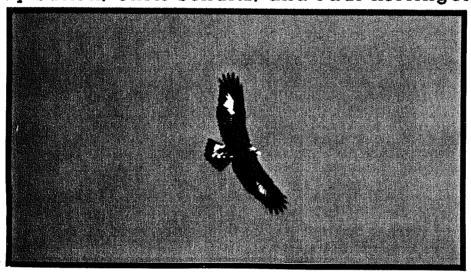
HA File No. 90.31

Autumn Raptor Migration Along New Jersey's Delaware Bayshore. A Hawk Migration Study at East Point, New Jersey

Clay Sutton, Chris Schultz, and Paul Kerlinger



(Immature Golden Eagle Over the Maurice River, Near East Point, November, 1990)

Submitted April, 1991

to

Citizens United to Protect the Maurice River and Its Tributaries P.O. Box 474, Millville, N.J. 08332

by

Herpetological Associates, Inc.
Wildlife and Environmental Consultants
129 Buck Avenue
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Bog Turtle, Clemmys muhlenbergii

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April 18, 1991

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

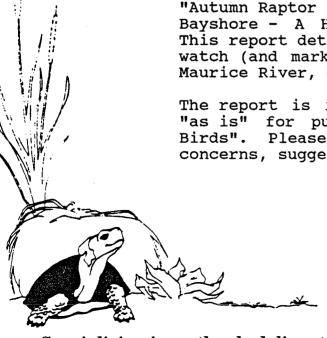
Dr. Paul Kerlinger Director The Cape May Bird Observatory The New Jersey Audubon Society P.O. Box 3 Cape May Point, New Jersey 08212

Point Raptor Migration Study Delaware Bayshore, Cumberland County. HA File No. 90.31.

Dear Jane and Paul,

As per our agreement and contract dated September 14, 1990, enclosed please find our final report entitled, "Autumn Raptor Migration Along New Jersey's Delaware Bayshore - A Hawk Migration Study at East Point". This report details the results of our fall, 1990 hawk watch (and marking project) conducted at East Point, Maurice River, Cumberland County.

The report is in a format designed to be considered "as is" for publication in "Records of New Jersey Please contact with me any comments, concerns, suggestions, or changes.



Specializing in wetlands delineations and "endangered" and "threatened" plants and wildlife, their ecology and environment.

Mrs. Jane Morton Galetto Dr. Paul Kerlinger Page Two

Let me know of your approval or acceptance of the paper as it should be mailed to both Rich Kane and Larry Niles as soon as possible.

Thank you for the opportunity to work with CU and CMBO once again on a project with such important conservation implications.

Sincerely,

HERPETOLOGICAL ASSOCIATES, INC.

Clay C Sutton Vice President

CCS/jm Enclosures

cc: Robert T. Zappalorti, Pres., HA
Rick Radis, HA staff
James Dowdell, HA staff
Chris Schultz, CMRBP



Bog Turtle, Clemmys muhlenbergii

I. Introduction



Bog Turtle, Clemmys muhlenbergii

AUTUMN RAPTOR MIGRATION ALONG NEW JERSEY'S DELAWARE BAYSHORE A HAWK MIGRATION STUDY AT EAST POINT, NEW JERSEY

INTRODUCTION:

While raptors have long been characterized as reluctant to cross water barriers (Heintzelman, 1975), recent studies have clearly shown that many raptor species regularly make water crossings (MacRae, 1985). The Delaware Bay crossing (12 miles) should be of little impediment to autumn raptor flights, yet for virtually as long as it has been known that major hawk concentrations occur at Cape May Point, New Jersey, it has also been known that not all raptors recorded there appear to cross the Delaware Bay, but that many return north up the western side of the Cape May peninsula (Allen and Peterson, 1936).

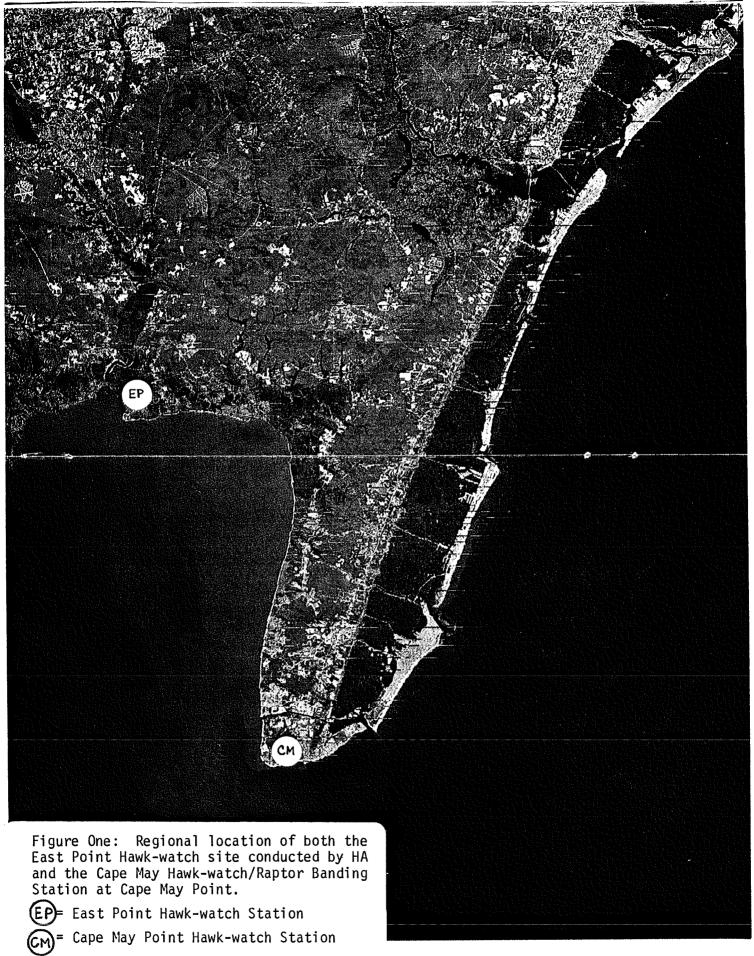
Witmer Stone (1937) noted a reverse migration up Bayshore, but presumed that most birds "eventually" crossed the Delaware Bay. Stone recorded the heaviest (or most visible) concentrations on northwest winds, but also noted flights on days of little or no wind as well. anecdotal information has been subsequently confirmed with hawk counts (Dunne and Clark, 1976) and radar studies as well (Kerlinger and Gauthreaux, 1984). While Delaware Bay crossing does occur on many wind conditions, a substantial return flight up the Delaware Bayshore is confirmed as well. During the expanded hawk watch project of the Cape May Bird Observatory, Ward recorded 632 hawks (including 192 sharpshinned hawks and 419 American kestrel) migrating west over East Point on October 14, 1979 (Dunne and Clark, 1979). November 29, 1981, a remarkable 15 rough-legged hawks were seen migrating west on the treeline near East Point (Sutton, 1981).

More telling, of 48 hatching year female sharp-shinned hawks followed via telemetry in 1980 and 1981, only one crossed the Delaware Bay, while most flew north up the peninsula (Hotthuijzen and Oosterhuis, 1985). This pattern has recently been confirmed by telemetry studies conducted by the Nongame Endangered Species Project of the New Jersey Division of Fish Game and Wildlife as well (Niles, in lit.).

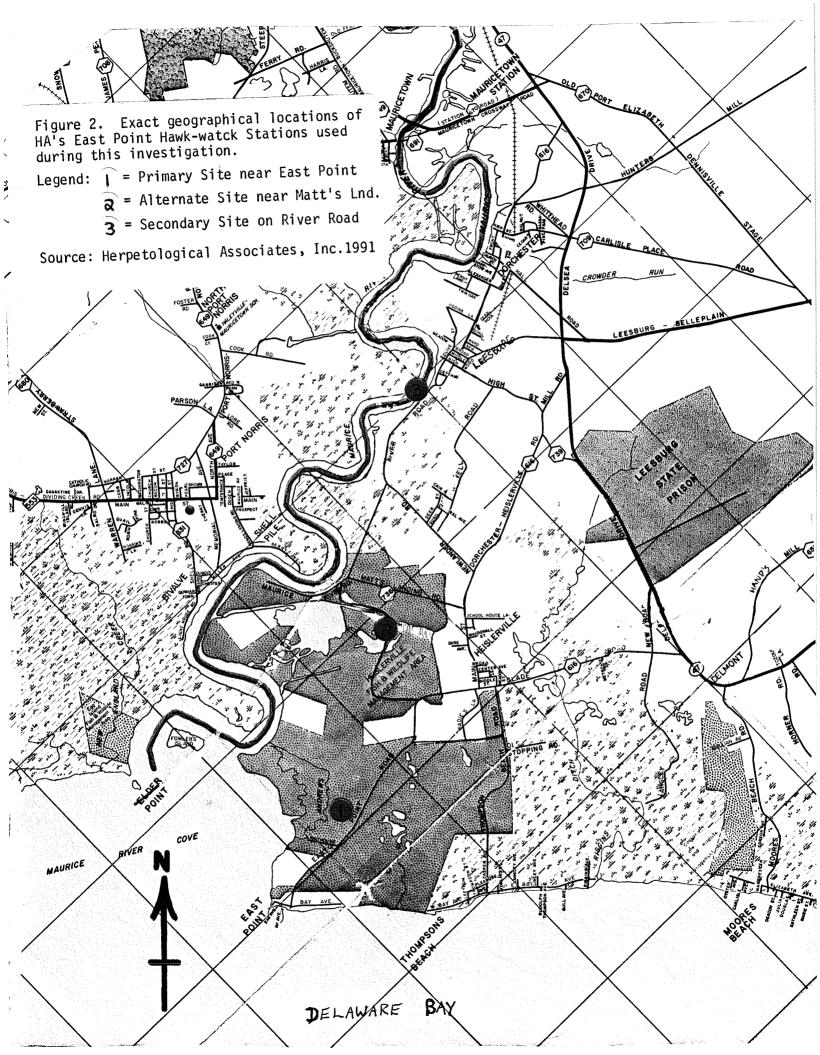
It is theorized that, rather than risk being blown to sea by strong northwest winds during a water crossing of Delaware Bay, many raptors instead return up the peninsula and finally turn west along the Delaware Bayshore in an attempt to find a shorter crossing site. Indeed, these bayshore flights continue west as far as Greenwich and even Fort Mott in Salem County (Sutton, 1984; and Barber, 1990).

Other than the aforementioned studies, little systematic study has been made of flights going around Delaware Bay. In 1959, Don Kunkle organized a hawk watch for various sites along the bayshore (Cape May Point to Fort Mott), but results were inconclusive due to weather (Kunkle, 1978). In 1976, Kunkle recounted numerous hawk flights noted over the years heading northwest along the bayshore, and said that all "crossing" then takes place west of a line stretching from Bayside, New Jersey to Woodland Beach, Delaware. In this area, the bay is only four miles wide and hawks then readily make the crossing (Kunkle, 1976).

In 1987 and 1988, Sutton noted considerable hawk migration occurring in fall along the lower Maurice River, including East Point, as part of a larger seasonal study of raptor and waterfowl use of the Maurice River system (Sutton, 1988). Most significantly, on September 22, 1988, Barber saw a major flight heading west over Bivalve about two miles north This flight contained an estimated 2,000 of East Point. broad-winged hawks, on a day when only 134 (the largest flight of the month) were seen at Cape May. This flight intimated that not only was a large percentage of the Cape May flight returning up the bayshore, but that a larger number of birds might be short-cutting or bypassing the cape altogether. It was this flight more than any other event which inspired a full-time migration study at East Point in an attempt to document the dynamics of Delaware Bay hawk flights. All known East Point historical raptor migration records are shown in Table 1.



Source: Photo credit by Earth Satellite Corp.



II. Methodological Approach



Bog Turtle, Clemmys muhlenbergii

MATERIALS AND METHODS:

Delaware Bay is a large estuary encompassing over 400 square miles. The mouth of the bay measures about 12 miles from Cape May to Cape Henlopen, and at its widest point, near East Point, the bay measures 22 miles across. From Cape May to the head of the bay is a distance of about 35 miles. East Point is a small peninsula lying on the east bank at the mouth of the Maurice River, in Cumberland County, New Jersey. The distance from Cape May to East Point is 26 miles following the treeline of the bayshore marshes, or "as the raptor flies".

East Point was chosen as the watch site because both historical data and the preliminary studies during the falls and 1988 clearly showed that a major raptor concentration was occurring there. Raptors following the are geographically treeline west around Delaware Bay concentrated near East Point lighthouse by a peninsula of vegetated uplands extending southwest into the salt marsh and terminating on Maurice River Cove. The geographical location of East Point, and its relation to Cape May, are shown in Figure One. Raptor concentrations occur here because of the tendency for raptors to follow the treeline as well as the fact that they are faced with a water crossing across the mouth of the Maurice River. If a hawk flies directly northwest from East Point light, it must cross the two miles of water in Maurice River Cove before landfall over the salt marshes on the west bank. addition, it is almost a total of four miles before the treeline is encountered again. Therefore, most hawks circle briefly, and then return about one to two miles north, to the vicinity of Matts Landing, before crossing the river to Here they are only confronted with a treeline to the west. treeline crossing of about one mile. In short, the East Point peninsula clearly functions as a "miniature Cape May", funnelling and concentrating raptors moving southwest along the treeline.

