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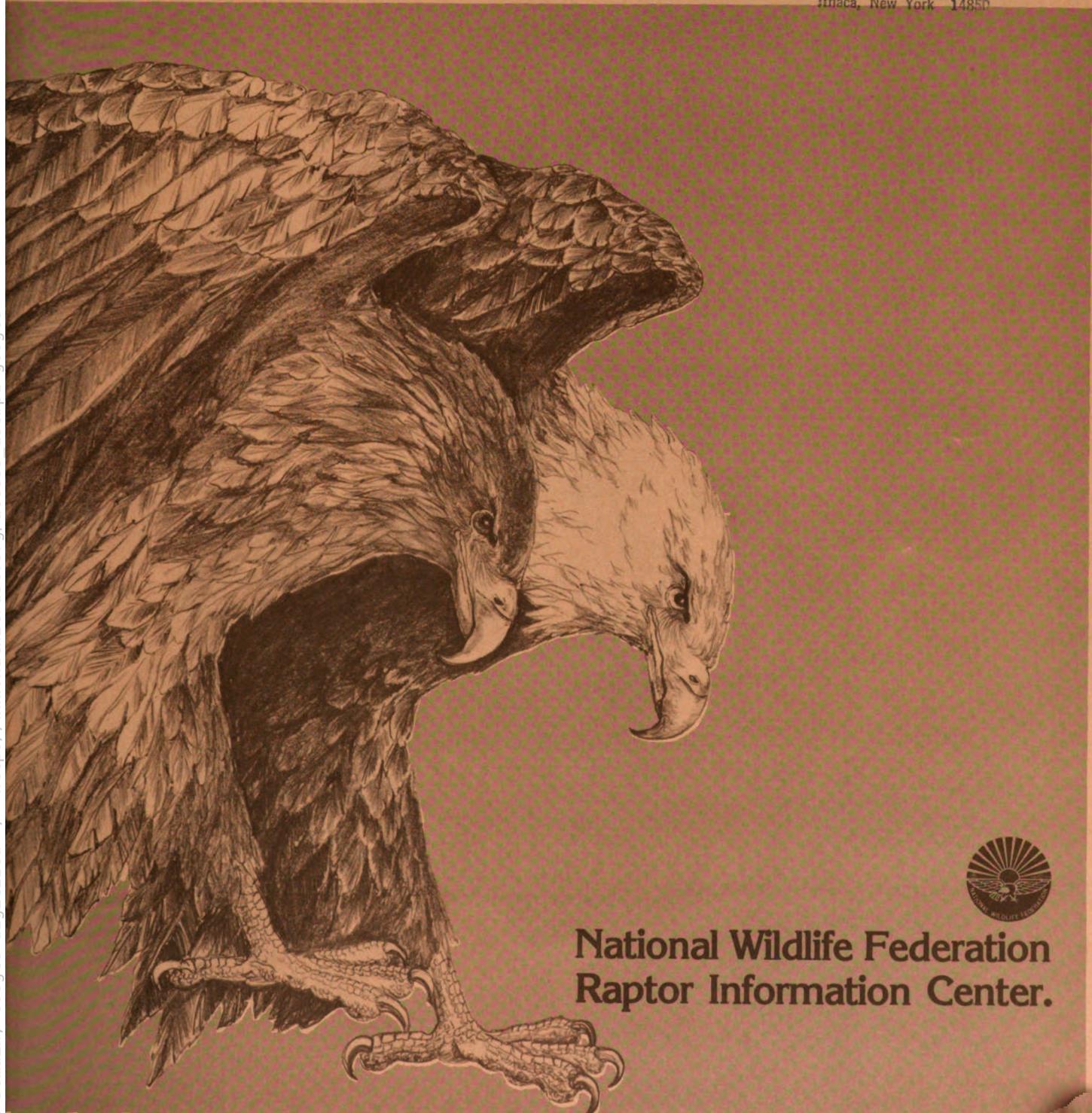
Illustration of Bank Swallow by Louis Agassiz Fuertes

# CHESAPEAKE BAY BALD EAGLE BANDING PROJECT.

JAN 21 1982

## 1981 Report and Five Year Summary

Laboratory of Ornithology  
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Raptor Information Center.



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## PROGRESS REPORT

State: Maryland/Virginia/Delaware                  Project Number: E-1 (MD)  
    W-40-R-24 (VA)  
Project Type: Research                                      E-1-2 (DE)

Project Title: Resident Endangered Species Investigations

Period Covered: July 1, 1980 - June 30, 1981

Study Number and Title: Study V.                      Bald Eagle Study (MD)  
    Endangered Species  
    Investigations (VA)  
    Endangered Species  
    Research and  
    Management (DE)

Study Objective: The maintenance and expansion of the breeding populations of bald eagles in the Chesapeake Bay region.

Job Number and Title: Job 7.                              Life History and Movements (MD)  
    Job VI-E.    Bald Eagle Investigations (VA)  
    Job II-4.    Studies of the Nesting Bald  
   Eagle in Delaware (DE)

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## TABLE OF CONTENTS

	PAGE
<b>Introduction .....</b>	<b>1</b>
<b>1981 Results .....</b>	<b>1</b>
<b>Summary .....</b>	<b>1</b>
<b>Status of the 1981 Project .....</b>	<b>7</b>
<b>Discussion .....</b>	<b>7</b>
<b>Nest Locations .....</b>	<b>7</b>
<b>Band Tags .....</b>	<b>7</b>
<b>Radio Transmitters .....</b>	<b>7</b>
<b>Eggs Collected .....</b>	<b>7</b>
<b>Eaglet Introduction .....</b>	<b>8</b>
<b>Causes of Nest Failure .....</b>	<b>8</b>
<b>Nest Trees .....</b>	<b>10</b>
<b>Eagle Feathers .....</b>	<b>11</b>
<b>Landownership .....</b>	<b>11</b>
<b>Prey Remains .....</b>	<b>11</b>
<b>Adults .....</b>	<b>14</b>
<b>5 Year Summary .....</b>	<b>15</b>
<b>Introduction .....</b>	<b>15</b>
<b>Nest Locations .....</b>	<b>15</b>
<b>Coverage .....</b>	<b>15</b>
<b>Banding Crew .....</b>	<b>15</b>
<b>Results .....</b>	<b>16</b>
<b>Productivity .....</b>	<b>16</b>
<b>Banding Summary .....</b>	<b>16</b>
<b>Discussion .....</b>	<b>17</b>
<b>Eggs Collected .....</b>	<b>17</b>
<b>Colormarking .....</b>	<b>17</b>



Discussion (Con't.)	PAGE
<b>Patagial Markers</b> .....	17
<b>Eaglet Introductions</b> .....	17
<b>Egg Transplants</b> .....	18
<b>Radio Transmitters</b> .....	18
<b>Video Cameras</b> .....	18
<b>Nest and Nest Tree Measurements</b> .....	18
<b>Prey Remains</b> .....	20
<b>Landownership</b> .....	24
<b>Nesting Territories</b> .....	26
<b>Band Returns</b> .....	28
<b>Recommendations</b> .....	30
<b>Acknowledgements</b> .....	30



## LIST OF TABLES

	PAGE
Table 1 - 1981 Active Nest Summary .....	1
Table 2 - 1981 Eaglet Productivity Data .....	2
Table 3 - 1981 Nest Visitation Summary .....	2
Table 4 - 1981 Banding Summary .....	3
Table 5 - Eagle Chick Summary for Virginia .....	3
Table 6 - Eagle Chick Summary for Maryland .....	5
Table 7 - Eagle Chick Summary for Delaware .....	7
Table 8 - Unsuccessful Nests in Virginia .....	8
Table 9 - Unsuccessful Nests in Maryland .....	9
Table 10 - Unsuccessful Nests in Delaware .....	10
Table 11 - Nest Tree Species of Visited Active Nests (1981) .....	10
Table 12 - Property Type of Visited Active Nests (1981)	11
Table 13 - Prey Evidence Found In and Under Nests (1981)	11
Table 14 - Adult Attendance at Active Nests (1981) ..	14
Table 15 - Comparative Productivity of the Chesapeake Bay Bald Eagle Population ..	16
Table 16 - 5 Year Summary .....	16
Table 17 - Nest and Nest Tree Measurements .....	19
Table 18 - Nest Tree Species of Visited Active Nests	19
Table 19 - Prey Evidence Found In and Under Nests ...	20
Table 20 - Comparison of Prey Found .....	24
Table 21 - Property Type of Visited Active Nests ....	25
Table 22 - Active Nesting Territories by County .....	26
Table 23 - Band Recoveries .....	29



