Herpetological Associates, Inc. - Environmental Consultants

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March 24, 1991

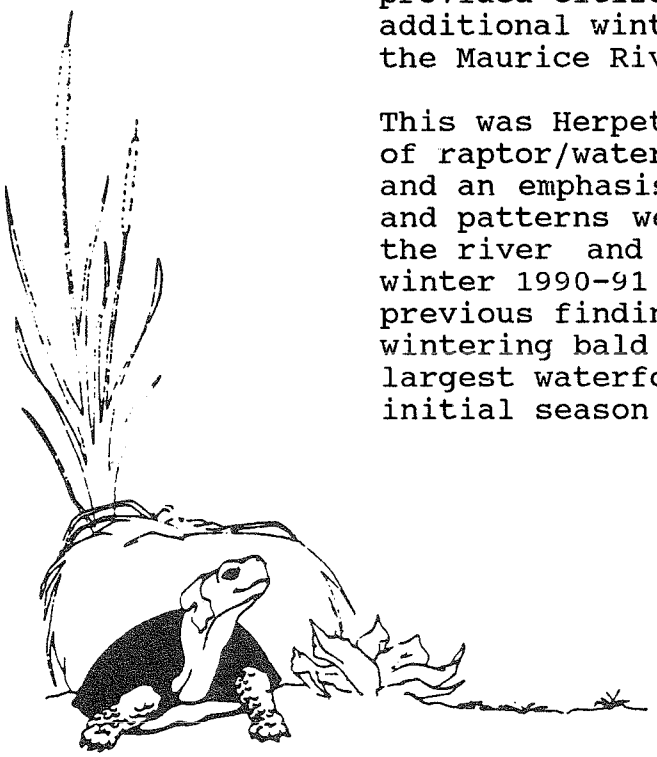
Mrs. Jane Morton Galetto
President
Citizens United to Protect the
Maurice River and Its Tributaries
P.O. Box 474
Millville, NJ 08332

Re: Ongoing Wildlife Survey of the Maurice River, Cumberland County, New Jersey. HA File No. 90.44.

Dear Mrs. Galetto:

In response to our agreement dated December 21, 1990, this letter-form report will serve as Part 1 of our two phase 1991 investigations on the Maurice River and Its Tributaries. As per our agreement, HA has provided Citizens United (CU) with the findings of an additional winter of raptor/waterfowl censusing along the Maurice River - data for the winter of 1990-91.

This was Herpetological Associates' (HA) fourth winter of raptor/waterfowl studies along the Maurice River, and an emphasis was placed on determining what trends and patterns were occurring regarding wildlife use of the river and its tributaries. The findings from winter 1990-91 not only confirm and corroborate previous findings, but also detail increasing wintering bald eagle use of the area, and document the largest waterfowl concentrations present since the initial season of study.



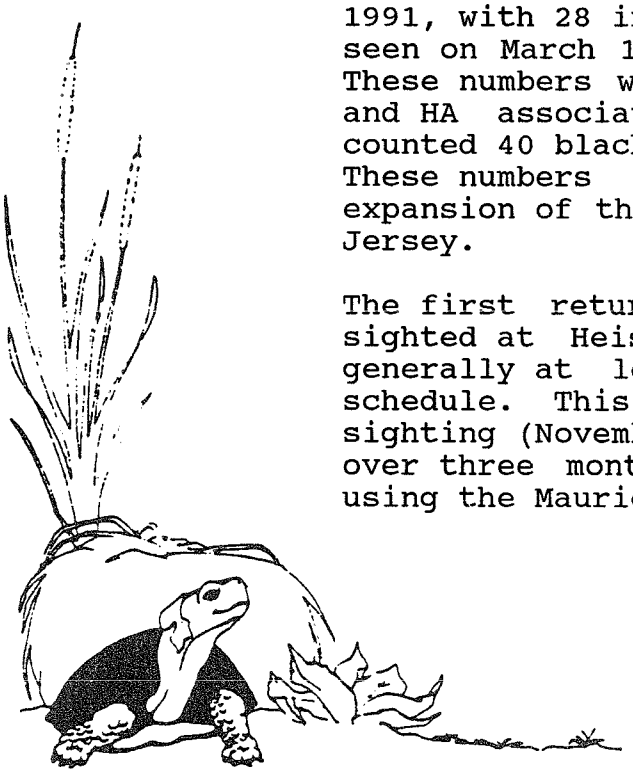
RAPTORS:

Seven full surveys were conducted during the winter season of 1990-91, and survey dates ranged from December 23, 1990 to March 16, 1991. Attachment One presents the findings of the raptor survey for this period. The study area for this ongoing Maurice River research is as outlined in our March 30, 1988 submission to CU, and is also detailed in a featured paper in "Records of New Jersey Birds", Vol. XIV, No. 3, Autumn, 1988. Methodological approaches remained the same as well, with 50 minute observation periods occurring at seven stations along the fourteen mile river study area. The results of this study, as shown in Attachment One, is summarized as follows.

