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Peregrine Falcon Investigations

M. A. Byrd
The Center for Conservation Biology

R. Cashwell

K. Terwilliger

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PERFORMANCE REPORT

STATE:	VIRGINIA	PROJECT NO.:	W-77-R-5
PROJECT TYPE:	Research and/or Inventory	STUDY NO.:	IV
PROJECT TITLE:	NONGAME AND ENDANGERED SPECIES INVESTIGATIONS	JOB NO.:	A-D
STUDY TITLE:	PEREGRINE FALCON INVESTIGATIONS		
PERIOD COVERED:	July 1, 1987 - June 1988		
JOB IV-A OBJECTIVE:	To census migrant peregrines in the fall and to locate wintering birds.		
JOB IV-B OBJECTIVE:	To introduce captive-reared peregrine falcons at mountain hack sites as recommended by the Eastern Peregrine Falcon Recovery Team.		
JOB IV-C OBJECTIVE:	To operate a peregrine falcon trapping and banding station during fall migration at Fisherman Island and at Wise Point on the Eastern Shore of Virginia.		
JOB IV-D OBJECTIVE:	To make detailed studies of non-breeding peregrine falcons at nest sites to determine possible causes of non-breeding status of the birds at these sites.		

SUMMARY:

Five pairs of peregrines produced eggs at nest sites. Four pairs were successful with a total of 16 young produced of which 12 fledged.

Ten of 12 young placed at two mountain hack sites have fledged successfully but have not dispersed from the hack site.

A summary of the coastal hacking program with population projections is included.

FALL MIGRATION:

Three stations to monitor peregrine falcon and other raptor movements during the fall migration were operated at Fisherman Island Wise Point, and Kiptopeke Beach. The stations were operated a total of 142 man days during September, October, and November. A total of 212 peregrines was seen at these stations during migration. This number was substantially below the peak count of 365 in 1986.

WINTERING POPULATIONS

Numerous observations were recorded at Eastern Shore and Tidewater Virginia sites throughout the winter season. No identifiable birds were sighted. All known nesting sites were regularly monitored beginning in March to determine the presence or arrival of breeding birds.

JOB IV-B - To introduce captive-reared peregrine falcons at mountain hack sites as recommended by the Eastern Peregrine Falcon Recovery Team.

The Mount Rogers hack site was not used in 1988 because of the reported presence of adult birds in the area. Although these reports could not be verified, it was considered prudent not to use the site for releases.

Two additional sites were established in the mountains in 1988. Five birds were placed on a constructed tower at Cole Mountain in Amherst County. One bird was lost early in the hack. The remaining four are flying well and still have not dispersed from the site.

Six birds were placed on a cliff site in Shenandoah County. One bird was lost early in the hack and was subsequently replaced with a bird of the same age found in Philadelphia. All six birds are still in the area of the hack site.

