

**RAPTORS AND WATERBIRDS  
ON THE GREAT EGG HARBOR RIVER**

**ATLANTIC COUNTY, NJ**

**WINTER, 2007 - 2008**

*The Fifth Field Season of a Systematic Study  
of an Important Avian Wintering Area*

*including Key Comparisons to the MULLICA RIVER*

*and an investigation of  
SPRING MIGRATION  
on the Great Egg Harbor River*

**Submitted to: The Great Egg Harbor Watershed Association**



**By Clay Sutton and James Dowdell  
July 30, 2008**

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***On the cover:***

Obviously not a raptor or waterbird, this **Orange-crowned Warbler** was none-the-less a very good find on January 16, 2008, at Jeffer's Landing. Wintering Orange-crowned Warblers are rare in New Jersey, and particularly so away from the Cape May Point vicinity.

(Photo by Clay Sutton)



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The water birds and raptors of the Great Egg Harbor River Watershed are one of the many “Outstandingly Remarkable Resource Values” that enabled designation of the river into the National Wild and Scenic Rivers System in 1992. This continuing study provides information on the status and trends of water birds and raptors in the river corridor to assure their long-term protection and promote the importance of wild places in the American landscape, and especially here in South Jersey.

The Great Egg Harbor Watershed Association (GEHWA) would like to recognize and thank the National Park Service, Conectiv Energy, RC Cape May Holdings, LLC, BL England Station, and the Estate of Lynn Ward for their financial support of this stewardship project. Successful public-private partnerships like this are fundamental to the protection of the resources of the Great Egg Harbor and Mullica Rivers.

Special thanks to Clay Sutton and Jim Dowdell, who continue to bring their wealth of bird knowledge and years of professional expertise to the Great Egg Harbor and Mullica Rivers.



*A New Generation of Energy*

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# RAPTORS AND WATERBIRDS ON THE GREAT EGG HARBOR RIVER

Winter and Spring, 2007-2008

## Background and Introduction:

Studies carried out on the Great Egg Harbor River during winter 2007-2008 and in spring 2008 marked the fifth field season of detailed surveys of the avifauna of the Great Egg Harbor River. These avian studies were again carried out under the auspices of the Great Egg Harbor Watershed Association.

Because an in-depth summary report of all five seasons of study is in preparation and will soon be forthcoming, this current report will only detail the specific findings of the fifth season of study. Minimal discussion will be offered in this year five report, deferring most analysis and discussion of status and trends to the upcoming larger report that will analyze and reflect on all five years of effort.

Also, because all four previous year's reports are available on line (on the website of the Great Egg Harbor Watershed Association – [www.gehwa.org/newsletter/](http://www.gehwa.org/newsletter/) ) no discussion of methodology or techniques will be offered in this short-form year five report. Visit the website for in-depth review of all methodologies and sampling locations, as well as all goals and objectives of this five-year project. The detailed findings and discussion of the first four years of study are also found in these archived reports. (Editor's Note: See Appendix 2, page 25, for methodology and observation site locations).

## Findings:

The results of the Great Egg Harbor River Winter Raptor and Waterbird Survey for winter 2007-2008 are shown in **Table 1**. Ten full surveys were carried out during the core winter period (November 30, 2007, through March 30, 2008). In addition, three spring surveys were carried out, on April 10, April 24, and on May 30. (The survey on May 30 was a partial survey, covering Gibson's Landing, Corbin City Impoundments, and the Tuckahoe WMA sites only). These spring surveys are also shown in Table 1, but are not included in the core winter season *average* shown in the table. Peak winter season daily high counts are shown in **boldface**, although in a number of cases, spring totals exceed the peak winter count.

**Appendix 1:** Field Mapping for Rare, Threatened, and Endangered Species, is included at the end of this summary report, and shows where all RTE species were sighted during survey efforts on the Great Egg Harbor River.

## Comparison to Previous Season's Findings:

An in-depth comparison of all five seasons of study will be included in the forthcoming Five-Year Summary Report. Most findings were well in-line with the previous four seasons of study, but due to the mild winter, winter populations of a number of species were down in winter 2007-2008. Even so, a number of waterfowl species posted surprisingly high totals.

Mallard set both a new peak high count and seasonal average in 2007-2008. Likewise Northern Pintail set new highs for both peak count and seasonal average. Green-winged Teal were present in exceptional numbers in winter and early spring. Both the 2007-2008 peak (2,510) and average (894) were close to three times higher than any counts achieved in the previous four years of study.

The peak count of 18 Bald Eagles on January 4, 2007, tied the previous peak of 18, but the winter seasonal average of 9.1 eagles per survey bested all previous seasons. For the first time in five seasons of study, no Golden Eagles were found on the Great Egg Harbor River during winter 2007-2008. At least one was present in the system in 2007-2008, seen on two occasions by veteran observer Paul Kosten, but it could never be located during any of our regular surveys (Golden Eagles are well known to range far and wide).

Red-tailed Hawks were slightly below average, possibly due to the mild fall and resultant low migration totals, but Northern Harrier tied their previous high count (47 on December 20, 2007), and posted their second highest seasonal average of the five years of study. It was an excellent year for Short-eared Owls, with a high count of 10 made on January 29, 2008.

### **Comparisons to the Mullica River:**

In depth comparisons between the Great Egg Harbor River and the Mullica River will be made in the upcoming five-year summary report, but once again the two rivers proved to be remarkably similar in many aspects – and both rich in wintering raptors and waterbirds.

The findings for winter 2007-2008 for the Mullica River are found in **Table 2**. Mullica raptor and waterfowl numbers proved to be similar to those found during the previous four seasons of comparative studies. The Mullica peak of 17 Bald Eagles and average of 9 is remarkable similar to the numbers recorded for the Great Egg Harbor River.

Black Vultures posted new peaks and seasonal highs on the Mullica River, and Turkey Vultures produced a new high seasonal average. Northern Harriers were particularly abundant on the Mullica River in winter 2007-2008; the new peak high (58 on December 14, 2007) and the average (45) easily bested previous records. An amazing peak count of 8 Peregrines was recorded on December 27, 2007. We are comfortable that this is a good count, with little or no “double counting” occurring. Indeed at least 4 pairs of Peregrines are known to breed in the Mullica River system and vicinity. As on the Great Egg, it was a good year for Short-eared Owls on the Mullica; an excellent 8 were recorded on December 27.

Exceptional counts of Bufflehead (806 on December 27, 2007) and Hooded Mergansers (649 on December 27, 2007) were achieved. 584 of these 649 Hooded Mergansers were on a single pond off Great Bay Boulevard, and are the second highest single-site maxima known for New Jersey (second only to the “1,000” recorded for Forsythe NWR on December 11, 1982 – and Forsythe ... aka Brigantine NWR ... is a far larger area).



**TABLE 1-1**  
**2007 – 2008 Great Egg Harbor River Raptor and Waterbird Survey**

<b>DATE</b>	11/30	12/20	1/4	1/16	1/29	2/15	2/24	3/7	3/17	3/31	WINTER AVG. 11/30-3/31	4/10	SPRING 4/24 5/30
<b>LOONS to CORMORANTS</b>													
Red-throated Loon	3			2	<b>22</b>	9	12	1	18	8		2	
Common Loon	9	13	4	17	25	4	17	5		42		46	26
Pied-billed Grebe	2								1				
Horned Grebe	5		1	6	<b>42</b>	6	9	7	17	42		12	
Northern Gannet	4								<b>500</b>	4			
Double-cr Cormorant	151	181	120	31	75	57	65	86	94	<b>189</b>		247	341 4
Great Cormorant								3					
<b>HERONS to VULTURES</b>													
Great Blue Heron	6	17	10	12	<b>27</b>	26	21	15	8	7		17	3 2
Great Egret				5		4	7	5		<b>28</b>		43	22 30
Snowy Egret										1		14	38 25
Tricolored Heron													1
Black-cr Nt-Heron													2
Yellow-cr Nt-Heron													4
Glossy Ibis													3 50
Black Vulture	8			2	1	<b>12</b>	9		2		3.78	6	1 2
Turkey Vulture	81	<b>106</b>	80	88	50	90	97	14	98	59	83	98	76 50
<b>WATERFOWL</b>													
Canada Goose	33	447	<b>562</b>	433	253	382	265	109	147	72	270	72	41 200
Brant	<b>4984</b>	4400	3600	1626	1925	1900	2399	1700	1072	1233	2484	712	1043
Mute Swan	83	69	75	<b>94</b>	28	82	80	51	84	46		38	49 125
Tundra Swan	11	13	4	14	19	<b>24</b>	<b>24</b>	19	3				
Wood Duck									1				
Gadwall		20		4	5	26	10	7	<b>32</b>	13		8	2

Winter Avg. is computed for 11/30/07 to 3/31/08 only; spring dates not included in Winter Avg. \* Raptor totals not factored into Winter Avg. due to rainy conditions. \*\* Partial Survey Only: Gibson's Landing/Tuckahoe WMA only.