## LIST OF APPENDICES

	PAGE
<b>Appendix A - Band Tag Scheme for Chesapeake Bay Bald Eagles .....</b>	<b>32</b>
<b>Appendix B - Field Form .....</b>	<b>34</b>
<b>Appendix C - Form Letter Sent to All Cooperating Landowners .....</b>	<b>36</b>



## CHESAPEAKE BAY BALD EAGLE BANDING PROJECT

Introduction: In 1977 a bald eagle banding project was begun in the Chesapeake Bay Region in the States of Maryland, Virginia and Delaware. This report consists of 2 parts. The first discusses the results of the 1981 project while the second section contains a summary of the entire 5 years of the project, 1977 - 1981.

### I.

#### 1981 Results

Summary: From aerial survey reports and ground observations by the banding crew, it was determined that 93 bald eagle nests were active in the Chesapeake Bay Region during the 1981 nesting season. Of these 93 active nests, 59 were successful and 34 failed and were abandoned (Table 1). An active nest is defined as a nest where incubation was observed or a chick or egg was seen or found in the nest. A successful nest is defined as a nest where young were hatched and survived to banding age (at least 6 weeks).

TABLE 1  
1981 ACTIVE NEST SUMMARY

	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
No. of active nests	39	50	4	93
No. of successful nests	27	30	2	59
No. of failures	12	20	2	34
Success rate (no. active nests/ no. successful nests)	69%	60%	50%	63%

A total of 95 chicks were counted in the region resulting in a mean productivity of 1.02 young per active nest (Table 2). One of these 95 chicks disappeared when the nest (VA-LA-75-01) was blown out in a storm. No trace could be found of the chick which was believed to be 3-4 weeks old when last seen during an aerial survey.



TABLE 2

## 1981 EAGLET PRODUCTIVITY DATA

	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
No. of active nests	39	50	4	93
Total number of young	41	51	3	95
Productivity (no. of young/active nest)	1.05	1.02	0.75	1.02

The banding crew visited 81 of the 93 active nests this season, 49 of these successful and 32 abandoned. Of the 10 successful nests not visited, in 8 cases the landowner refused permission to the crew to visit the nest, one landowner was identified too late in the season and in one case the tree was known to be dead and too dangerous to climb. Of the 2 abandoned nests not visited, one landowner refused permission and one nest could not be found after a lengthy search from the ground. (VA-KG-81-01) (Table 3)

TABLE 3

## 1981 NEST VISITATION SUMMARY

	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
No. of active nests visited	33	44	4	81
No. of successful nests visited	23	24	2	49
No. of active nests not visited	6	6	0	12
No. of successful nests not visited	4	6	0	10

76 eaglets were banded this season. In addition to the band each was also marked with an orange band tag, numbered in white with the numbers 1 to 76. One chick was also fitted with a radio transmitter. Of the 18 young not banded, 10 were in nests where the landowner refused permission, 4 were in nests in dead trees that were not climbed and 4 were determined to be past banding age, when the risk of a bird fledging prematurely was too great to attempt banding (Table 4). Tables 5-7 that follow contain a summary of all successful nests including band and band tag numbers.

In addition to banding, the field crew collected 11 whole eggs and 15 sets of eggshell fragments. These were turned over to Stan Wiemeyer of the Pesticide Monitoring Lab at the Patuxent Wildlife Research Center for pollution analysis and eggshell thickness measurements. (Table 4)



TABLE 4  
1981 BANDING SUMMARY

	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
No. of young banded	32	41	3	76
No. of young not banded	8	10	0	18*
No. of eggs collected	4	7	0	11

\*One chick from nest LA-75-01 that blew out is not included in this total.

TABLE 5  
EAGLE CHICK SUMMARY FOR VIRGINIA

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
VA-AC-80-01	629-08122	12	Accomac	
	629-08123	13		
VA-ND-79-01	629-08124	17	Heathsville	
VA-WE-71-04	629-08125	18	Pierce Ck.	Band #629-08126 destroyed-pop rivet problem
	629-08127	19		
VA-RI-74-01	629-08128	20	Totusky Ck.	One whole addled egg recovered
VA-RI-78-01	629-08129	21	Sabine Hall	
	629-08130	22		
VA-WE-79-01	629-08131	24	Stratford Hall	
	629-08132	23		
	629-08133	25		
VA-WE-79-05	629-08134	26	Machodoc Ck.	
	629-08135	27		
VA-PG-61-01	629-08136	28	Chippokes Ck.	
	629-08137	29		
	629-08138	30		
VA-NK-79-04	629-08139	31	Goddins Pond	One whole addled egg recovered from the nest on 4/29/81



TABLE 5 (Con't.)

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
VA-NK-80-01	629-08140	33	Pamunkey River	
VA-ES-78-01	629-08197 629-08198	32 34	E. of Caret	
VA-KG-80-01	629-10826 629-10827	35 36	Cedar Grove Farm	
VA-KG-80-04	629-10828	37	Belvedere Beach	One whole addled egg recovered but cracked by climber
VA-MI-81-01	629-10829 629-10830	68 69	Corbin Hall	
VA-WE-81-01	629-10831	70	Bonum Ck.	
VA-KG-78-04	629-10832	71	Dahlgren	Eggshell fragments found in nest
VA-KG-81-02	629-10834	73	Gingoteague Ck.	#629-10833 band destroyed pop rivet problem
VA-WE-79-04	629-10835	74	Wakefield	
VA-KW-79-01	629-10836 629-10837	75 72	Mattaponi River	#629-10836 fitted with radio trans.
VA-WE-77-04	629-10838	76	Owl Hollow	
VA-MI-80-02	one chick		Urbanna Ck.	Already fledged
VA-SY-81-01	one chick		Surry Nuclear Power Plant	Chick was out on a limb
VA-LA-75-01	one chick (3-4 wks.) 4/26/81		Irvington	Nest was blown out with no trace of the chick (5/31/81)
VA-RI-79-02	two chicks		Cat Pt. Ck.	Nest tree was too dead to climb
VA-MI-77-01	two chicks		Parrot's Ck.	No permission



TABLE 5 (Con't.)

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
VA-GL-81-01	one chick		Dragon Swamp	Landowner was found late in the season
VA-CC-81-01	one chick		Shirely	No permission

TABLE 6

## EAGLE CHICK SUMMARY FOR MARYLAND

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
MD-DO-74-06	629-08167 629-08168 629-08169	1 2 3	Marshyhope Ck.	
MD-DO-81-06	629-08170 629-08171 629-08172	6 5 4	Sen. Malkus	
MD-DO-69-04	629-08173 629-08174	7 8	Riggins Corner	
MD-DO-77-04	629-08175	9	Andrews	
MD-WI-78-02	629-08176 629-08177	10 11	Sharptown	
MD-AA-74-01	629-08178 629-08179	14 15	South River	
MD-CA-76-05	629-08180	16	St. Leonards Ck.	
MD-SM-80-01	629-08181	38	Poplar Hill Ck.	
MD-CH-77-03	629-08182 629-08183	39 40	Banks O'Dee Rd.	
MD-CH-77-01	629-08184 629-08185	41 42	Linton prop.	
MD-DO-69-07	629-08186 629-08187	43 44	Sunken Is. Marsh	
MD-WO-78-01	629-08188 629-08189	45 46	Pocomoke St. Forest	
MD-DO-78-01	629-08190 629-08191	50 51	Henry's X-roads	



TABLE 6 (Con't.).