COASTAL SITES

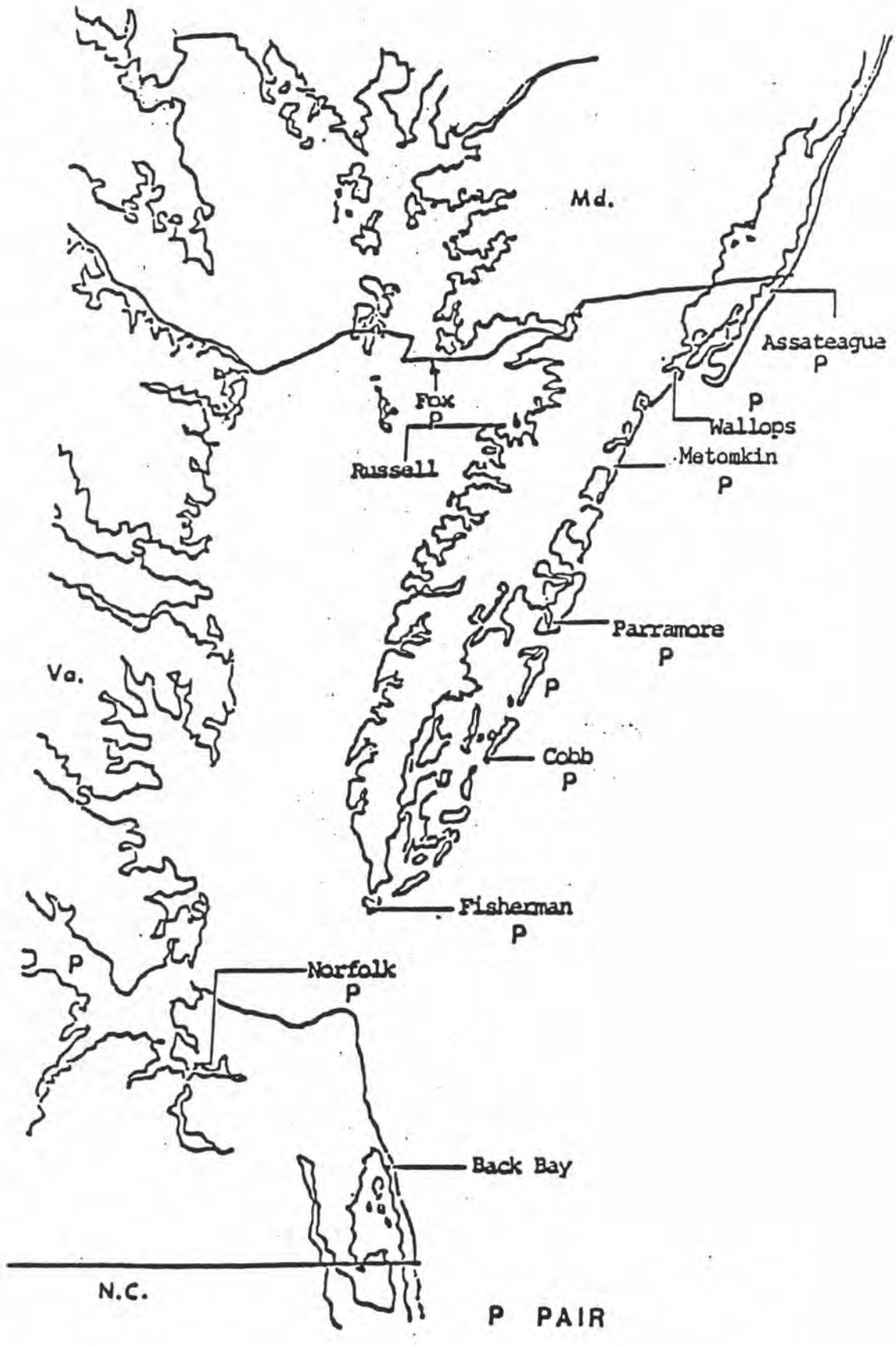
Releases at coastal sites were discontinued in 1985 because of the presence of adult birds at most areas. A complete summary of the hacking program on the coast is included along with the history of breeding success of this population since the first pair was successful in 1982. A population model is presented as it relates to this population. All coastal release sites are indicated in Figure 1.

HACKING RESULTS

Sixteen releases of captive-produced peregrines were made at six island sites (Table 1) from 1978-1985. Two additional releases were made at an urban site in Norfolk in 1981 and 1982 and one release at Back Bay National Wildlife Refuge in 1982 (Table 2).

A total of 110 birds was released at these 19 sites between 1978-1985.

Figure 1. Named hack sites indicating pairs of peregrines at these and other sites, 1988.


Md.
Assateague
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Fox
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Wallops
Russell
Metomkin
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Parramore
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Va.
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Cobb
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Fisherman
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Norfolk
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Back Bay
N.C.
P PAIR
S SINGLE

TABLE 1. Percentage fledging success of peregrine falcons released on the Barrier Islands, 1978-1985.

Year	Location	Number Released	Number Fledged	% of Young Fledged
1978	Cobb Island	5	3	60
1979	Cobb Island	5	5	100
1980	Cobb Island	5	5	100
	Fisherman Island	5	3	60
1981	Assateague Island	6	3	50
	Great Fox Island	6	6	100
	Cobb Island	6	6	100
1982	Russell Island	6	6	100
	Great Fox Island	6	6	100
1983	Cobb Island	7	7	100
	Russell Island	7	7	100
	Great Fox Island	4	1	25
1984	Russell Island	6	6	100
	Cobb Island	5	5	100
	Parramore Island	7	7	100
1985	Russell Island	7	2	29
Totals		93	78	84

Hacking success is measured by the percentage of released peregrines that become independent with respect to food and normally disperse from the hack site. This success rate may be biased due to the inherent difficulty in distinguishing mortality following dispersal during the fourth and fifth weeks following release. For consistency, birds not seen after four weeks post release are assumed independent unless individual evaluation or other evidence suggests otherwise. The success rate of peregrine releases in Virginia was 83 percent. The success and mortality by site and year appear in Tables 1 and 2. Barclay (1980) determined a 72% success rate of releases in the eastern U.S. from 1975 to 1979.