Historical and preliminary studies during the falls of 1987 and 1988 led to the formulation of a pilot study in 1989 and a full-time hawk migration study project in 1990. In the fall of 1989, we conducted fixed point surveys of migratory raptors on the lower Maurice River; a total of 43 hours of observation were conducted over 10 survey dates. This survey was essentially a hawk watch conducted at East Point and Heislerville Wildlife Management Area. The Heislerville site was generally used later in the day when, on some winds (particularly northwest) the flight line shifted inland (as

birds flew higher) away from the actual beach and East Point Light. In addition, on a few occasions, observations were conducted from a point overlooking the river just south of Leesburg. The specific location of these watch sites (used in both 1989 and 1990) is shown in Figure 2. The Heislerville site is about two miles north of the East Point watch site (which was about one-half mile north of the lighthouse on East Point Road). The Leesburg site (rarely used) was an additional 2.2 miles inland. The use of the alternative watch sites allowed the observer to better monitor high mid-day broad-front flights than would the use of only the primary site.

In 1990, a full time hawk watch was conducted; a total of 308.5 hours of observation occurred on 60 days spanning from September 9 to December 7, 1990. Sutton and Dowdell were principal observers. Observations were conducted following the guidelines of the Hawk Migration Association of North America (HMANA) and all data were kept on standard HMANA forms. (see Appendix I). All raptor identifications, as well as aging and sexing were done following the guidelines of Clark and Wheeler (1987) and Dunne, Sibley, and Sutton (1988). Both daily and seasonal results were compared and contrasted to Cape May's hawk watch results.

In addition to raptor enumeration, a color marking project was carried out in conjunction with the Cape May Raptor Banding Project (CMRBP) under the direction of Schultz. The purpose of the marking project was an additional test of the speculation that Cape May raptor flights go north and west along the Delaware Bayshore and cross into Delaware near the headwaters of the bay. Raptors were marked at Cape May and watched for at East Point. By recording each color-marked raptor seen, noting the shape of the maker and location of the marker on the tail, the time and distance traveled could then be calculated based on the known marking sequence. The relative percentages of Cape May Point birds occurring at East Point can be theoretically calculated based on the sample marked by the CMRBP.

The CMRBP used three inch pieces of black vinyl tape folded in half so that they projected approximately one inch beyond the end of the tail. Permits for marking were obtained from the Bird Banding Laboratory, USF&W Service, in Patuxent, Maryland. Based on the results of similar color marking conducted by the CMRBP during the autumn 1980 season, only square and pointed shapes, black color, and only central and outer rectrices were marked. Marking was conducted only on hatching year female American kestrels, hatchling year female sharp-shinned hawks, and hatching year red-tailed hawks. On succeeding days either rectrix L1, L6, or R6 were

marked. By selecting shapes and rectrices, six different marking combinations were achieved allowing observers to know exactly when a color-marked bird was marked. Marking was conducted by all cooperating banders of the CMRBP. Marking was begun on sharp-shins and kestrels on September 29, and two repetitions of the six combinations were conducted, with the marking finished on October 10. Redtails were marked with just one repetition of the six combinations beginning on November 8.

The objectives of the study were to conduct a hawk migration study at East Point which would allow us to compare and contrast bird numbers going around Delaware Bay with those counted at Cape May Point, and to monitor for Cape May color-marked individuals in order to determine the amount of time necessary for migrants to reach East Point. This would allow a determination of the migratory route habitat use by migrating hawks and an estimation of the importance of Delaware Bay upland edge habitat to migrants. A major goal of the project was to provide conservation groups with data relevant to the identification and protection of habitats critical for the resting and feeding of migratory raptors.

Because no quantification of Delaware Bay fall migration had ever been done, raptors or otherwise, detailed daily estimates of all non-raptor migrants were made as well. In addition, migratory butterfly numbers were estimated daily as an adjunct to the project.

III. Results of Investigation



Bog Turtle, Clemmys muhlenbergii

RESULTS:

In 1989, the hawk watch at East Point recorded 1788 raptors of 15 species during 43.25 hours of observation spread over 10 days from October 11 to December 2. These results are shown in Table 2. A comparison to Cape May flights is shown This pilot study gave valuable insight to the as Table 3. dynamics of the flight, and was used as a basis for 1990 project planning. The 1989 hawk watch particularly yielded good data regarding late season buteo movements. Because only late season "flight days" were chosen for observation East Points 41.3 hawks/hour easily bested Cape May's 36.9 hawks/hour. (A figure which in itself is usually one of the highest in the nation north of Texas.) In 1989, 73% of the total number of hawks seen at Cape May were seen at East Point for the day compared, including exactly 100% of the red-tails and 550% of the bald eagles.

In 1990, a total of 9,042 raptors of 17 species were recorded as migrants at East Point during 308.5 hours of observation on 60 days between September 9 and December 7. This is an average of 150.7 birds per day or 29.3 hawks/hour. The 1990 daily results are shown in Table 4 as well as monthly and seasonal totals.

Comparisons of East Point data to Cape May flights are shown in Table 5. This table contains daily comparisons, Cape May grand totals and Cape May's compared total (comparison for In the the mutual 60 days when both watches were covered). color marking program, the Cape May Raptor Banding Project marked a total of 219 sharp-shinned hawks, 37 American kestrels and 104 red-tailed hawks for a total of 360 birds. Marked birds were sighted regularly from the Cape May Point hawk watch as well as the CMRBP stations up to six days after original marking. Marked birds were recaptured at the banding stations up to three days after marking and all tags appeared to be holding well and were still firmly attached, with no evidence of damage from preening behavior. color marking scheme, and the report on birds banded and Sightings (or lack marked is included here as Appendix 2. thereof) are discussed in species commentaries below.

SPECIES COMMENTARY:

(DATA IS FOR 1990, UNLESS OTHERWISE NOTED)

BLACK VULTURE (Coragyps atratus):

A total of 15 black vultures were recorded at East Point, compared to 9 at Cape May for the 60 days of comparison. Therefore, 166% of Cape May's flight was seen at East Point. Considerable care was taken to separate local black vultures from migrants. The 15 vultures counted were all perceived to be migrants - usually high and moving rapidly northwest. The peak flight was 6 birds on November 15.

TURKEY VULTURE (Cathartes aura):

Turkey vultures, more than any other species, presented counting problems due to the presence of a large local In 1989, TV totals undoubtedly include "locals". In 1990, however, numerous flocks were seen moving, and were fairly easy to separate from locals; only flocks which disappeared to the west were counted. 1991, 596 turkey vultures were counted, or 107% of Cape May's flight, with a peak of 40 on November 18. Significant was the appearance of a leucistic turkey vulture at East Point on November 15; this same bird was seen at Cape May five days earlier on November 9, indicating 5 days of travel time to cover the 26 miles between Cape May and East Point. Almost certainly, this same turkey vulture had appeared at Cape May the previous year in October. (All descriptions matched and Sutton saw both the 1989 Cape May bird and the 1990 East Point bird)

OSPREY (Pandion haliaeetus):

Osprey predictably should be one of the species least deterred by water at Cape May and have little reason to migrate around the bay. Indeed, only 182 birds were recorded (peak - 23 on 60 ct.), only 12% of the Cape May flight. Of birds aged, 12 were adult and 7 were hatching year. While some osprey were migrating west up the bay, many were seen migrating down the Maurice River, and a few were recorded moving east.

BALD EAGLE (Haliaeetus leucocephalus):

Bald eagles were a highlight of the East Point counts. 1989, 33 were seen, with peaks of 9 on October 23 and 7 on In 1990, 46 were recorded, or 90% of the 51 October 11. seen at Cape May in the same time period. A total of 19 adults, 25 immature, and two unaged bald eagles were seen, a make-up which differs markedly from that at the Cape. At East Point, 43% of the balds were adult. At Cape May, only 18% were adult, lending proof that not all East Point migrants have previously been to Cape May (indeed, over half of Cape May's migrants, crossed the bay directly-meaning that many of East Points birds have a different origin. Four balds were seen on October 20, October 30 and November 14 at East Point. Two local adults presented some counting problems but were eliminated to the best of the counter's ability.

NORTHERN HARRIER (Circus cyaneus):

Harriers presented a difficult counting problem as many feeding "locals" were always present northwest of the hawk watch. In 1989, the counts no doubt reflect some residents. In 1990, great effort was made to eliminate local birds and 538 migrants were recorded (150 hatching year, 40 adult females and 36 adult males) with a peak of 27 on October 24. This was 68% of the Cape May flight, yet because so many birds cross at Cape May (the harrier is remarkably unafraid to cross water), many different birds were undoubtedly involved in the total.

SHARP-SHINNED HAWK (Accipiter striatus):

As expected, sharp-shinned hawk was the most numerous raptor at East Point, comprising 44% of the flight westward along the Delaware Bay. Birds were generally quite low early in the day, flapping at tree-top level out to the lighthouse itself. Later in the day birds were usually higher and heading west or northwest well north of the primary watch site near the light. A total of 4,013 sharp-shins were recorded, peaking at 528 on October 2. Most were hatching year birds, with 187 adults casually noted. Thirty-six percent of the Cape May total was observed, but it appeared that the ratio of immatures to adults may have differed. On October 15, 37 of 315 sharp-shins at East Point were adult when none of the 437 sharp-shins at Cape May were seen to be

adults (although not all were carefully checked). Of 219 sharp-shinneds color-marked, only one was recorded on the bayshore - and even then not by the official count at East Point. A sharp-shinned marked October 1 at Cape May was seen on October 2 at Jakes Landing, Cape May County (about 8.5 miles east of East Point) by a Division of Fish, Game and Wildlife employee while radio-tracking sharp-shinneds. In approximately one day, it had traveled two-thirds of the way to East Point after being banded at Cape May.

COOPER'S HAWK (Accipiter cooperii):

A total of 604 Cooper's hawks were counted with a peak of 63 on October 2; 37 adults were casually recorded. Forty percent of the Cape May total was recorded, however, again, a different adult/immature ratio was suspected. On October 15, 8 of 41 Cooper's hawks at East Point were adult (19.5%), but only 2 of 119 were adults (1.7%) at Cape May (although a few may have been missed). Many Cooper's hawks recorded were low and hunting as they migrated over the trees and through the trees at East Point.

NORTHERN GOSHAWK (Accipiter gentilis):

Only 7 northern goshawks were seen (1 adult male and 6 hatching year) just 23% of those seen at Cape May. The peak of 2 individuals occurred on October 25. Some northern goshawks may have been missed at East Point due to their well known migratory behavior of migrating low "through the trees".

RED-SHOULDERED HAWK (Buteo lineatus):

A total of 68 red-shouldered hawks were counted (16 adults, 31 hatching year) with a peak of only 11 on October 27. They represented 38% of the compared total at Cape May. In 1989, only 20 were recorded, but 10 birds each were seen on November 13 and November 22.

BROAD-WINGED HAWK (Buteo platypterus):

If the major broad-winged flight around Delaware Bay witnessed by Barber on September 22, 1988 (2,000 birds) occurs yearly, it was missed by observers in 1990. Only 183 broad-wings (2 adults and 72 hatching year) were counted, peaking at 73 on September 20. Approximately 18% of Cape May's total was recorded. However, it should be noted the the September 20 flight was very high and spread-out (broadfronted) with many birds well to the north, and many broadwings could easily have been missed by the single observer at East Point. Nonetheless, based on the 1988 flight, it appears that in some years Delaware Bay could be a major leading line for broad-winged hawks, many of which may have bypassed or short-cut Cape May.

SWAINSON'S HAWK (Buteo swainsonii):

A single Swainson's hawk was seen on November 9 from the Heislerville watch site. It was a hatching year light form bird which was decidedly not the same Swainson's (hatching year - light form) seen at Cape May on October 24 (Sutton saw the East Point bird and reviewed photos of the bird banded at Cape May - which was a much darker individual). Interestingly, the November 9 bird at East Point was not migrating west, but was seen coming downriver on west winds. It disappeared to the southeast towards Cape May - yet this western vagrant was never recorded by the watchers there.

RED-TAILED HAWK:

In 1989, major red-tailed hawk flights were encountered on November 13 when 165 were seen (55 in sight at once, 21 in a tight kettle over the East Point watch), and on November 22, when 195 were recorded - all streaming west up the bayshore. In 1990, 753 were seen (91% of Cape May's flight), with 86 adults and 178 hatching year birds recorded. Peak flight was only 84 on November 14. Of note, however, was the regularity of the flights, and on gale force northwest winds, East Point regularly bested Cape May - conditions under which birds are well known to short-cut the hawk watch Of 104 red-tailed hawks which were colorat Cape May. marked at Cape May, only one was recorded at East Point. A bird captured, banded and tagged at Cape May on November 14 was seen at East Point four days later on November 18. While some birds no doubt can cover the 26 miles from Cape May to East Point in a single day or even a couple of hours in good winds, this bird clearly spent four days in transit resting, roosting and feeding in the important intervening Delaware Bayshore habitat.

ROUGH-LEGGED HAWK (Buteo lagopus):

A major rough-legged migratory pathway up the Delaware Bayshore was one of the major discoveries of the study. In 1989, twice the number of rough-legs (11) were seen at East Point in just 10 days than were seen at Cape May for the entire season. In 1990, 27 migrant rough-legged hawks were seen at East Point versus only three at Cape May - (900% of Cape May's flight) 15 hawks were light form, 8 dark form, and three undetermined. The year 1990 was the worst rough-legged hawk year ever at Cape May in the 15 years of the official count there. It is interesting to speculate that 900% of the average six seen there would mean that 54 rough-legs might occur at East Point, and during the best year when 12 were recorded (1980), 108 rough-legs might have been counted at East Point, if the 900% figure held true.

