

Herpetological Associates, - Environmental Consultants

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James Skibbee

February 26, 1990

Mr. Keith Chain

President

Citizens United to Protect the
Maurice River and its Tributaries

P.O. Box 474

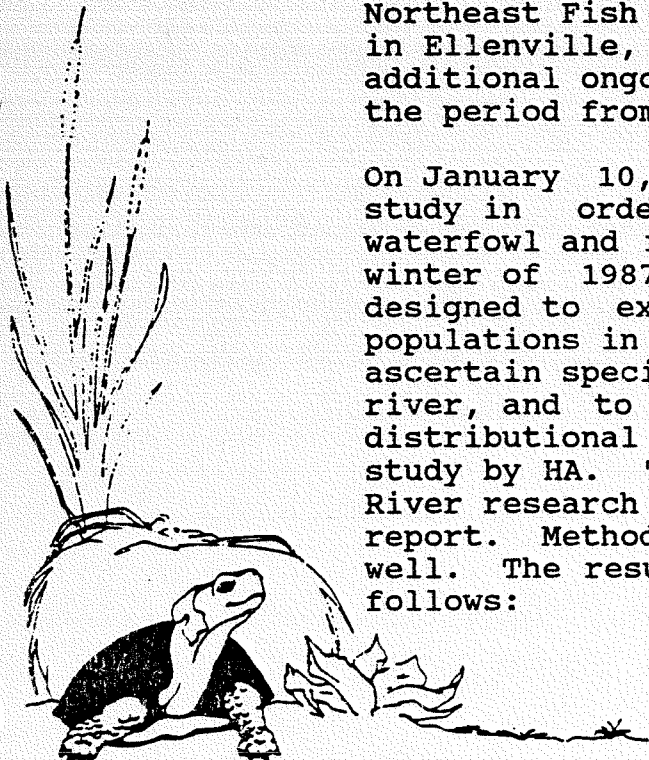
Millville, NJ 08332

Re: Ongoing Wildlife Survey of the Maurice River,
Cumberland County, New Jersey. HA File No.
87.44 and 90.01-A.

Dear Mr. Chain:

This letter will serve to update, corroborate and strengthen our report dated March 30, 1988, entitled "Wintering Raptors and Waterfowl along the Maurice River on the Delaware Bayshore, Cumberland County, New Jersey". As you know, this study was published as a featured paper in "Records of New Jersey Birds", Vol. XIV, No. 3 (Autumn 1988) of the New Jersey Audubon Society. In addition, this paper was presented in a revised and updated version, by HA at the 45th Annual Northeast Fish and Wildlife Conference on May 8, 1989 in Ellenville, New York. This addendum will detail additional ongoing studies carried out by HA during the period from April 1988 to March 1989.

On January 10, 1989, you authorized a comparative study in order to contrast winter 1988-1989's waterfowl and raptor use to that observed during the winter of 1987-1988. These ongoing studies were designed to examine wintering raptor and waterfowl populations in relation to previous data gathered, ascertain specific important bird use areas along the river, and to complement and complete the seasonal distributional patterns determined in the 1987-1988 study by HA. The study area for this ongoing Maurice River research is as outlined in our March 30, 1988 report. Methodological approaches were the same as well. The results of these additional studies are as follows:



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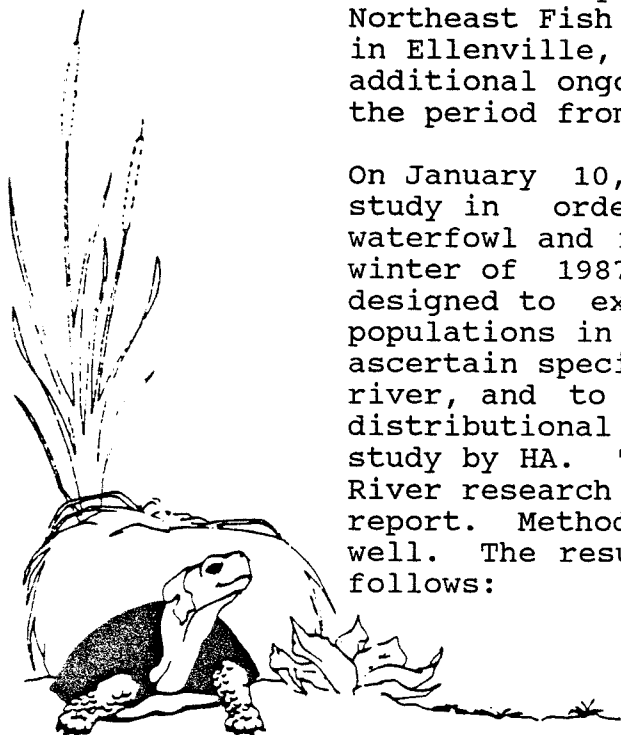
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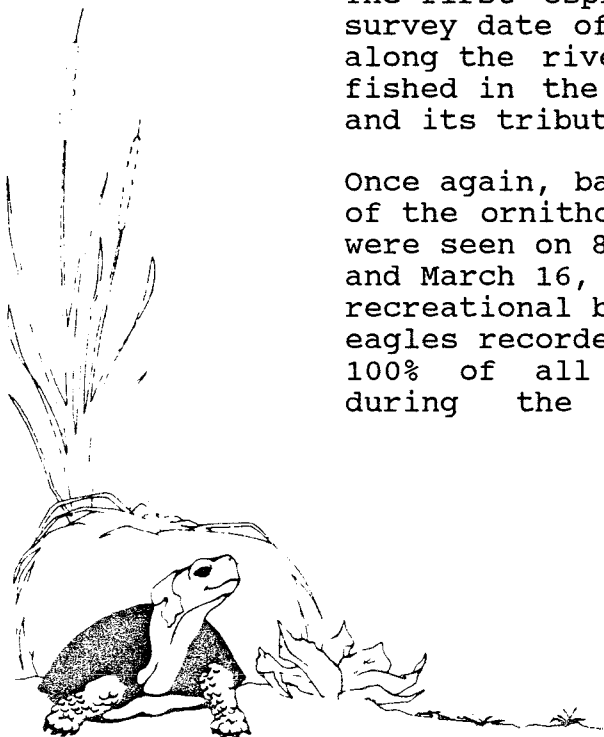
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The study carried out for Citizens United by HA in 1988-1989 was essentially a wintering raptor and waterfowl study, but with some surveys carried out in spring, summer and fall in order to gain a full seasonal picture of avian use. Since the previous report was published, sixteen additional days have been spent on the Maurice River. The raptors recorded during these survey dates are shown on Attachment 1. Waterfowl numbers recorded to date are shown on Attachment 2. (These attachments will update and complete those charts found in our previous report). As in 1987-1988, the abundance and diversity of raptors and waterfowl on the Maurice River was highly noteworthy, both in the state and in the mid-Atlantic region. Not only serving as excellent wintering habitat, the areas also represent valuable migratory bird habitat in both spring and fall, and is excellent breeding habitat in summer for many species.