TABLE 2. Percentage fledging success of all eastern Virginia peregrine falcon releases.

Years	Locations	Number Released	Number Fledged	% of Young Fledged
1978-1985	Barrier Islands	93	78	84
1980	Downtown Norfolk	6	5	83
1981	Downtown Norfolk	4	4	100
1982	Back Bay N.W.R.	7	7	100
Totals		110	91	83

Mortality and other losses incurred during the hacking process at 19 sites ranged from 0 percent to 71 percent. The greatest single loss of 5 young at Russell Island in 1985 was due to the unexpected predation by a great horned owl. The loss of 3 young at Assateague Island in 1981 and 3 young at Great Fox Island in 1983 was due to harassment and killing by returning adult falcons.

As observed in most avian groups, mortality of first year peregrines is the highest of any age class. Estimates of first year mortality rates of wild peregrines vary from 55% (Shor, 1970) to 80% (Mebs, 1960 in Barclay, 1980). First year mortality of 70% as calculated by (Enderson, 1969) is accepted for North American peregrine populations. This first year mortality can be divided into pre- and post-dispersal periods. The post-dispersal period has been commonly thought to be a more difficult time as it requires the young birds to hunt successfully. Post-dispersal young are also prone to encounter more hazards due to their increased range. Pre-dispersal birds, however, are subject to many dangers. The fledging or first flight is an important phase in avian development and tends to be hazardous. Injuries that occur due to lack of judgment or skill may doom a young peregrine. Data are lacking on the pre-dispersal mortality for wild peregrines, but estimates do exist for a congener with similar population dynamics. Prairie falcons (Falco mexicanus) in Idaho experience pre-dispersal mortality rates varying from 12-26% (Kochert, 1976; Peterson, 1976 in Barclay, 1980). These figures are minimal estimates as every individual was not accounted for due to the lack of radio telemetry. The moderate pre-dispersal mortality of Virginia releases (17%) is probably due to several factors, namely, the choice of predator free hack sites and the dedication of hack attendants. In several cases, young peregrines were rescued from predicaments that would have proven fatal if not for human intervention.

We have much less control over post-dispersal mortality of released peregrines. Hunting is an instinctive behavior yet much practice is necessary to perfect the skill. For this reason food is made available to the released peregrines at the sites for up to six weeks post release. A "weaning" process is also employed to further stimulate hunting without risking starvation. Hunting proficiency of hacked birds is possibly enhanced by the amount of practice each bird experiences. The high density of potential prey, especially migrating shorebirds, on the barrier islands of Virginia increases prey encounters.