**TABLE 1-2**  
**2007 – 2008 Great Egg Harbor River Raptor and Waterbird Survey**

DATE	WINTER										WINTER AVG. 11/30-3/31	SPRING		
	11/30	12/20	1/4	1/16	1/29	2/15	2/24	3/7 *	3/17	3/31		4/10	4/24	5/30 **
Eurasian Wigeon								1						
American Wigeon	14	42		14	4	32	18	<b>97</b>	<b>97</b>	26		3		
Am Black Duck	473	534	<b>882</b>	315	407	638	620	365	518	812	556	117	41	8
Mallard	64	87	119	109	94	<b>263</b>	177	96	90	48	115	26	16	16
Blue-winged Teal	4									8		10	2	
Northern Shoveler	3							6	37	1		2		
Northern Pintail	64	91	7	219	204	515	754	<b>783</b>	668	188	349	115	4	
Green-winged Teal	126	362		178	160	464	697	<b>2510</b>	2026	2413	894	1376	425	
Common Teal		1				1	1	1						
Canvasback										1				
Ring-necked Duck						1	2							
Greater Scaup	6	10	<b>60</b>			3		2						
Lesser Scaup					1	1								
Scaup (sp.)	50	600	750	602	320	600	550		<b>800</b>	393		190	3	
Surf Scoter	<b>14</b>	7		2	3		1					2		
Wh-winged Scoter	1													
Black Scoter	<b>3</b>	1											3	
Scoter (sp.)		4								50				
Long-tailed Duck	34	236	6	352	310	320	120	190	28	<b>484</b>		560		
Bufflehead	226	210	139	196	780	550	559	242	221	<b>1088</b>	421	577	1	
Com. Goldeneye	2			2	46	<b>48</b>	6	27		8				
Hooded Merganser	28	118	6	<b>138</b>	92	<b>138</b>	124	101	3	22				
Com. Merganser			7	17	61	83	<b>141</b>	59	8	5		6		
Red-br Merganser		30	20	69	104	82	123	99	110	<b>140</b>	78	193	3	
Ruddy Duck										6				

Winter Avg. is computed for 11/30/07 to 3/31/08 only; spring dates not included in Winter Avg. \* Raptor totals not factored into Winter Avg. due to rainy conditions. \*\* Partial Survey Only: Gibson's Landing/Tuckahoe WMA only.



**TABLE 1-3**  
**2007 – 2008 Great Egg Harbor River Raptor and Waterbird Survey**

DATE	WINTER										WINTER AVG. 11/30-3/31	SPRING		
	11/30	12/20	1/4	1/16	1/29	2/15	2/24	3/7 *	3/17	3/31		4/10	4/24	5/30 **
<b>DIURNAL RAPTORS</b>														
Osprey	3			1					5	39		42	27	14
Bald Eagle	3	1	18	9	10	8	10	2	11	13	9.1	22	5	3
Northern Harrier	34	47	35	35	36	32	32	8	26	33	34	35	10	3
Sharp-sh Hawk	6	1	2	2	1	3	1	1			1.78		1	
Cooper's Hawk	4				2	1	1	2	1	3	1.3	1	2	1
Red-sh Hawk	2	1									0.33			
Red-tailed Hawk	43	37	41	42	31	41	49	4	39	20	38	25	11	4
Rough-leg. Hawk	3		1	4	4	2	2	1			1.78			
American Kestrel													1	
Merlin													1	
Peregrine Falcon	4	2		2	4	1	1	1		2	1.89	2		
<b>GROUSE to SHOREBIRDS</b>														
Ring-nk Pheasant	1		2	1										
Wild Turkey												15		
Clapper Rail												1	3	10
American Coot									6					
Black-bellied Plover	10		1		4	4	1	1		8				1
Semipalmated Plover														30
Killdeer				14						2		3	2	1
Am Oystercatcher	67	44	46	17	10	8	12	8	14	24		13	2	
Greater Yellowlegs	24	3	4	1	1	3	12	32	24	89		31	51	1
Lesser Yellowlegs										8		2		1
Willet													34	18
Spotted Sandpiper														1

Winter Avg. is computed for 11/30/07 to 3/31/08 only; spring dates not included in Winter Avg. \* Raptor totals not factored into Winter Avg. due to rainy conditions. \*\* Partial Survey Only: Gibson's Landing/Tuckahoe WMA only.

**TABLE 1-4**  
**2007 – 2008 Great Egg Harbor River Raptor and Waterbird Survey**

DATE	WINTER										WINTER AVG. 11/30-3/31	SPRING		
	11/30	12/20	1/4	1/16	1/29	2/15	2/24	3/7 *	3/17	3/31		4/10	4/24	5/30 **
Whimbrel													1	
Sanderling	25		26		90	25	4	75	10					
Semipalmated Sdp														1320
Western Sandpiper														1
Least Sandpiper													2	10
Pectoral Sandpiper										2				
Dunlin	565	200	132	40	99	35		1225	20	535			2	25
Sh-billed Dowitcher														2
Wilson's Snipe			1		1			1		2		1		
Unid. Shorebird (sp.)														
TOTAL SHOREBIRDS														1411
<b>GULLS to ALCIDS</b>														
Laughing Gull									2	25		500	✓	✓
Bonaparte's Gull													7	
Ring-billed Gull	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Herring Gull	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Gt Bl-backed Gull	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Forster's Tern												42	163	✓
<b>OWLS to KINGFISHERS</b>														
Great Horned Owl				1										
Short-eared Owl	3			6	10							1		
Belted Kingfisher	3	4	3	5	4	3			1	1		2		

Winter Avg. is computed for 11/30/07 to 3/31/08 only; spring dates not included in Winter Avg. \* Raptor totals not factored into Winter Avg. due to rainy conditions. \*\* Partial Survey Only: Gibson's Landing/Tuckahoe WMA only.

**TABLE 2-1**  
**2007 – 2008 Mullica River Raptor and Waterbird Survey**

									<b>WINTER</b>
<b>DATE</b>	12/14	12/27	1/8	1/23	2/2	2/16	2/28	3/10	<b>AVG.</b>
<b>LOONS to CORMORANTS</b>									
Red-throated Loon	10	9	1	<b>15</b>	14	8	2	<b>15</b>	
Common Loon	13	14	2	8	11	9	9	<b>26</b>	
Pied-billed Grebe	3	<b>6</b>		2		1	4	1	
Horned Grebe				1	12	2	5	<b>24</b>	
N. Gannet	<b>20</b>		2						
Double-cr Cormorant		2	1	1	2	1	4	<b>5</b>	
Great Cormorant	1				1				
<b>HERONS to VULTURES</b>									
Great Blue Heron	24	<b>38</b>	12	19	23	17	9	13	
Great Egret	3	<b>4</b>	2	1	1			2	
Black-cr Nt-Heron	1								
Black Vulture			<b>25</b>	8	12	3	7	4	7.38
Turkey Vulture	27	47	82	81	<b>116</b>	79	67	95	74.00
<b>WATERFOWL</b>									
Snow Goose	500	250			140	60		<b>1000</b>	244.00
Canada Goose	610	440	515	<b>665</b>	437	322	317	246	444.00
Brant	950	450	975	<b>3100</b>	965	460	1470	889	1157.00
Mute Swan	4	2		2	4	4	2	1	
Tundra Swan					1	2		6	
Wood Duck	1		3			2	11		
Gadwall	4	4							
American Wigeon						1			
Am Black Duck	273	422	573	295	<b>870</b>	499	490	405	478.00
Mallard	236	427	454	458	<b>547</b>	544	404	374	431.00
Northern Shoveler						10			
Northern Pintail		5		6		1			1.50
Green-winged Teal	1			1		2	1	8	1.60
Canvasback	1							32	
Redhead							20	5	
Ring-necked Duck	7	25	12		18	6	15	30	
Greater Scaup					2			10	
Lesser Scaup				4	1	5		10	
Scaup (sp.)		15		310	375			1265	
Surf Scoter	3							6	
White-winged Scoter		1							
Black Scoter								1	
Scoter (sp.)	5		25	10	6		3	35	

**Peak Counts** shown in **Bold Face**

**TABLE 2-2**  
**2007 – 2008 Mullica River Raptor and Waterbird Survey**

<b>DATE</b>	<b>12/14</b>	<b>12/27</b>	<b>1/8</b>	<b>1/23</b>	<b>2/2</b>	<b>2/16</b>	<b>2/28</b>	<b>3/10</b>	<b>WINTER AVG.</b>
Scoter (sp.)	5		25	10	6		3	35	
Long-tailed Duck	14	21	7	30	36	14	11	<b>61</b>	
Bufflehead	445	<b>806</b>	234	342	405	255	81	188	345.00
Com. Goldeneye	3	26	74	8	7	12		10	
Hooded Merganser	193	<b>649</b>	129	198	214	86	259	88	
Com. Merganser				6	23	1	16	5	
Red-br Merganser	12	58	41	94	129	63	48	<b>136</b>	73.00
Ruddy Duck	47	54	10						
<b>DIURNAL RAPTORS</b>									
Bald Eagle	5	<b>17</b>	8	14	9	7	6	6	9.00
Northern Harrier	<b>58</b>	48	56	45	44	37	29	45	45.00
Sharp-sh Hawk	2		3		<b>5</b>	2	1	3	2.00
Cooper's Hawk	2	<b>4</b>	2	3	3	1	1	2	2.25
Red-sh Hawk			1						0.13
Red-tailed Hawk	20	18	27	31	<b>40</b>	32	31	27	28.00
Rough-leg. Hawk	6	5	5	2	3	<b>7</b>		2	3.80
Golden Eagle				<b>2</b>	1				0.38
Merlin		<b>2</b>	1						0.38
Peregrine Falcon	3	<b>8</b>	4	4	5	3	3	1	3.88
<b>GROUSE to CRANES</b>									
American Coot		1						1	
<b>SHOREBIRDS</b>									
Killdeer			6	9	2		7		
Am. Oystercatcher			2					2	
Greater Yellowlegs	6		2	4	1	1		1	
Lesser Yellowlegs	5								
Red Knot					1				
Sanderling	30			100	60			25	
Purple Sandpiper		10							
Dunlin	1107	140	300	40	35	4	1	160	
Wilson's Snipe	5								
<b>GULLS to ALCIDS</b>									
Bonaparte's Gull		1							
Ring-billed Gull	√	√	√	√	√	√	√	√	
Herring Gull	√	√	√	√	√	√	√	√	
Gt Bl-backed Gull	√	√	√	√	√	√	√	√	
<b>PIGEONS to WOODPECKERS</b>									
Short-eared Owl	2	8		5		1		1	
Belted Kingfisher	7	1	5	6	2	6	1	1	