A total of 3,999 raptor sightings were accrued in the 16 survey dates subsequent to the 1987-1988 published report. The turkey vulture roost near Laurel Lake held considerably more birds in the winter of 1988-1989; a total of 209 birds were present on January 13, 1989. Black vultures, an increasing yet uncommon species in New Jersey, were present throughout the study; a maxima of 3 were recorded on March 2. Osprey, a "threatened" species in New Jersey, were abundant both during migration and as breeding birds. The first osprey returned to the river on the non-survey date of March 13; a minimum of five pairs bred along the river in 1989 and numerous migrant osprey fished in the bountiful waters of the Maurice River and its tributaries.

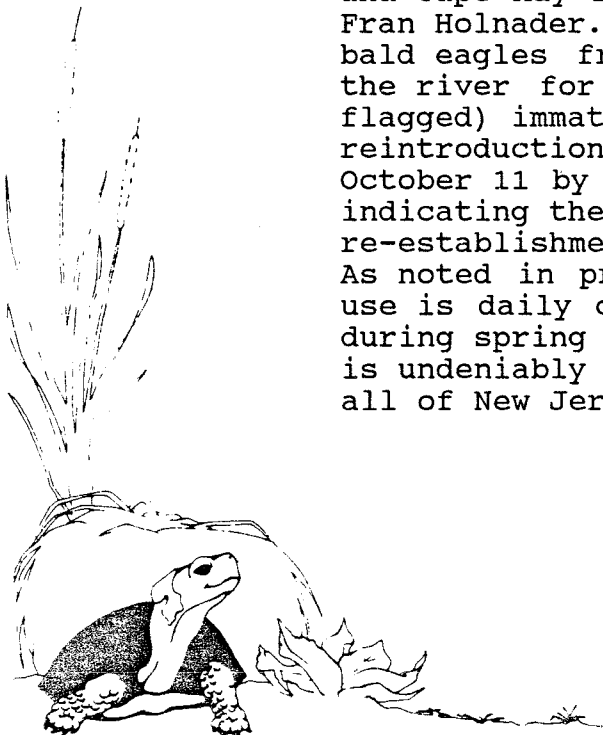
Once again, bald eagle use was found to be a hallmark of the ornithology of the Maurice River. Bald eagles were seen on 88% of all surveys between April 13, 1988 and March 16, 1989. Only during July and August, when recreational boating traffic is at its peak, were no eagles recorded. Bald eagles were tallied on a full 100% of all fall, winter and spring survey dates during the 1988-1989 season.



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A maxima of four birds were seen on three different dates. In addition, four eagles were recorded on the non-survey dates of May 17, 1988 and January 1, 1989 by competent observers reporting to HA. A total of six eagles were seen on the river on December 1, 1988, including four bald eagles, one golden eagle, and one unidentified eagle. A minimum of 16 individual bald eagles were present during the winter period (September to March) 1988-1989, based on the multiple sightings, concurrent sightings, and plumage variations. (The 1987-1988 study, which was more intensive, revealed a minimum of 18 individuals present).