GOLDEN EAGLE (Aquila crysaetos):

Twelve golden eagles were seen at East Point in 1990, or 57% of Cape May's record count of 21 birds. However, all of Cape May's birds were immatures, where East Point saw two adult and 10 immatures, indicating that since 17% of East Point's flight were adult, at least 17% were different birds than had occurred at the Cape. This is more proof of differential age class migration and that East Point sees, to a degree, a different flight than Cape May. Golden eagles peaked at three on November 14, considerably later than Cape May's peak of four on October 29.

AMERICAN KESTREL (Falco sparverius):

With a total of 1,663 birds, American kestrels represented 18.4% of the East Point flight in 1990. These included 267 males and 202 females (57% male verses 45% male at Cape May). The East Point flight was 26% of the Cape May flight. Kestrels peaked at 495 on October 2; 37 kestrels were colormarked, yet none were seen at East Point. While most kestrels were seen traveling west up the bay on northwest winds, some were headed south (usually on southerly winds) and may have eventually reached Cape May.

MERLIN (Falco columbarius):

Approximately 270 merlins were recorded, an unexpectedly high number and 21% of the Cape May flight. A total of 76 merlins were seen on October 15 and 65 on October 19. Approximately 45 were adult males and four adult females; all others were female/ hatching year type. Merlins were seen traveling in many directions -while a few were seen heading west, most were seen heading due south, probably crossing the bay at East Point. These birds were probably different than the birds recorded at Cape May. Merlins usually spent considerable time hunting near the East Point watch site in the late afternoon.

PEREGRINE FALCON (Falco peregrinus):

Of all raptors, perhaps the peregrine shows the least fear of water crossings, with the adult male having been characterized as "pelagic" during its fall migration Accordingly, only 9% of the famous Cape (Cochran, 1985). May coastal peregrine flight was seen. Nonetheless, 64 peregrines were recorded - easily the highest count in the region away from the immediate barrier beaches. Peaking at 13 on October 4, 18 adults were tallied (two adult females/ six adult males) and 27 immatures (nine hatching year females and six hatching year males). While a few birds were seen heading west, most were traveling due south, and some southwest (possibly heading for Egg Island Point). Considerable hunting was noted over the Maurice River marshes.



Figure 3. An osprey as seen flying over the East Point Hawk-watch Station in October of 1990 by Clay Sutton of Herpetological Associates, Inc.

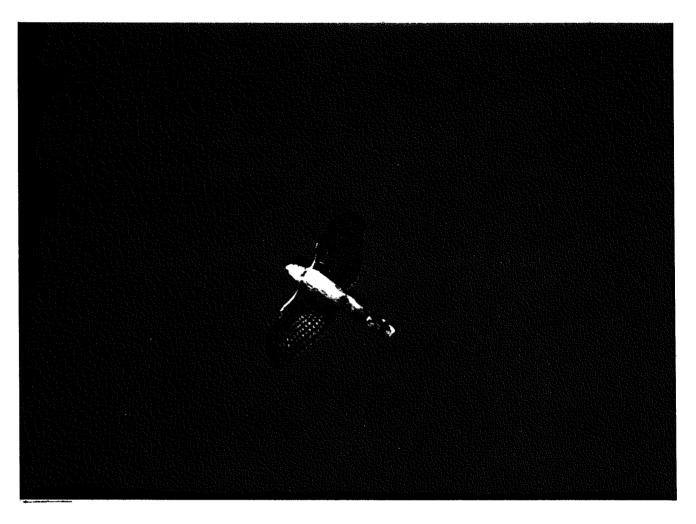


Figure 4. Immature Cooper's hawk circling over the East Point Hawk-watch Station and captured on film by Clay Sutton, October, 1990.

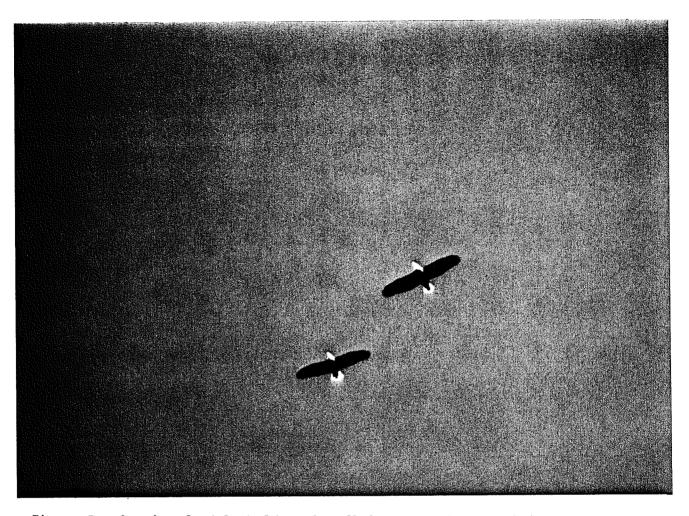


Figure 5. A pair of adult bald eagles flying over the East Point Hawk-watch Station as photographed by Clay Sutton on October 23, 1990.

OTHER MIGRANTS RECORDED

PASSERINES AND BUTTERFLIES:

A daily number was estimated for all non-raptor migrants at East Point, and passerine flights were equally spectacular as the hawk flights. Table 6 shows daily counts for all species at East Point. Table 7 shows peak flights and dates for all species (including raptors), as well as totals for all migratory species seen in passage (for many species, the peak shows only the maximum numbers of "locals" resident in the area - and for these species no migratory total is shown). In what may be a first for any hawk watch anywhere, a black rail was heard calling from the East Point watch site on September 28. Geese passed East Point in large numbers, many going south, but many (particularly snow geese) moving west up the bay. Surprisingly, 14 red-headed woodpeckers were seen migrating over East Point while only 4-5 were seen at the Cape May hawk watch (Brett Ewald, 1990). While red-bellied woodpeckers are largely thought to be non-migratory, at least 54 were seen at East Point which were clearly exhibiting migratory behavior. Tree swallow numbers were spectacular, and a massive blue jay flight was noted in late September and early October, peaking at over 1,000 birds each day on October 1 and October 3. Point blue jay flights were seemingly much larger than those witnessed in Cape May during the 1990 season). yellow-rumped warbler movement occurred on October 15, when over 4,500 were witnessed passing East Point. In 1989, one massive passerine flight (larger than any seen in 1990) was encountered; when 2,000 sparrows (including two vesper sparrows and dozens of white-crowned sparrows), thousands of American robins, and hundreds of eastern bluebirds were seen around and over the watch on October 23.

A total of 169 species were noted from the hawk watch in 1990. While songbirds are clearly concentrated by the peninsular geography of East Point, and many were seen, it is important to note that numbers shown in Tables 5 and 6 do not represent any concerted birding effort and are simply birds recorded from or near the hawk watch sites, while the In addition, virtually no hawk watch was in progress. counting was done at dawn or shortly afterward, when migratory passerine movement would be heaviest (most hawk counting began at 8 to 9 a.m.). Early morning count-hours would vastly increase the number of passerines seen at East Point. Suffice it to say that a massive movement of land birds occurs in autumn at East Point. Birds are clearly concentrated there by the wooded treeline ending on a peninsula, and by the threat of a water crossing. Only a specific songbird project at East Point could hope to elucidate the true magnitude of the astounding passerine movement there.

In what is believed to be a first for New Jersey, totals were estimated for migratory butterflies passing East Point each day of the season. Exact numbers were tallied for rarer species; only estimates were possible for species occurring in large numbers such as monarchs. Table 8 shows While most were estimated daily counts for butterflies. recorded from the hawk watch, some were seen at seaside goldenrod patches along East Point Road. Resident species counts are included as well. Table 9 shows totals seen, peak flights and dates for East Point butterflies. A total of 35 species were seen, and seasonality is clearly shown in Monarch butterflies were the most numerous the tables. species, with 10,106 estimated, peaking at 1,500 September 28. On September 29, 300 per hour were estimated passing the watch site. Buckeye and red admiral were the next most numerous species. One true vagrant, a long-tailed skipper was present on September 20 and 21 along East Point Road. This is perhaps the first Cumberland County record for this southern vagrant butterfly. Little Sulphur, an uncommmon emigrant, was recorded on five dates. To some degree, the geography of East Point seemed to concentrate butterflies much like it concentrated birds. While most monarchs were seen heading south, on some days virtually all red admirals, buckeyes, American painted lady's and question marks were seen migrating west - up the Delaware Bayshore.

DISCUSSION:

The East Point watch recorded 9,042 raptors or 34.6% of the 26,164 birds seen at Cape May during the same 60 day period. Except for osprey, merlin and peregrine, virtually all birds were moving west around Delaware Bay, giving us a picture of the importance of bayshore habitats to migratory raptors.

This compared percentage grew during the season, from 24.5% on September 30 to 28.4% on October 15, to 33.2% on October 31, and to 34.5% by November 15, good indication that fewer accipiters and falcons comprise the East Point flight, and that the large buteos are comparatively more likely to appear at East Point. In addition, since adults of all raptor species are known to migrate later, and because preliminary information suggests that the percentage of adults is higher at East Point, it would be expected that East Point flights would grow in comparison later in the season.

The percentage of the Cape May flight subsequently going around the bay is undoubtedly higher than the 34.6% Observations clearly noted that the flight was recorded. broad-fronted later in the day when birds were higher, and particularly during west and northwest winds. For a total of 8.5 hours between October 5 and November 7, an alternate watch site (either the Heislerville or Leesburg site) was manned in addition to the primary site at East Point. During this 8.5 hour period, a second observer saw 111 raptors (in addition to the 203 at the "official count") that it is believed the primary site did not record. Therefore, 55% of the birds passing were not being recorded by the O.C. If this were extrapolated to the 25 days of northwest or west winds (at the 151 birds/day average), an additional 2,076 raptors would have been recorded.

In addition, the East Point watch was conducted with only a single observer. The effects of varying observer numbers on raptor count totals have been well explored and at Cape May, 2-3 observers will record from 13.3% to 44.4% (depending on species - average 23%) higher numbers than a single observer (Kochenberger and Dunne, 1985). Applied to East Point, an additional 23% would have meant an additional 2,080 raptors. Keep in mind that Cape May totals are accrued from dozens of "helpers" to the official counter. At East Point, the single observer could not hope to record all birds passing on high flight days.

Finally, it is speculated that possibly between 2.3 and 6.7% of Cape May raptors are recounted, based on markings and recaptures, as birds re-enter the cape on successive days and/or roost overnight in the immediate area (Sutton, 1991).

Such recounting is not a problem at East Point (except for the aforementioned "local" resident turkey vultures, etc.) as all birds are rapidly passing west. We can create a theoretical model regarding Delaware Bay flights. By adding the additional birds which might be seen by a second observer farther to the north (broad-front migrants) adding the additional birds which would be accrued by 2-3 watchers at the primary site and by deleting the maximum possible 6.7% recounted at Cape May, we can predict that possibly 54% of the Cape May flight is returning up the bayshore and passing East Point.

The 1990 Cape May hawk watch total of 29,630 raptors was the lowest total in the 15 year history of that count (Dunne and Sutton, 1986), and it is therefore somewhat unfortunate that 1990 was chosen as the year for the East Point comparison. (East Point actually "beat" Cape May totals on 8 out of 60 days, or 13.3% of the time in 1991, but 1991 East Point buteo counts were nowhere near as high as those in 1989 and 1990). Cape May's 15 year average, 1976-1989, is 59,811 raptors per year; on an average year, at 34.6%, it could be predicted that 20,695 hawks would pass west past East Point. At the theoretical 54%, 32,298 birds could be expected to migrate west up the bayshore.

Cape May's peak year was 88,937 hawks (1981); 34.6% of this number would be 30,772, and 54% of this would mean an astonishing 48,026 raptors going around the Delaware Bay according to our theoretical model. Whether 34.6% or 54%, we cannot gainsay the importance of the Delaware Bayshore habitat to coastal migrant raptors as a major proportion of Cape May raptors are proven to be migrating north and west through Cape May, Cumberland and Salem Counties.

Finally, the lack of marked bird sightings must be explored. Discussing red-tailed hawks alone, the CMRBP marked 104 of the 161 birds counted during the six day period from November 8-14, 1991, or 65% of the birds, that passed. East Point, allowing for some lag time, only one bird of the 270 seen during the six day period from November 11-18 was marked, or .37% of the flight. Realistically, due to distance and altitude of flight, not all of these birds were close enough to see the markings if present. However, 95 of these red-tailed hawks were aged by the counter during that period, and we can assume if a bird was close enough to age that the color marking should have been seen if present. Therefore, 35% (95 birds) of the flight was close enough to see markings. Only one bird of the 95 was marked, or about 1% versus a predicted 65% (65% of 95 birds would be 62 birds). In short, East Point should have seen 62 of the 104 marked red-tailed hawks, yet only one was seen.

The reasons for this disparity is unknown, and we can only assume, based on the color markings, that the coastal plains flights are much larger than realized (and counted), due to the broad-front movement. It has long been known that on northwest winds, far more hawks pass Cape May on a broadfront than are recorded at the official count (Dunne and Clark, 1979). It is quite possible that many more hawks than realized (or counted) actually diluted the marked population prior to reaching East Point. It would then have to be assumed that large numbers were both: A) passing west on a broad-front inland from the hawk watches at either Cape May, East Point, or both, and B) crossing the bay at Cape May, and therefore never reaching East Point, with East Point totals then, in fact, being birds of a different origin (.e., not coming from Cape May).