Peak Counts shown in **Bold Face**

## Spring Migration on the Great Egg Harbor River:

While the main focus of the raptor and waterbird studies was on wintering birds, once again several spring surveys were carried out in an effort to learn the full extent of waterfowl use and migratory staging. Three spring counts were conducted in 2008 and these are included in **Table 1**.

Some significant findings were made. Common Loons peaked at 46 on April 10, 2008, and considerable spring use of the system by herons and egrets was again documented. Green-winged Teal use of the Great Egg Harbor River extends well beyond the classic winter season, with staging teal present into May. Red-breasted Merganser numbers were higher on April 10 (193) than at any time in winter.

The biggest surprise of spring studies was the 22 Bald Eagles recorded on April 10. This bested the all-time winter peaks of 18 and is a solid count: 17 of the eagles (15 immatures, 2 adults) were in sight *at once* as we viewed from English Creek Landing early on April 10. Such a spring gathering is virtually unprecedented in New Jersey; most wintering eagles leave in late February or early to mid March.

We can only theorize that Bald Eagles have recovered so well regionally and along the East Coast that previously unseen spring migration patterns are beginning to emerge. That is to say that when eagles were rare, there weren't enough of them that such a spring migratory "spike" could be discerned. Such a great eagle concentration was certainly a key highlight of the 2007-2008 study. Indeed probably more than 22 eagles (15 immatures, 7 adults) were present, but after counting the 15 immatures in sight at once, we conservatively did not count *any* of the additional immatures we encountered throughout the rest of the survey route.

Spring studies also again confirmed that Northern Harriers (endangered) still breed in the Great Egg Harbor River wetlands. On April 24, a harrier was watched "sky dancing" (the aerial courtship display) from the observation tower at the Corbin City impoundments (which are part of Tuckahoe WMA).

Cooper's Hawks (threatened) were confirmed as breeders as well. On May 8, a Cooper's Hawk was seen in its aerial courtship flight over Linwood near Patcong Creek. On March 31, two Cooper's Hawks were seen in a courtship flight near the "bulkhead" on Route 559 in Mays Landing.

At least 4 pairs of breeding Bald Eagles were present in the system in 2007-2008 (Great Cedar Swamp, Tuckahoe River, Lake Lenape, and Gibson's Landing), and a pair of adults continues to be seen frequently in the Patcong Creek area. At least one young eagle fledged from the Gibson's Landing area nest in spring 2008; an adult was watched feeding a juvenile perched about 100 yards from the nest on May 31. For a complete report on nesting Bald Eagles in the region, go to the New Jersey Endangered and Nongame Species Program's website:

[http://www.njfishandwildlife.com/ensp/raptor\\_info.htm](http://www.njfishandwildlife.com/ensp/raptor_info.htm)

Spring surveys again showed that the Great Egg is exceptional for birds beyond the winter season. Once again considerable shorebird use was documented in spring. On May 30, 2008, a total of 1,411 shorebirds were counted at the Corbin City and Tuckahoe WMA impoundments alone, hinting at a far greater use of the entire tidal Great Egg River system by shorebirds in spring.

## Highlights and Other Sightings of Note:

As expected, the Great Egg Harbor River surveys produced many exceptional sightings beyond the raptors and waterfowl recorded. A Snow Bunting was seen on the Tuckahoe WMA wildlife drive on November 30, always a good find away from barrier island beaches. A male Red Crossbill was seen at Steelman Landing on January 4. Also on January 4, tens of thousands of American Robins were seen everywhere. This late, weather-related southbound migration was witnessed all day, as birds (pushed by cold temperatures) moved into and out of the region.

An Orange-crowned Warbler was a good find at Jeffers Landing on January 16 (and is shown on the cover of this report), and a Sedge Wren found near Gibson's Landing on April 10 was either a wintering bird or early spring migrant. Uncommon birds such as these are more than just an exciting or fun find for birders; they are an indicator of the birding potential and associated ecotourism value of Great Egg Harbor River natural areas.

Brian Johnson found a wintering Long-eared Owl near Wharf Road on January 12, 2008. Also on that day, which was the day of the annual Endangered and Nongame Species Program's mid-winter eagle census, various observers reported 12 Bald Eagles at the Lake Lenape roost, as well as a total of at least 12 adult Bald Eagles in the Great Egg Harbor River system (fide Paul Kosten), a total arrived at through multiple observers and concurrent sightings.

Common Teal (the Eurasian race of the Green-winged Teal) were again found on the Great Egg during winter, 2007-2008. Four sightings throughout the survey may have involved two individuals. A major highlight of the season was the drake Eurasian Wigeon found at the Corbin City area of the Tuckahoe WMA on March 7, the first seen in the five seasons of study.

Of great interest, a Hermit Thrush was found within the region during the breeding season of 2007. Dowdell and Sutton found a "singing male" Hermit Thrush on several occasions in summer 2007 on the upper South Branch of Absecon Creek. While not technically in the Great Egg watershed, the bird was very close to the headwaters of Gravelly Run. While successful breeding was not confirmed, this "probable breeding record" is a first for Atlantic County. Away from the Kittatinny and Highlands, Hermit Thrush is a patchy and rare breeder in the core New Jersey Pine Barrens. They were found in only 8% of the 180 Pine Barrens blocks during the 1990s Breeding Bird Atlas Project carried out by New Jersey Audubon Society (*The Birds of New Jersey*, by New Jersey Audubon Society, 1999).

Beyond birds, a young Harbor Seal was seen in the lower bay on February 24, and two Harbor Seals were there on March 31.

The Mullica River also produced Harbor Seals, with 2 seen from the end of Great Bay Boulevard on February 16, and 4 recorded there on March 10. Also on March 10, a Harbor Porpoise was watched at length from this location. The Harbor Porpoise is a northern cold water species, and only rarely is recorded from shore in New Jersey.



## Discussion:

The fifth year of raptor and waterbird studies on the Great Egg Harbor River and the fourth year of comparative studies on the Mullica River were again successful in elucidating avian status, patterns, and concentrations on these major South Jersey rivers. Results clearly confirm and corroborate previous findings for both the Great Egg and Mullica Rivers. Both of these coastal rivers continue to support significant regional populations of raptors, waterfowl, and waterbirds in winter and during spring staging and migration.

Once again these studies were conducted during an extremely warm winter. Autumn 2007 was very warm, with October 10.7 degrees F. warmer than average. Warm falls impact the migration into the region of many raptor and waterfowl species. There is a clear link between fall migration and subsequent wintering populations, and while it varies greatly among species, in general very warm falls simply don't send as many birds south to our area.

The warm autumn was followed by a warm winter. December was 1.7 degrees F. above normal; February was 3.8 degrees above normal, and March 1-18 was 3.4 degrees above the normal average. Total snowfall of 10 inches was 2 inches below normal (although total precipitation was above normal, 17.42 inches compared to a normal average of 11.92 inches for December through March 19). (Source for all above weather data: The National Weather Service in Mount Holly, NJ; data presented is for Atlantic City International Airport.)

Only in January were some icy conditions encountered during surveys, when the impoundments and small creeks were largely blocked by ice. It is well known that colder winters send the most waterfowl and raptors to the region, and particularly concentrate them in open water areas. The winter of 2007-2008 was not such a year, and therefore it is somewhat surprising that Bald Eagle numbers were above average. A number of species of waterfowl posted good totals as well, including Green-winged Teal and Northern Pintail.

There were certainly some interesting examples of the warm winter's effects on birds. Probably for the first time ever, one or more Osprey successfully wintered on the Great Egg Harbor River. Three Osprey were counted at Tuckahoe WMA on November 30, 2007, lingering due to the warm fall and warm water, and at least one made it through the winter – seen on January 6 by Tom Reed, by our survey on January 16, and by others subsequently at various locations. Although not seen during our Mullica River surveys, an Osprey also successfully wintered adjacent to the Mullica River, at Forsythe NWR. Such events, no doubt related to climate change, are virtually unprecedented for these rivers.