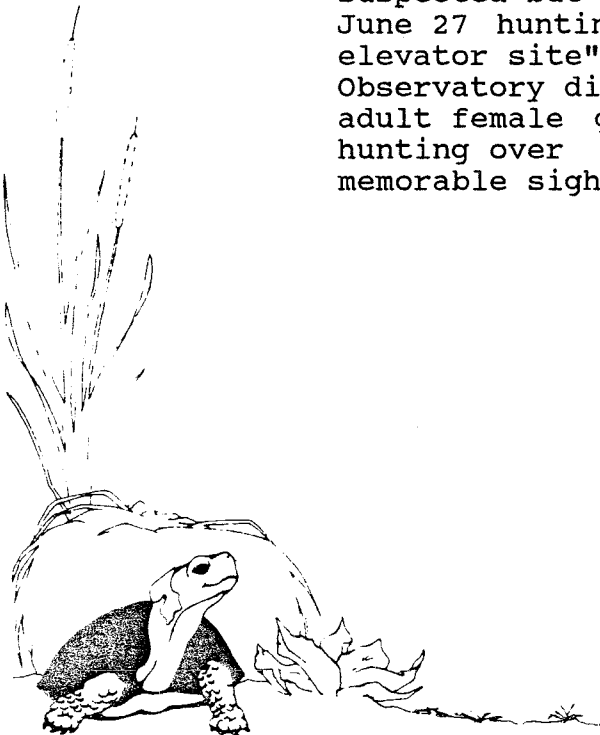
On November 7, 1988, we observed the same adult bald eagle flushed by boats three times during a ten minute period. A second eagle, an immature, was flushed as well. Details are on file. On this day, one immature eagle was believed to be the same one seen by this writer on October 29 at Cape May, indicating migratory holdover in the region. In fact, this same bird was present until at least December 18. Bald eagles were seen in the vicinity of the Maurice River Bluffs ("grain elevator site") and just south of the Maurice River bridge on about one-half of the survey dates during the winter. Three bald eagles (one adult and two immatures) were seen perched on the cedar island on the west bank of the river, and south of the Maurice River bridge on April 16 by competent observer and Cape May Bird Observatory reporter and associate, Fran Holnader. Finally, the adult nesting pair of bald eagles from Cumberland County continued to use the river for feeding daily in winter, and a (red-flagged) immature bald from the Blades Hack site (DEP reintroduction effort) was seen on the river on October 11 by HA and subsequently by other observers, indicating the importance of the Maurice River to the re-establishment of our nation's symbol in New Jersey. As noted in previous studies and reports, bald eagle use is daily on the Maurice River both in winter and during spring and fall migrations; the Maurice River is undeniably the top wintering eagle stronghold in all of New Jersey.



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Northern harrier populations were similar to the previous winter; the 1987-1988 maxima of 32 individuals was tied on December 1, 1988 (with only one of the minimum of two adult males present being seen - indicating, again that more birds are present than are recorded on a given survey). In fact, Frank and John Craighead indicate in their famous study, Hawks, Owl and Wildlife (Dover, New York, 1969) that (due to the reticent nature of harriers, coupled with the fact that they spend over 50% of the time perched on the ground, out of sight) 2.3 harriers are present for each recorded during a census. Applying this multiplying factor to the Maurice River, over 73 harriers were present on the Maurice River during each winter of study. Northern harriers were noted in courtship on March 16, indicating probable nesting near East Point. Northern harriers or marsh hawks are an important component of Maurice River raptor populations, and here achieve one of the highest reported densities in New Jersey.

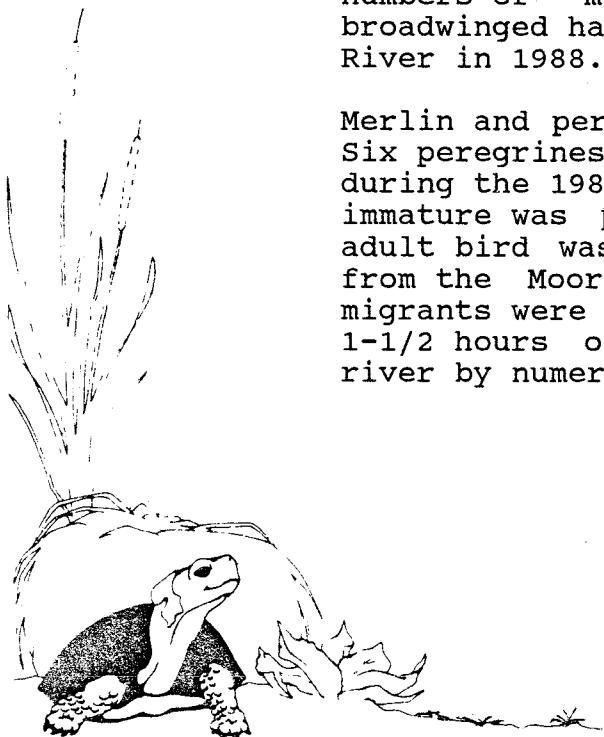
Cooper's hawks ("endangered") were recorded on 11 of 16 visits. A maximum of six migrants were seen on September 22. Cooper's hawks successfully nested and fledged at least one young bird along Bowker's Run, a tributary to the Maurice River near Port Norris during the 1988 nesting season. This was the first documented nesting on the New Jersey coastal plain in at least 50 years. In addition, a second nest was suspected but not found; an adult male was seen on June 27 hunting at the Maurice River Bluffs ("grain elevator site") by this writer and Cape May Bird Observatory director, Dr. Paul Kerlinger. A migrant adult female goshawk was seen at point blank range hunting over the river on December 1, a highly memorable sighting.