A total of 966 raptor sightings, of 13 species, were accrued during the seven survey dates for the winter (138 raptors/day average) and it is clear that raptor use remained at significantly high levels comparable to the previous three study season.

While turkey vulture numbers remained about average, with a peak of 105+ at the Laurel Lake roost on February 12, 1991, black vulture numbers skyrocketed this past winter. In previous seasons, nine birds were the maximum seen on the river on a given day. In 1991, an amazing 35 birds were counted on February 28, 1991, with 28 in a single circling flock. Twenty were seen on March 16 as well, with 19 in a single group. These numbers were in fact bested by local biologist and HA associate, Robert Barber, who on March 2 counted 40 black vultures near the Laurel Lake roost. These numbers dramatically highlight the rapid expansion of this "southern" vulture species into New Jersey.

The first returning spring osprey (threatened) was sighted at Heislerville on March 9 an early date generally at least a week ahead of the expected schedule. This sighting coupled with the last fall sighting (November 19), testifies that there is little over three months in the year when osprey are not using the Maurice River.

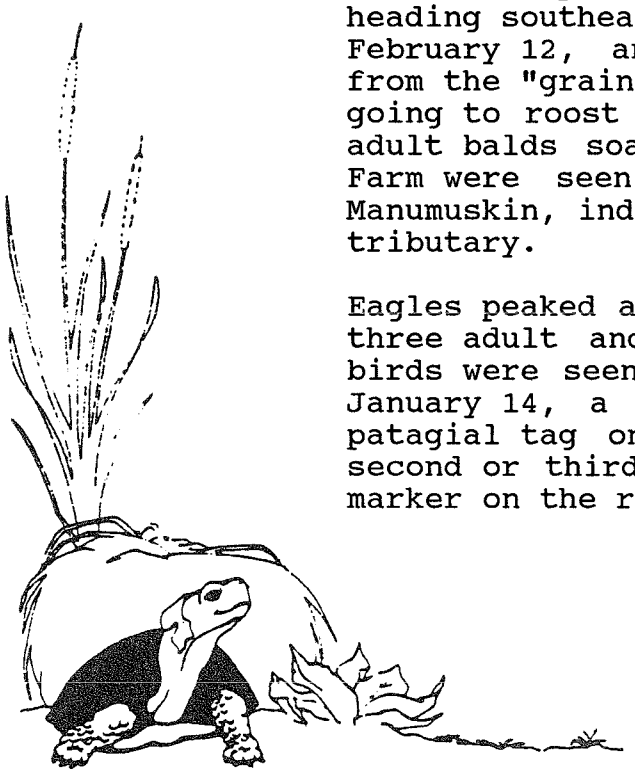


Bog Turtle, *Clemmys muhlenbergii*

A total of 38 bald eagle (endangered) sightings were accrued, for an average per river visit of 5.43. This is a substantial increase over the 5.08 birds/visited recorded in 1989-1990. (1988 - 1989 = 2.57; 1987-1988 = 2.71). This represents a clear trend of increasing bald eagle use of the river, reflecting a region-wide increase in sightings (although the Maurice River remains as the principle eagle-use area on the entire coastal plain of New Jersey). Of the 38 sightings, a minimum of 18 individual birds were believed present on the river at some point during the survey period. This compares to 20 individual balds in 1989-1990, 16 in 1988-1989 and 18 in 1987-1988. Two pairs of resident adult balds use the river daily; the Bear Swamp breeding birds consistently use the upper river, and the East Creek pair can be found feeding and perching near Leesburg/Heislerville on almost any given day in winter.

On February 28, an adult bald was seen feeding on carrion (a dead male red-breasted merganser) at Heislerville, and then flew east-southeast at 2:35 p.m. carrying a stick to be used as nesting material - probably at the East Creek nest. Regarding the local origins of the birds, two adult balds were spotted soaring together over the river at Heislerville on the afternoon of February 1 then split-up, one heading northwest, probably to Bear Swamp, and the other heading southeast - probably towards East Creek. On February 12, an immature eagle flew east-southeast from the "grain elevator" site at 5:15 p.m. - no doubt going to roost along the Menantico. On March 6, two adult balds soaring over the river south of Burcham Farm were seen to disappear heading east, up the Manumuskin, indicating probable roosting on that tributary.