Numerous Tree Swallows also wintered in the region – the most in the authors' experience and the first in the five years of study. Over 40 Tree Swallows were seen on the Great Egg Harbor River on January 16, and the Mullica River hosted 20 on December 27, 30 on January 8, and 40 on January 23. While Tree Swallows can survive without insects (by feeding on Bayberry and Waxmyrtle berries) they cannot survive the low temperatures of colder winters.

Because some avian-use patterns seem to be changing, five years indeed may not be enough time to determine what truly constitutes an "average" year for our South Jersey rivers. Five years of study on the Great Egg Harbor and Mullica Rivers have given us good insight into the wildlife phenology (the relation of climate to periodic wildlife phenomena), yet we lack data on what patterns might be expected during colder winters, and on how the 21<sup>st</sup> Century data might compare to the cold winters of the late 20<sup>th</sup> Century. Further analysis and discussion of status and trends will be offered in the upcoming five year summary report, including comparisons from season to season, as well as comparisons between the Great Egg Harbor River and estuary and the Mullica River and Great Bay estuary.

## **Summary and Acknowledgments:**

Winter 2007-2008 marked the fifth year of the planned five years of study of wintering raptors and waterfowl on the Great Egg Harbor River, as well as the fourth year of comparative surveys on the Mullica River.

Studies conducted for the Great Egg Harbor Watershed Association again documented an amazing array of avian use of these key South Jersey rivers. 2007-2008 efforts confirmed, corroborated, and bolstered the findings of the first four seasons of study, and documented and substantiated the Great Egg Harbor and Mullica Rivers as premier avian resource areas of not only New Jersey, but of the entire Mid-Atlantic Region.

Further analysis and discussion, as well as recommendations, will be offered in the upcoming five-year summary report. For now, suffice it to say that year five has substantially underpinned the findings of the previous four seasons, and continued to document the Great Egg and Mullica as important bird areas by any standard applied.

We thank the members, supporters, and friends of the Great Egg Harbor Watershed Association for allowing us to be a part of these significant discoveries on the Great Egg and Mullica Rivers. We particularly thank Fred Akers for his vision of what role these studies might mean for the protection of these valuable resources.

We thank Brian and Karen Johnson for shared sightings and insights, and thank Paul Kosten for his continuing input and keen interest in the birds of the Great Egg. We thank Michael O'Brien for his able assistance on the March 7 count.

Ms. Carole Brown, of Philadelphia, joined us on a number of surveys as part of her practicum on Environmental Monitoring, an elective project of her course work for her Master's Degree Program at Prescott College in Arizona. Carole contributed much and served as a full and able counter on several of the Great Egg and Mullica (and Maurice) River surveys. We thank her for her assistance, but more importantly for her enthusiasm and the vision of her upcoming thesis and degree.

We also heartily thank Conectiv Energy, RC Holdings, LLC, the Estate of Lynn Ward, and the U.S. Department of the Interior's National Park Service, Wild and Scenic Rivers Program, for their assistance to the Great Egg Harbor Watershed Association. The award of Wild and Scenic River Partnership Grants enabled these surveys to be carried out. Thank you for all of your important work in Southern New Jersey, and for your ongoing vision of a wild and scenic Great Egg Harbor River.

**Appendix I:**

**Rare, Threatened, and Endangered Species**

**Field Mapping**

**2006 – 2007**

**KEY:**

<b>BE</b>	<b>Bald Eagle</b>
<b>NH</b>	<b>Northern Harrier</b>
<b>CP</b>	<b>Cooper's Hawk (also: Coop.)</b>
<b>NG</b>	<b>Northern Goshawk</b>
<b>RS</b>	<b>Red-shouldered Hawk</b>
<b>GE</b>	<b>Golden Eagle</b>
<b>PF</b>	<b>Peregrine Falcon</b>
<b>SE</b>	<b>Short-eared Owl</b>
<b>AB</b>	<b>American Bittern</b>
<b>RH</b>	<b>Red-headed Woodpecker</b>
<b>OS</b>	<b>Osprey</b>
<b>a</b>	<b>Adult</b>
<b>i</b>	<b>Immature</b>