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Red-tailed hawk numbers recorded were similar to winter 1987-1988. That is to say, a density perhaps unequalled in New Jersey was again documented. A new maximum was recorded for the river; 44 individuals were observed on December 1. Evidence that not all regional red-tails are recorded each survey date, a full albino red-tailed (perhaps the same individual noted the previous winter) was seen on December 30, apparently mated with a normal plumaged red-tail. This bird was not seen by HA again, yet was recorded by local resident, Jane Galetto on a few other dates during the study period. In short, more than 44 red-tails hunt the river in winter. A minimum of seven pairs of red-tails rest along the river. Migrant red-shouldered hawks ("threatened") were seen on November 7 and December 16. On September 22, 1988, an incredible raptor migration was witnessed at Bivalve by HA associate, Bob Barber. On that day, over 2,000 broadwings were seen in a single dense kettle (flock) moving over the river, following the Delaware Bayshore westward. The birds had roosted somewhere in the region the previous evening; this sighting is highly significant because little is known about where the known fall raptor concentrations at Cape May go after they depart the Cape. Here is solid evidence that these birds move west around the bay (rather than attempting the water crossing) and that the Cumberland County bayshore region, including the Maurice River, is important as roosting and feeding habitat for high numbers of migrant raptors. Three pairs of broadwinged hawks were found nesting along the Maurice River in 1988.

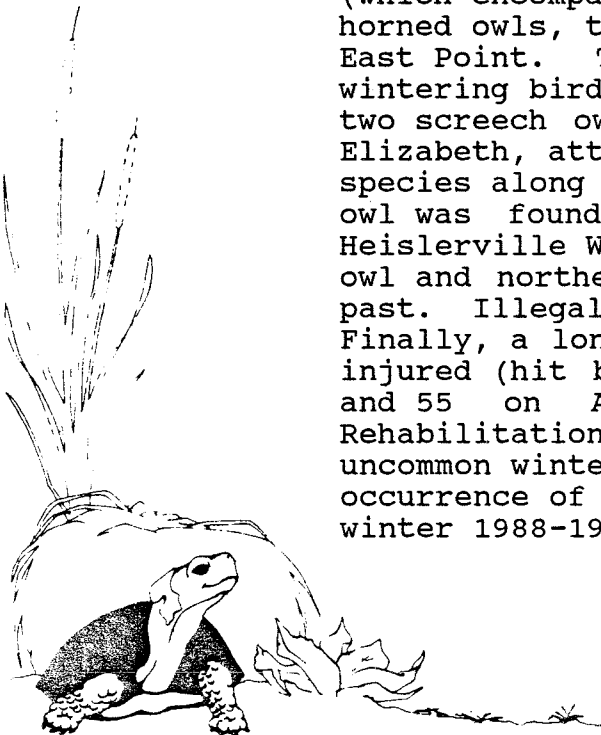
Merlin and peregrine use is no doubt daily in autumn. Six peregrines ("endangered") were seen on five dates during the 1988-1989 study. A summering or dispersing immature was present on July 20 and one wintering adult bird was noted on February 2 (perhaps a bird from the Moore's Beach nesting tower pair). Two migrants were noted at Bivalve on September 22 in just 1-1/2 hours of observation, indicating use of the river by numerous peregrines in fall.



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In summary, our ongoing studies have revealed that raptor use of the Maurice River is not limited to winter. Significant nesting populations occur for many species including the "endangered" Cooper's hawk and "threatened" osprey and northern harrier. Migratory use of the Maurice River region is considerable in both spring and fall, and significant in the coastal region. Finally, 1988-1989 wintering raptor data serves to complement, confirm and reaffirm the findings of the 1987-1988 wintering raptor study. The Maurice River continues to exhibit the highest density of wintering raptors reported in New Jersey, as well as host the highest concentration of wintering bald eagles in the state. As such, the Maurice River plays a major role in NJDEP Fish and Game's Nongame Endangered Species Program's efforts to preserve, protect, enhance, and restore New Jersey's "threatened" and "endangered" raptor populations. Maurice River's raptor populations are of statewide and mid-Atlantic regional significance, and as such require the highest form of protection through the various applicable planning processes.

Owl species were well represented as an adjunct to our 1988-1989 work. Two short-eared owls ("endangered") were discovered on December 18, and were present for most of the winter near Bivalve. Also seen on December 18, discovered by various observers (including HA) on the Belleplain Christmas Bird Count (which encompasses the lower river) were four great horned owls, two screech owls, and a saw whet owl near East Point. The saw whet owl is a rare migrant and wintering bird anywhere in New Jersey. On January 28, two screech owls were found as road kills near Port Elizabeth, attesting to the high numbers of this species along the river. On January 28, a long-eared owl was found dead (shot) at East Point, in the Heislerville Wildlife Management Area where both barn owl and northern harrier have been found shot in the past. Illegal shooting continues in the region. Finally, a long-eared owl is known to have been found injured (hit by a car) at the junction of Routes 47 and 55 on April 5, and taken to the Avian Rehabilitation Center in Marmota. The long-ear is an uncommon wintering bird in New Jersey, and the occurrence of at least two on the Maurice River during winter 1988-1989 is significant.