Also, it is possible that some, or even many birds were removing the tail tag through preening, and this impact on the study remains unknown. Looking at rough-legged numbers, adult eagle percentages, and both accipiter and falcon age and sex ratios, however, we can assume that to an unknown degree, East Point is seeing a different flight than Cape May. Not just a flight comprised of birds leaving the Cape, it is augmented to an unknown degree by additional different raptors short-cutting Cape May itself or even the entire peninsula. Because it is assumed that adult birds will navigate by using landmarks (Drost, 1938), it is quite possible that they avoid the "dead-end" that is Cape May altogether, and make their turn to the west as far north as Dennis Creek or even the Tuckahoe River. These flight strategies might be expected by experienced adult birds Such a theory would explain (Kerlinger, 1989). the different composition of East Point flights, yet offers little in resolving the enigma of the lack of marked bird sightings.

SUMMARY AND RECOMMENDATIONS:

Because 1990 saw the lowest raptor migration totals in the 15 years of Cape May record keeping, it is recommended that this project be carried out again, including the color marking. The 1990 results did not include the large buteo flights seen in 1988 and 1989, either broad-wings or redtails, and it is quite possible that the magnitude of the Delaware Bay flights have yet to be realized. Three specific recommendations are offered:

- Hours of coverage should be increased. In 1990, East A) Point was covered for 308.5 hours for a figure of 29.3 hawks/hour. This just bested Cape May's hawks/hour figure of 29.1, where 29,630 birds were seen in 1,018 hours of coverage. This is not to assume that 1000+ hours at East Point would record a flight of Cape May magnitude, however, for indeed, East Point was covered at all peak hours and peak days in 1990. Nonetheless, coverage earlier in the morning would undoubtedly record many more sharp-shinned hawks (coverage beginning at dawn would allow for passerine study as well), and coverage later would probably increase merlin totals appreciably. Indeed, many hundreds, if not thousands, of additional birds would be recorded at East Point through additional coverage. Coverage should begin earlier in the season as well.
- B) An additional observer would greatly augment the count. A second observer could assist the watcher at the primary site on days of north, northeast and southerly winds, and cover an alternative site (inland) on broadfront flights -days of northwest, west and southwest winds.
- A close-site study should be carried out, particularly C) during the color marking project, in an attempt to track individuals and groups of birds around the Observers should be stationed at Reed's Beach, Landing, East Point, Turkey Point, Dix Wildlife Management Area (Cohansey River) and Bayside. coverage, centered on a cold front, could present an excellent picture of raptor-use and raptor movement around Delaware Bay.

D) An observation tower should be built at the primary watchsite (the "turn-out", one-half mile north of East Point light). This is an excellent observation site, and the best watch site compromise, yet vision is obscured to the east by a red cedar grove. An observation tower about 20 feet tall would allow an unobstructed view to the east and northeast and would probably substantially increase peregrine and merlin sightings. Additionally, such an observation deck, with proper publicity and environmental education, could be a major asset to the Heislerville Wildlife Management Area and help meet the State's goal of multiple uses for public lands. Fall, 1990 proved that the area is an excellent hawk watch site, and publicity would result in birders coming to the site in numbers.

In summary, a major autumn raptor flight has been discovered and documented flying west up the Delaware Bayshore rather than crossing the bay at Cape May. A concentration of this fight occurs at East Point, in Cumberland County, due to geography (birds following a wooded peninsula to southwest) and a minor water crossing (Maurice River Cove). In 1989, 1,788 raptors were recorded in 43.25 hours over 10 days of observation. In 1990, 9,042 raptors were recorded in 308.5 hours of observation over a 60 day period. Flights were compared and contrasted to Cape May. Travel times between Cape May and East Point as determined by color marking were about one day for a sharp-shinned hawk, four days for a red-tailed hawk, and five days for a leucistic This data presents a picture of the turkey vulture. importance of the Delaware estuary shoreline, both salt marshes and upland edges, to migratory raptors for roosting, resting and feeding. Prior to this study, virtually all knowledge of the return flight up the bay was anecdotal. From this quantitative study, we now have a clearer picture of the dynamics of coastal plain raptor migration through New Jersey and around the Delaware Bay.

ACKNOWLEDGMENTS:

The authors wish to thank the many people who assisted in this study. James Dowdell shared principal observer duties (with Sutton) and his abilities and insight brought much to the project, particularly in regards to passerine migrants and butterflies. Bobby Mitchell and Fred Mears covered the watch for four days each, and the continuity of the watch would have suffered greatly without their contributions. Zemaitis, Usewicz Louise and Joe Paul Guris, volunteered their efforts for one day, and we appreciate We would also like to thank the many their interest. birders from the Cape May Raptor Banding Project of the Cape May Bird Observatory who took the time and effort to colormark the birds ... we could not have done the study without particularly would like to acknowledge We individuals, Jane Galetto and Joe Usewicz, for their ongoing assistance and involvement with the project. Their extreme interest and presence at the watch, was most helpful and Bob Zappalorti, appreciated. We President thank Herpetological Associates, encouraging Inc. for participation far beyond contract requirements.

This project was made possible due to a contract from Citizens United to Protect the Maurice River and its Tributaries (P.O. Box 474, Millville, New Jersey 08332) to Herpetological Associates, Inc. Their financial support, coupled with a research grant from the Cape May Bird Observatory made possible by a generous donation from Jane and Bob Engel, enabled this project. The authors sincerely thank them.

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TABLE 1:

RAPTOR TOTALS 1979-88

MONTH: Historical records PROJECT: East Point, N. J.

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observations from Sutton Road, 6 miles east of East Point.

TABLE 2:

RAPTOR TOTALS 1989

PROJECT: East Point N. J. MONTH: Oct. - Dec.

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TABLE 3:

RAPTOR TOTALS 1989

PROJECT: East Point N. J. MONTH: Oct. + Dec.

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TABLE 4:

RAPTOR TOTALS 1990_

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RAPTOR TOTALS 1990

PROJECT: East Point, N.J. MONTH: October

TABLE 4 cont.:

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TABLE 4 cont.: PROJECT: East Point, N. J.

East Point, N.J. MONTH: December

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TABLE 5:

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TABLE 5 cont. :

RAPTOR TOTALS 1990

MONTH: October S Point

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RAPTOR TOTALS 19 90

1926 8327 24/192 18 2 13 379 6/NW 88.25/ TATOT HTWOM 300 64 8 8 63 <u>v</u> 8 3 23 2810 (12) |38 16 (4) /ENE 7 75 74 2 28 MONTH: November Cape May totak shown in red 23 3/2 5 8 7 74 9 ដ 24643 20938 1655 10023 (25) 23 1 4.5/www 4/N و 197 21 30.3 2 ત 8 14 TT 2 نېرو 3.9 19 346 n/9 34 38 7 ی و 18 17 5057 × 98 103/57 33/93 40 31 (24) (30) 16 12 13 5.5/ 6.5/m 6.5/m 6/5/ 1/5W 4 9 M 15 32 *8# 30 13 4815 31 18 M 239 7 ľv 7 14 9 331 7 2 34 7 ż 13 ż 4 474 == <u>70</u> ~ 4 3 Point 3.13 .21 <u>Λ</u>ας 7 5 0 0 5 11 East Jape 10 2325 14 13 28 LA 37 (0) 5.5/4 S/NW 4.25/ 19 30 43 7 11 10 5 976 62 33 12024 26 12 3 Comparison to: 56 21 15/2 PROJECT: 12 5 16 3 . $\overline{\mathcal{N}}$ ₩ 100 ∞ 00 ત 137 ~ 55.2 5 M 9 S (44) TABLE 5 cont. : 5434 11423 206 (134) 4 HOURS/WIND DIRECTION 6/5 3/5 25/5 21 22 108 22 1622 m 7 ч 3 7 ق ٦ --AM. SW-TAILED KITE TURKEY WULTURE COOPER'S HAWK ROUGHLEGGED SHARP-SHINNED GOLDEN EAGLE BLACK WULTURE BROAD-WINGED TOTAL HAWKS RED-SH. HAWK AM. KESTREL N. GOSHAWK SWAINSON'S RED-TAILED BALD EAGLE PEREGRINE N. HARRIER MISS. KITE MERLIN SPREY

RAPTOR TOTALS $19 \frac{Q0}{10}$

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TABLE 6:

Non-raptor Migrants Recorded, East Point, N.J., Fall 1990. Page 1A.

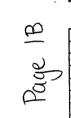
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	-				8	Black Vulture	_	9		12	-ī	Baird's Sandpiper	andpiber	1	+	20/10	Ţ
	+		1	F	٤	Turkey Vulture		9		11 /18	~	Pectoral	Pectoral Sandpiper	1	+	7	Ţ
SOOILY SHEET WATER	+	†	+		Č	Osorev	L	12		2/01		Purple Sandpiper	undpiper	7	-		Ţ
Manx Shearwater	+	1	+	F		Am Cwallow tailed Kite		-		F	Γ-	Dunlin			8	=	Ţ
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	-	1	+	1	z	A. Harrier	†	7			Т	Ruff			-	_	
Am. White Pelican	4		+	1	Š	Sharp-shinned Hawk	1	77.	1	+	Ť	Short-b	lled Dowitcher.		-	L	L
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	-	9	1,0	او	ě	Rough-legged Hawk		<u>v</u>		1(//4	_	Hed maraba	arope	7	+	\pm	+
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Ocean Aight. Heron	+	1	-	1/2	æ	Ring-necked Pheasant	F			11/18		Laughing Guil	g cuii	+	3	*	9
Sieck-Clowing Haron	+	1	-		ď	Buffed Grouse				81/11		Little Gull		+	1	1	+
	+	+	F	F		Mild Tuckey	L			-01/6	41/01401/6	Con. B	Com, Black-headed Guil	1	-	1	+
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Fulvous Whistling-Duck				+	_	Yellow Rail	+	1	1	,	Ï	Herring Gull	Gull	-	157		1.61
		#	=		φ.	Black Rail	-			77	Ī	Beland Gull	Sull.	-			-
	•	9	ŭ	2	0.	Clapper Rail	-	1	2	77	Ï	i a	Discharged Gull	-	E	1	-
Gr. White-fronted Goose					×	King Rail				-	I		-	+	1		╁
	2,5	Ş	01	53	-	Virginia Rail				-10/15	ĺ	Ciancous du	Ciaucous cuii	+	3	S	100
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		8	3		<u> </u>	Black - ballied Plover	3	1	ফ্	1	Ţ	Roseate Tern	Tern				
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Blue-winged Teal					_	Wilson's Plover	-				I	A satis	Term	$\frac{1}{2}$	t		\vdash
			\vdash			Semipalmated Plover				\$	I		Tern	\perp	S		120
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Com. Murre Thick-billed Murre Razorbill Black Guillemot Atlantic Purfin Rock Dove Mourning Dove Black-billed Cuckoo Vallow-billed Cuckoo Com. Barn-Owl IE, Screech-Owl Great Horned Owl Snowy Owl Barned Owl	Deared Owl Short-eared Owl Short-eared Owl N, Saw-whet Owl Com. Nighthawk Chuck-will's-widow Whip-poor-will Chimney Swift Ruby-throated Hum Belted Kingfisher Red-bellied Woodpec Yellow-bellied Sapsu Downy Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker Harry Woodpecker	Dive-sided Flycatcher E. Wood-Pewee Yellow-bellied Flycatc Acadian Flycatcher Alder Flycatcher Least Flycatcher E. Phoebe Great Crested Flycatch W. Kingbird E. Kingbird Horned Lark Purple Martin	N. Rough-winged Bank Swallow Giff Swallow Giff Swallow Barn Swallow Barn Swallow Bute Jay Am. Crow Com. Raven Com. Raven Back-capped Chi Carolina Chickade Boreal Chickade Futfed Titmouse Red-breasted Nut White-breasted Nu
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	N. Shrike				Ĺ			
	Loggerhead Shrike			Н	\vdash	L		
	European Starling			0001	0	12/		
	White-eyed Vireo				0	\square		
	Solitary Vireo		Г		,			
	Yellow-throated Vireo							
	Warbling Vireo							
	Philadelphia Vireo				Н			
	Red-eyed Vireo	_		_	4	135		
	unidentified Warbler (sp.)	744		9	10	1/		
	"Brewster's Warbler"			_				
	"Lawrence's Warbler"							
	.Golden-winged Warbler							
	Tennessee Warbler			Н	Н			
	Orange-crowned Warbler			_	$\frac{9}{2}$	//7	٦	
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	Yellow Warbler	٥		4	6	ন	٦	
	Chestnut-sided Warbler			\dashv	-		\neg	
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+	+	\Box			Scarlet Lanager	+	\rfloor	1	Т
Ť	-			\int	W. Tanager	+	1	+	:
7	-4	5			N. Cardinal	+	7	1	₹
	5	3	೨		Rose-breasted Grosbeak	+	\downarrow	+	
1	-				Black-headed Grosbeak	+	\bot	1	
2	Ş		*		Blue Grosbeak	+	1	\pm	- 12
_	_				Indigo Bunting	-1	\exists	1	थ
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	2	9	72		Rufous-sided Towhee	ខ្ព	38	1	প্র
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	-	9			Vellow-headed Blackbird	-	-	1	٦,
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_	+	_	\prod	\perp	Com. Grackle	+	3	\top	=]:
	-	4			Brown-headed Cowbird	+	3		<u>Ľ,</u>
	\dashv	_			Orchard Oriole	+	\bot	1	-
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1	4	Ì	च		Pine Grosbeak	+	١	1	1
×	3	9	ध्य		Purple Finch	3	3	1	⊇િ
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\top	+	1	I	\perp	Pine Siskin	+	ξ	†	:1:
\dagger	+	1	I	\perp	Franco Grebat	╪	₹°	\dagger	3
\dagger	+	\perp	I	\prod	House Sparrow	╬	∛ ⊆	\dagger	₹
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Black - throated Green Warbler

Blackburnian Warbler Yellow-throated Warbler

Yellow-rumped Warbler

Black-and-white Warbler

Bay-breasted Warbler

Prairie Warbler Palm Warbler

Pine Warbler

Blackpoll Warbler Cerulean Warbler Prothonotary Warbler Worm-eating Warbier Ovenbird

Am. Redstart

Black-throated Blue Warbler

Cape May Warbler



erthn

169 species recorded - 9/9 → 12/8

Non-migratory species are shown in this list as well as migratory. Some species récorded along East Point Road, between the primary and alternate weatch sites.