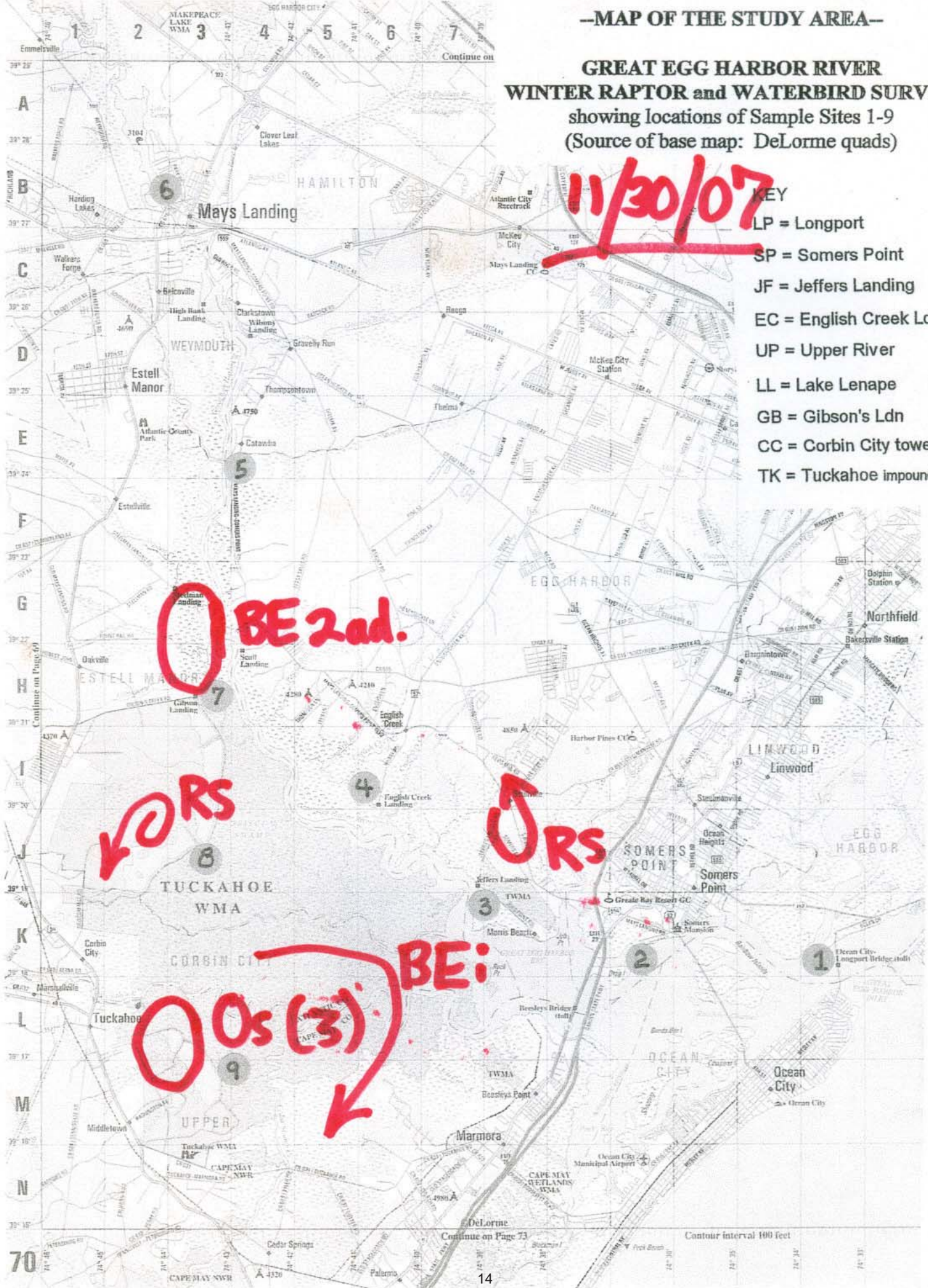
# —MAP OF THE STUDY AREA—

## **GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY** showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

11/30/07

### KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



Continue on Page 73

Contour interval 100 feet

11.5 x 12 = 13.8

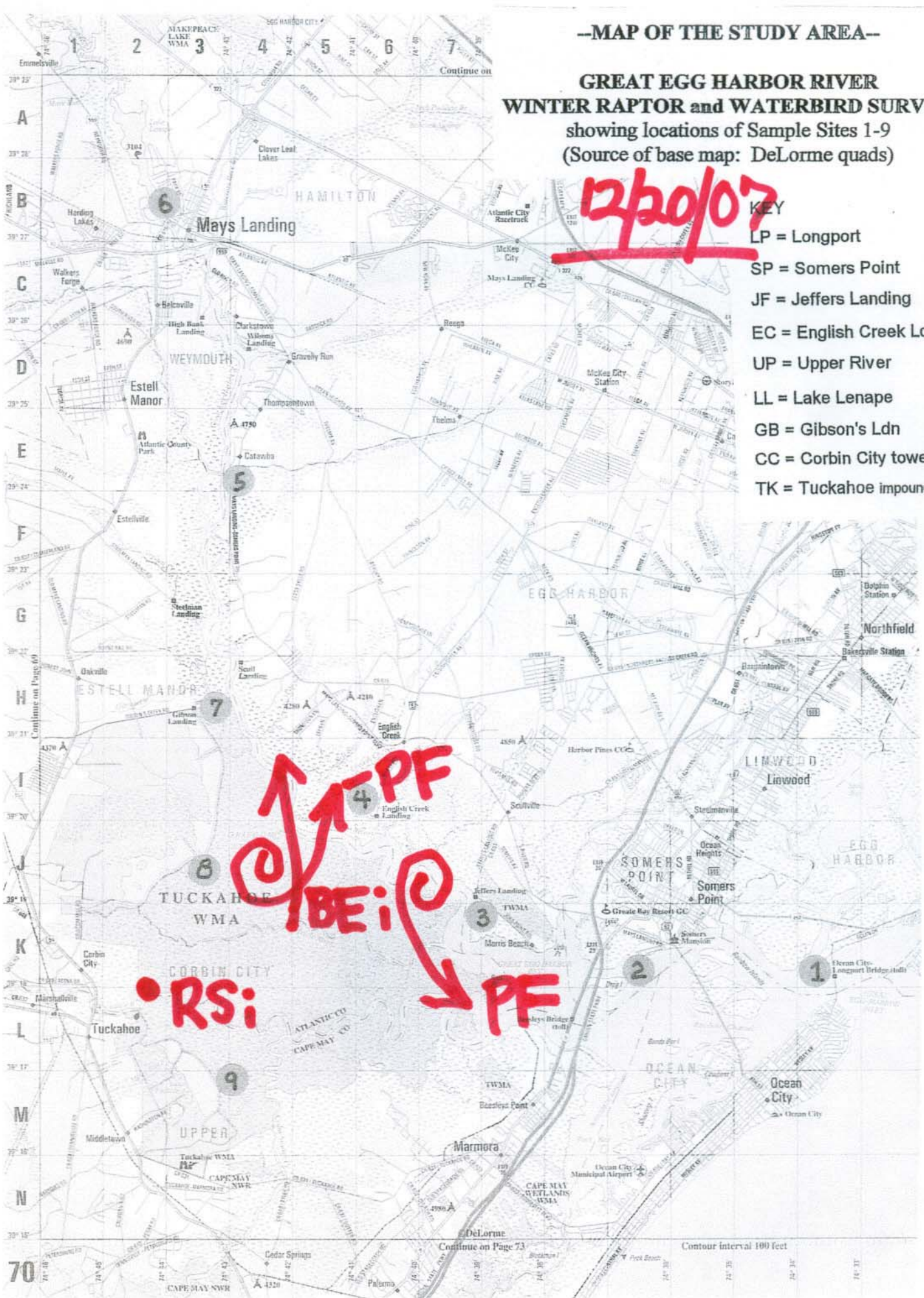


# MAP OF THE STUDY AREA

## GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

12/20/07

- KEY
- LP = Longport
  - SP = Somers Point
  - JF = Jeffers Landing
  - EC = English Creek Ldn
  - UP = Upper River
  - LL = Lake Lenape
  - GB = Gibson's Ldn
  - CC = Corbin City tower
  - TK = Tuckahoe impoundments



11.5 x 12 = 13.8



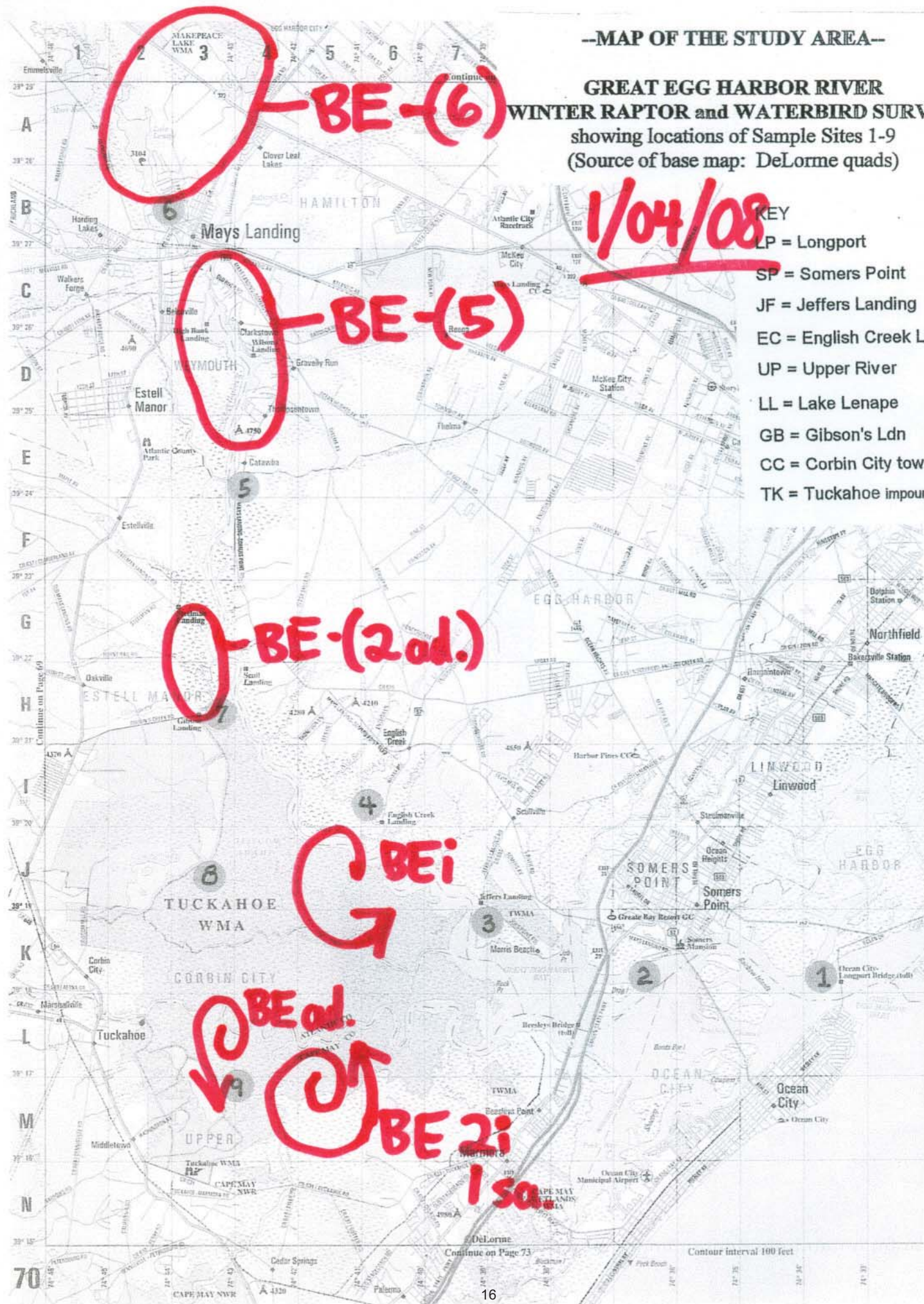
**-MAP OF THE STUDY AREA-**

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)

**1/04/08**

**KEY**

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
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- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



Continue on Page 73

Contour interval 100 feet

11.5 x 1.2 = 13.8



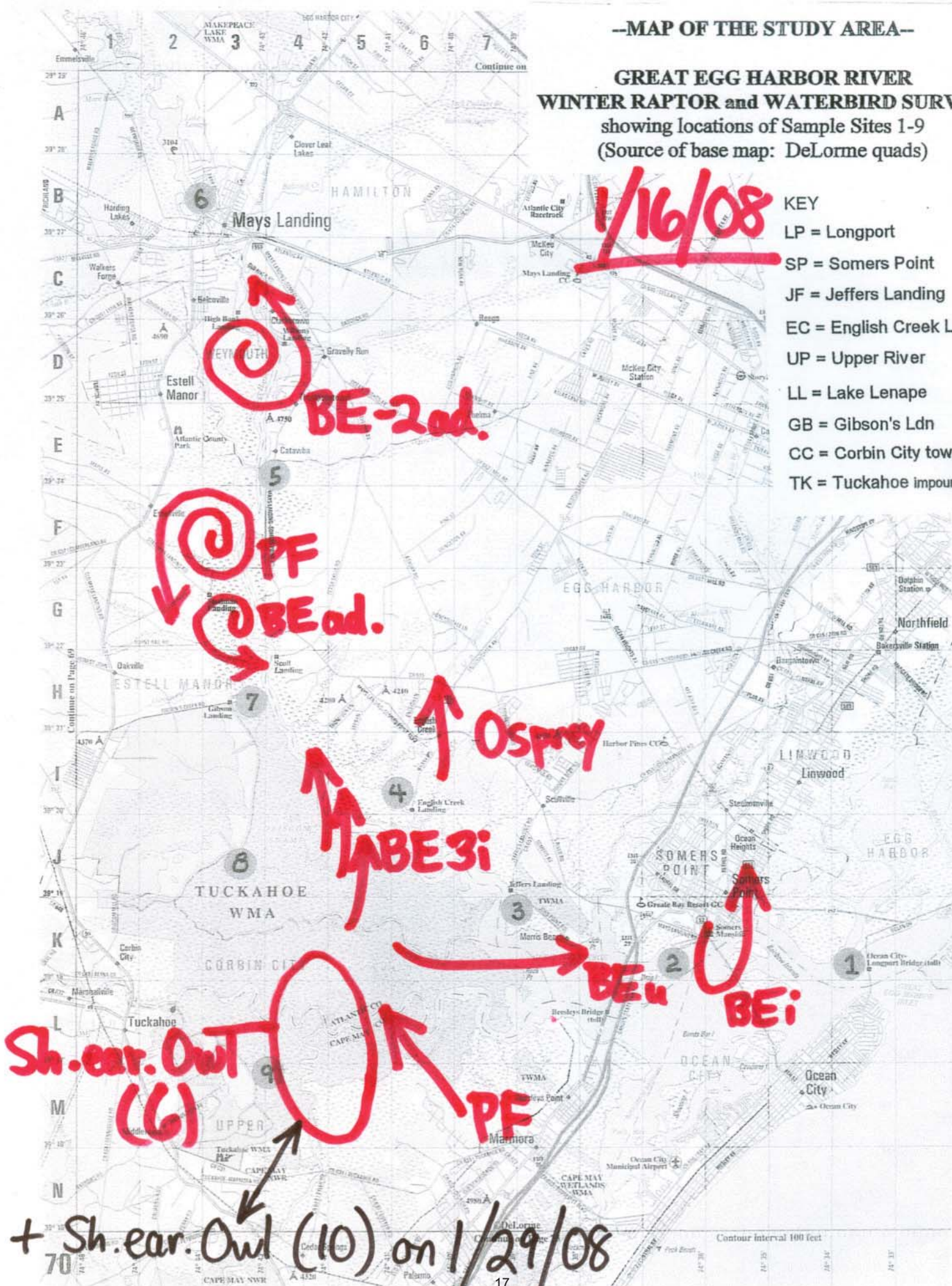
--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)