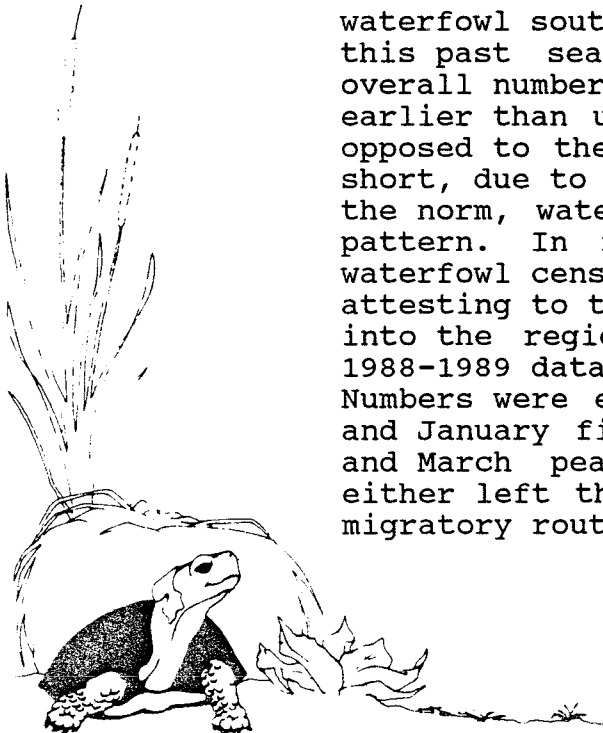


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Other significant sightings during the 1988-1989 study include numerous great blue herons ("threatened") with 15 seen on both December 18 and March 2. An American bittern was recorded on October 11, and a pied-billed grebe on November 7. At least three great cormorants wintered on the river - highly uncommon for Cumberland County, but reflecting this species' expanding range. A brown pelican was seen in Maurice River Cove on July 20, one of very few records ever for Cumberland County.

Additional Maurice River waterfowl survey data is shown in Attachment 2. Waterfowl sightings totaled 36,594 of 24 species. A bare minimum of 17,445 waterfowl have occurred on the Maurice River during the study period subsequent to our March 30, 1988 report. This figure is a minimum achieved by simply adding maxima for each species; this total would assume no turnover, when in fact considerable seasonal turnover is known to occur.

In general, waterfowl numbers were down on the Maurice in winter 1988-1989 as compared to 1987-1988. While it would seem easy to relate this to known continent wide waterfowl population decreases, the picture is much more complex. The 1988-1989 season saw vastly different weather conditions than the previous year. This past winter was characterized by a relatively very early cold spell and partial freeze-up (beginning in mid-December) conditions which apparently moved waterfowl south into our region much earlier in winter this past season than most years. Indeed, while overall numbers were down, populations peaked much earlier than usual in 1988-1989, in early January as opposed to the usual peak of February and March. In short, due to weather conditions highly different than the norm, waterfowl migration was of a far different pattern. In fact, New Jersey DEP's annual January waterfowl census showed record numbers in our state, attesting to the early freeze up and push of waterfowl into the region (fide Fred Ferrigno, NJDEP). HA's 1988-1989 data clearly reflect this fact as well. Numbers were excellent, and well above last December and January figures. However, the expected February and March peaks never came; birds had apparently either left the region by then or followed different migratory routes northward.

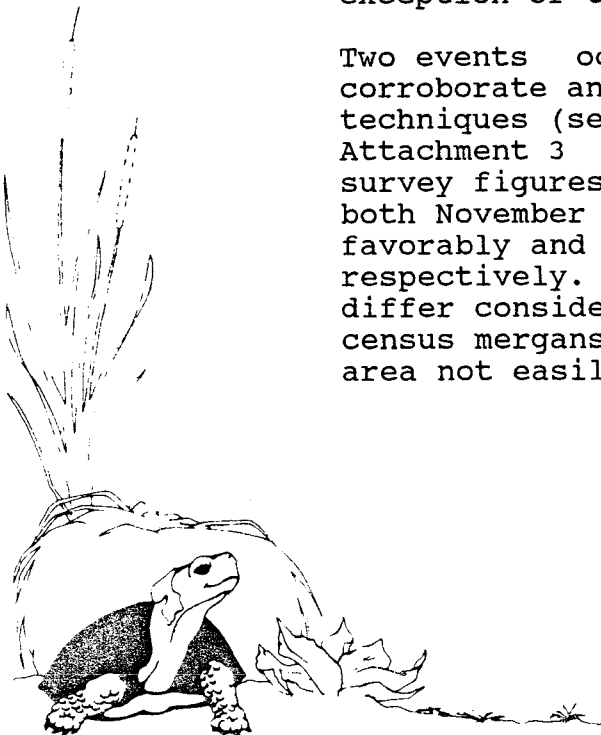


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Snow geese peaked on the non-survey date of January 25, when 8,000+ were estimated near Heislerville by HA associate, Bob Barber, a high number for the past two seasons. A total of 2,000 were seen on the non-survey date of December 13. Numbers varied considerably due to the itinerant nature of snow geese as they traded up and down the Delaware Bayshore largely as a response to hunting pressure. Black ducks peaked early (January 1, 1989) with only 4,470 birds, just over one-half of February 1988's 8,120. Mallards peaked at 2,766, a figure statistically similar to last season's 3,250. Pintail showed the most dramatic population decrease, with a peak of only 547 birds (January 1) compared to last year's 3,170 (March 15). The well known and expected March concentrations of pintail simply never materialized on the Maurice River in 1989, perhaps dramatically illustrating this prairie pothole duck's known nation-wide draught related plight. It will be important to monitor Maurice River pintail numbers in future seasons.