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
MD-DO-81-08	629-08192	52	Ross' Neck	
MD-CAR-80-01	629-08193 629-10801	53 54	Tuckahoe Ck.	
MD-TA-74-04	629-10802	55	Wye Heights Plant.	One broken egg recovered
MD-TA-80-01	629-10803 629-10804	56 57	Copperville	
MD-QA-80-02	629-10805 629-10806	58 59	Greenwood Ck.	
MD-QA-78-02	629-10807 629-10808	60 61	Decoursey Thom Rd.	
MD-KE-76-01	629-10809	62	Lloyd's Ck.	Eggshell fragments were found at the base of the nest
MD-KE-81-01	629-10810 629-10811	63 64	Wilkins Ln.	
MD-KE-80-08	629-10812 629-10813 629-10814	65 66 67	Andelot Farm	
MD-CH-73-02	one chick		Nanjemoy Ck.	Chick was too old to band
MD-KE-80-02	two chicks		Church Ck.	Nest tree was too dead to climb
MD-SM-73-02	one chick		Scotland	No permission
MD-CH-79-01	one chick		Simms Landing	"
MD-AA-80-01	two chicks		Chews Church	"
MD-SO-76-01	one chick		Widgeon	"
MD-TA-81-01	one chick		Trappe	"
MD-DO-81-07	one chick		Savannah Rd.	"



TABLE 7

## EAGLE CHICK SUMMARY FOR DELAWARE

<u>Nest No.</u>	<u>Band No.</u>	<u>Band Tag</u>	<u>Location</u>	<u>Remarks</u>
DE-SU-80-01	629-08194	49	Millsboro	
DE-SU-81-01	629-08195	47	Gumboro	
	629-08196	48		

Status of 1981 Project: The field work has been completed and letters of appreciation have been sent to all landowners thanking them for their cooperation. Each letter contained a photograph of chicks in the nest or of an adult bald eagle. The banding schedules have been submitted to the banding lab.

Discussion

Nest locations: In addition to the nest locations furnished to the banding crew from the aerial surveys, several new nest locations were discovered from information provided by people living near the nest sites. In Virginia two new nests were found in this manner, one in Middlesex Co. and one in King George Co. In Maryland there was one located in Dorchester Co. and another was found in Sussex Co., Delaware.

A member of the banding crew again participated in several of the nest survey flights. This continues to be of help to the banding crew in locating nests from the ground.

Band Tags: This year an orange band tag was again used to mark each of the banded chicks. The band tag was round and consisted of a double layer of rubber coated vinyl fabric ("Herculite"). In the past 4 years the young eagles have been known to tear apart and shred the material used for the tags. This year a new adhesive was used in an attempt to make the tags stronger and prevent tearing. Each tag was marked with a single numeral (1-76) with a white vinyl paint to identify each individual bird. This new paint was chosen in an attempt to prevent the fading of the numerals on the tags as has been observed in the past. It is still unclear whether these changes have helped to increase the life or visibility of the tags. With the evidence of the past problems with the tags however, it is likely that a new method of colormarking of the eaglets will be developed for the 1982 season.

Radio Transmitters: The banding crew again assisted Dave Wallin in placing a radio transmitter on one of the eaglets. This was the 14th transmitter placed on young eagles during the past 3 years as part of Mr. Wallin's radio telemetry study of the post fledging behavior of bald eagles.

Eggs Collected: A total of 11 whole, addled eggs, 7 from Maryland and 4 from Virginia nests were collected along with 15 sets of eggshell



fragments. As stated earlier all were turned over to Stan Wiemeyer at the Patuxent Wildlife Research Center for analysis. Every attempt was made this year to get to nests as soon as possible when it was believed to contain an addled egg. In response to an aerial nest survey report 2 eggs were recovered on May 29th this year, one week before the regular field work was begun.

Eaglet Introduction: No captive raised eaglets were introduced into nests in the region this year.

Causes of Nest Failure: Tables 8-10 that follow list all abandoned nests in Maryland, Virginia and Delaware and an explanation of what was found in the nests (eggs, eggshell fragments, etc.). This year there was one nest in Maryland where there was evidence of human disturbance during the incubation period. The nest failed and eggshell fragments were found in the nest by the climber. A raccoon was found in a nest in Maryland, believed to be active early in the nesting season, when the nest was climbed on May 24th. One abandoned nest in Virginia was found to have a mammal nest (raccoon?) burrowed into the sticks at the base of the eagle nest.

TABLE 8  
UNSUCCESSFUL NESTS IN VIRGINIA

<u>Nest No.</u>	<u>Date of Last Activity</u>	<u>Eggs?</u>	<u>Remarks</u>
VA-FF-81-01	4/26/81	eggshell fragments in nest	
VA-JC-64-1A	3/21/81	eggshell fragments in nest	there were two nests in the nest tree
VA-KG-80-05	5/16/81	eggshell fragments in nest	on 5/16 an intact egg was found in the nest and left by the climber
VA-KW-80-01	3/21/81	one whole egg	
VA-ND-70-01	3/15/81		mammal burrow in side of nest
VA-RI-71-01	4/26/81		
VA-RI-81-02	4/26/81	one whole egg	
VA-WE-77-03	4/26/81	eggshell fragments in nest	
VA-WE-78-01	3/15/81		
VA-WE-78-05	4/26/81		
VA-NK-77-01	3/21/81		not visited, no permission
VA-KG-81-01	4/26/81		could not find



TABLE 9

## UNSUCCESSFUL NESTS IN MARYLAND

<u>Nest No.</u>	<u>Date of Last Activity</u>	<u>Eggs?</u>	<u>Remarks</u>
MD-CE-81-01	4/27/81	one whole egg, intact	
MD-DO-36-03	3/25/81	one egg, whole, leaking	a system of three nests in the nest tree
MD-DO-76-03	4/29/81	two whole, intact eggs	
MD-DO-80-01	not clear		
MD-DO-81-01	4/1/81	one whole egg, intact	
MD-DO-81-03	3/25/81		
MD-DO-81-04	4/15/81		the nest appeared to be older than one year
MD-KE-80-01	3/10/81	eggshell frag. in nest	
MD-KE-80-07	4/27/81		raccoon in nest
MD-QA-80-01	4/27/81	eggshell frag. in nest	
MD-WO-68-03	3/2/81		
MD-AA-78-01	3/9/81		an adult was seen sitting in a tree 100 yards from the nest tree
MD-CA-80-01	3/9/81	one whole egg, intact	
MD-CA-81-01	approx. 5/1/81	shell fragments in nest	evidence of human disturbance
MD-CH-75-01	3/9/81		
MD-CH-78-02	3/9/81		one adult perched near the nest tree
MD-KE-80-05	4/27/81	eggshell fragments in nest	
MD-CH-80-01	4/22/81	eggshell fragments in nest	
MD-CH-80-02	4/7/81	one whole egg, intact	
MD-SM-78-02	3/9/81	-	two eagles at nest, one possibly a sub-adult



TABLE 10  
UNSUCCESSFUL NESTS IN DELAWARE

<u>Nest No.</u>	<u>Date of Last Activity</u>	<u>Eggs?</u>	<u>Remarks</u>
DE-KE-81-01	approx. 4/30/81	eggshell fragments in nest	
DE-SU-81-02	unknown		

**Nest Trees:** The field crew continued to record nest tree species and take nest and nest tree measurements on all successful and abandoned nests climbed. Table 11 lists the tree species used for nesting by the eagles this year. Thirteen different species were represented with the loblolly pine again being the most frequently chosen for nesting.