1/16/08

KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



$11.5 \times 1.2 = 13.8$



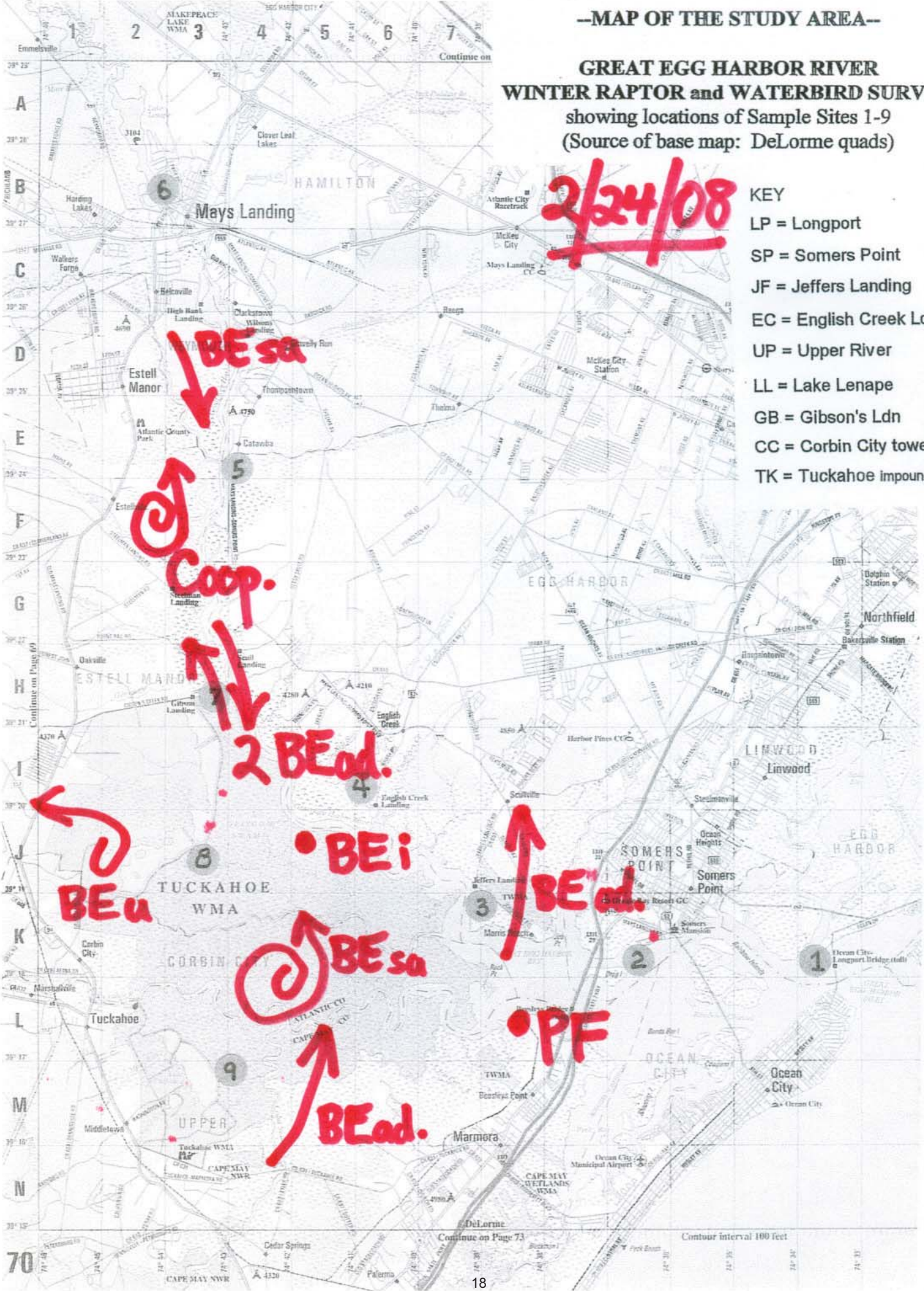
# —MAP OF THE STUDY AREA—

## **GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY** showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

2/24/08

### KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments





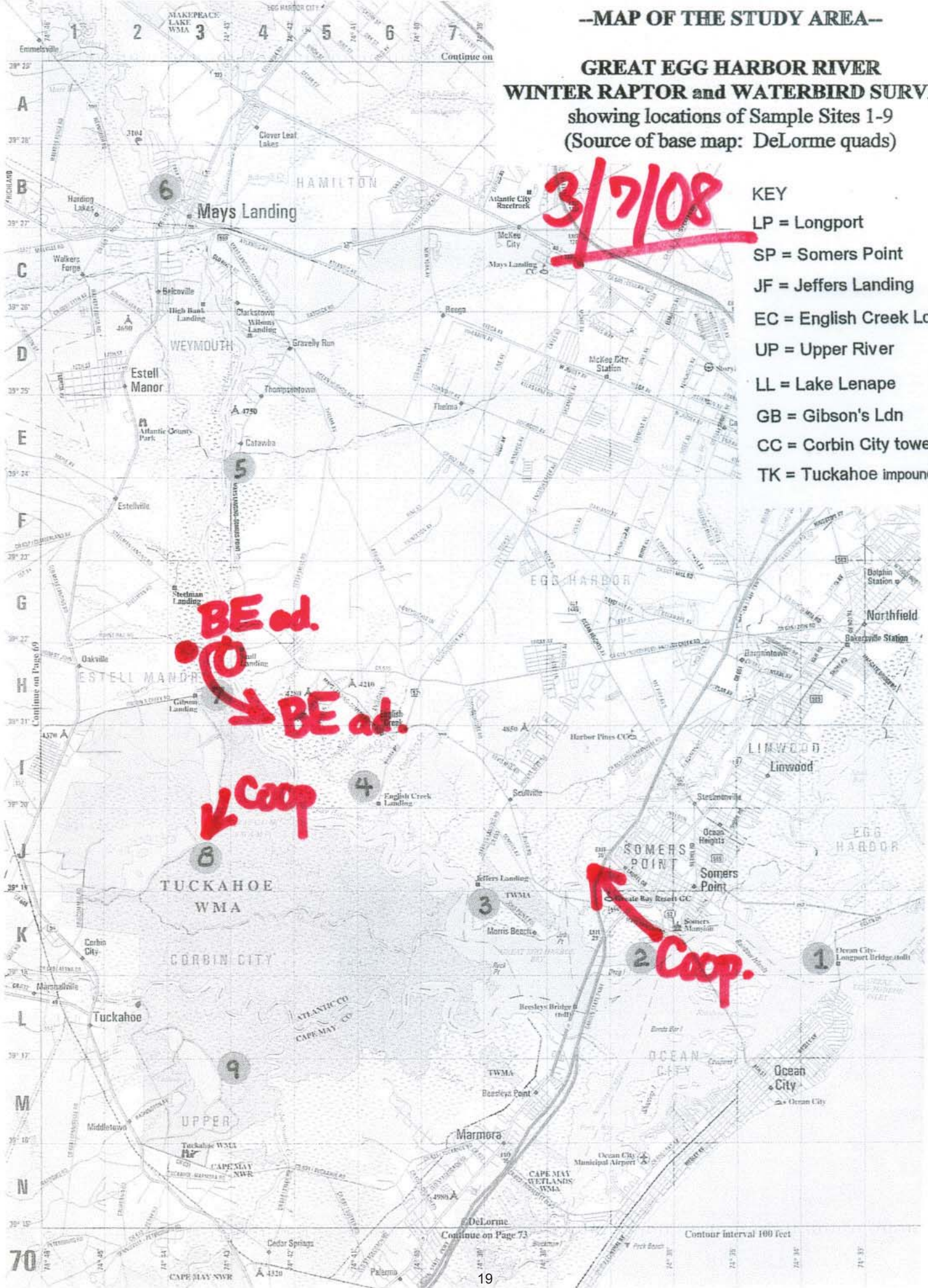
# -MAP OF THE STUDY AREA-

## **GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY** showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

**3/7/08**

### KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



11.5 x 12 = 13.8



3/17/08

LP = Longport  
SP = Somers Point  
JF = Jeffers Landing  
EC = English Creek Ldn  
UP = Upper River  
LL = Lake Lenape  
GB = Gibson's Ldn  
CC = Corbin City tower  
TK = Tuckahoe impoundments

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments



# --MAP OF THE STUDY AREA--

## GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

### KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
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- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments

**BEad.**

**3/31/08**

**Cooper's (2)  
in courtship flight**

**BEad.**

**Cooper's - calling**

**BEad.**

**BEad.**

**BE(3i)**

**BEi**

**BEad.**

**BEad.**

**PFad.**

**BEim.**

**PFim.**



# -MAP OF THE STUDY AREA-

## GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

4/10/08

KEY

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments

BE ad (nest)

Coop.