Eagles peaked at 10 birds present on February 1, with three adult and seven immatures noted. Two marked birds were seen during the course of the survey. On January 14, a subadult bald was seen with a green patagial tag on the left wing. On February 16, a second or third year immature was seen with a yellow marker on the right wing. These were reported to the



Bog Turtle, *Clemmys muhlenbergii*

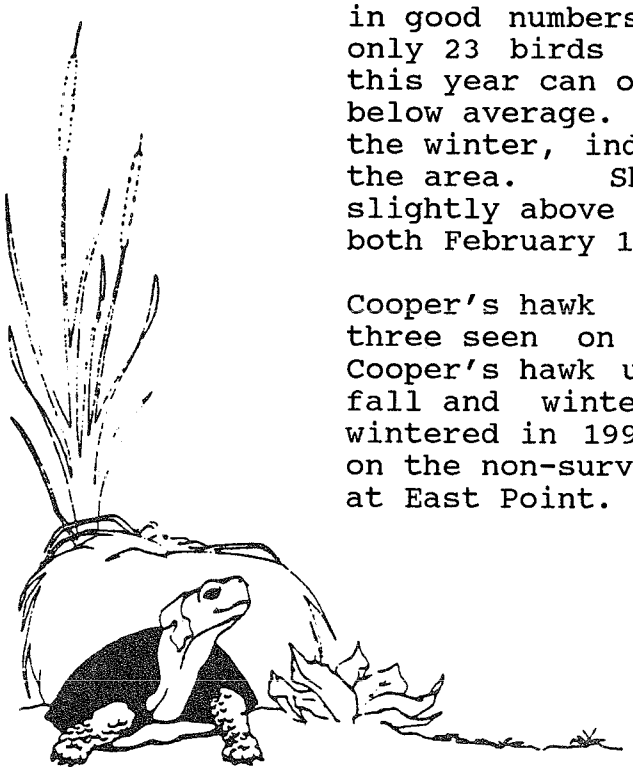
Division of Fish, Game and Wildlife, Nongame/ Endangered Species Project, the origin of these birds was learned. The green tagged bird had been marked in Pennsylvania, and the yellow tagged bird was from New York; dramatically underscoring the importance of the Maurice River to eagles throughout the eastern region.

Eagle distribution and use of the river continued to be impacted by boat traffic in 1990-91. On February 1, the New Jersey State Police Boat flushed three eagles north of the Burcham Farm. On February 28, a boat flushed an immature bald at the same location. On March 16, a fishing boat flushed three immature eagles perched north of Spring Garden at 11:00 a.m. One bird re-perched, but the others drifted away from the river. Finally, on January 13, dirt bikes and/or ATV's flushed three immature eagles perched on the Maurice River bluffs at the "grain elevator" site.

Despite a record fall migration and the fact that a golden eagle was seen on the lower river as late as November 20, no goldens were recorded on the winter survey this year. Also, for the first time in the four year study, no red-shouldered hawks were sighted along the river in 1990-91 despite their presence at East Point as late as November 26 in the fall.

Northern harriers (endangered) were naturally present in good numbers in 1990-91; although with a peak of only 23 birds on December 23, the winter population this year can only be described as average or slightly below average. As expected, numbers declined late in the winter, indicating dispersal or migration out of the area. Sharp-shinned hawks were average or slightly above average with five individuals seen on both February 1 and February 28.

Cooper's hawk (endangered) numbers were good with three seen on both December 23 and February 12. Cooper's hawk use of the river occurs daily both in fall and winter. A minimum of six individuals wintered in 1990-91. Northern goshawk was seen only on the non-survey date of December 5, an immature bird at East Point.