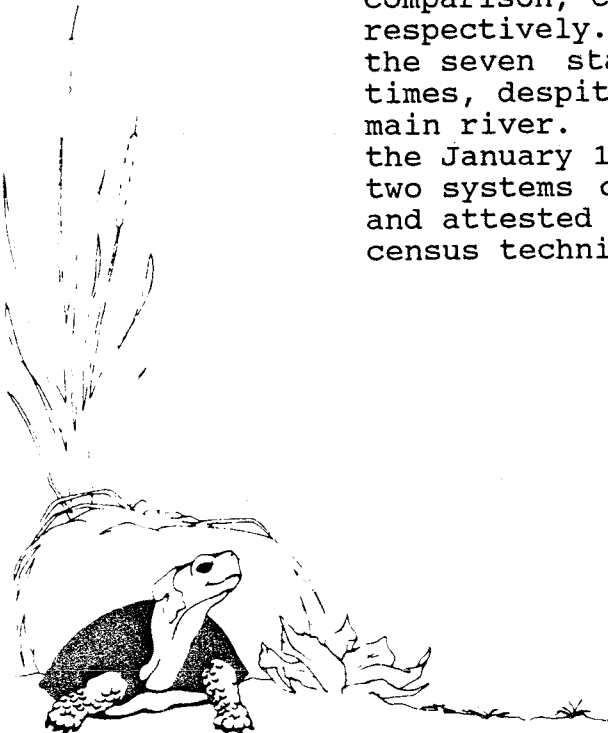
The 75 common mergansers seen on January 14 is a good total for southern New Jersey, and perhaps was associated with known high numbers in Union Lake. A large raft of scaup was in Maurice River cove most of the winter, with about 700 birds present. The 51 canvasback seen on March 16 was unexpected and excellent for the Delaware Bayshore - and a significant number for anywhere in New Jersey with the exception of the North Shore (Monmouth County coast).

Two events occurred in this past season which corroborate and underscore the accuracy of HA's count techniques (see previous report for details). Attachment 3 compares HA's 1987-1988 ground based survey figures to NJDEP's aerial census figures for both November and January. The counts compare highly favorably and differ by less than 1% and 3% respectively. For both counts, only merganser numbers differ considerably; it is theorized that most aerial census mergansers were seen in Maurice River Cove, an area not easily surveyed (and only cursorily covered)



by HA's ground based census. While snow goose numbers differ substantially in the January comparison, it is important to remember the itinerant nature of snow goose flocks. If HA's estimated 5,000 in the region (February peak) is used for comparison instead of the January 24 number of 1,100, the two totals compare remarkably favorable. In summary, New Jersey Fish and Game aerial census figures have remarkably corroborated HA's ground based population estimated for 1987-88.

In addition, HA "checked" our own figures in 1988-1989, using a second census technique to corroborate the usual count method (for both winters, the seven count stations were manned for 50 minutes each - see March 30, 1988 report; all data shown to date reflects this technique). In 1989, Jane and Peter Galetto discovered an exceptional downriver waterfowl flight occurring at dusk each evening. We can only speculate as to the reasons, or about the destination of this flight. It is assumed the ducks (principally black and mallards) are heading for the downriver marshes or Egg Island Point. At dusk, it appears that virtually all waterfowl on the upper river (north of the Maurice River bridge) and its tributaries fly downriver at high altitudes. On January 13 and 14, HA counted this downriver flight (which occurs in about a one-half hour span of time just before dark). Attachment 4 compares the "normal" census for the day (using the seven station count) to that achieved by counting the dusk downriver flight. For the two dates of comparison, count methods differ by only 7% and 3% respectively. While both are estimates, it appears the seven station technique may be conservative at times, despite geographically covering more of the main river. Of particular note is the similarity of the January 1 and January 13 dusk counts. In summary, two systems of checks and balances have corroborated and attested to the accuracy of the HA waterfowl census technique and totals.