TABLE 11  
NEST TREE SPECIES OF VISITED ACTIVE NESTS (1981)

<u>Species</u>	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
Loblolly Pine	23	28	3	54
Tulip Poplar	3	3	0	6
Shortleaf Pine	4	1	0	5
Northern Red Oak	0	1	1	2
Hickory	0	2	0	2
Beech	1	1	0	2
Sycamore	0	2	0	2
Virginia Pine	1	1	0	2
Sweet Gum	0	1	0	1
Swamp Chestnut Oak	0	1	0	1
Black Oak	0	1	0	1
Southern Red Oak	0	1	0	1
Longleaf Pine	1	0	0	1
Unidentified Pine (dead)	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
	<u>33</u>	<u>44</u>	<u>4</u>	<u>81</u>



Eagle Feathers: Molted adult bald eagle feathers found at the nest sites were collected again this year. These feathers have been turned over to the U.S. Fish and Wildlife Service Law Enforcement Division for transmittal to the Eagle Feather Bank.

Landownership: Table 12 lists the types of property in which the active bald eagle nests are located. In the Chesapeake Bay Region a majority of the nests (92%) continue to be located on privately owned land, divided equally between timber harvested lands and privately owned estates, farms and woodlands. This year the banding crew encountered 9 landowners that refused to give permission for the crew to visit the nests on their property. Six of these landowners had also refused permission in previous years. Two refusals came from new landowners and one from a landowner who had been cooperative last year.

TABLE 12  
PROPERTY TYPE OF ACTIVE NESTS VISITED (1981)

<u>Property Type</u>	<u>VA</u>	<u>MD</u>	<u>DE</u>	<u>TOTAL</u>
Federal or State land	3	3	1	7
Timber harvested land	15	17	0	32
Private estates (includes woodlands, farm edge, woodlots, etc.)	12	24	3	39
Developments	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
	33	44	4	81

Prey Remains: The banding crew continued to collect the prey remains found in the nests and at the base of the nest trees. These prey remains have been identified and the results are contained in Table 13.

TABLE 13  
PREY EVIDENCE FOUND IN AND UNDER NESTS (1981)  
(listed by number of occurrences)

BIRDS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Mallard ( <u>Anas platyrhynchos</u> )	10
Domestic chicken ( <u>Gallus domesticus</u> )	6
Canada goose ( <u>Branta canadensis</u> )	6



TABLE 13 (Con't.)

BIRDS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Lesser scaup ( <u>Aythya affinis</u> )	4
Common crow ( <u>Corvus brachyrhynchos</u> )	3
Mourning dove ( <u>Zenaidura macroura</u> )	2
Common grackle ( <u>Quiscalus quiscula</u> )	2
Ruddy duck ( <u>Oxyura jamaicensis</u> )	2
Ring billed gull ( <u>Larus delawarensis</u> )	2
Little blue heron ( <u>Florida caerulea</u> )	2
Rock dove ( <u>Columba livia</u> )	2
Bonapartes gull ( <u>Larus philadelphia</u> )	1
Herring gull ( <u>Larus argentatus</u> )	1
Black duck ( <u>Anas rubripes</u> )	1
Blue winged teal ( <u>Anas discors</u> )	1
Black vulture ( <u>Coragyps atratus</u> )	1
Common gallinule ( <u>Gallinula chloropus</u> )	1
Greater yellowlegs ( <u>Totanus melanoleucus</u> )	1
Gadwall ( <u>Anas strepera</u> )	1
Horned grebe ( <u>Podiceps grisegena</u> )	1
Clapper rail ( <u>Rallus longirostris</u> )	1
Wood duck ( <u>Aix sponsa</u> )	1
Laughing gull ( <u>Larus atricilla</u> )	1
Glossy ibis ( <u>Plegadis falcinellus</u> )	1
Red shouldered hawk ( <u>Buteo lineatus</u> )	1
Unidentified shore bird	1
Unidentified duck	2



TABLE 13 (Con't.)

MAMMALS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Muskrat ( <u>Ondatra zibethica</u> )	8
Eastern Cottontail ( <u>Sylvilagus floridanus</u> )	7
Woodchuck ( <u>Marmota monax</u> )	2
Eastern Grey Squirrel ( <u>Sciurus carolinensis</u> )	1
Norway Rat ( <u>Rattus norvegicus</u> )	1
Marsh Rabbit ( <u>Sylvilagus palustris</u> )	1

TURTLES

<u>Species</u>	<u>Occurrence (# of nests)</u>
Stinkpot ( <u>Sternotherus odoratus</u> )	9
Diamondback Terrapin ( <u>Malaclemys terrapin</u> )	9
Snapping Turtle ( <u>Chelydra serpentina</u> )	2
Mud Turtle ( <u>Kinosternum subrubrum</u> )	2

FISH

<u>Species</u>	<u>Occurrence (# of nests)</u>
Catfish ( <u>Ictalurus</u> sp.)	23
Carp ( <u>Cyprinus cypio</u> )	19
Channel Catfish ( <u>Ictalurus punctatus</u> )	6
American Eel ( <u>Anguilla rostrata</u> )	4
Striped Bass ( <u>Morone saxatilis</u> )	2
Chain Pickerel ( <u>Esox niger</u> )	2
White Catfish ( <u>Ictalurus catus</u> )	2
Brown Bullhead ( <u>Ictalurus nebulosus</u> )	1
Black Bullhead ( <u>Ictalurus melos</u> )	1
Unknown Serranoid	1
Unknown Catostomidae	1
Unknown Species	6



Adults: The banding crew also recorded the number of adult eagles present at each active nest site visited (Table 14). At all the successful nest sites visited there were one or both adults present. At only one abandoned nest were there 2 adult eagles seen. At 3 abandoned nests there was one adult present while no adults were seen in the vicinity of the other 28 abandoned nests.

This year the carcass of an adult bald eagle was found at the base of a nest tree in Wicomico Co., Maryland (MD-WI-77-01). The bones and feathers, with the feet missing, were turned over to Stan Wiemeyer at Patuxent who sent the remains to the National Wildlife Health Laboratory in Madison, Wisconsin. The necropsy report indicated that a single shotgun pellet was found but it was not clear whether the pellet was involved in the death of the bird.

TABLE 14  
ADULT ATTENDANCE AT ACTIVE NESTS\*

<u>No. of Adults</u>	<u>Successful Nests</u>	<u>Unsuccessful Nests</u>
0	0	28
1	15	3
2	<u>32</u>	<u>1</u>
	<u>47</u>	<u>32</u>

\*Active nests: VA-LA-75-01 and VA-MI-80-02 not included.



## II.

### 5 Year Summary

#### Introduction

In 1977 a proposal for the creation of a bald eagle banding project was presented to the States of Maryland and Virginia by the Raptor Information Center of the National Wildlife Federation. In 1978 the State of Delaware was included in the project. Arrangements were made for funding of the project by the U.S. Fish and Wildlife Service and the cooperating States through the Federal Aid to Endangered Species programs in the respective States. The first eagle chicks were banded in May of 1977.

Nest Locations: The banding crew was provided with information on nest locations and reproductive activity by the aerial nesting surveys conducted in the 3 states. The nest locations provided by the flight observers were plotted on topographic maps for use in the field. Whenever possible during the early part of the nesting season a member of the banding crew participated in the nesting surveys. The field crew then had a better idea of the nest locations and landmarks that can be used to find the nests from the ground.

Coverage: In 1977, using the information provided by the flight surveys, the field crew attempted to visit every nest that contained chicks. In this first year only these successful nests were visited. Since 1977 the field crew has attempted to visit and climb to every active nest, both successful and abandoned. Each year the number of nests actually visited falls short of the number of known active nests in the region. The reasons for some nest trees not being visited or climbed will be discussed later in this report.

