scenic Maurice River, and brightly colored, restless feeding shorebirds by the thousands are yet one more reason that the Maurice River is a very special place indeed.

A final note is the large number of birders (ecotourists) who are coming to the Delaware Bayshore region, and particularly the lower Maurice River to view the migratory shorebirds gathered there. Places such as East Point, Heislerville WMA, and Bivalve have become a definitive destination in spring, visited by dozens of birders daily.

Such coverage leads to many discoveries and many “good birds.” It is a simply fact (and not overstatement) that Heislerville WMA has become the best place to see Curlew Sandpiper (a Eurasian species) in all of North America, with up to 3 individuals recorded each spring from 2006 through 2010. Indeed, birders have come from all over North America to enjoy the lower Maurice River and Delaware Bayshore at their finest – teeming with shorebirds on their way to or from the high Arctic breeding grounds. The Maurice River is an important way station on that journey.

ACKNOWLEDGMENTS

We thank the officers and the membership of Citizens United to Protect the Maurice River and its Tributaries, Inc. for the privilege and pleasure of carrying out these important studies of the timeless Maurice River. Thank you for all of your important work in Southern New Jersey, and for your ongoing vision of a wild and scenic Maurice River.

We thank Karen Johnson, Brian Johnson, Janet Crawford, Sandra Keller, Chris Vogel, Tom Reed, and Vince Elia for sharing sightings from the Maurice River in spring and fall and for discovering and documenting a number of the rarer shorebirds that have graced the Maurice River of late.

We sincerely thank Yvonne Ter Haar Grant and James Grayson Grant for their interest in all of the natural world, and for their interest in and support of this project and the many wonders of the Maurice River.

Clay Sutton

July 2010

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 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:

Sutton, C. and J. Dowdell. 1987. An Inventory and Habitat Assessment of the Birds of the Manumuskin River Drainage System and Portions of the Adjacent Maurice River, Cumberland County, N.J. Herpetological Associates, Inc.

Sutton, C., 1988. "Wintering Raptors and Waterfowl on the Maurice River." *Records of New Jersey Birds*, 14(3): 42-51. New Jersey Audubon Society.

Sutton, C., J. Dowdell, et al. 1988-2009. "Wintering Raptors and Waterfowl on the Maurice River." Yearly progress and summary reports prepared for Citizens United to Protect the Maurice River and its Tributaries. (Twenty-two Individual Seasonal Reports.)

Sutton, C., C. Schultz, and P. Kerlinger. 1991. "Autumn Raptor Migration Along New Jersey's Delaware Bayshore - A Hawk Migration Study at East Point, New Jersey." *Hawk Migration Studies*, 17(1): 58-64. Hawk Migration Association of North America.

Sutton, C. and K. Williams. 1992. Comparative Raptor and Waterfowl Use of Specific Sections of the Maurice River. Report prepared for the Natural Lands Trust, Inc., by Herpetological Assoc., Inc.

Niles, L. and C. Sutton. 1995. Migratory Raptors. Pages 433-440 in L.E. Dove and R.M. Nyman, Editors. *Living Resources of the Delaware Estuary*. Delaware Estuary Program, USEPA.

Sutton, C. and P. Kerlinger. 1997. "The Delaware Bayshore of New Jersey: A Raptor Migration and Wintering Site of Hemispheric Significance." *The Journal of Raptor Research*, 31(1): 54-58. The Raptor Research Foundation.

Sutton, C., V. Elia, and J. Dowdell. 1998. "Status and Trends in Wintering Raptors and Waterfowl on the Maurice River: A Ten Year Study." *Records of New Jersey Birds*, 24(2): 26-35. New Jersey Audubon Society.

Sutton, C. and J. Dowdell. 2002. "Wintering Raptors and Waterfowl on the Maurice River – The Fifteenth Year of an on-going and long-term study. Observed Status and Trends: A Fifteen Year Review 1987-2002." Prepared for Citizens United to Protect the Maurice River and its Tributaries, Inc.

Sutton, C. and J. Dowdell. 2007. "Wintering Raptors and Waterfowl on the Maurice River – A Twenty-Year Summary of Observed Status and Trends, 1987-2007." Prepared for Citizens United to Protect the Maurice River and its Tributaries, Inc. May 2009.