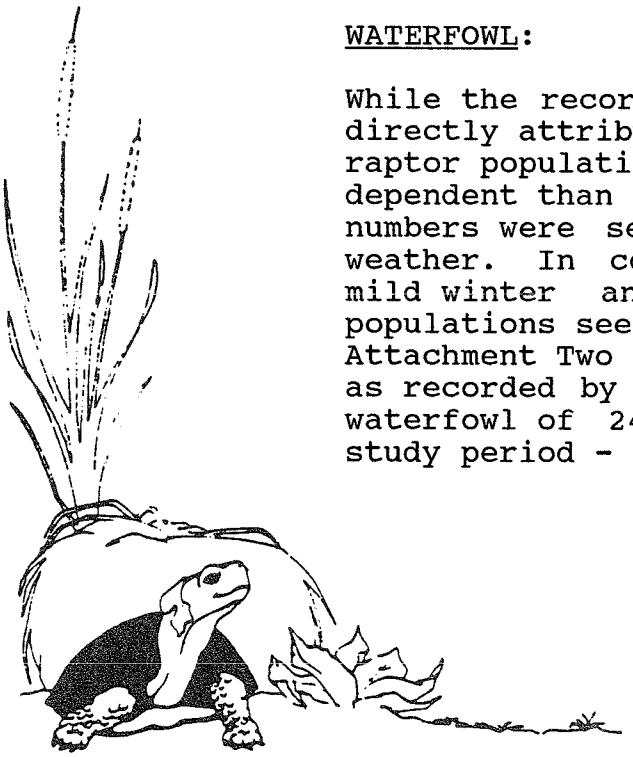


Bog Turtle, *Clemmys muhlenbergii*

Red-tailed hawks are a hallmark of the Maurice River, and due to the consistency of the counts, were seen in above average numbers in 1990-91. The peak of 53 birds on March 16, probably contained a few spring migrants, and just fell short of the all-time record of 59 seen on February 28, 1990. Rough-legged hawk sightings were consistent as well, with four birds recorded on February 1.

About six American kestrels wintered at various spots along the river, but the only merlin sighting was one seen on the non-survey date of January 1. A highlight of the survey was the adult female peregrine falcon (endangered) watched for over an hour on February 28 as it hunted green-winged teal near Spring Garden. Peregrines have wintered on and around the river for three of the four winters of this survey.

At least one short-eared owl (endangered) wintered on the lower river in 1990-91, and was often seen hunting north of East Point in late afternoon. Other significant bird records included two great cormorants which were present most of the winter. A lesser black-backed gull, uncommon anywhere in New Jersey, was found on the river on March 1. Great blue heron numbers peaked at 15 on December 23, but were generally down due to the mild weather of winter 1990-1991.



Bog Turtle, *Clemmys muhlenbergii*

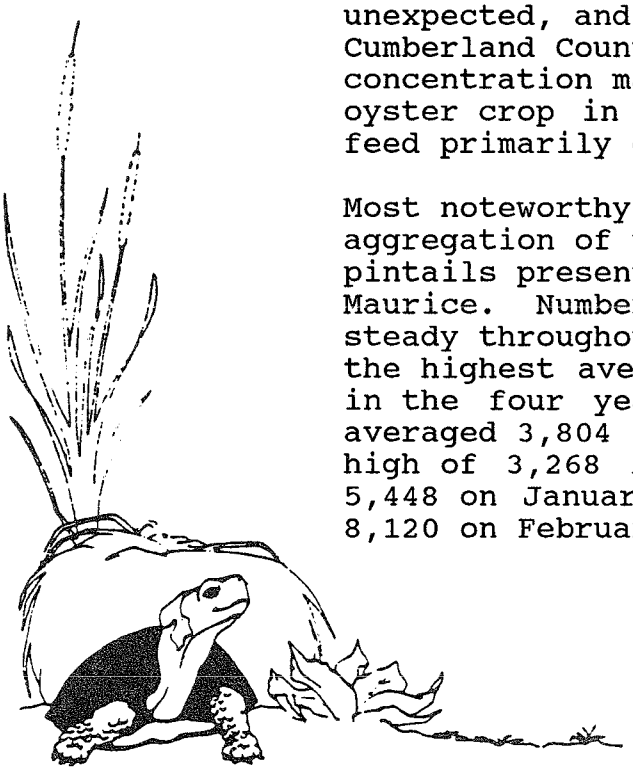
WATERFOWL:

While the record bald eagle numbers of 1989-1990 were directly attributed to the severe weather in December, raptor populations in general are far less weather dependent than of waterfowl. In 1989-1990, waterfowl numbers were severely down due to the harsh winter weather. In contrast, 1990-1991, was an extremely mild winter and allowed for the best waterfowl populations seen since the first winter of the study. Attachment Two shows waterfowl survey numbers by date as recorded by HA in 1990-1991. A minimum of 18,995 waterfowl of 24 species used the river during the study period - a figure achieved by simply adding the

highest counts for each species together. (This method is highly conservative, as it does not allow for any seasonal turnover of birds. While species specific turnover rates are unknown, it is safe to say that far more birds used the Maurice River marshes than mere peak numbers imply). This total of 18,995 compares very favorably with the 27,102 of 1989-1990, 17,445 of 1988-1989, and the 22,244 of 1987-1988. This peak number is achieved in 1990-1991 with only 3,500 snow geese present, versus 14,000 in 1989-1990.

Green-winged teal peaked at 1,045 on March 9, 1991, a figure which would probably be higher if the survey continued through late March and April. A total of 140 wood ducks were recorded on the non-survey date of October 7 - birds which ultimately wintered far to the south of New Jersey; a female common goldeneye hooded merganser hybrid was present at Heislerville from February 12 through the end of the period. This, to HA's knowledge, is the first time a female of this pairing has been observed, and the bird will be described and the record published elsewhere. A major highlight of the 1990-91 season, and perhaps unprecedented for the upper Delaware Bay, was the huge flock of scoter present at East Point in late December. This flock, containing almost 3,000 birds of all three scoter species, was present in Maurice River Cover for some time. These numbers were unexpected, and unparalleled in the 41 years of the Cumberland County Christmas Bird Count. This concentration may have been related to the abundant oyster crop in the Delaware Bay in 1990, as scoters feed primarily on shellfish.