Banding Crew: The banding crew is made up of professional tree climbers and biologists who have gained climbing experience with their own raptor nesting studies. All the climbers on the project use the safest methods possible, all climb with safety belts, climbing lines, lanyards and tree or pole spurs. Most of the climbers have incorporated some rock climbing and tree climbing techniques to enable them to get into and out of the nest in the safest and quickest method possible. Chances are not taken with dead, unsafe trees. Some trees are not climbed when the safety of the climber or the nestlings is questioned. Over the 5 years and nearly 350 climbs there has not been a single accident causing injury to a climber or a nestling.



## Results

**Productivity:** During the 5 years of the banding project the number of active bald eagle nests, those where incubation was observed or a chick or egg was found, increased from a low of 77 in 1977 to a high of 93 in 1981 (Table 15). The number of successful nests, those where young were raised at least to banding age, increased from a low of 40 in 1977 to a high of 59 in 1981. The success rate for active nests also reached a high in 1981 of 63%. The largest number of nestlings found in the region was 95 in 1981, compared to only 63 chicks counted in 1977. The mean productivity of the population increased dramatically during the 5 years from a low of 0.65 young per active nest in 1978 to a high of 1.02 in 1981.

TABLE 15  
COMPARATIVE PRODUCTIVITY OF THE CHESAPEAKE  
BAY BALD EAGLE POPULATION

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Number of active nests	77	85	85	85	93
Number of successful nests	40	41	41	49	59
Success rate	52%	48%	48%	58%	63%
Number of young	63	55	60	72	95
Productivity (number of young per active nest)	0.82	0.65	0.71	0.85	1.02

**Banding Summary:** During the 5 year study a total of 281 chicks were banded using U.S. Fish and Wildlife Service aluminum pop-rivet bands, 5 of these eaglets being captive bred chicks introduced into nests in the wild (see Discussion). These banded nestlings represent 80% of the eaglets counted in the Chesapeake Bay population over the 5 years. A total of 343 active nests were visited, both successful and abandoned. These 343 nest visits accounted for 81% of the known active nests in the Bay region (Table 16).

TABLE 16  
5 YEAR SUMMARY

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Totals</u>
Nests Visited	36	69	77	80	81	343
Chicks Banded	37	46	59	63	76	281
Eggs Collected	5	7	10	7	11	40



TABLE 16 (Con't.)

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Totals</u>
Eggshell Fragments Collected	4	4	7	11	15	41
Radio Transmitters	-	-	7	6	1	14
Chick Introductions	-	2	3	-	-	5

Discussion

Eggs Collected: In all 5 years addled eggs and eggshell fragments were collected from the nests and turned over to Stan Wiemeyer of the Pollution Monitoring Laboratory at Patuxent Wildlife Research Center in Patuxent, Maryland. A total of 40 eggs and 41 sets of eggshell fragments were collected for analysis. In 1981 each whole egg retrieved was wrapped in aluminum foil and placed in a metal can with styrofoam padding material to help prevent cracking. The eggs were then transported immediately to Patuxent, usually the same day. Despite these precautions some of these eggs were cracked and leaking and could not be analyzed (Table 16).

Colormarking: Each banded nestling was also marked with a colored tag attached to the band. The band tags were constructed of a rubber coated vinyl fabric ("Herculite") that was riveted to the band itself. Several different combinations of alphanumeric or geometric symbols were used on the tags to identify individual birds from a distance. A summary of the types of band tags used in each of the 5 years is contained in Appendix A. As mentioned earlier, it is likely that the band tags will not be used in the future and that a more reliable method of colormarking, such as color bands, will be used.

Patagial Markers: In 1978 patagial markers made of white vinyl with black lettering (V01-V04) were placed on 4 nestlings in Virginia, 2 in King George Co., one in Westmoreland Co. and one in Stafford Co. The patagial markers were placed on both wings. Sightings of these marked birds will be discussed later.

Eaglet Introductions: In 1978 and 1979 a total of 5 captive bred eaglets were introduced into nests in the region. The banding crew assisted Stan Wiemeyer in the placing of 2 chicks into nests in 1978 and 3 in 1979, all were placed into nests in Virginia. All five of the eaglets were bred in captivity at the Patuxent Wildlife Research Center.

The 2 chicks introduced in 1978 were placed in a nest together in Westmoreland Co. The one older chick that was hatched in this nest was transferred to a nest in King George Co. where there was also one chick of approximately the same age. In both nests the adults accepted the transplants and all 4 eaglets involved in the transplants were known to have fledged successfully.



In 1979 again 2 captive bred chicks were placed into a wild nest (King George Co.) with the one wild chick from that nest being transplanted into a nest with one chick in Westmoreland Co. The third captive bred chick introduced that year was placed into a nest in Westmoreland Co. with one wild chick approximately the same age. As in 1978 all eaglets involved in the transplants were known to have fledged (Table 16).

Egg Transplants: In 1978 2 egg transplants were also attempted. Eggs laid by captive birds at Patuxent were placed into 2 different nests, one in Virginia at Mason's Neck National Wildlife Refuge and one in a nest in Delaware at Bombay Hook National Wildlife Refuge. Unfortunately neither of these attempts were successful. In 1977 however, one egg from a captive pair of eagles at Patuxent was placed into a nest at Mason's Neck where the egg hatched and the eaglet was banded by the crew later in the season.

Radio Transmitters: In 1979, 1980 and 1981 the climbing crew assisted Dave Wallin, a graduate student of the College of William and Mary, in placing radio transmitters on 14 of the nestlings, 7 in 1979, 6 in 1980 and one in 1981 (Table 16).

Video Cameras: The crew also assisted Dave Wallin by placing and removing 3 video cameras. The cameras were used to observe the nests as part of a study of the nesting biology of the bald eagle. In 1979 one camera was placed in a tree adjacent to the nest tree in King George Co., Va. In 1980 another camera was placed in a tree adjacent to a nest tree in Middlesex Co., Va., and another camera was placed in the nest tree above the nest in Westmoreland Co., Va.

Nest and Nest Tree Measurements: Since the project began in 1977, nest and nest tree measurements were taken by the field crew. For each nest visited measurements of the nest dimensions, nest height, tree height and tree circumference were taken. In 1977 only successful nests were visited and in 1978 and 1979 measurements were not taken on some abandoned nests. (Appendix B is a sample of the field form used).

Table 17 lists the mean values for the measurements taken in 1981 which allows a comparison between abandoned and successful nests. In 1981 the deepest nest measured 300cm (almost 10 ft.) with a nest as wide as 233cm (87 in.). Two nests measured 424 and 425cm (166 in.) in circumference. The maximum nest tree height reached 38m (125 ft.) with the highest nest recorded (measurement to the top of the nest) at 33m (108 ft.).



TABLE 17  
NEST AND NEST TREE MEASUREMENTS  
(1981 NESTS)

	<u>All Nests</u>	<u>Successful Nests</u>	<u>Abandoned Nests</u>
Tree Circumference (cm)	192 (74)	188 (44)	196 (30)
Tree Height (m)	27.0 (77)	27.4 (45)	26.5 (32)
Nest Height (m)	23.0 (78)	23.3 (46)	22.7 (32)
Nest Depth (cm)	105 (75)	101 (45)	108 (32)
Nest-Long Axis (cm)	157 (75)	162 (45)	150 (32)
Nest-Short Axis (cm)	125 (75)	128 (45)	123 (32)

(n) = number of nests measured

Table 18 lists the nest tree species used by the nesting eagles in the Bay region. The predominant nest tree species, representing 69% of the nest trees, is the loblolly pine (Pinus taeda). Fifteen other species of trees were also selected including 3 other pine species, 7 species of oak, at least 2 species of hickory, also tulip poplar, sweet gum, sycamore and American beech.