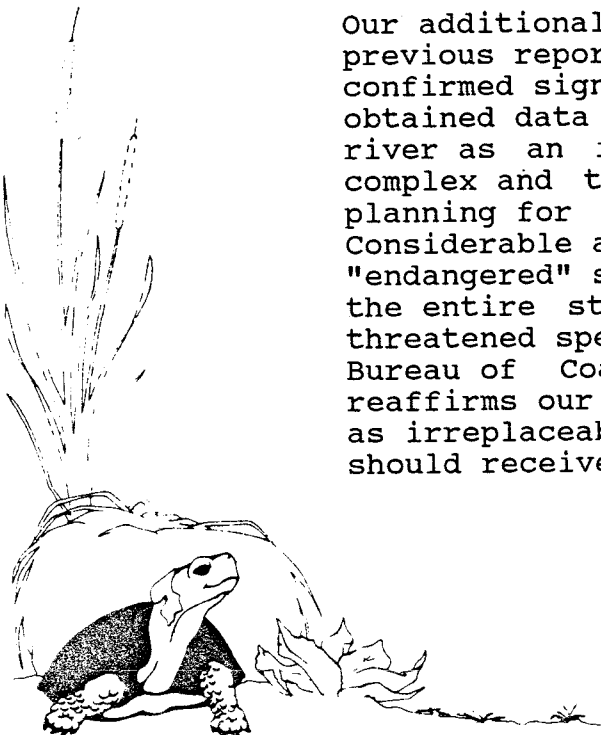


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The Maurice River continues to exist as one of New Jersey's top waterfowl use areas. Particularly, the numbers of snow geese, black ducks, mallards and pintails are significant both to the state and the Atlantic Flyway. While numbers were depressed in comparison to 1987-1988, this was largely weather related. Particularly, the Maurice River assumes an inestimable importance in light of known continent-wide waterfowl production decreases. Numbers of blacks, mallards and pintails continue to be among the most significant in the east, and the habitat must be protected due to this fact, particularly at such a crucial time in waterfowl population history. Because of exhibited waterfowl use, the wetlands and upland buffers of the Maurice River and its tributaries should receive top consideration for National Wildlife Refuge status. This should occur above and beyond current North American Waterfowl Management Plan attention being given to the Maurice by the U.S. Fish and Wildlife Service.

In summary, the Maurice River is critical bird habitat when compared to any other area on a statewide scale. The 1988-1989 survey by HA clearly shows that the Maurice River is a crucial part of the important Delaware Bay complex. It functionally serves as a major refuge for both waterfowl and raptors in the region, and is used by vast numbers of other migratory and breeding birds as well.

Our additional findings reinforce the results of HA's previous reports on the Maurice River. We have confirmed significant additional wildlife use and have obtained data to support both the consideration of the river as an integral part of the Delaware Bayshore complex and the need for the most careful regional planning for this unique wildlife resource. Considerable additional confirmed "threatened" and "endangered" species use strengthens the argument that the entire study area qualifies as "endangered and threatened species habitat" as defined by NJDEP, Bureau of Coastal Project Review (7:7E-3.36) and reaffirms our belief that the area should be regarded as irreplaceable critical wildlife habitat and as such should receive National Wildlife Refuge status.



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Our 1988-1989 field work confirms the conclusions and recommendations of our 1987-1988 studies and emphasizes the status of the entire Maurice River system as one of the most critically important wildlife habitats remaining unprotected not only on the Delaware Bay, but in the entire state of New Jersey.

Thank you for the opportunity to work with Citizens United again. Please call should you have any questions or concerns regarding these 1988-1989 studies.

Sincerely,

HERPETOLOGICAL ASSOCIATES, INC.

Clay C. Sutton, Jr.

Clay C. Sutton, Jr.
Southern Regional Management

Attachments

cc: Donald Fauerbach, CU
Jane Morton Galetto, CU
R.T. Zappalorti, HA
James Dowdell, HA
Robert Barber, HA



ATTACHMENT 1

MAURICE RIVER RAPTOR SURVEY, 1988-1989

	4/13	5/7	5/26	7/20	8/23	9/22	10/10	10/11	11/7	12/1	12/16	12/18	1/13	1/14	3/2	3/16
Black Vulture	1								1	2					3	
Turkey Vulture	31	35	26	20	14	20	35	40	68	148	84	94	209	166	69	45
Osprey	11	11	8	12	9	7	3	4	1							
Bald Eagle	1	1	2			1	2	3	4	4	3	1	3	4	1	2
Northern Harrier	8	6	3			3	22	18	22	32	21	25	17	23	17	13
Sharp-shinned Hawk	2					40	5	14	8	8		1	2	1		1
Cooper's Hawk	1	1	1	1	1	6			4	2	1	1	1			
Northern Goshawk										1						
Red-shouldered Hawk									1		1					
Broad-winged Hawk		1	3	1		2000										
Red-tailed Hawk	20	12	17	12	8	2	22	25	34	44	31	33	16	35	36	39
Rough-legged Hawk									1			2		1	1	2
Golden Eagle										1						
American Kestrel	1	1				16	2	5	2	2	4	3	1	3	3	4

ATTACHMENT 1 (Continued)

MAURICE RIVER RAPTOR SURVEY, 1988-1989

4/13 5/7 5/26 7/20 8/23 9/22 10/10 10/11 11/7 12/1 12/16 12/18 1/13 1/14 3/2 3/16

Merlin

1

5

Peregrine

1

2

1

1

NOTES: Full survey not completed on 9/22 - data shown is for 1-1/2 hours observation only at Bivalve by Robert Barber.

Additional non-survey date sightings:

- 3 black vultures seen on 1/25
- 4 bald eagles seen on 5/17; 3 bald eagles seen on 4/16
- 1 Cooper's hawk seen on 6/27
- 1 rough-legged hawk seen on 2/11
- 1 golden eagle seen on 11/27; 1 unidentified eagle seen on 12/1
- 1 peregrine seen on 2/10