SE Owl. (mig.?)

(virtually all day long)  
(see notes)

@ PF ad.

PF ad.

Coop. display flight 5/8/08



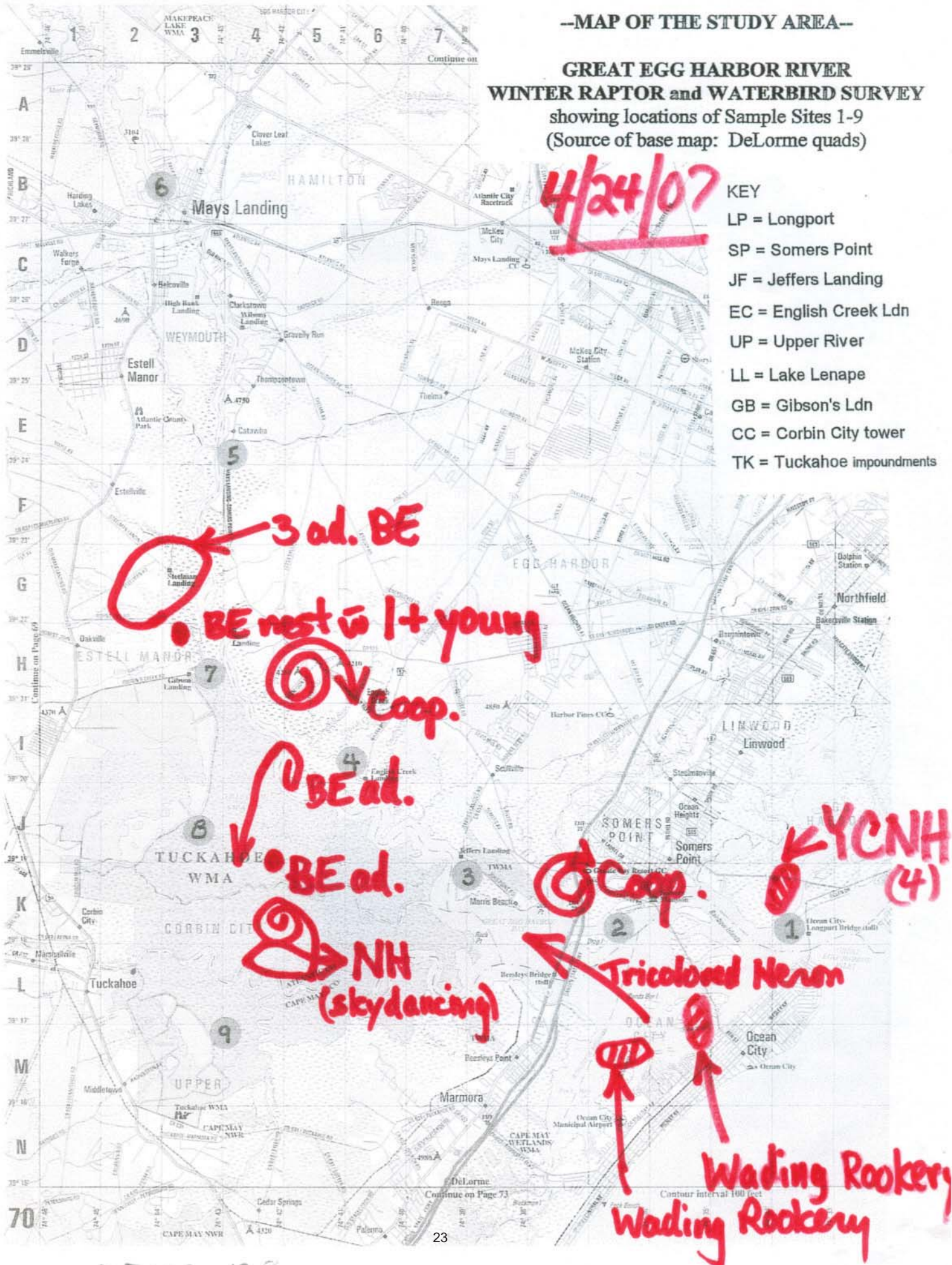
--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)

**4/24/07**

**KEY**

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



$4.5 \times 1.2 = 13.8$



—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)

5/30/08

KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments

BE juv. — BE ad.

NH un.

NH ♀

NH un.

Cooper's ad.

BE ad.

## **APPENDIX 2.**

### **Methodology and Sampling Site Maps**

## GREAT EGG HARBOR RIVER METHODOLOGY:

Two observers, Sutton and Dowdell, spent 45 minutes apiece at each of nine sampling sites. All raptors and waterbirds were tallied at each site, whether in flight or sitting (perched or on the water). All hawks and eagles were searched for in accordance with Sutton and Sutton (1996). Raptors were identified, aged, and sexed in accordance with Dunne, Sibley, and Sutton (1986), Clark and Wheeler (1987), and Wheeler and Clark (1995). Waterbirds were found and identified in accordance with Sibley (2000), Sutton, *et al.*, (2004), and, of course, the two authors' many years of extensive experience in Southern New Jersey and elsewhere.

Additional birds, most often raptors, observed *between* official count sites were recorded if and only if the observers were confident it had not been previously counted. For example, a low-flying Cooper's Hawk dashing across the road would be added to the count if it had not been observed at the previous site. While the nine sampling sites were generally far enough apart to preclude "double-counting," the observers used extreme care to avoid recounting the same bird or birds. For example, eagles range widely up and down the river; a Bald Eagle roosting at Lake Lenape may range east to Tuckahoe WMA or farther. A "new" eagle would only be counted when direction of flight, age, plumage, or circumstance would allow the observers to confidently assess that it could not possibly have been already counted. Due to such constraints, counts of raptors, particularly eagles, are thought to be conservative. As discussed below, the Great Egg basin is a very large area, extremely wide in the lower portions.

The nine count locations, the official sampling sites, are shown on **Map 1**. Some sites did have supplemental count locations (labeled A, B, and C on our field maps, but not on Map 1) to allow for all areas to be seen and thereby all birds counted. For example, the Tuckahoe WMA site, Site 9, southeast of Tuckahoe has three impoundment pools, and not all pools can be viewed or counted from the same location. Therefore, the Site 9 count is a composite of tallies taken at three separate locations, but only one final tally is given for the site on the daily and summary data sheets. In this case, the 45 minutes are expended at the three stops put together. Only by using such alternate viewing locations could all birds, particularly waterbirds, be reasonably and reliably tallied.



In order to avoid bias in the sampling technique, the route was reversed each subsequent sampling date, run “upriver” and then “downriver” on alternate sampling days. The nine sites ultimately settled upon as a reasonable and doable sampling route are as follows, (starting on the lower estuary and working upriver):

- (1) Longport Bridge Fishing Pier. This site allowed counting of the lower portion of Great Egg Harbor Bay and the Rainbow Channel/Rainbow Island area.
- (2) John F. Kennedy park in Somers Point. Allowed counting of the bay east of the Garden State parkway Bridge. An alternate site was employed here; the foot of the Route 9 Bridge over Great Egg Harbor bay (north end) allowed the bay west of the bridges to be seen and censused.
- (3) Jeffers Landing, including alternate sites on Job’s Point Road and Jeffers Landing Road.
- (4) English Creek Landing, at Wharf Road.
- (5) The “Upper” tidal river. The principal count location was from the Shady River Marina on Route 559. A supplemental site used was “the bulkhead” in Mays Landing just south of Route 40.
- (6) Lake Lenape. Observations were conducted from the spillway in Mays Landing.
- (7) Gibson Landing, at the end of Gibson’s Creek Road in the Corbin City unit of Tuckahoe WMA.
- (8) The observation tower on the dikes of the Corbin City unit of the Tuckahoe WMA. Here supplemental observation points were used in order to observe all of the various nooks and crannies of the several impoundments.
- (9) The Tuckahoe unit of the Tuckahoe WMA, including three supplemental stops which allowed all three impoundments to be viewed and counted. Particularly Site 9 allowed those raptors and waterfowl using the lower Tuckahoe River tributary to the Lower Great Egg Harbor River basin area to be included in survey results. This site was in Cape May County; all others were in Atlantic County.