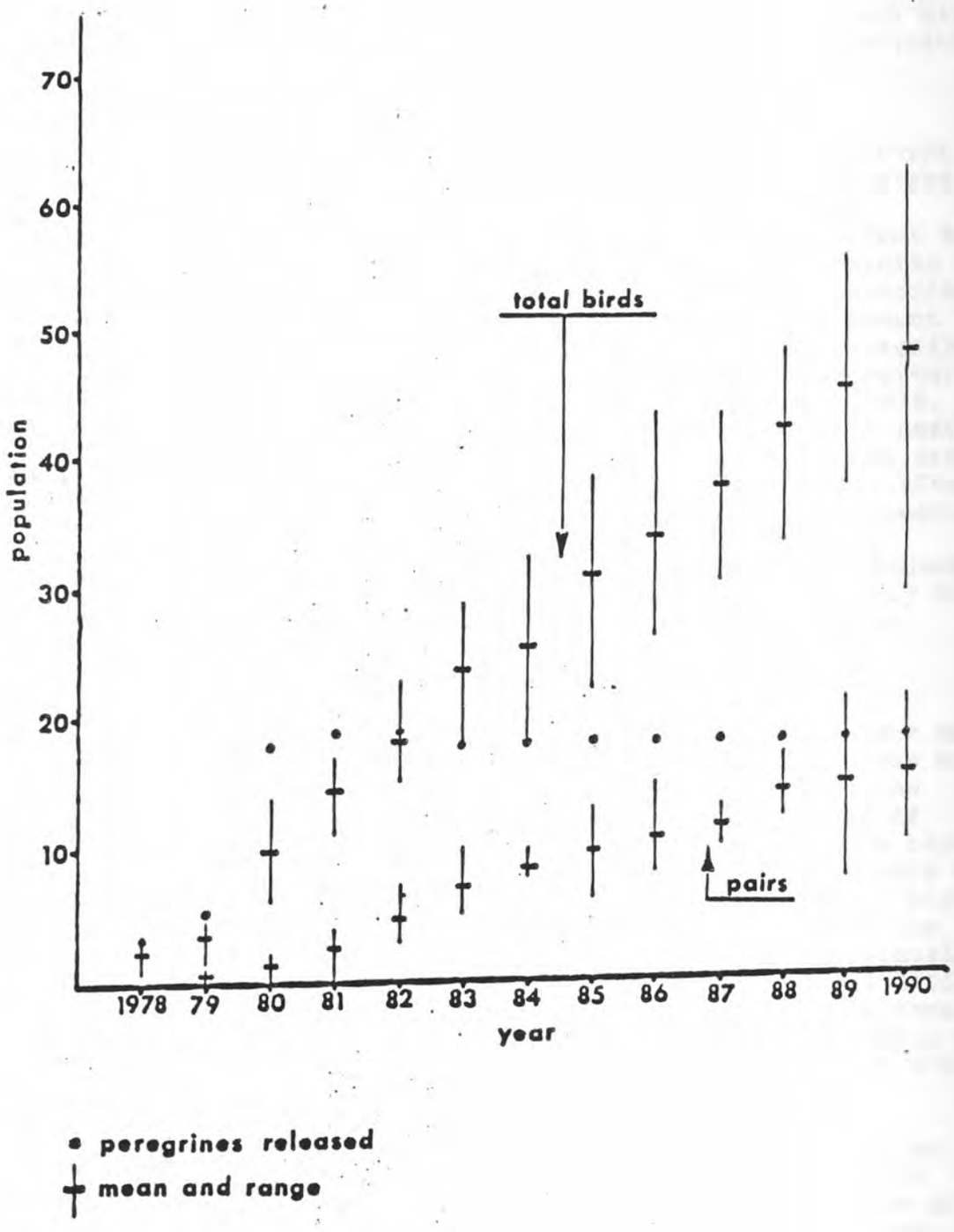
Human persecution has been and may continue to be an important cause of post-dispersal mortality. One half of the band recoveries in studies by Shor, (1970) and Enderson, (1969) occurred through shooting. Peregrines released by hacking are unavoidably subject to human contact although techniques are used to minimize the chances of developing human-food relationships. Nevertheless, hacked peregrines are not necessarily wary of humans. Coupled with the large amount of gunning which occurs in the Chesapeake Bay area, losses of peregrines to unscrupulous hunters is a distinct possibility. Only one peregrine shooting is known to have occurred in eastern Virginia since 1978. An unbanded individual (implying a wild peregrine) was found shot near Norfolk, Virginia. The possibility exists that more peregrines are being shot and not reported since it is an unlawful activity. After reviewing band recovery data, Barclay (1980) concluded that peregrines hacked in the eastern U.S. are not subject to heavier shooting pressure than wild peregrines. Evidence does exist that the amount of raptor shooting has decreased since 1949 (Newton, 1979) possibly due to a more conservation minded public and protective legislation.

Population Estimation and Projection

Determining total population numbers of peregrines resident on the barrier islands and in Virginia, generally, is difficult due to the high mobility of the young birds and our inability to follow widely dispersed individuals throughout the year. The number of adults is more easily determined due to the tendency for these birds to remain territorial at suitable breeding sites, ie. hack towers and bridges. At present, ten established pairs and three unpaired birds (2 males and one female) are known to exist. Although two of the single birds comprise a hypothetical eleventh pair, the individuals occupy separate territories approximately 40 km apart. The locations of adult pairs and singles are shown in Figure 1. Both birds remain sedentary throughout the year making it improbable that they will pair with each other. Each bird does represent a potential pair at its respective site.

A stochastic model for population growth developed by Grier, (1979), was used to assist in population estimates and to project results of the reintroduction program. The model simulates the growth of an existing or reintroduced population using known or assumed

Figure 2. Projected growth of Virginia peregrine population assuming 60% hatch-year and 20% after-hatch year mortality.