TABLE 18  
NEST TREE SPECIES OF VISITED ACTIVE NESTS

<u>Species</u>	<u>Total</u>
Loblolly Pine ( <u>Pinus taeda</u> )	209
Tulip Poplar ( <u>Liriodendron tulipifera</u> )	22
Shortleaf Pine ( <u>Pinus echinata</u> )	13
Virginia Pine ( <u>Pinus virginiana</u> )	9
Hickory ( <u>Carya</u> sp.)	8
American Beech ( <u>Fagus grandifolia</u> )	8
Southern Red Oak ( <u>Quercus falcata</u> )	6
Northern Red Oak ( <u>Quercus rubra</u> )	5
Sycamore ( <u>Platanus occidentalis</u> )	5



TABLE 18 (Con't.)

<u>Species</u>	<u>Total</u>
White Oak ( <u>Quercus alba</u> )	4
Sweet Gum ( <u>Liquidambar styraciflua</u> )	3
Swamp Chestnut Oak ( <u>Quercus michauxii</u> )	2
Black Oak ( <u>Quercus velutina</u> )	2
Willow Oak ( <u>Quercus phellos</u> )	2
Longleaf Pine ( <u>Pinus palustris</u> )	1
Swamp White Oak ( <u>Quercus bicolor</u> )	1
Unidentified Oak (dead)	1
Unidentified Pine (dead)	1

Prey Remains: In each of the 5 years of the project, prey remains in the nest and at the base of the nest trees were collected and identified. In 1977 only successful nests were visited but from 1978 to 1981 prey remains were collected from all successful and abandoned nests visited. In 1978 a portion of the collected prey samples were lost making the information for that year incomplete.

Forty-five species of birds were identified as prey items of the bald eagles with Mallards being the most common avian prey (Table 19). Five different species of turtles were found with the Diamondback terrapin being the most common. Twelve species of fish were found with catfish and carp making up the bulk of the fish prey found, catfish accounting for 50% of the occurrences of fish prey. Eleven species of mammals were found with muskrat being the most common.

TABLE 19  
PREY EVIDENCE FOUND IN AND UNDER NESTS  
(listed by number of occurrences)

BIRDS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Mallard ( <u>Anas platyrhynchos</u> )	29
Domestic chicken ( <u>Gallus domesticus</u> )	13
Common goldeneye ( <u>Glaucionetta clangula</u> )	12
Common crow ( <u>Corvus brachyrhynchos</u> )	9



TABLE 19 (Con't.)

BIRDS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Common grackle ( <u>Quiscalus quiscula</u> )	9
Canada goose ( <u>Branta canadensis</u> )	8
American coot ( <u>Fulica americana</u> )	8
Pintail duck ( <u>Anas acuta</u> )	7
Black duck ( <u>Anas rubripes</u> )	5
Lesser scaup ( <u>Aythya affinis</u> )	5
Common gallinule ( <u>Gallinula chloropus</u> )	5
Ring-billed gull ( <u>Larus delawarensis</u> )	4
Rock dove ( <u>Columba livia</u> )	4
Snowy egret ( <u>Leucophoyx thula</u> )	3
Glossy ibis ( <u>Plegadis falcinellus</u> )	3
Red-tailed hawk ( <u>Buteo jamaicensis</u> )	3
Herring gull ( <u>Larus argentatus</u> )	3
Mourning dove ( <u>Zenaidura macroura</u> )	3
Yellow-shafted flicker ( <u>Colaptes auratus</u> )	3
Horned grebe ( <u>Podiceps grisegena</u> )	2
Pied-billed grebe ( <u>Podilymbus podiceps</u> )	2
Little blue heron ( <u>Florida caerulea</u> )	2
Cattle egret ( <u>Bulbulcus ibis</u> )	2
Brant ( <u>Branta bernicla</u> )	2
American widgeon ( <u>Mareca americana</u> )	2
Wood duck ( <u>Aix sponsa</u> )	2
Canvasback ( <u>Aythya valisineria</u> )	2
Ruddy duck ( <u>Oxyura jamaicensis</u> )	2
Bobwhite quail ( <u>Colinus virginianus</u> )	2
Laughing gull ( <u>Larus atricilla</u> )	2



TABLE 19 (Con't.)

BIRDS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Gadwall ( <u>Anas strepera</u> )	1
Common teal ( <u>Anas crecca</u> )	1
Green-winged teal ( <u>Anas carolinensis</u> )	1
Blue-winged teal ( <u>Anas discors</u> )	1
Northern shoveler ( <u>Spatula clypeata</u> )	1
Greater scaup ( <u>Aythya marila</u> )	1
Black vulture ( <u>Coragyps atratus</u> )	1
Red-shouldered hawk ( <u>Buteo lineatus</u> )	1
Merlin ( <u>Falco columbarius</u> )	1
Clapper rail ( <u>Rallus longirostris</u> )	1
Greater yellowlegs ( <u>Totanus melanoleucus</u> )	1
Bonaparte's gull ( <u>Larus philadelphia</u> )	1
Great horned owl ( <u>Bubo virginianus</u> )	1
Blue jay ( <u>Cyanocitta cristata</u> )	1
Fish crow ( <u>Corvus ossifragus</u> )	1

MAMMALS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Muskrat ( <u>Ondatra zibethica</u> )	46
Eastern Cottontail ( <u>Sylvilagus floridanus</u> )	26
Nutria ( <u>Myocaster coypus</u> )	4
Eastern Grey Squirrel ( <u>Sciurus carolinensis</u> )	3
Woodchuck ( <u>Marmota monax</u> )	2
Norway Rat ( <u>Rattus norvegicus</u> )	2
Raccoon ( <u>Procyon lotor</u> )	2
Marsh Rabbit ( <u>Sylvilagus palustris</u> )	1
House Cat ( <u>Felis domesticus</u> )	1



TABLE 19 (Con't.)

MAMMALS

<u>Species</u>	<u>Occurrence (# of nests)</u>
Opposum ( <u>Didelphis virginiana</u> )	1
Sheep or Goat ( <u>Ovis</u> sp. or <u>Capra</u> sp.)	1

TURTLES

<u>Species</u>	<u>Occurrence (# of nests)</u>
Diamondback Terrapin ( <u>Malaclemys terrapin</u> )	27
Stinkpot ( <u>Sternotherus odoratus</u> )	23
Eastern Mud Turtle ( <u>Kinosternum subrubrum</u> )	8
Eastern Box Turtle ( <u>Terrapene carolina</u> )	7
Snapping Turtle ( <u>Chelydra serentina</u> )	4
Unknown Species	2

FISH

<u>Species</u>	<u>Occurrence (# of nests)</u>
Catfish ( <u>Ictalurus</u> sp.)	109
Carp ( <u>Cyprinus carpio</u> )	58
American Eel ( <u>Anquilla rostrata</u> )	9
Striped Bass ( <u>Morone saxatilis</u> )	3
Chain Pickerel ( <u>Esox niger</u> )	2
Bluegill ( <u>Lepomis machrochirus</u> )	2
White Shad ( <u>Alosa sapidissima</u> )	1
Menhaden ( <u>Brevoortia tyrannus</u> )	1
White Perch ( <u>Morone americana</u> )	1
Large-mouth Bass ( <u>Micropterus salmoides</u> )	1
Atlantic needlefish ( <u>Strongylura morina</u> )	1
Gizzard shad ( <u>Dorosoma cepedianum</u> )	1
<u>Alosa</u> sp.	1
<u>Esox</u> sp.	3



TABLE 19 (Con't.)

FISH

<u>Species</u>	<u>Occurrence (# of nests)</u>
Unknown Clupeidae ( <u>Alosa</u> or <u>Brevoortia</u> )	7
Unknown Serronoid	3
Unknown Catostomidae	1
Unknown Species	14

Table 20 compares the occurrence of prey types at nest sites for 1979-1981. Each separate species collected at a nest site is recorded as one occurrence, the minimum number of individuals of each species at the nest were not determined. Over the 3 years examined, fish represented 41% of all the occurrences of prey with avian prey representing 35%, followed by mammals at 14% and turtles 10%.