Totals not shown for resident or "local" species, (or migratory species hard to count due to lingering, etc.).

THE THE CONTROL OF THE PROPERTY OF THE PROPERT 1 1 5 000000 3. 000 50 50 50 50 000 00 3 1 1 Sept. 9 to Nov. 26, 1990 15 15 10 50 50 st 1 C 8 4 Fall Migration, 1990. - Daily Counts SHOT PROPOSIONES 35 species total 5 2 50 48 Jan 787 56 8607 * probable Compton's Tortoiseshell - 10/30 OCOLA & LONG-WINGED \$KIPPER* SKIPPERS (Hesperildae)
SILVER-SPOTTED SKIPPER, U

V LONG-TAILED SKIPPER, I

HOARY EDGE, c ZABULON SKIPPER, U
AAHONIS OF SAFRON SKIPPER, E
BROADWINGED SKIPPER, C
DION OF SEGGE SKIPPER, U
DION OF SEGGE SKIPPER, U SOOTWING, U.
SLEEPY DUSKWING, U.
JUNEMALS DUSKWING, CA.
HÖRGE'S DUSKWING, C.
ZARUCCO DUSKWING, C. CROSSLINE SKIPPER, C NORTHERN BROKEN DASH, C LITTLE GLASSYWING, U ORANGE-BARRED SULPHUR HARVESTER SOUTHERN CLOUDYWING A NORTHERN CLOUDYWING C BEARDGRASS SKIPPER MULBERRY WING NORTHERN GOLDEN OF HO SKIPPER, u
TAWNY-EDGED SKIPPER, u TWO-SPOTTED SKIPPER FIERY SKIPPER, C*
LEONARDUS SKIPPER, U
PECK'S OF YELLOWPATCH WILD INDIGO DUSKYWING, BRAZILIAN SKIPPER, r* SALT MARSH SKIPPER, c COLUMBINE DUSKYWING EDWARD'S HAIRSTREAK HICKORY HAIRSTREAK SILVER CRESCENTSPOT GOLDEN-BANDED SKIPP EASTERN CLOUDYWING EUROPEAN SKIPPER, u Buck Hoth - 10/24 1000+ Dragon Rics - 9/9 SACHEM, U-C"
DELAWARE SKIPPER, C
SOUTHERN GOLDEN OF DATE: DUSTED SKIPPER ROADSIDE SKIPPER CLOUDED SKIPPER* MILKWEED BUTTERFLIES (Denainae:Nymphalidae) (Species to look for)
GIANT SWALLOWTAIL
DOGFACE* SWARTHY SKIPPER, C. / LEAST SKIPPER, c DOTTED SKIPPER HYPOTHETICAL LIST BLACK DASH 2 L 1 2 2 L 2 2) 3 31 East Point, N. J OHECKERED WHITE 9 55 3 4 65 20 16 WIND IS WITE 17 10 10 2 1 1 1 10 2 3 4 ELICATE ORANGEID. 1 4 23 3 2 2 4 8 2 1 2 1 2 1 1 6 3 4 43 3 18 20 10 10 1 8 15 5 2 2 21111 181512 1 1 1 BUTTERFLIES SWALLOWTAILS (Papilionidae)
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TSP (Nymphalinae:Nymphalidae)

GLIF FRITLIARY, C*

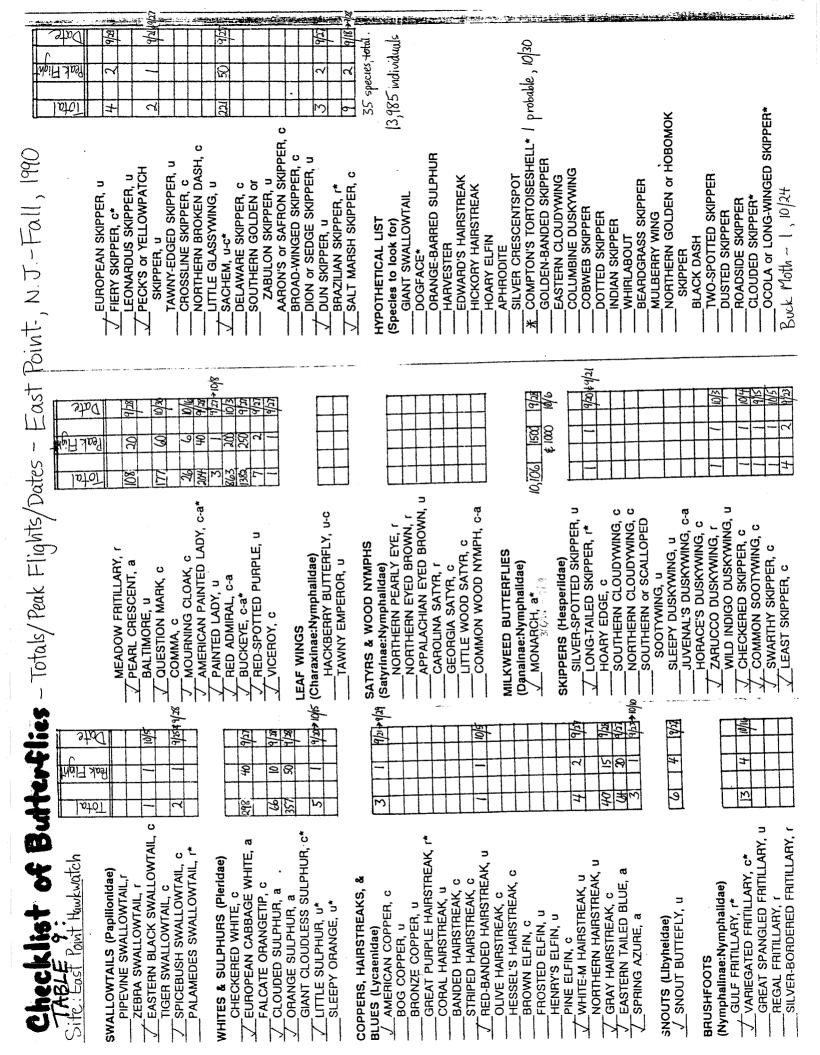
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NORTHERN EYED BROWN, I
APPALACHAN EYED BROWN, U BRONZE COPPER, u GREAT PURPLE HAIRSTREAK, r CORAL HAIRSTREAK, u 7 PED ADMINA, C.S.
7 RED ADMINA, C.S.
7 BUOGEYE, C.S.
7 RED-SPOTTED PURPLE, U.
7 VICERON, C. (Charaktae:Nymphalidae)
HACGBERRY BUTTERELY, u.g.
TAWMY EMPEROR, u MOURNING CLOAK, C. AMERICAN PAINTED LADY, C.B. BANDED HARSTREAK C STRIPED HARSTREAK C RED-BANDED HAIRSTREAK, U OLIVE HAIRSTREAK, C WHITES & SULPHURS (Pleridae) DATE NORTHERN HAIRSTREAK, U GRAY HAIRSTREAK, C EASTERN TALED BLUE, B CHECKLIST OF TABLE 8: HESSEL'S HAIRSTREAK, C PINE ELFIN, C WHITE-M HAIRSTREAK, U COPPERS, HAIRSTREAKS, & CAROLINA SATYR, r GECAGIA SATYR, c LITT E WOOD SATYR, c MEADOW ERITILLARY, C. SATYRS & WOOD NYMPHS BLUES (Lycaenidae)

V AMERICAN COPPER, c
BOG COPPER, u FROSTED ELFIN, u HENRY'S ELFIN, u SNOUTS (LIbyheldae)

SNOUT BUTTEFLY, u PEARL CHESCENT, B. BALTMORE, U OUESTION MARK C SPRING AZURE, B BROWN ELFIN, c BRUSHFOOTS



RECORDS

If you see a given species in one hour but not in other hours, enter "0" in any hour when none of that species was seen. If you don't see a particular species all day, leave all the hours

BLANK for that species.

doubts that they are migrants, mark the appropriate COMMENT box "1" and If you do not keep records of certain raptor species you observe because of explain on the back. Large Numbers: Early and late hourly columns provide space for only 3 digits; others allow for 4 and the TOTALS column for 5. Numbers too long for the space must be entered on the back of the form or on an attached sheet-with written details. For such hours or totals leave the space on the form BLANK and write "1" in the COMMENT box for the species.

numbers, altitude and behavior. Species that are rare or endangered in your Unusual Sightings: Please note the passage of all unusually large groups of raptors, with information about time of appearance and disappearance, area should also be specially noted, with passage times and as much other Information as possible included in COMMENTS.

SUPPLIES AND EQUIPMENT

lookouts, for finding the latitude and longitude of an existing site, and for establishing precise distances by which to judge vis-Topographic maps are very useful for locating possible new

ibility from a lookout. A kilometer scale is printed on such maps, too.

gauges, obtainable through scientific instrument outlets, are useful, too. So is a Celsius thermometer and a compass. Don't forget your watch. And something to Other equipment to take along to your lookout might include a strip of ribbon. Fluttering in the breeze it makes a fine indicator of wind direction. Small windwrite with.

Many observers write all their original records in field notebooks and transfer the data to report forms once they get home. This allows them to be as detailed in their notes as they want to be, and it leaves them with permanent personal records. Carry a notebook. That's usually the easiest way to keep your notes for the day.

Regional editors can provide report forms and instruction folders as well as station-description cards.

GOOD HAWKING!

Hawk Migration Association of North America P.Ö. Box 3482, Rivermont Station Lynchburg, VA 24503



of North America

Hawk Migration Association

INSTRUCTIONS FOR DAILY REPORT FORMS

iation of North America (HMANA) to all hawkwatchers who ask for them. The style of the report form has changed rapidly since 1974. We began with a design appropriate for casual record-keeping, and the forms were to be stored for researchers who however, HMANA hoped to link up with computer technology, to quickly advance knowledge of bird-of-prey migration. Basic changes are suggested to make the form "computer-compatible" and to insure that essential data conformed to standards adopted by the world scientific community-metric distances and Standard daily lookout report forms are supplied by the Hawk Migration Assocwould get their data by going through the sheets one by one. From the beginning, Celsius temperatures.

The resulting form may take some getting used to, but HMANA agreed to the changes because our data thereby become more accessible to science and consequent. It more beneficial to the welfare of the birds of prey.

Design and details of these forms and instructions are the combined product of many contributors, who worked on it for more than a year. The initial printing was done with the aid of a grant from the Raptor Information Center of the National

Wildlife Federation.

INSTRUCTIONS GENERAL

Use one data sheet for each day's observations at any given site (see LOCATION on next page). Be aware that the keypuncher will record only what you record on the form and

will not assume or guess at what you may have meant. So if you treat the form casually, your day's observations may have less value than they deserve.

Don't try to supply data that you're not sure about, but do record the rest. We raptors, the type of equipment and the count methods you are using - anything you think is noteworthy. Enter a "1" in the COMMENT box to the right of the weather section or, if a particular raptor species is involved, to the right of the vertical TOTALS column, opposite the appropriate species designation; write your comments on the back of the form or on a sheet you attach to the form. Fill in the form as completely as you can. Even simple daily species totals are useful, but the more other data you record the more valuable your observations are. ing hour, interesting bird behavior, the passage of birds other than diurnal also welcome additional information—key weather changes that occur in a record-

All written numbers should be right-justified: a single digit number goes in the rightmost column; a double-digit number in the rightmost 2 columns, etc.

Disregard the numbers in small print on the form; they are guides for the keypunchers only.

Date (8 digits): Using all the spaces, record day and month and year. Sample: 01091979 for 1 September 1979. **LINE BY LINE**

out doesn't have such a number or if you don't know what the number is, ignore the boxes and simply write the name of the site, locating it in terms of map lookouts are established, they will be assigned location-code numbers, based on station-description cards available from HMANA regional editors. If your look-Location (blank for location name, followed by 4-digit location code): As coordinates or in relation to a town, a lake, a road intersection, or the like. If you move your lookout operation during any one day, or if your group splits a time, use a separate report form for each post. The rule of thumb is, fill out a new form if by moving or dividing you have affected your count. The separate its operation to cover the passage of hawks from more than one vantage point at forms will help provide information about the width of flight paths and about the effects of time of day and changing weather conditions on flight paths. Banding Station (1 digit): If the count is made while operating a ragtor-trappingand-banding station, enter "1."

to end with the initials-e.g., FEATHERSTONHAGW.) In the address space G. W. Featherstonhaugh-print only so much of the last name as will allow you Station Leader (15 spaces and separate address box): In the 15 spaces print in capital letters last name and initials. (If that totals more than 15 letters—e.g., write your name and address, with ZIP. Maximum Visibility (3 digits): This indicates atmospheric clarity. Judge from if it is less than 1 km enter 0 in the first box, the decimal point in the second, your longest view and enter distance in kilometers (conversion table on next page) the tenths of a km in the last. Treat other fractions similarly. Sample: [5], [5] Air Temperature (2 digits): Record in Celsius (conversion table on next page). Below 0°C, use a minus sign in the first space; below -9°C, mark the COMMENT box "1" and note the hour and temperature on the back of the sheet.

scribing the predominant condition. If you feel that you can't do justice that way to a given set of conditions, leave the space blank for the hour, mark the COM-Sky Code (1 digit): Using the table on the next page, enter the number best de-MENT box "1," and elaborate on the back of the form.