70
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50
40
30
20
10
population
total birds
pairs
1978
79
80
81
82
83
84
85
86
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88
89
1990
year
• peregrines released
mean and range

parameters. The incorporation of random chance within given probabilities for reproduction, sex of individuals, and mortality realistically approximates the unpredictability of small founding populations. The program parameters include:

1) monogamous or polygamous breeding pattern

2) age that breeding begins

3) maximum number of young per female

4) mean number of young per total breeding attempt

5) mean number of young per successful breeding

6) first year mortality rate

7) mortality rate of older animals

8) limit (if any) on number of breeding pairs per year

9) number (if any) of first year animals released per year

10) number (if any) of older animals released per year.

Simulation results include number of animals of given age classes present at the beginning and end of any year. The stochastic nature of the program produces variable results due to random chance. For this reason, five simulations are run for every year and the mean and range of possible outcomes is presented.

Figure 2 displays the simulated growth of the Virginia reintroduced peregrine population. This model was based on the number of peregrines released through 1982 and assumed that nine male and nine female peregrines would be released per year to 1990. Other parameters included 60% hatch year mortality and 20% post hatch year mortality. These mortality rates are conservative estimates which include pre-dispersal losses and are based on band recovery data from wild populations (Enderson, 1969) and returns of released peregrines (Barclay, 1980). Reproduction averages of 1.5 young per nesting attempt and 2.5 young per successful nesting attempt were utilized. Several studies (Mebs, 1960 in Barclay, 1980, Herren, 1969) indicate that this productivity is conservatively realistic. Forty percent of nesting attempts produce no young which is largely a reflection of the low reproductive success of second year birds which are included as breeders in this model. Beebe (1960) found approximately 60% breeding success of all recorded attempts in the F. p. pealei population of Queen Charlotte Islands. The number of breeding pairs in coastal Virginia will probably be limited by the number of towers or other suitable nesting substrata which are present in a given year. The number of pairs which can attempt breeding is limited to 14 for this series of simulations. That is the maximum number of hack/breeding towers that could be erected in the immediate future. It does not take into account other possible nesting substrata such as bridges or

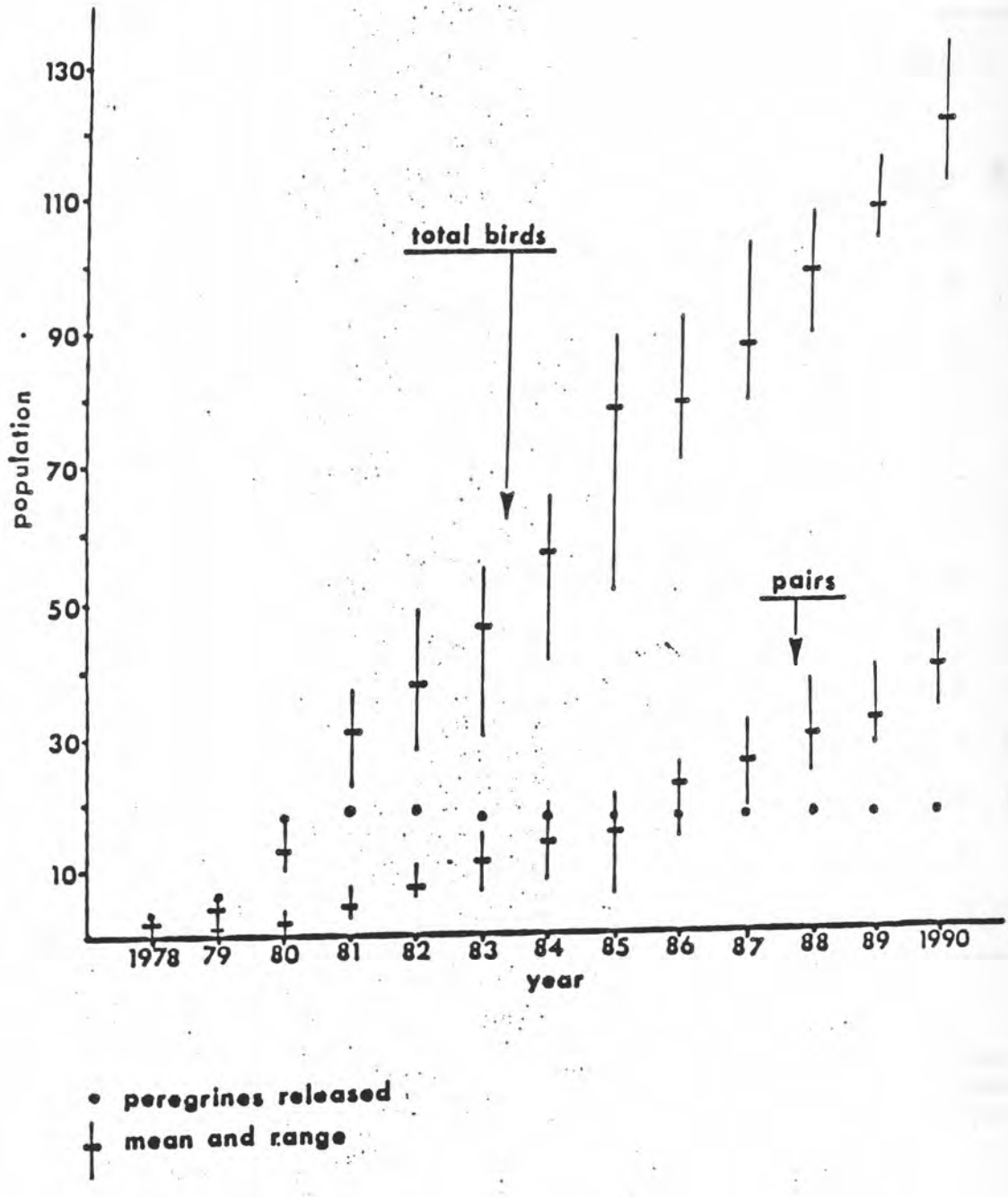
buildings. The number of pairs present in any simulation is defined by the number of the sex which is limiting in any given year. The model indicates a current population in Virginia of 33-48 peregrines (mean=41.8) including 12-17 pairs (mean=14.0). Yearly projected population numbers from 1978 to 1990 are present in Table 3.