Most noteworthy in 1990-1991, was the large aggregation of the black ducks, mallards, and pintails present in the wild rice marshes of the Maurice. Numbers were remarkably consistent and steady throughout the season. In fact, allowing for the highest average per visit for blacks and mallards in the four year history of the study, black ducks averaged 3,804 birds/visit, compared to the previous high of 3,268 in 1987-1988 (although 1991's peak of 5,448 on January 13 was well below the 1988 peak of 8,120 on February 16). Mallards averaged 2,584/day,

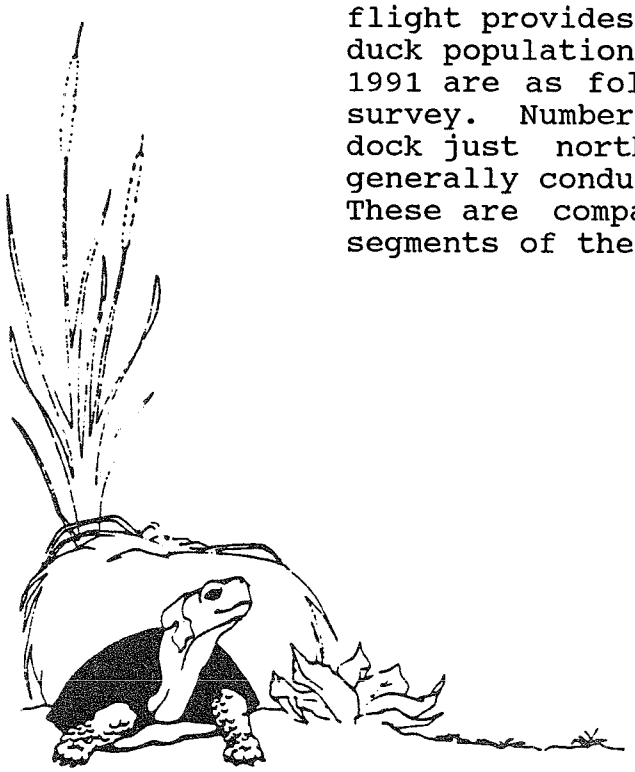


Bog Turtle, *Clemmys muhlenbergii*

well above 1987-1988's 1,518/day, and with the mallard peak of 3,758 on February 1, 1991, well above the previous peak of 3,250 on February 16, 1988. Pintails were present in the best numbers since 1987-1988. While the 1990-1991 season average (852) was below that of 1987-1988 (1,307), the population built nicely through the season. The peak of 1,503 (February 28) was the most in three years, yet remained below the river's potential as displayed by the 3,170 pintails recorded on March 15, 1988.

After two years of comparatively low waterfowl counts due to extreme weather conditions, it was good to study a "normal year" and see Maurice River waterfowl numbers return to those expected levels as recorded on the 1987-1988 census. Overall waterfowl numbers were lowered somewhat this past season by the relative absence of snow geese (with a peak of only 3,500). For unknown reasons, the Delaware Bay snow goose population was centered on the Cohansey River in 1990-1991, with over 15,000 present there for much of the winter. This is no doubt where many of the missing Maurice River birds were.

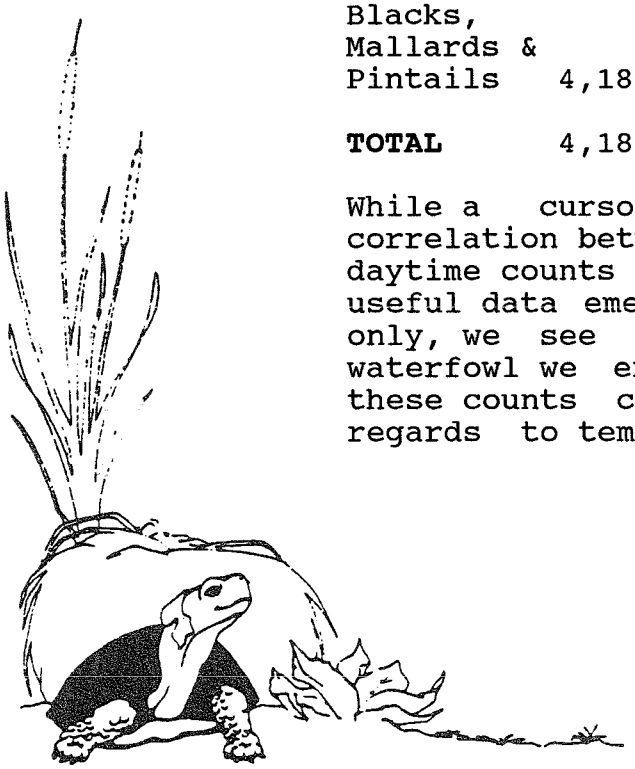
As per CU's request, the evening "downriver" duck flight was again monitored by HA in 1991. Both the purpose and destination of this nightly exodus of waterfowl remain unknown, but the monitoring of this flight provides an excellent handle on upper river duck populations. The downriver flight counts for 1991 are as follows, and are compared to the daytime survey. Numbers shown were counted from the Galetto dock just north of the Burcham dike (counts were generally conducted from 4:30 p.m. to 6:15 p.m.). These are compared to the daytime count for those segments of the river north of that site.