Wind Speed Code (1 digit): Describe wind speed by the table on the next page.

Wind From (3 spaces): Enter direction from which the wind is blowing. Sample: NNW. Variable wind: VAR. No wind, enter "0."

Altitude of Flight Code (1 digit): Using the table on the next page, give the code number of representing the apparent height of most passing birds of prey when they pass the count point.

moving when they are directly above or to the side of the count point. In a Flight Direction (3 spaces): Record the direction toward which the birds are strong wind, this may be different from the direction they are facing in flight. If different birds follow markedly different courses, write "1" in the appropriate comment boxes and note the variations on the back of the form. of Observers (2 digits): Include only observers who are actively engaged in helping take the count. Number

METRIC CONVERSIONS

WIND STEEDS

YARDS/MILES / KM	MILES,	X X	Эo	၁	0	 Less than 1 km/h; calm; smoke rises vertine cally
25		0.0	0	-18	-	1-5 km/h (1-3 m/h); smoke drift shows
9		0.1	9	-12		wind direction
300		0.3	20	1-	7	6-11 km/h (4-7 m/h); leaves rustle, wind
	0.25	0.4	35	Ö	c	15 tell on lace 15.10 km/s (8.30 c./h): Jaavas valid
	0.5	9.0	40	4	ר	twits in constant morion: light flag ex-
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. 10%		1.6	8	16	4	20-28 km/h (13-18 m/h); raises duar,
	~	3.2	20	71		leaves, loose paper; small branches in
	m	4.8	8	27		niotion
- Asset	4	6.4	8	32	သ	29-38 km/h (19-24 n./h); small trees in
in the second	လ	89	100	æ	(leaf sway
1.2:	10	16	110	43	9	39-45 km/h (25-31 m/h); larger branches
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To convert miles to kilometers, multi-	convert n	niles to h	Kilometers	i muiti-	œ	62-74 km/h (39.40 m/h); twigs, small
ply by 1.61 To convert of to °C, subtract 32,	1 convert	₽ to	°C, subtr	act 32,		branches broken off trees; walking general-
multiply E	, S, a	vide by	oi o		O	ry impeded Greater than 75 km/n (47 m/h)
A CONTRACTOR OF THE PROPERTY O	are the children as	Section and Section	* * *			

ALTITUDE OF FLIGHT

o – c	 D. Below eye level Eye level up to about 30 meters (160 feet) overhead Birds seen easily with unaded eye (explisees not 	(100 feet) overhead
	Contract of side)	eye teyegidəses nor

At limit of unaided vision Beyond limit of unaided m 4

counted as aids)

- eye but visible with binoculars - to 10X
- At limit of binoculars Beyond limit of binoculars 10X or less, but can (Mark "1" in COMMEINT box and note detect with binoculars or telescope of greater magnification) power 9 2
 - No predominant height

SKY CODE

- Mostly cloudy; 51-75% cover Partly cloudy; 16-50% cover Clear; 0-15% cloud cover er) overhead
- Wind-driven sand, dult, snow Overcast; 76-100% cover ol of
- Fog or haze
- Drizzle 9
- Rain
- Sriow
- Thunderstorm, with or without precipitation ထာ တ

Minutes of Observation per Hour (2 digits): This permits you to note the precise time covered during the hours you arrive and depart a lookout and to indicate other partially-covered hours.

CONDITIONS AS THEY ARE AT THE START OF THE HOUR. It a condition PLEASE PROVIDE THE WEATHER AND OBSERVATION INFOHMATION remains the same one hour to the next, draw a line from the recorded data through the hours in which no change occurred; do not use ditto marks or dashes. If any information can't be provided for a particular hour, or if the lookout is uncovered AT THE TOP OF THE FORM FOR EACH HOUR YOU OBSERVE. REPORT or any whole hour, leave the pertinent spaces blank.

The Hawk Migration Association of North America

See instruction sheet for weather codes and metric equivalents. If code instructions or any data are unavailable or insufficient lomit that information. Send filled-out form to the appropriate HMANA regional editor or to HMANA PO Box 3482 Rivermont Station. Lynchburg, VA 24503.

TIME (Standard) 5. 6 5. 7 7.8 8.9 9.10 10.11 11.12 12.1 1.2 2.3 3.4 4.5 5.6 6.7 7.8 Address AMAX VISIBILITY # 1 10.1 1 11.12 12.1 1.2 2.3 3.4 4.5 5.6 6.7 7.8 Address AMAT. FILISHT OIR. # 1 10.1 1 11.12 12.1 1.2 2.3 3.4 4.5 5.6 6.7 7.8 # 10.1 11.12 12.1 1.2 2.3 3.4 4.5 5.6 6.7 7.8 # 10.1 11.12 12.1 1.2 1.2 1.2 1.2 1.2 1.2 1.	Day Month Year	LOCATION	-NOI.					I Па	OC. CODE 10	BAN	BAND STA. 14		LEADER	R ₁₅			
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Appendix 2.

Chris Schultz, Director, Cape May Raptor Banding Project FROM:

Clay Sutton, Biologist, Herpetological Associates, Inc. TO:

Paul Kerlinger, Director, Cape May Bird Observatory

Color Marking Raptors during 1990 Autumn Migration SUBJECT:

20 November 1990 DATE:

PURPOSE

The purpose of this color marking project was to test the historic speculation that the Cape May Point raptor flights go north from Cape May along the Delaware Bay shore and cross into Delaware near the mouth of the Delaware River, and to assess the importance of the bay shore to migratory raptors. Mr. Clay Sutton of Herpetological Associates, Inc. conducted observations at East Point, NJ. Mr. Sutton recorded each color marked raptor seen, noting species, shape of marker and location of marker on the tail. The timing and distance traveled can then be calculated based on the marking schedule. The relative percentages of Cape May Point birds occurring at East Point can be calculated based on the sample marked by the CMRBP.

METHODS

The CMRBP used three inch pieces of black vinyl tape folded in half so that they projected approximately one inch beyond the end of the tail. Based on the results of similar color marking conducted by the CMRBP during the autumn 1980 season we used only square and pointed shapes, black color, and only central and outer rectrices were marked. Marking was conducted only on HY female American Kestrels, HY female Sharp-shinned Hawks and HY Red-tailed Hawks. On succeeding days either rectrix L1, L6 or R6 was marked. By randomly selecting shapes and rectrices, six different marking combinations were achieved.

MARKING SCHEDULE

We began marking Sharp-shinned Hawks and American Kestrels on 29 September and conducted two repetitions of the six combinations, finishing the marking on 10 October. Beginning on 8 November we marked Red-tailed Hawks for one repetition of the six combinations. Marking was conducted by all cooperating banders operating stations for the Cape May Raptor Banding Project. 'The following list is the schedule of marker shapes and locations used by the CMRBP.

Date	Shape	Location on Tail
9/29 & 11/8	Square	L6
9/30 & 11/9	Point	L1
10/1 & 11/11	Square	R6 '
10/2 & 11/12	Point	R6
10/3 & 11/13	Point	L 6
10/4 & 11/14	Square	L1
10/5	Square	L6
10/6	Point	L1
10/7	Square	R6
10/8	Point	R6
10/9	Point	L6
10/10	Square	L1

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RESULTS

The Cape May Raptor Banding Project marked a total of 219 Sharp-shinned Hawks, 104 Red-tailed Hawks and 37 American Kestrels. On 2 October NJ Fish, Game and Wildlife employees sighted a Sharpshinned Hawk at the Dennis Creek Wildlife Management Area wearing a square marker on the right side of the tail. On 19 November Sutton observed a Red-tailed Hawk wearing a square marker on the L1 tail feather. To my knowledge these are the only reported sightings of marked birds outside of Cape May Point. Marked birds were sighted regularly from the Cape May Point Hawkwatch as well as the CMRBP banding stations up to six days after original marking. Marked birds were recaptured at the banding stations up to three days after marking and all tags appeared to be holding well and still firmly attached with no evidence of damage from preening behaviors. Study results and data analysis will be submitted for publication in an appropriate scientific journal with Mr. Sutton, Dr. Kerlinger and myself as co-authors.

1

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	105331787	НУ	F	09/28/90	NN	SC	MARKED L 6 SQUARE
SSHA	103396001	НУ	F	09/29/90	E	BO	MARKED L 6 SQUARE
SSHA	105331788	НУ	F	09/29/90	NN	SC	MARKED L 6 SQUARE
SSHA	105331789	НХ	F	09/29/90	·NN	SC	MARKED L 6 SQUARE
SSHA	105331790	HY	F	09/29/90	NN	SC	MARKED L 6 SQUARE
SSHA	105331791	HĀ	F	09/29/90	NN	SC	MARKED L 6 SQUARE
SSHA	105331792	НУ	F	09/29/90	NN	sc	MARKED L 6 SQUARE
SSHA	105331793	НУ	F	09/29/90	NN	SC	MARKED L 6 SQUARE
SSHA	105331794	НУ	F	09/29/90	NN	SC	MARKED L 6 SQUARE
SSHA	137358025	НУ	F	09/29/90	N	CE	MARKED L 6 SQUARE
SSHA	137358026	HY	F	09/29/90	N	CE	MARKED L 6 SQUARE
SSHA	105331795	HY	F	09/30/90	NN	SC	MARKED L 1 POINT
SSHA	105331796	НУ	F	09/30/90	NN	SC	MARKED L 1 POINT
SSHA	105331797	НҮ	F	09/30/90	NN (SC	MARKED L 1 POINT
SSHA	105331798	HY	F	09/30/90) NN	SC	MARKED L 1 POINT
SSHA	123340418	HY	F,	09/30/90	S	EN	MARKED L 1 POINT
SSHA	123340419	НУ	F	09/30/90	S	EN	MARKED L 1 POINT
SSHA	103396005	5 НУ	F	10/01/90	E	во	MARKED R 6 SQUARE
SSHA	103396006	5 НУ	F	10/01/90	E	BO	MARKED R 6 SQUARE
SSHA	103396007	7 HY	F	10/01/9) E	BO	MARKED R 6 SQUARE
SSHA	103396009	Э НҮ	F	10/01/9) E	30	MARKED R 6 SQUARE
SSHA	10339601	о ну	F	10/01/9	O E	BO	MARKED R 6 SQUARE
SSHA	10533179	э нү	F	10/01/9	O NN	SC	MARKED R 6 SQUARE
SSHA	10533180	0 HY	F	10/01/9	O NN	SC	MARKED R 6 SQUARE
SSHA	10533193	4 HY	F	10/01/9	O NN	SC	MARKED R 6 SQUARE

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	105331935	HY	F	10/01/90	NN	SC	MARKED R 6 POINT
SSHA	105331936	HY	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331937	НУ	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331938	HY	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331939	НУ	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331940	HY	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331942	HY	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331943	HY	F	10/01/90	NN	SC	MARKED R 6 SQUARE
SSHA	105331944	HY	F	10/01/90	NN	SC	MARK R 6 SQUARE
SSHA	123340420	HY	F	10/01/90	S	EN	MARKED R 6 SQUARE
SSHA	123340421	HY	F	10/01/90	S	EN	MARKED R 6 SQUARE
SSHA	123340422	НУ	F	10/01/90	S	EN	MARKED R 6 SQUARE
SSHA	123340423	НУ	F	10/01/90	S	EN	MARKED R 6 SQUARE
SSHA	123340424	HY	F	10/01/90) S	EN	MARKED R 6 SQUARE
SSHA	123340425	HY	F	10/01/90	S	EN	MARKED R 6 SQUARE
SSHA	125391904	НҮ	F	10/01/90	N	or	MARKED R 6 SQUARE
SSHA	125391905	НҮ	F	10/01/90	N	OT	MARKED R 6 SQUARE, RETRAPPED NN STA 0950 TODAY
SSHA	125391906	5 НҮ	F	10/01/9	N C	OT	MARKED R 6 SQUARE
SSHA	149392706	5 НҮ	F	10/01/9) E	BO	MARIÇED R 6 SQUARE
SSHA	10339601:	l HY	F	10/02/9	O E	BO	MARKED R 6 SQUARE
SSHA	10339601	7 HY	F	10/02/9	0 E	BO	MARKED R 6 POINT
SSHA	10339601	в ну	F	10/02/9	O E	BO	MARKED R 6 POINT
SSHA	10339601	э нү	F	10/02/9	O E	30	MARKED R 6 POINT
SSHA	10339602	1 HY	F	10/02/9	OE	BO	MARKED R 6 POINT, RETRAPPED N STA 1236 TODAY