TABLE 20  
COMPARISON OF PREY FOUND  
(# of occurrences)

<u>Prey Type</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Total</u>	<u>% of all Prey</u>
Fish	60	55	68	183	41%
Bird	56	41	59	156	35%
Mammal	27	18	20	65	14%
Turtle	12	11	22	45	10%
	n=77*	n=80*	n=81*		

\*n = number of nests visited

Landownership: Since a majority of the bald eagle nests in the Bay region are located on private land, a great deal of time must be spent obtaining permission from each landowner before the crew can visit a nest site. The nest locations have been plotted as accurately as possible on topographic maps. These maps are then compared to the tax maps within each county to identify the individual landowners. Each landowner was then contacted to gain permission to enter their property. In each of the 5 years, letters of appreciation have been sent to each landowner whose nest was visited informing them of what was found in the nest and explaining the purpose of the project (see Appendix C).



Table 21 lists 6 different property types where the bald eagle nests are located. This table was compiled to give some idea of the types of threats to, or security provided for, the nest sites in the Bay region. Changes in timber harvesting practices, the breakup of private estates into smaller parcels, the conversion of farmlands and woodlands to private or commercial development, all of these will have an impact on the availability and quality of nesting habitat of the bald eagles in the 3 State area.

In the 3 years of data presented in Table 21 the number of nests located on each type of property has remained consistent. The one change shown is the decrease in the number of nests on Federal or State land. In 1980 part of this decrease resulted from the movement of nesting pairs of eagles outside the boundaries of the Blackwater National Wildlife Refuge. In 1981 the further decrease was caused by the lack of activity at the nest sites on the Army's Aberdeen Proving Grounds in Maryland at the northern end of the Bay.

For the last 3 years a successful nest has been located in the middle of a housing development under construction in Westmoreland Co., Va. (VA-WE-79-05). In each of the 3 years, 2 young were raised in the nest. The nest is located on the corner of 2 streets laid out for the development with one house within 200 yds. of the nest. These eagles have coexisted with dump trucks passing by within 100 yds. of the nest and the neighborhood children that sit and watch the nest.

TABLE 21  
PROPERTY TYPE OF VISITED ACTIVE NESTS

	<u>1979</u>	<u>1980</u>	<u>1981</u>
<b>Federal or State Land (includes N.W.R., military bases, etc.)</b>	13	9	7
<b>Timber harvested Land (includes both lumber co. and privately-owned lands)</b>	32	29	32
<b>Private Estates (large tracts of land with restricted access)</b>	8	13	12
<b>Farmlands</b>	9	13	14
<b>Woodlands or Marshes</b>	14	14	13
<b>Developments (housing developments built or under construction)</b>	1	2	3
	<hr/>	<hr/>	<hr/>
	77	80	81



**Nesting Territories:** Table 22 is a listing of the counties within the 3 State area in which there are nesting bald eagles. Within each county the number of individual active nesting territories were identified and counted for each of the 5 years. The total number of separate territories identified over the 5 year period are given. Comparing this figure with the number of active nesting pairs in any one year indicates the number of possible nesting territories available but not active.

The labeling of a nest or several alternate nests as a single nesting territory required examining the nesting records over the last five years noting the distance between nests, occupancy of adjacent nests, the discovery of new nests etc. The figures given for the total number of nesting territories are to be considered estimates based on the information available to us. A total of 121 nesting territories were identified in the Bay region over the last 5 years. The greatest number of active nesting territories found in any one year was 93 in 1981.

**TABLE 22**  
**ACTIVE NESTING TERRITORIES BY COUNTY**

**MARYLAND**

<b>County</b>	<b>1977<sup>1</sup></b>	<b>1978</b>	<b>1979</b>	<b>1980</b>	<b>1981</b>	<b>Total Territories</b>
Anne Arundel	-	2	2	3	3	3
Calvert	2	1	1	1	3	4
Caroline	-	-	-	1	1	1
Charles	5	8	8	8	8	9
Cecil	-	1	1	2	1	2
Dorchester	9	10	14	10	14	20
Harford	-	1	2	3	-	3
Kent	3	2	3	7	7	7
Queen Anne	1	3	2	1	3	3
St. Mary's	2	5	6	5	3	6
Somerset	-	1	1	1	1	2
Talbot	1	3	3	3	3	3
Wicomico	-	2	2	1	1	2
Worcester	1	2	2	2	2	2
<b>Total<sup>2</sup></b>	<b>24</b>	<b>41</b>	<b>47</b>	<b>48</b>	<b>50</b>	<b>67</b>



TABLE 22 (Con't.)

## DELAWARE

<u>County</u>	<u>1977</u> <sup>1</sup>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Total Territories</u>
Kent	-	1	1	1	1	1
Sussex	-	2	1	1	3	3
<b>Total<sup>2</sup></b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>

## VIRGINIA

Accomac	1	1	1	1	1	1
Charles City	-	-	-	-	1	1
Essex	1	1	1	1	1	1
Fairfax	1	1	1	1	1	1
Gloucester	-	-	-	-	1	1
James City	-	1	-	-	1	1
King George	2	7	6	6	6	8
King William	-	2	4	2	2	4
Lancaster	2	2	2	1	1	2
Middlesex	1	3	3	3	3	4
Northumberland	-	3	2	2	2	3
New Kent	1	3	2	3	3	4
Prince George	-	-	1	1	1	1
Richmond	3	4	4	5	5	5
Stafford	-	1	2	1	-	2
Sussex	-	-	-	-	1	1
Westmoreland	5	6	5	8	9	9
York	-	1	1	-	-	1
<b>Total<sup>2</sup></b>	<b>17</b>	<b>36</b>	<b>35</b>	<b>35</b>	<b>39</b>	<b>50</b>

<sup>1</sup>Numbers represent only successful nests visited by the banding crew.

<sup>2</sup>Except for 1977, totals represent all active nests known by the banding crew during the banding project.



Band Returns: There have been 8 band recoveries from the bald eagles banded in the Chesapeake Bay region (Table 23). The most distant recoveries coming from the Bruce Peninsula in Ontario and from Hale Co., Alabama. In addition to the 8 recoveries listed here, there were 5 band returns from fledglings found dead at or near the nest sites. These birds were found either shortly after fledging or the next year when the crew returned to the nest site.

There has been one report of a colormarked eagle (orange band tag) from a Maryland nest sighted in New York State in March of 1978. This was a bird fledged in the summer of 1977.

Additional information on banded and colormarked birds was obtained from observations made from blinds on small ponds near the Potomac River in King George Co., Va. This includes the Caledon State Park and Cedar Grove Farm properties where there is a high concentration of summering bald eagles. Over 40 individual bald eagles have been seen in this area in a single day during the month of July 1981. Four bald eagles, all banded in the Bay region, were identified in 1981 by reading all or part of the band numbers using a 20 power scope. Two were banded in 1977 and 2 had been banded in 1979. Five other eagles were identified from the band tag, 4 having fledged in 1981 and one in 1980. There have been 2 reported sightings of the birds with patagial markers banded in 1978. One sighting was in January of 1979 and another in April of 1981. Both sightings came from the Cedar Grove Farm area, the same general area in which the birds fledged in 1978.