TABLE 3: Population growth simulation A data. Fifty percent hatch-year and fifteen percent after-hatch-year mortality. Pairs defined by number of limiting sex.

		Total birds present							Pairs present						
		Simulations:							Simulations						
Year	Birds released	1	2	3	4	5	Mean	Range	1	2	3	4	5	Mean	Range
1978	3	1	1	3	1	1	1.6	1-3	0	0	0	0	0	0.0	0-1
1979	5	2	5	5	1	4	3.4	1-5	0	0	1	0	1	0.8	0-1
1980	18	6	12	14	9	8	9.8	6-14	0	2	2	0	2	1.2	0-2
1981	19	15	17	16	11	14	14.6	11-17	0	4	4	2	3	2.6	0-4
1982	19	17	15	20	16	23	18.2	15-23	3	5	7	4	5	4.8	3-7
1983	18	29	21	22	18	29	23.8	18-29	5	5	8	7	10	7.0	5-10
1984	18	32	23	27	18	26	25.2	18-32	9	8	8	8	10	8.6	8-10
1985	18	38	27	31	22	36	30.8	22-38	13	6	11	7	10	9.4	6-13
1986	18	43	26	32	30	32	32.6	26-43	15	8	9	10	11	10.6	8-15
1987	18	40	30	43	38	35	37.2	30-43	13	10	11	12	12	11.6	10-13
1988	18	42	33	48	43	43	41.8	33-48	14	12	17	12	15	14.0	12-17
1989	18	36	36	55	45	52	44.8	36-55	14	7	21	15	17	14.8	7-21
1990	18	39	28	62	52	55	47.2	28-62	14	10	21	16	20	16.2	10-21

An identical model was run without limiting the number of breeding pairs to determine maximum population numbers. The mean number of breeding pairs present in 1990 under those circumstances was 18. This indicates that 18 nest sites would be needed by 1990 to allow the mean number of potential pairs to attempt breeding.

Figure 3. Projected growth of Virginia peregrine population assuming 50% hatch year and 15% after-hatch-year mortality.


130
110
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population
total birds
pairs
1978
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1990
year
peregrines released
mean and range

TABLE 4. Differences of simulated populations using t-test comparison of means. Degrees of freedom equal 8 for all tests.