ATTACHMENT 2

MAURICE RIVER WATERFOWL SURVEY, 1988-1989

	4/13	5/7	5/26	7/20	8/23	10/10	11/7	12/1	12/16	12/18	1/1	1/13	1/14	3/2	3/16
Tundra Swan											12				
Mute Swan	3	6	4			2	16	2	2	2	9	9	9	9	9
Snow Goose								60		200		1550	200	380	
Canada Goose			3			60	26	110		23	45	61			
Wood Duck						50	6			1					
Green-winged Teal	429	4				50	76		7				11	330	
Black Duck	517	151	64	60	20	110	533	1267	2621	1161	4470	3688	2734	1161	1640
Mallard	20	6	9			15	90	312	740	385	1585	1919	2660	302	176
Pintail							2	2	375	127	547	385	305	272	72
Blue-winged Teal	20	4													1
Gadwall		2	4											39	
American Widgeon													28	32	
Canvasback													6	51	
Ring-necked Duck													3	1	
Greater Scaup	18									12					
Lesser Scaup								3	1	1					
Scaup (Species)									2	690	14	630	6		

ATTACHMENT 2 (Continued)

MAURICE RIVER WATERFOWL SURVEY, 1988-1989

	4/13	5/7	5/26	7/20	8/23	10/10	11/7	12/1	12/16	12/18	1/1	1/13	1/14	3/2	3/16
Oldsquaw										3					
Black Scoter										1					
Com. Goldeneye							1	1		8		19	16	24	8
Bufflehead							90	48	21	18	2	34	154	21	86
Hooded Merganser							2	1		2		3	3		
Com. Merganser									2	16	3		74	7	3
Red-br. Merganser	10	14							11	8			20	13	10
Ruddy Duck						10									1
TOTALS	1017	187	84	60	20	297	842	1806	3782	2658	6652	6071	8216	2063	2839

NOTES: Full Survey not completed on 1/1; survey covered upper Maurice River only, from the Bluffs ("grain elevator site") to the Burcham Farm.

2,000 snow geese seen on 12/13

8,000 snow geese seen on 1/25

The 60 black ducks recorded on 7/20 included 3 broods of fledged young.

ATTACHMENT 3

COMPARATIVE COUNTS - AERIAL SURVEY VERSUS GROUND SURVEY

FISH & GAME		FISH & GAME		FISH & GAME		FISH & GAME		FISH & GAME	
NOV., 1987	(AERIAL)	NOV., 1987	HA (GROUND)	JAN., 1988	HA (GROUND)	JAN., 1988	HA (GROUND)	JAN 24, 1988	HA (GROUND)
Snow	-	Snow	250	Snow	6000	Snow	1100	Snow	(5,000)
Canada	-	Canada	200	Canada	-	Canada	150	Canada	
Mallard	500	Mallard	600	Mallard	1500	Mallard	1750	Mallard	
Black	1400	Black	1350	Black	4200	Black	5425	Black	
Pintail	-	Pintail	161	Pintail	-	Pintail	200	Pintail	
Gadwall	-	Gadwall	-	Gadwall	100	Gadwall	2	Gadwall	
GW Teal	400	GW Teal	50	GW Teal	-	GW Teal	-	GW Teal	
Merganser	300	Merganser	-	Merganser	1200	Merganser	33	Merganser	
Other	-	Other	5	Other	-	Other	25	Other	
	2,600		2,616		13,000		8,685		(12,500)*

NOTES: *Alternate total achieved using February estimate of 5,000 snow geese instead of 1,100 January 24, 1988 figure.

November data count methods differ by less than 1%.

January data count methods differ by only 3% (if the 5,000 geese figure is used).

ATTACHMENT 4

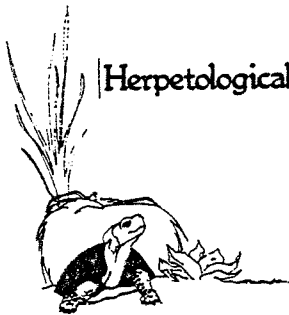
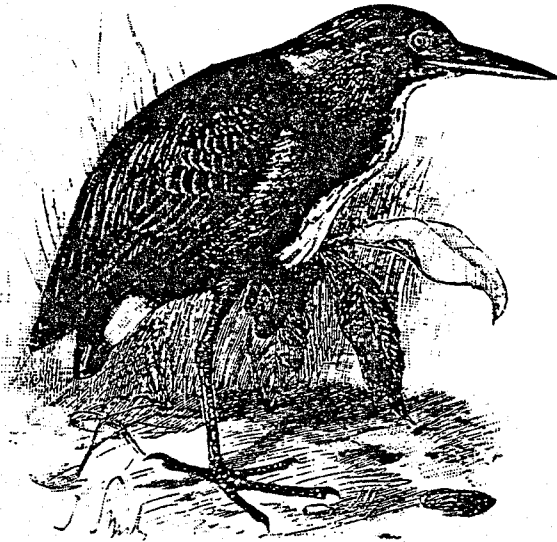
COMPARATIVE COUNTS; REGULAR (7 STOP, 50 MINUTES EACH) CENSUS TECHNIQUE VERSUS DUSK DOWNRIVER FLIGHT COUNT

<u>REGULAR CENSUS TECHNIQUE</u>			<u>DOWNRIVER DUSK FLIGHT COUNT</u>	
	<u>1/13</u>	<u>1/14</u>	<u>1/13</u>	<u>1/14</u>
Blacks	3688	2734	-	-
Mallards	1919	2660	-	-
Pintails	385	305	-	-
TOTAL	5992	5699	6478	5532

NOTE: Blacks, mallards and pintails not differentiated in downriver flight due to difficulty of identification of high-flying birds at dusk.

January 13 count methods differ by only 7%.

January 14 count methods differ by only 3%.



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