TABLE 23

BAND RECOVERIES

Outside the Bay Region

<u>Band No.</u>	<u>Date Banded</u>	<u>Location</u>	<u>Date Recovered</u>	<u>Location</u>	<u>Condition</u>
629-04557	May 18, 1977	Dorchester Co., MD	July 15, 1978	Chester Co., PA	Dead
629-04577	May 5, 1978	Dorchester Co., MD	Sept. 25, 1978	Bruce Peninsula, ONT	Dead
629-06569	May 19, 1980	Stafford Co., VA	Dec. 17, 1980	Berkeley Co., SC	Shot/Alive
629-04561	May 21, 1977	Queen Annes Co., MD	May 21, 1981	Hale Co., AL	Dead

Bay Region

<u>Band No.</u>	<u>Date Banded</u>	<u>Location</u>	<u>Date Recovered</u>	<u>Location</u>	<u>Condition</u>
629-08144	May 9, 1980	Wicomico Co., MD	August 17, 1980	Dorchester Co., MD	Dead
629-08161	May 26, 1980	Kent Co., MD	Dec. 19, 1980	Essex Co., VA	Shot/Alive
629-06510	May 15, 1979	Charles Co., MD	Oct. 18, 1980	King George Co., VA	Shot/Alive
629-00093	May 28, 1978	Stafford Co., VA	April 20, 1981	Richmond Co., VA	Dead



## Recommendations

1. It is recommended that the nestling banding project be continued for another 5 years. This is necessary because the original questions that prompted this study have not been answered. The ongoing summer (Cedar Grove Farm/Caledon studies by Byrd and Clark) and planned winter (Aberdeen study by R.I.C.) studies will enhance the data gathered from this banding project.
2. It is also recommended that additional winter and summer studies of bald eagle concentration areas be initiated.
3. And lastly, it is recommended that a color leg band marking system be implemented for all bald eagles banded in the Chesapeake Bay region.

## Acknowledgements

This project was funded by the Maryland Wildlife Administration, the Virginia Commission of Game and Inland Fisheries and the Delaware Department of Natural Resources and Environmental Control, through their Cooperative Wildlife Agreements with the U.S. Fish and Wildlife Service. Funding was also provided by the Environment Contaminant Evaluation Program, U.S. Fish and Wildlife Service, through Stanley Wiemeyer.

Without the excellent job of those involved in the aerial survey, the success of the project would not have been realized. We appreciate the effort and the support given by Gary Taylor, Ken D'Loughy and Bob McKee, Maryland Wildlife Administration, Dr. Mitchell Byrd, College of William and Mary, and Jackson Abbott and Fred Scott, of the Audubon Naturalist Society, and of course the pilots, including Greg Stover and Sherman Beck, without whose skills this survey information would not be possible.

The personnel at the Blackwater National Wildlife Refuge were again extremely helpful to the crew in visiting nests on the refuge and providing information on other nests in Dorchester Co., Maryland.

In Delaware, Paul Burns, Division of Fish and Wildlife, made the job much easier for us in locating the nests and contacting the landowners.

Special thanks go to Dotty and Eddie Mendenhall for their hospitality and assistance given to the crew as we visited the nests in Kent Co., Maryland.

The crew would also like to thank Ms. Anne Wheeley for the information and assistance that she provided to us in visiting the nests in Middlesex Co., Virginia.

We would like to acknowledge the help given by the following in the identification of prey species found at the nest sites: Roxy Laybourne,



U.S. Fish and Wildlife Service and Beth Ann Sabo, Smithsonian Institute (Birds); Mr. George Van Dyke, Smithsonian Institute (Fish); and Mark Causey whose skills as a climber were greatly missed this year, who identified the mammal prey remains.

And a very special thanks to the members of the banding crew whose dedication and skill made this years project such a successful one: Craig Koppie, John B. Holt, Jr., Tony Steffer and Mike Pramstaller.

And finally we would like to acknowledge the contributions made by all those who have assisted us in the first 5 years of the project. In addition to those already mentioned special thanks go to: Buck Bradley and Janeas Bradley, original members of the climbing team who helped to teach many of us how to climb into a bald eagles nest: to Mark Causey, Marty Gilroy and Tom Prunier who have also participated as members of the climbing team: to Mike Pramstaller and Bob Dittrick for their contributions as project leaders: and to the staff of the Raptor Information Center and National Wildlife Federation who have helped in all phases of the banding project and in the publication of this and the previous years reports, including Tina Bandle for the cover design for this and last years report.



## **APPENDIX A**

### **Band Tag Scheme for Chesapeake Bay Bald Eagles**



Band Tags

- 1977 Maryland - Orange, black letter/number (Example: M12)  
Virginia - Blue, black letter/number (Example: V01)  
(Single thickness vinyl, oblong shape, squared edges)
- 1978 Maryland - Orange  
Virginia - Blue  
(Same tag as 1977 but constructed of double thickness  
of vinyl)
- 1979 Maryland, Virginia, Delaware - Orange  
(Same tags as 1978 with a more rounded shape)
- 1980 Maryland, Virginia, Delaware - Orange  
(Triangular shape, triple thickness of vinyl, with geometric  
shapes in black or white designating watersheds)
- 1981 Maryland, Virginia, Delaware - Orange  
(Round tag, white numerals)



## **APPENDIX B**

**Form used to record data in the field**



CHESAPEAKE BAY BALD EAGLE BANDING PROJECT  
FIELD FORM

Nest No. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Map ID <input type="text"/> <input type="text"/> <input type="text"/>	Lat. <input type="text"/> <input type="text"/> <input type="text"/>	Long. <input type="text"/> <input type="text"/> <input type="text"/>	Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Time <input type="text"/> <input type="text"/> <input type="text"/>
8	11	14	18	24	28

Tree Species <input type="text"/>	Tree Circ. <input type="text"/> <input type="text"/> <input type="text"/>	Height of Tree (M) <input type="text"/> <input type="text"/>	Height of Nest (M) <input type="text"/> <input type="text"/>
29	32	34	36

Size of Nest (CM)

Depth <input type="text"/> <input type="text"/> <input type="text"/>	Long Axis <input type="text"/> <input type="text"/> <input type="text"/>	Short Axis <input type="text"/> <input type="text"/> <input type="text"/>	Depth of Cup <input type="text"/> <input type="text"/>
39	42	45	47

Unaddled eggs <input type="text"/>	No. of Young <input type="text"/>	Adults Present <input type="text"/>
48	49	50

Band No.	Color Tag No.
① <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 58	<input type="text"/> <input type="text"/> <input type="text"/> 61
② <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 69	<input type="text"/> <input type="text"/> <input type="text"/> 72
③ <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 80	<input type="text"/> <input type="text"/> <input type="text"/> 83

Climber's Initials  
   
85

Recorder's Initials  
   
87

Remarks: (List prey items found in and under nest first, then comments)

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## **APPENDIX C**

**Form letter sent to all cooperating landowners**



**DATE**

**ADDRESS**

**Dear NAME:**

On behalf of the National Wildlife Federation, Maryland Wildlife Administration, Delaware Department of Natural Resources and Environmental Control, and the Virginia Commission of Game and Inland Fisheries, we would like to thank you for your cooperation in the 1981 Chesapeake Bay Bald Eagle Banding Project. Your help in this important study has assisted us in gathering valuable information and helps us provide a more secure future for our endangered national bird.

**INSERT (see next page)**

Please find enclosed a photograph of an adult bald eagle (or eaglets in a nest).

**Sincerely,**

**KEITH W. CLINE  
Project Leader**

**WILLIAM S. CLARK  
Project Manager  
Director, Raptor Information Center**

**Enclosure**



Inserts

Fortunately the nest on your property in (STATE) was successful and (#) eagle chicks were banded. This banding effort will help us to determine unknown information about the Chesapeake Bay eagles such as their movements, survival rate, prey species, and their level of contamination due to environmental pollutants.

Unfortunately, the nest on your property in (STATE) failed to produce young eagles. However, an egg was collected from the nest long after it was due to hatch. The Patuxent Wildlife Research Center of the U.S. Fish and Wildlife Service will be analyzing the egg for indications of contamination. We hope the information received from this egg will give us clues as to why the eagles were unsuccessful.

Unfortunately, the nest on your property in (STATE) failed to produce young eagles. However, eggshell fragments were collected from the nest long after they were due to hatch. The Patuxent Wildlife Research Center of the U.S. Fish and Wildlife Service will be analyzing the eggshells for indications of contamination. We hope the information received from these eggshells will give us clues as to why the eagles were unsuccessful.

Unfortunately, the nest on your property in (STATE) failed to produce young eagles. However, valuable information was collected at the nest site. This information may help us to understand why the eagles at this nest were unsuccessful.