	Simulation A (n-5)	Simulation B (n-5)	t
1982			
pairs present	4.8 ± 1.44	7.6 ± 4.30	2.95
total birds present	18.2 ± 3.27	31.0 ± 5.15	4.69
1990			
pairs present	16.2 ± 4.49	40 ± 4.30	8.56
total birds present	47.2 ± 13.59	47.2 ± 5.12	9.46

t .05 (8) = 2.306
t .01 (8) = 3.355
t .001 (8) = 5.041

Simulation A - 60% hatch year mortality; 20% post-hatch year mortality.
Simulation B - 50% year mortality; 15% post hatch-year mortality.

Analysis of survivorship tables show that mortality rate affects population growth to varying degrees, partly dependent upon the age at maturity of the species. Populations of animals such as the bald eagle (Haliaeetus leucocephalus) which do not breed until their fourth year are extremely affected by slight changes in mortality rates. Species which breed at very young ages, ie. Peromyscus spp. are affected more by reproduction rate changes than mortality rate changes. Peregrines generally do not breed successfully until their third year. The attempts of sub-adult birds are usually included in reproductive figures. The relatively high percentage of unsuccessful breeding attempts reported (40%) is probably reflective of these sub-adult attempts. Survivorship tables do indicate that relatively small changes in mortality rates have profound effects on peregrine population growth (Young 1969).

Figure 3 shows the simulated growth of a Virginia peregrine population which is subject to 50% hatch year mortality and 15% post hatch year mortality. Other parameters in this model are identical to the growth simulation displayed in Figure 2. The reduction of hatch year mortality by 17% and post hatch year mortality by 25% in the growth simulations produces a significantly higher number of pairs and total birds present in the year 1990. The current population estimate in the simulation is also significantly affected. Table 4 contains the figures and statistical results. As noted earlier, studies of mortality by band recovery methods indicate that some peregrine

populations may experience mortality rates as low as 55% (Shor, 1970) for hatch year birds.

The above model allows one to determine whether populations defined by certain parameters can be self-supportive. When no artificial release of animals occurs, natural reproduction must be sufficient to compensate mortality or the population declines. Repeated simulations indicate that a peregrine population experiencing 60% hatch year and 20% post hatch year mortality rates cannot be self-supportive at documented reproductive rates. This implies that stable wild populations which display these reproductive rates probably are subject to lower mortality rates than those calculated by band recovery studies. More study is needed to accurately determine breeding parameters of re-established peregrine falcon populations.

One of the parameters utilized in these models, the release of 18 peregrines per year until 1990, has not been realized. All releases on the barrier islands were terminated after 1985. Despite this, the currently known number of 10 adult pairs appears close to the lower limit of adult pairs as projected by the simulation A of the model (Table 3).

The model does not however, account for emigration and immigration of peregrines.

Peregrine Movements

Virginia is within the wintering range of a migrant population of peregrines. Peregrines sighted from September through June, therefore, are possibly birds that are emigrating or wintering and not released birds. Since the commencement of Virginia peregrine hacking in 1978, summer sightings have dramatically increased, attesting to the efficiency of hacking. Only banded peregrines can be identified as individuals and then only under excellent viewing conditions or when trapped. For this reason, most sightings are of unidentified peregrines. Peregrines seen between June 1 and August 15 or exhibiting breeding behavior may probably be safely assumed to be released birds or their progeny. Due to the Virginia recovery of several birds released in other states, resident birds in Virginia cannot be assumed to be Virginia releases. For population considerations, recruitment from and loss to other states was assumed to occur with equal frequency.

Information compiled through 1982 from band recoveries on movement of 12 Virginia released peregrines and four peregrines released out of state and recovered in Virginia are indicated in Table 5. Most of these records are due to trapping efforts of raptor banders. The movement of Virginia released peregrines appears to be consistent with the wandering typical of juvenile birds.

TABLE 5. Recovery of known individuals of peregrine falcons hacked in Virginia.