To the greatest extent practicable, all counts were conducted in good weather. The observers carefully selected sampling days which were sunny and breezy, conditions which readily facilitate raptor hunting and movement along the river. Such conditions particularly allow for the best raptor counts (on cloudy, windless days raptors often spend much of their time perched, and therefore often are out of sight).

**-MAP OF THE STUDY AREA-**

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)



**KEY:**

Site # 1.	Longport	(LP)
Site # 2.	Somers Point	(SP)
Site # 3.	Jeffers Landing	(JF)
Site # 4.	English Creek Ldn.	(EC)
Site # 5.	Upper River	(UP)
Site # 6.	Lake Lenape	(LL)
Site # 7.	Gibson's Landing	(GB)
Site # 8.	Corbin City (WMA) (CC)	
Site # 9.	Tuckahoe (WMA) (TK)	



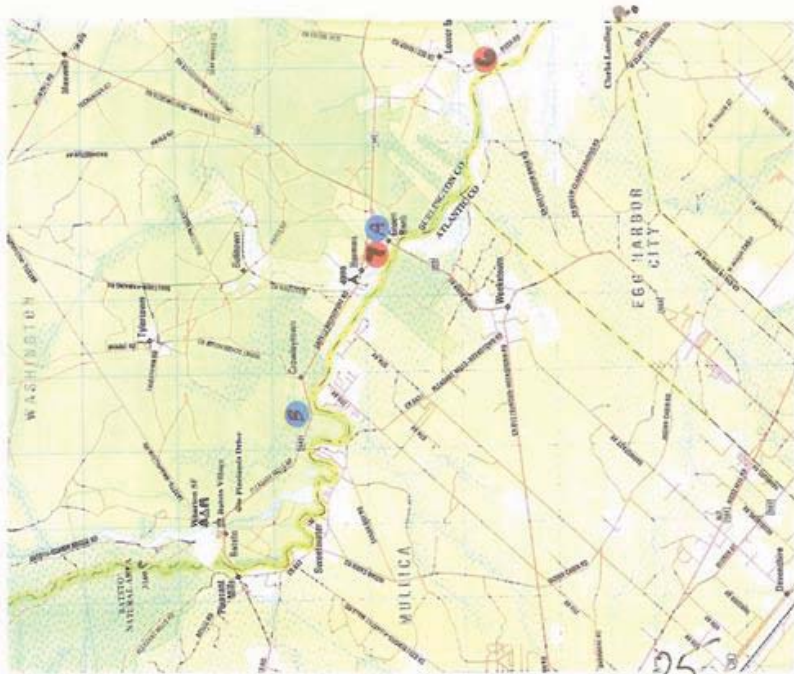
## MULLICA RIVER METHODOLOGY:

The Mullica River study area and sample locations are shown on **Map 2**. The methodology used on the Mullica was designed to be identical to that used on the Great Egg: Nine sample locations were established on the Mullica between Green Bank in the west and on downriver to Great Bay Boulevard near Little Egg Inlet. Each site was visited for approximately 45 minutes each during a given survey. Sampling direction was reversed every other survey to avoid time-of-day bias. There is some difference in the geographical scope of the study areas. The Great Egg River, from Lake Lenape east to the Longport Bridge constitutes about 12 linear miles (direct miles, not accounting for turns on the river). The Mullica River, on the other hand, is about 15.6 linear miles in length from Green Bank east to the landing at the foot of Great Bay Boulevard (Seven Bridges Road). While it bears noting that the study area on the Mullica is longer, no attempt has been made (as yet) to compare width or acreage (or habitat types) of the comparative study areas. This can be carried out in future years as part of future in-depth comparisons.

Any avian discussion of the Mullica River complex and Great Bay must include discussion of Forsythe National Wildlife Refuge, a.k.a. “Brigantine.” While not technically/geographically in the study area, it exerts a tremendous influence on the birds of the region - particularly waterfowl. Just as the quality impoundments at Corbin City and Tuckahoe WMAs attract and concentrate ducks and geese (and as the Bivalve EEP does on the Maurice River), Brigantine by its sheer size and quality of habitat (vast impoundments) attracts and concentrates vast numbers of Mullica River region waterfowl. But where Corbin/Tuckahoe can be counted because they are “within” the study area, the impoundments at Brig are adjacent to Reeds Bay, Little Bay, and Brigantine Inlet - and are not really a part of Great Bay or the Mullica River system.

None-the-less, Forsythe exerts a massive influence on Mullica waterfowl. Because of the size and high quality of the impoundments, as well as the relative safety from hunting pressure, the NWR clearly pulls in birds from the Mullica. As one person aptly put it, “Brigantine simply ‘sucks in’ most of the area’s waterfowl.” And while many return to the nearby Mullica River to feed at night, by day they are safely back at the refuge, sanctuary, and feeding station that is Forsythe NWR.

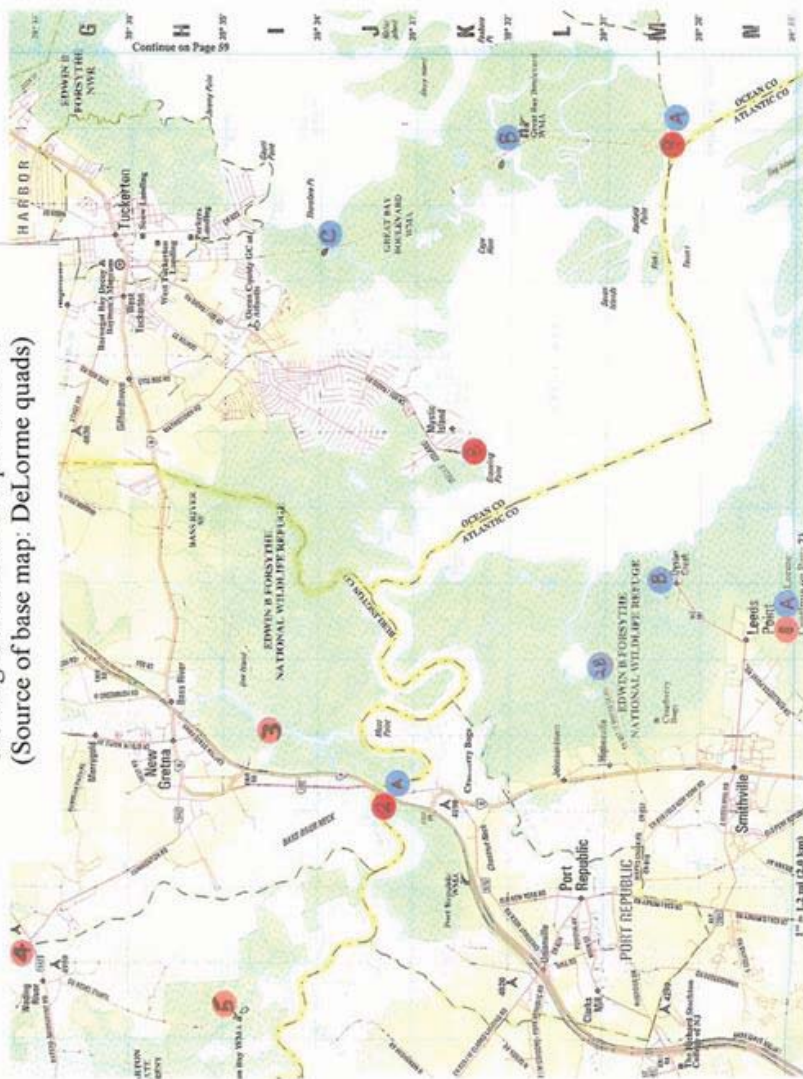
While one could make a case to include this site and its birds in a Mullica count, to do so would bias the count to such a degree that comparisons to the Great Egg and/or other rivers would be moot and meaningless. For example, few Green-winged Teal and virtually no Pintails were counted on Mullica surveys, but at the same time, just two miles away, perhaps 10,000 teal and 10,000 pintails were known present. It is a dilemma with no real answer - to count Brig birds would be to bias the count beyond comparability (plus it would take 6-8 hours each survey to truly census the Refuge...) But, at the same time, to not count Brigantine waterfowl will forever undercount (and so bias) any Mullica survey efforts. Such are the issues with Forsythe NWR, one of the premier refuges in the country, and the implications when attempting hard comparisons to the Great Egg Harbor River.



MAP 2

--MAP OF THE STUDY AREA--

**MULLICA RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)



**KEY:**

- |           |                         |      |
|-----------|-------------------------|------|
| Site # 1. | Leed's Point            | (LD) |
| Site # 2. | GSP Bridge              | (BR) |
| Site # 3. | Amassas Landing         | (AM) |
| Site # 4. | Wading River Bridge     | (WD) |
| Site # 5. | Swan Bay WMA            | (SW) |
| Site # 6. | Lower Bank              | (LB) |
| Site # 7. | Green Bank              | (GB) |
| Site # 8. | Graveling Point         | (GP) |
| Site # 9. | Seven Bridges Road (SB) |      |
|           | (Great Bay Blvd. WMA)   |      |

**DISCLAIMER REQUIRED BY  
COOPERATIVE AGREEMENT  
OF THE GREAT EGG HARBOR  
WATERSHED ASSOCIATION  
WITH THE U.S. DEPARTMENT OF THE  
INTERIOR, NATIONAL PARK SERVICE:**

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