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	103396022	2 HY	F	10/02/90	E	во	MARKED R 6 POINT
SSHA	103396024	HY	F	10/02/90	Ē	BO	MARKED R 6 POINT
SSHA	105331945	5 HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	105331946	5 HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	105331941	7 HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533194	в ну	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533194	э нү	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA .	10533195	о ну	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533195	1 HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533195	2 HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533195	з ну	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	10533195	4 HY	F	10/02/90) NN	SC	MARKED R 6 POINT
SSHA	10533195	5 HY	F	10/02/90	NN (SC	MARKED R 6 POINT
SSHA	10533195	6 НҮ	F	10/02/90) NN	SC	MARKED R 6 POINT
SSHA	10533195	7 HY	F	10/02/90	NN C	SC	MARKED R 6 POINT
SSHA	10533195	8 HY	F	10/02/90	NN C	SC	MARKED R 6 POINT, R P 6,7,8,9 B 1/4
SSHA	10533195	9 HY	F	10/02/90	NN C	SC	MARKED R 6 POINT
SSHA	10533196	о ну	F	10/02/90	NN C	SC	MARKED R 6 POINT
SSHA	10533196	51 HY	F	10/02/9	NN C	SC	MARKED R 6 POINT
SSHA	10533196	52 HY	F	10/02/9	O NN	SC	MARKED R 6 POINT, BAND
			É				OVERLAPPED & RELEASED ACCIDENTALLY
SSHA	10533196	53 HZ	F	10/02/9	O NN	SC	MARKED R 6 POINT
SSHA	1053319	54 HY	? F	10/02/9	O NN	SC	MARKED R 6 POINT, KEEL SHARP
SSHA	1053319	65 H	? F	10/02/9	O NN	SC	MARKED R 6 POINT

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TAIL MOUNTED MARKERS APPLIED BY CAPE MAY RAPTOR BANDING PROJECT AUTUMN 1990

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS '
SSHA	105331966	HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	105331967	HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	105331968	НУ	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	105331969	HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	123340426	НХ	F	10/02/90	s	EN	MARKED R 6 POINT
SSHA	123340428	HY	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340429	HY	F	10/02/90	, S	EN	MARKED R 6 POINT
SSHA	123340430	HY	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340431	НХ	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340432	НУ	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340433	НУ	F	10/02/90	s	EN	MARKED R 6 POINT
SSHA	123340434	НХ	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340435	НУ	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340436	НУ	F	10/02/90	S	EN	MARKED R 6 POINT
SSHA	123340437	НУ	F	10/02/90	s	EN	MARKED R 6 POINT
SSHA	123340438	HY	F	10/02/90	s	EN	MARKED R 6 POINT
SSHA	123340439	НХ	F	10/02/90	S	EN	MARKED R & POINT
SSHA	125391907	HY	F	10/02/90	ИС	OT	MARKED R 6 POINT
SSHA	125391908	НҮ	F	10/02/9	N C	OT	MARKED R 6 POINT
SSHA	125391910	HY	F	10/02/9	ИС	OT	MARKED R 6 POINT
SSHA	125391911	. НУ	F	10/02/9	ОИ	TO	MARKED R 6 POINT
SSHA	125391912	2 HY	F	10/02/9	ои	OT	MARKED R 6 POINT
SSHA	125391913	з ну	F	10/02/9	O N	OT	MARKED R 6 POINT
SSHA	125391914	1 HY	F	10/02/9	O N	OT	MARKED R 6 POINT
SSHA	125391915	5 HY	F	10/02/9	O N	OT	MARKED R 6 POINT

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SPECIES	BAND # 1	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	125391916	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391917	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391918	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391919	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391920	HY	F	10/02/90	N	ot	MARKED R 6 POINT
SSHA	125391921	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391922	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391923	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391924	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	125391925	HY	F	10/02/90	N	OT	MARKED R 6 POINT
SSHA	143350287	HY	F	10/02/90	NN	SC	MARKED R 6 POINT
SSHA	149392730	HY	F	10/02/90	E	BO	MARKED R 6 POINT
SSHA	103396028	НУ	F	10/03/90	E	BO	MARKED L 6 POINT
SSHA	105331970	НУ	F	10/03/90	NN	SC	MARKED L 6 POINT
SSHA	105331971	НУ	F	10/03/90	NN (SC	MARKED L 6 POINT
SSHA	105331972	НУ	F	10/03/90) NN	SC	MARKED L 6 POINT
SSHA	105331973	НА	F	10/03/90) NN	SC	MARKED L 6 POINT
SSHA	105331974	HY	F	10/03/90	NN C	SC	MARKED L 6 POINT
SSHA	123340441	HY	F	10/03/90	S	EN	MARKED L 6 POINT
SSHA	123340442	HY	F	10/03/90	o s	EN	MARKED L 6 POINT
SSHA	123340443	HY	F	10/03/90	o s	EN	MARKED L 6 POINT
SSHA	123340444	HY	F	10/03/9	0 8	EN	MARKED L 6 POINT
SSHA	125391927	HY	F	10/03/9	ОИ	OT	MARKED L 6 POINT
SSHA	125391928	НҮ	F	10/03/9	o N	OT	MARKED L 6 POINT
SSHA	125391929	HY	F	10/03/9	O N	OT	MARKED L 6 POINT

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SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS			•
SSHA	125391930	НА	F	10/03/90	N	OT	MARKED	L	6	POINT
SSHA	125391931	HY	F	10/03/90	N	OT	MARKED	L	6	POINT
SSHA	125391932	НУ	F	10/03/90	N	OT	MARKED	L	6	POINT
SSHA	105331975	HY	F	10/04/90	NN	SC	MARKED	L	1	SQUARE
SSHA	105331976	HY	F	10/04/90	NN	SC	MARKED	L	1	SQUARE
SSHA	123340446	НУ	F	10/04/90	N	EN	MARKED	L	1	SQUARE
SSHA	123340447	НХ	F	10/04/90	N	EN	MARKED	L	1	SQUARE
SSHA	123340448	HY	F	10/04/90	N	EN	MARKED	L	1	SQUARE
SSHA	123340449	НА	F	10/04/90	N	EN	MARKED	L	1	SQUARE
SSHA	125391933	HY	F	10/04/90	N	OT	MARKED	L	1	SQUARE
SSHA	103396030	НУ	F	10/05/90	E	BO	MARKED	L	6	SQUARE
SSHA	105331977	HY	F	10/05/90	NN	SC	MARKED	L	6	SQUARE
SSHA	105331978	НУ	F	10/05/9¢	NN	SC	MARKED	L	8	SQUARE
SSHA	105331980	НХ	F	10/05/90	NN	SC	MARKED	L	6	SQUARE
SSHA	105331981	НХ	F	10/05/90) NN	SC	MARKED	L	6	SQUARE
SSHA	105331982	HY	F	10/05/90	NN C	SC	MARKED	L	ε	SQUARE
SSHA	123340450	НУ	F	10/05/90	N	EN	MARKED	L	6	SQUARE
SSHA	123340451	НУ	F	10/05/90	N	EN	MARKED	L	6	SQUARE
SSHA	125391934	НУ	F	10/05/90	N	OT	MARKED	L	6	SQUARE
SSHA	125391935	НҮ	F	10/05/90	N C	OT	MARKED	L	6	SQUARE
SSHA	125391936	НУ	F	10/05/90	N C	OT	MARKEL	L	6	SQUARE
SSHA	103396031	НУ	F	10/06/9	O E	BO	MARKEL) L	. 1	POINT
SSHA	103596032	HY	F	10/06/9	O E	30	MARKEL) L	. 1	POINT
SSHA	105331984	HY	F	10/06/9	O NN	SC	MARKEI) I	. 1	POINT
SSHA	105331986	з ну	F	10/06/9	O NN	SC	MARKEI) L	. 1	POINT

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SPECIES	BAND # A	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	105331987 F	HY	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331989 I		F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331990 I	HY	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331991 1	ΗY	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331992	HY	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331993	HY	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	105331994	HY	F	10/06/90	NN.	SC	MARKED L 1 POINT
SS!!A	105378008	HY	F	10/06/90	s	CE	MARKED L 1 POINT
SSHA	105378009	HY	F	10/06/90	S.	CE	MARKED L 1 POINT
SSHA	123340452	HY	F	10/06/90	N	EN	MARKED L 1 POINT
SSHA	123340453	HY	F	10/06/90	N	EN	MARKED L 1 POINT
SSHA	123340454	HY	F	10/06/90	N	EN	MARKED L 1 POINT
SSHA	125391938	HY	F	10/06/90	N	OT	MARKED L 1 POINT
SSHA	125391939	HY	F	10/06/90	N	OT	MARKED L 1 POINT
SSHA	149331407	НУ	F	10/06/90	NN	SC	MARKED L 1 POINT
SSHA	103396035	НУ	F	10/07/90	E	BO	MARKED R 6 SQUARE
SSHA	103396036	НУ	F	10/07/90	E	во	MARKED R 6 SQUARE
SSHA	105331995	НУ	F	10/07/90	NN C	SC	MARKED R 6 SQUARE
SSHA	105331996	НУ	F	10/07/90	NN C	SC	MARKED R 6 SQUARE
SSHA	105331997	НУ	F	10/07/90	NN C	SC	MARKED R 6 SQUARE
SSHA	105331998	HY	F	10/07/90	NN C	SC	MARKED R 6 SQUARE
SSHA	105331999	HY	ř	10/07/9	NN C	SC	MARKED R 6 SQUARE
SSHA	116335248	HY	f	10/07/9	o s	FO	MARKED R 6 SQUARE
SSHA	116335249	HY	F	10/07/9	0 8	FO	MARKED R 6 SQUARE
SSHA	116335250	HY	F	10/07/9	o s	FO	MARKED R 6 SQUARE

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	116335251	HY	F	10/07/90	s	FO	MARKED R 6 SQUARE
SSHA	116335252	HY	F	10/07/90	S	FO	MARKED R 6 SQUARE
SSHA	116335253	HY	F	10/07/90	S	FO	MARKED R 6 SQUARE
SSHA	116335254	НУ	F	10/07/90	S	FO	MARKED R 6 SQUARE, REMOVED OLD BONE PROTRUDING FROM CROP
SSHA	105378103	НУ	F	10/08/90	NN	SC	MARKED R 6 POINT, BAND USED OUT OF SEQUENCE
SSHA	105378104	НУ	F	10/08/90	NN	SC	MARKED R 6 POINT, BAND USED OUT OF SEQUENCE
SSHA	105378105	НХ	F	10/08/90	NN	SC	MARKED R 6 POINT
SSHA	105378106	HY	F	10/08/90	NN	SC	MARKED R 6 POINT
SSHA	116335255	НҮ	F	10/08/90	S	FO	MARKED R 6 POINT
SSHA	116335256	НУ	F	10/08/90	s	FO	MARKED R 6 POINT
SSHA	116335257	HY	F	10/08/90	s	FO	MARKED R 6 POINT
SSHA	116335258	н	F	10/08/90	s	FO	MARKED R 6 POINT
SSHA	143349015	НҮ	F	10/08/90	N	OR	MARKED
SSHA	143349016	HY	F	10/08/90	N	OR	MARKED
SSHA	143349017	HY	F	10/08/90	N	OR	MARKED
SSHA	143349018	з ну	F	10/08/90	И	OR	MARKED
SSHA	143349019	Э НҮ	F	10/08/90	N	OR	MARKED
SSHA	103369038	з ну	Ė	10/09/90	E	BO	MARKED L 6 POINT
SSHA	105378108	з ну	F	10/09/90	NN C	SC	MARKED L 6 POINT
SSHA	105378109	э ну	F	10/09/90	O NN	SC	MARKED L 6 POINT
SSHA	105378110	о ну	F	10/09/9	O NN	SC	MARKED L 6 POINT
SSHA	10537811	3 HY	F	10/09/9	O NN	SC	MARKED L 6 POINT
SSHA	10537811	4 HY	F	10/09/9	O NN	SC	MARKED L 6 POINT

SPECIES	BAND#	AGE	SEX	DATE	STA.	BNDR	REMARKS
SSHA	116335259	НУ	F	10/09/90	s	FO	MARKED L 6 POINT
SSHA	116335260	HY	F	10/09/90	·S	FO	MARKED L 6 POINT
SSHA	116335261	НУ	F	10/09/90	s	FO	MARKED L 6 POINT
SSHA	143349020	HY	F	10/09/90	N	OR	MARKED
SSHA	143349021	ну	F	10/09/90	N	OR	MARKED L 6 POINT
SSHA	87236784	НУ	M	10/10/90	HV	SW	MARKED L 6 POINT
SSHA	87236785	НХ	M	10/10/90	HV	SW	MARKED L 6 POINT
SSHA	103396039	НУ	F	10/10/90	E	ВО	MARKED L 1 SQUARE
SSHA	105378115	HY	F	10/10/90	NN	SC	MARKED L 1 SQUARE
SSHA	105378116	НУ	F	10/10/90	NN	SC	MARKED L 1 SQUARE
SSHA	105378117	HY	F	10/10/90	NN	SC	MARKED L 1 SQUARE
SSHA	105378118	HY	F	10/10/90	NN	SC	MARKED L 1 SQUARE
SSHA	116335263	HY	F	10/10/90	S	FO	MARKED L 1 SQUARE
SSHA	116335264	НҮ	F	10/10/90	s	FO	MARKED L 1 SQUARE
SSHA	116335265	HY	F	10/10/90	S	FO	MARKED L 1 SQUARE
SSHA	116335266	HY	F	10/10/90	S	FO	MARKED L 1 SQUARE
SSHA	132349320	YH	F	10/10/90	N	OR	MARKED L 1 SQUARE
SSHA	143349022	2 HY	F	10/10/90	N	OR	MARKED
SSHA	143349023	з ну	F	10/10/90	N	OR	MARKED
SSHA	143349024	1 HY	F	10/10/90	O N	OR	MARKED
SSHA	14334902	5 HY	F	10/10/90	ис	OR	MARKED
SSHA	14334902	з ну	F	10/10/9	ОИС	OR	MARKED
SSHA	144358310	ун с	F	10/10/9	VH C	SW	MARKED L 6 POINT
SSHA	14435831	1 HY	F	10/10/9	O HV	SC	MARKED L 1 SQUARE
RTHA	13873691	O HY	U	09/08/9	OE	BO	RETRAPPED NN STA 1040 11/09/90, WGT 970, MARKED L 1 POINT