Bog Turtle, *Clemmys muhlenbergii*

	EVENING FLIGHT	DAYTIME COUNT
February 1, 1991:		
Blacks	1,155	1,778
Mallards	543	3,125
Pintails	267	520
TOTAL	1,965	5,423
February 12, 1991:		
Blacks	621	2,080
Mallards	1,862	1,805
Pintails	527	625
TOTAL	3,010	4,510
March 1, 1991:		February 28, 1991:
Blacks & Mallards	3,007	4,348
Pintails	1,003	1,100
TOTAL	4,010	5,448
March 10, 1991:		March 9, 1991:
Blacks, Mallards & Pintails	4,180	2,000
TOTAL	4,180	2,000

While a cursory review might indicate little correlation between the counted evening flight and daytime counts for the same river sections, some useful data emerges. By looking at downriver counts only, we see the steady, progressive build-up of waterfowl we expect as the season progresses, and these counts correlate with each other nicely in regards to temporal distribution. Pintail numbers



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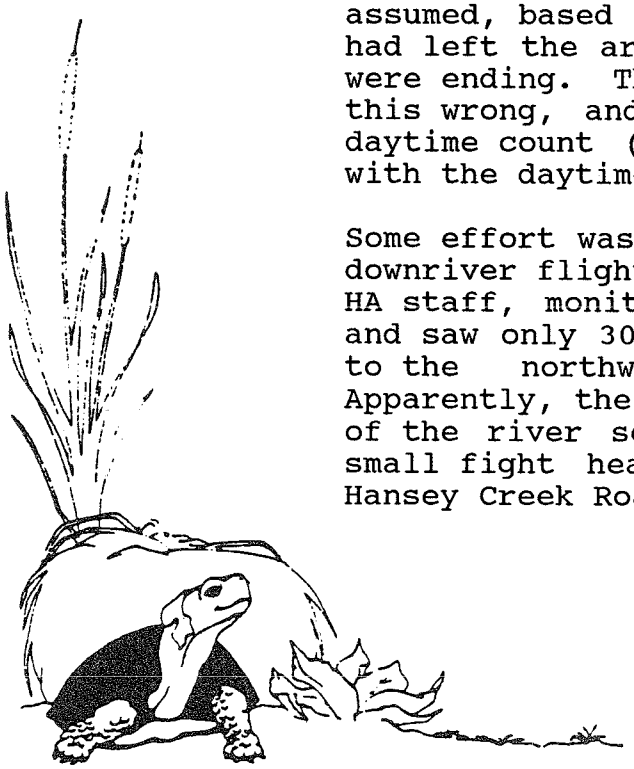
correlate well between the two count techniques; pintails are the most easily identified of the three species in flight at dusk (by the distinctive silhouette). Estimated ratios of blacks and mallards may be greater in error due to the difficulty of separating these two species at dusk at a distance. Therefore, totals are best compared rather than species estimates (excepting pintail).

Daytime counts average considerably higher for a number of reasons; the most basic of which is that some ducks move both before and after the evening count period. On February 12, mallard and pintail numbers correlate nicely, yet there is a vast discrepancy on black duck numbers. On that day, blacks were observed flying downriver in fair-sized groups virtually all day long and were simply gone before the evening flight count began. On other days, birds could still be heard going over at almost full dark (6:15 p.m.) when it was too late to count them. The discrepancy in the March 10 counts is easily explained. The daytime count was taken at low tide (the only count of the season not done at high tide), and many birds were missed because they were down in the tidal creeks out of site. In fact, this event best illustrates the value of the evening downriver counts: The March 10 downriver flight clearly proved that the March 9 count was erroneous. This observer assumed, based on the March 9 count, that many birds had left the area, and that the winter concentrations were ending. The March 10 evening flight count proved this wrong, and the subsequently scheduled March 16 daytime count (done at high tide) correlated nicely with the daytime count done on February 28.