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SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
RTHA	87724035	НУ	U	11/08/90	ИV	CE	MARKED L 6 SQUARE
RTHA	87724036	НУ	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724037	НУ	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724038	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724039	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724040	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724041	НУ	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724042	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	87724043	НУ	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	98779104	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	98779105	НУ	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	98779106	HY	U	11/08/90	HV	CE	MARKED L 6 SQUARE
RTHA	98797374	НХ	U	11/08/90	NN (SC	MARKED L 6 SQUARE
RTHA	98797375	НХ	U	11/08/90	NN C	SC	MARKED L 6 SQUARE
RTHA	98797376	НУ	U	11/08/90	NN C	SC	MARKED L 6 SQUARE
RTHA	98797377	HY	ָ <mark></mark> บ	11/08/90	NN C	SC	MARKED L 6 SQUARE
RTHA	120738662		U	11/08/90	NN C	SC	MARKED L 6 SQUARE
RTHA	120738663	HY	U	11/08/90	NN C	SC	MARKED L 6 SQUARE
RTHA	120755003	н	U	11/08/90	OHV	CE	MARKED L 6 SQUARE
RTHA	138747645	HY	υ	11/08/90	NN C	SC	MARKED L 6 SQUARE, RETRAPPED HV STA 0947 TODAY
RTHA	138747646	5 НҮ	ξ U	11/08/9	O NN	SC	
RTHA	138747648	в ну	U	11/08/9	o nn	SC	MARKED L 6 SQUARE
RTHA	138747649	э ну	U	11/08/9	O NN	SC	MARKED L 6 SQUARE

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SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
RTHA	138747650	НУ	U	11/08/90	NN	SC	MARKED L 6 SQUARE
RTHA	138747651	HY	U	11/08/90	NN	SC	MARKED L 6 SQUARE
RTHA	138747652	HY	U	11/08/90	NN	SC	MARKED L 6 SQUARE
RTHA	138754009	HY	ŭ	11/08/90	N	во	MARKED L 1 SQUARE, ACCIDENTALLY, SHOULD HAVE BEEN L 6 SQUARE
RTHA	138754010	НУ	U	11/08/90	N	во	MARKED L 6 SQUARE
RTHA	138754011	АНУ	U	11/08/90	N	SC	MARKED L 6 SQUARE, MARKED BY MISTAKE
RTHA	138754012	HY	U	11/08/90	N	ВО	MARKED L 6 SQUARE
RTHA	138754013	НУ	U	11/08/90	N	во	MARKED L 6 SQUARE
RTHA	138754014	HY	U	11/08/90	N	BO	MARKED L 6 SQUARE
RTHA	138754015	HY	U	11/08/90	N	BO	MARKED L 6 SQUARE
RTHA	138754016	HY	U	11/08/90	N	BO	MARKED L 6 SQUARE
RTHA	138754017	HY	U	11/08/90	N	BO	MARKED L 6 SQUARE
RTHA	138754018	з ну	U	11/08/90	N	BO	MARKED L 6 SQUARE
RTHA	138754019	ну	U	11/08/90	N	ВО	MARKED L 6 SQUARE
RTHA	138754020	HY	֖ ֖֖֖֖֖֖֖֖֖֖֖֞	11/08/90	N	во	MARKED L 6 SQUARE
RTHA	87724044	HY	U	11/09/90	VH C	CE	MARKED L 1 POINT
RTHA	98797378	з ну	U	11/09/90	NN C	SC	MARKED L 1 POINT
RTHA	13874765	з ну	U	11/09/90	NN C	SC	MARKED L 1 POINT
RTHA	8772404	5 HY	U	11/11/9	VH C	CE	MARKED R 6 SQUARE
RTHA	8772404	6 НҮ	Û	11/12/9	O HV	CE	MARKED R 6 POINT
RTHA	9879737	9 HY	U	11/12/9	O NN	SC	MARKED R 6 POINT, TAIL VERY RUFOUS
RTHA	9879738	о ну	U	11/12/9	O NN	SC	MARKED R 6 POINT
RTHA	12073866	4 HY	U	11/12/9	o nn	SC	MARKED R 6 POINT

SPECIES	BAND#	AGE	SEX	DATE	STA.	BNDR	REMARKS
RTHA	120755004	НХ	U	11/12/90	HV	CE	MARKED R 6 POINT
RTHA	138747655	HY	U	11/12/90	NN	SC	MARKED R 6 POINT
RTHA	138747656	НУ	Ū	11/12/90	NN	SC	MARKED R 6 POINT
RTHA	138747657	HY	U	11/12/90	NN	SC	MARKED R 6 POINT
RTHA	138747658	НУ	U	11/12/90	NN	SC	MARKED R 6 POINT
RTHA	138754021	HY	U	11/12/90	N	BO	MARKED R 6 POINT
RTHA	87724047	НУ	U	11/13/90	HV	CE	MARKED L 6 POINT
RTHA	98753826	НУ	U	11/13/90	N	BO	MARKED L 6 POINT
RTHA	98779107	НУ	U	11/13/90	W	CE	MARKED L 6 POINT
RTHA	98779108	HY	U	11/13/90	HV	CE	MARKED L 6 POINT
RTHA	98797381	HY	U	11/13/90	NN	SC	MARKED L 6 POINT
RTHA	98797383	HY	U	11/13/90	NN	SC	MARKED L 6 POINT
RTHA	120738665	НУ	U	11/13/90	NN	SC	MARKED L 6 POINT
RTHA	138747659	HY	U	11/13/90	NN	SC	MARKED L 6 POINT, RETRAPPED N STA 1110 TODAY
RTHA	138747660	НУ	U	11/13/90	NN	SC	MARKED L 6 POINT
RTHA	138747662	НҮ	ֿי עֿ	11/13/90	NN	SC	MARKED L 6 POINT
RTHA	138747663	НУ	U	11/13/90) NN	SC	MARKED L 6 POINT
RTHA	138747664	НУ	U	11/13/90	NN C	SC	MARKED L 6 POINT
RTHA	138747665	HY	U	11/13/90	NN C	SC	MARKED L 6 POINT
RTHA	138747666	НҮ	U	11/13/90) NN	SC	MARKED L 6 POINT
RTHA	138754022	HY	Ü	11/13/90	N	ВО	MARKED L 6 POINT, RETRAPPED NN STA 0940 TODAY
RTHA	138754024	HY	U	11/13/90	N	во	MARKED L 6 POINT
RTHA	138754025	5 НҮ	U	11/13/90	N	ВО	MARKED L 6 POINT

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SPECIES	BAND #	AGE	SEX	DATE	STA.		REMARKS
RTHA	87724048	HY	U	11/14/90	HV	CE	MARKED L 1 SQUARE
RTHA	87724049	HY	U	11/14/90	W	CE	MARKED L 1 SQUARE
RTHA	87724050	НУ	U	11/14/90	HV	CE	MARKED L 1 SQUARE
RTHA	98753827	НУ	U	11/14/90	N	ВО	MARKED L 1 SQUARE
RTHA	98753829	HY	U	11/14/90	N	во	MARKED L 1 SQUARE
RTHA	98 7 53830	НУ	ŭ	11/14/90	N	ВО	MARKED L 1 SQUARE
RTHA	98753831	ΗÝ	บ	11/14/90	N	ВО	MARKED L 1 SQUARE
RTHA	98753832	HY	ט	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	98797384	HY	U	11/14/90	NN	SC	MARKED L 1 SQUARE
RTHA	120738666	НУ	U	11/14/90	NN	SC	MARKED L 1 SQUARE
RTHA	120755005	НУ	U	11/14/90	HV	CE	MARKED L 1 SQUARE
RTHA	120756002	HY	U	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	120756003	HY	U	11/14/90	N	BO	MARKED L 1 SQUARE, RETRAPPED HV STA 1140 TODAY
RTHA	138747667	HY	U	11/14/90	NN C	SC	MARKED L 1 SQUARE, L 2 & R 1,2 T B 1/4
RTHA	138747668	HY	ט ֿ	11/14/90	NN C	SC	MARKED L 1 SQUARE
RTHA	138747669	НҮ	U	11/14/90	NN C	SC	MARKED L 1 SQUARE
RTHA	138747670	HY	U	11/14/90	NN C	SC	MARKED L 1 SQUARE
RTHA	138747671	НҮ	บ	11/14/90	NN C	SC	MARKED L 1 SQUARE
RTHA	138747672	HY	U	11/14/9	NN C	SC	MARKED L 1 SQUARE
RTHA	138747673	в ну	Ď	11/14/9	O NN	SC	MARKED L 1 SQUARE
RTHA	138747674	HY	U	11/14/9	O NN	SC	MARKED L 1 SQUARE
RTHA	138747675	5 НҮ	U	11/14/9	O NN	SC	MARKED L 1 SQUARE
RTHA	138747676	з ну	U	11/14/9	O NN	SC	MARKED L 1 SQUARE, L 2 T B 1/4

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
RTHA	138747701	НХ	U	11/14/90	HV	CE	MARKED L 6 SQUARE, BEGINNING OF STRING GIVEN TO LAURIE CLEARY
RTHA	138747703	HY	U	11/14/90	HV	CE	MARKED L 1 SQUARE, END OF STRING GIVEN TO LAURIE CLEARY
RTHA	138754026	НУ	บ	11/14/90	N	во	MARKED L 1 SQUARE
RTHA	138754027	НУ	บ	11/14/90	N	во	MARKED L 1 SQUARE
RTHA	138754030	НУ	U	11/14/90	N	во	MARKED L 1 SQUARE
RTHA	138754031	НХ	U	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	138754032	НУ	U	11/14/90	N	во	MARKED L 1 SQUARE
RTHA	138754033	НХ	U	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	138754034	НҮ	U	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	1387540,88	НУ	U	11/14/90	N	BO	MARKED L 1 SQUARE
RTHA	1 1387540 8 9	НУ	U	11/14/90	N	BO	MARKED L 1 SQUARE
AMKE	136342497	HY	F	10/01/90	S	EN	MARKED R 6 SQUARE
AMKE	137388501	HY	F	10/01/90	N	OT	MARKED R 6 POINT
AMKE	144334299	НҮ	F	10/01/90	N	OT	MARKED R 6 SQUARE
AMKE	144334300	HY	F	10/01/90	N	OT	MARKED R 6 SQUARE
AMKE	149331683	U	F	10/01/90	NN C	SC	SUB > 2, MARKED R 6 SQUARE
AMKE	149392704	НҮ	F	10/01/90	Ρ	ВО	MARKED R 6 SQUARE
AMKE	149392714	НҮ	F	10/01/90) E	ВО	MARKED R 6 SQUARE
AMKE	136342499	Э НҮ	F	10/02/9	o s	EN	MARKED R 6 POINT
AMKE	137388502	HY	F	10/02/9	ИС	OT	MARKED R 6 POINT
AMKE	137388503	3 HY	F	10/02/9	O N	OT	MARKED R 6 POINT
AMKE	137388504	4 HY	F	10/02/9	o n	OT	MARKED R 6 POINT
AMKE	13738850	5 HY	F	10/02/9	O N	OT	MARKED R 6 POINT

SPECIES	BAND #	AGE	SEX	DATE	STA.	BNDR	REMARKS
AMKE	137388507	HY	F	10/02/90	N	ÔT	MARKED R 6 POINT
AMKE	137388509	HY	F	10/02/90	N	OT	MARKED R 6 POINT
AMKE	137388510	НУ	F	10/02/90	N	OT	MARKED R 6 POINT
AMKE	137388511	НҮ	F	10/02/90	N	OT	MARKED R 6 POINT
AMKE	144334305	НҮ	F	10/02/90	S	EN	MARKED R 6 POINT
AMKE	144 3 34306	HY	F	10/02/90	s	EN	MARKED R 6 POINT
AMKE	144334307	НУ	F	10/02/90	S	EN	MARKED R 6 POINT
AMKE	149331402	НУ	F	10/02/90	NN	SC	MARKED R 6 POINT
AMKE	149331694	НХ	F	10/02/90	NN	SC	MARKED R 6 POINT
AMKE	149331696	НУ	F	10/02/90	NN	SC	MARKED R 6 POINT
AMKE	149331699	НУ	F	10/02/90	NN	SC	MARKED R 6 POINT
AMKE	149392723	HY	F	10/02/90	E	BO	MARKED R 6 POINT
AMKE	149392724	НУ	F	10/02/90	E	B0	MARKED R 6 POINT
AMKE	149392727	НУ	F	10/02/90	E	во	MARKED R 6 POINT
AMKE	149392728	НУ	F	10/02/90	E	BO	MARKED R 6 POINT
AMKE	149392732	HY	F	10/02/90	E	BO	MARKED R 6 POINT
AMKE	149331404	НУ	F	10/03/90) NN	SC	MARKED L 6 POINT
AMKE	144334308	HY	F	10/05/90	N	EN	MARKED L 6 SQUARE
AMKE	144334309	HY	F	10/05/90	N	EN	MARKED L 6 SQUARE
AMKE	149331406	HY	F	10/05/90	NN C	SC	MARKED L 6 SQUARE
AMKE	149392737	HY	F	10/05/90) E	BO	MARKED R 6 SQUARE
AMKE	149392738	з ну	F	10/05/9) E	BO	MARKED L 6 SQUARE
AMKE	149392739	HY	F	10/05/9	Œ	BO	MARKED L 6 SQUARE
AMKE	149331408	з ну	F	10/06/9	O NN	SC	MARKED L 1 POINT
AMKE	149392742	2 HY	F	10/06/9	OE	BO	MARKED L 1 FOINT