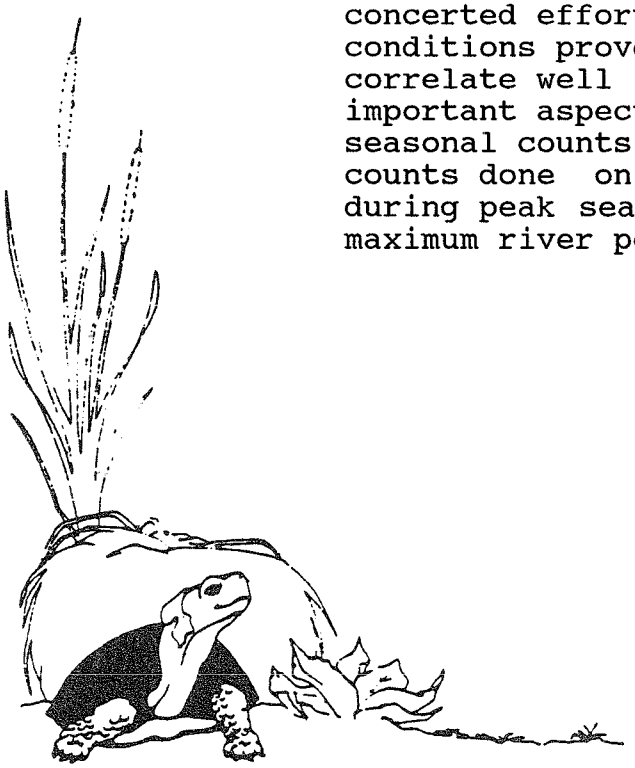
Some effort was made to locate the destination of the downriver flights. On February 28, James Dowdell of HA staff, monitored the flight at dusk, at Bivalve, and saw only 300 birds there, all at extreme distance to the northwest and all heading southwest. Apparently, the birds had not followed the full length of the river south. On February 21, Dowdell saw a small fight headed southwest (to his southeast) at Hansey Creek Road. Also, on January 14, we watched



Bog Turtle, *Clemmys muhlenbergii*

many ducks putting in well to the east of our observation point at the southwest of Fortescue, birds clearly coming from the north/northeast. We theorize that Egg Island Point, and specifically, the King Pond area is the destination of these waterfowl, yet this remains to be definitively proven, perhaps by radar studies. Birds are tough to see and count at dusk on the upper river, and they are arriving 13-15 miles away even later, perhaps often after dark, and radar studies may be the only way to ultimately resolve the mystery of the Maurice River evening downriver waterfowl flights.

Waterfowl and raptor counts were excellent in 1990-91, and confirmed the high populations of waterfowl previously documented in 1987-1988. Raptor and waterfowl counts were particularly remarkably consistent showing expected seasonal variation, but with each data set corroborating well with the others. In 1990-91, all counts except December 23, and March 9 were conducted on the high tide cycle allowing for ease of observation, and were conducted on northwest winds as well. Our previous three seasons of study have shown that both raptors and waterfowl are best counted on high tide, and that raptors are by far most active on a brisk northwest wind. The weekly fluctuations of previous years' counts have been largely the result of weather and tide, and a concerted effort in 1991 to survey only on maximum conditions proved that counts can be consistent and correlate well through the season. This is an important aspect to remember should any future seasonal counts be planned and undertaken. Just a few counts done on peak weather and tide conditions, during peak seasonal abundance, can quickly determine maximum river populations for a given winter.



Bog Turtle, *Clemmys muhlenbergii*

In summary, 1990-1991's additional findings reinforce the results of HA's previous studies of the Maurice River. We have confirmed significant additional wildlife use and considerable additional "threatened" and "endangered" species use. The entire study area qualifies as "endangered and threatened species habitat" and "critical wildlife habitat" as defined by NJDEP under 7:7E-3.36 and 7:7E-3.37. This study reaffirms our belief that the area should be regarded as unique and irreplaceable, and as such, should be considered for National Wildlife Refuge status.

The Maurice River is critical raptor and waterfowl habitat when compared to any other area on a statewide scale. This 1990-1991 survey by HA clearly shows that the Maurice River is not only a crucial link in the important Delaware Bay habitat complex, but also an integral raptor and waterfowl habitat at the center of regional population dynamics and distribution. It functionally serves as a major refuge for both waterfowl and raptors in the region, and remains the most critical unprotected (non-public land) waterfowl and raptor habitat on the entire Delaware Bay or in the entire state of New Jersey.

Thank you for the opportunity to again work with Citizens United on this important ongoing project. Should your group have any questions or concerns regarding our 1990-1991 survey, please contact me directly.

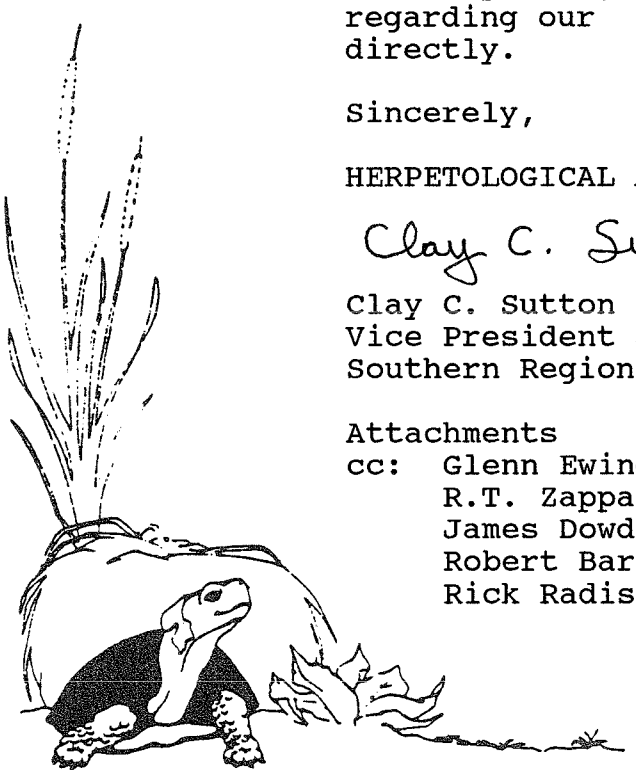
Sincerely,

HERPETOLOGICAL ASSOCIATES, INC.

Clay C. Sutton, Jr.

Clay C. Sutton
Vice President and
Southern Regional Manager

Attachments
cc: Glenn Ewing, Vice Pres., CU
R.T. Zappalorti, Pres., HA
James Dowdell, HA staff
Robert Barber, HA staff
Rick Radis, HA staff



Bog Turtle, *Clemmys muhlenbergii*

ATTACHMENT ONE: MAURICE RIVER RAPTOR TOTALS, WINTER 1990-1991

	12/30/90	1/13/91	2/01/91	2/12/91	2/28/91	3/09/91	3/16/91
Black Vulture				8	35	1	20
Turkey Vulture	30	64	31	105	78	42	75
Osprey						1	
Bald Eagle	5	7	10	5	2	3	6
Northern Harrier	23	21	16	14	17	15	12
Sharp-shinned Hawk	3		5	3	5	2	1
Cooper's Hawk	3	1	1	3		1	1
Red-tailed Hawk	19	35	46	31	44	33	53
Rough-legged Hawk	3	2	4	2	1	1	1
American Kestrel	4	4	1	1	3		2
Peregrine					1		
TOTALS	90	134	114	172	186	99	171

NOTES: Northern goshawk seen on non-survey date of December 5.
Merlin seen on non-survey date of January 1.
A total of 40 black vultures seen on non-survey date of March 2.

ATTACHMENT TWO: MAURICE RIVER WATERFOWL TOTALS
WINTER, 1990-1991

	12/30/90	1/13/91	2/01/91	2/12/91	2/28/91	3/09/91	3/16/91
Mute Swan	9	13	14	25	21	21	20
Snow Goose	222	1050	40	250	1705	2700	3500
Brant	2						
Canada Goose	37	33		27	16	18	12
Wood Duck					6		2
Green-winged Teal	4	40	55	192	452	1045	732
American Black Duck	2168	5448	4134	5332	4259	2518	2770
Mallard	2257	3714	3758	2318	2424	1180	2441
Northern Pintail	86	605	605	959	1503	818	1387
Blue-winged Teal		1					
Northern Shoveler				1			
Gadwall	4		13	13	14	40	14
American Wigeon	4	1		13	20	30	12
Canvasback	9			1	1		
Gr. Scaup	12		1	930	6	23	1

ATTACHMENT TWO - (CONTINUED)

	12/30/90	1/13/91	2/01/91	2/12/91	2/28/91	3/09/91	3/16/91
L. Scaup					1	2	12
Scaup (sp.)	46					400	
Scoter (sp.)	540						
Black Scoter	2			1			
Surf Scoter	2160			7			
White-winged Scoter	200				1		
Common Goldeneye	21	2	5	48	5	3	6
Bufflehead	7	34	9	24	53	60	45
Hooded Merganser		1		5	12	1	10
Common Merganser	1		4	1	5		
Red-breasted Merganser	14	15	14	28	12	7	5
TOTAL	7805	10957	8652	10175	10517	8866	10970

NOTE: A total of 140 wood ducks seen on non-survey date of October 7.
One "blue goose" was seen on February 28 and March 9.