Band number	Sex	Hack site/year	Recovery
576-89280	M	Cobb/78	Trapped Fisherman 9/78
576-89270	M	Cobb/78	Returned Cobb (seen) 5/79-7/79
987-01322	F	Cobb/79	Trapped Sandy Hook, NJ 4/15/80 Found dead Quogue, NY 4/24/80
816-40327	M	Cobb/80	Returned Cobb (seen) 5/81-6/81 Trapped Fisherman 10/5/81
816-40322	M	Assateague/80	Trapped Assateague 9/24/80
987-01343	F	Assateague/80	Trapped Assateague 9/24/80 Trapped False Cape 10/1/80 Trapped Assateague 10/8&10/13/80
987-49509F	F	Great Fox/81	Trapped Assateague 9/18/81
987-49507	F	Great Fox/81	Trapped Corolla, NC 9/30&19/1/80
987-49533	F	Great Fox/82	Seen at Horntown, VA 7/18/82
*987-01361	F	South Marsh, MD/80	Resident on Assateague 5/81-10/81 Trapped Assateague 10/81
*987-49559	F	South Marsh, MD/82	Trapped Wise Point, VA 9/25/82
**987-49598	F	Assateague/82	Trapped Back Bay, VA 9/16/82
987-49551	F	Great Fox/82	Trapped Cape May, NJ 9/18/82
*987-49564	F	South Marsh, MD/82	Trapped Assateague 10/3/82
*987-49577	F	Silver Lake, NY/82	Trapped Assateague 10/11/82

*Hacked outside Virginia; recovered in Virginia
**Young of "natural" nesting in Virginia

The longest movement entailed 520 km over 11 months in contrast to several birds that were captured a few months after release in the vicinity of their hack tower. Of the nine recoveries of Virginia peregrines, five were basically south, two movements were north, and two east. Any inland movements remain undetected with the possible

exception of unidentified males on a building in Richmond from 1983-1986 and on a bridge on the Rappahannock River from 1986-1988.

Although young peregrines wander widely, the ultimate test of hacking success is the return to and establishment of successfully breeding adults at the site of origin or at suitable sites in other areas.

TABLE 6. Location of breeding peregrine falcons in Virginia, or of Virginia origin, 1987.

Breeding Location	Sex	Origin of Bird and Year	
		Hack Release	Naturally Hatched
Great Fox Island, Va.	Female	Cobb Island, Va., 1981	
Cobb Island, Va.	Female	Cobb Island, Va., 1983	
Parramore Island, Va.	Male		Chincoteague N.W. R., VA 1983
Metomkin Island, Va.	Female	Smith Island, Md., 1984	
Chincoteague N.W.R., Va.	Male	Cobb Island, Va., 1978	
Chincoteague N.W.R., Va.	Female		Sea Isle, N.J., 1983
Hog Island, Va.	Male	Parramore Island, Va., 1984	
Fisherman Island, Va.	Male	Smith Island, Va., 1984	
Sedge Island, N.J.	Female	Russell Island, Va., 1983	
Manahawkin, N.J.	Female	Parramore Island, Va., 1984	
Brigantine, N.W.R., N.J.	Female		Chincoteague N.W.R., Va. 1982
Tuckahoe, N.J.	Female	Russell Island, Va., 1984	

TABLE 7. Breeding Success of Peregrine Falcons in Virginia

Year	Known Pairs	Pairs Attempting Nesting	% Attempting Nesting	Pairs Successful Which Attempted Nesting	% Pairs Successful Which Att. Nesting	Young Produced	Young Fledged Per Nesting Attempt	Young Fledged Per Successful Nesting Attempt
1982	1	1	100	1	100	4.0	4.00	4.00
1983	2	1	50	1	50	4.0	4.00	4.00
1984	4	2	50	2	100	4.0	2.00	2.00
1985	7	2	29	2	100	7.0	3.50	3.50
1986	7	4	57	3	75	7.0	1.75	2.33
1987	9	5	56	4	80	14.0(1)	2.80	3.50
1988	10	5	50	4	80	16.0(2)	2.40	3.00
TOTALS	40	20	50	17	85	54	2.70	3.17

(1) Two young in captivity but included in calculations

(2) Four young died of diesease, not included in calculations

During the breeding season of 1987, in collaboration with the Peregrine Fund, breeding adults were trapped at sites in Maryland, Virginia, and New Jersey to determine the origin of the resident adults. Twelve adults were captured which were breeding in Virginia or were of Virginia origin (Table 6). Of the 12 birds in the sample, five nesting in Virginia were of Virginia origin and three had immigrated from either Maryland or New Jersey. Four birds nesting in New Jersey had originated in Virginia.

These limited data indicate a free movement of birds, thus suggesting that the reestablished peregrine population should be considered as an eastern population and not as a Virginia or mid-Atlantic population.

Breeding Success and Population Viability

The first successful breeding attempt of peregrine falcons in Virginia for over 20 years occurred at the Assateague Island hack tower in 1982. Both of these birds were banded and were considered to be hacked birds. The number of known adult pairs each year since 1982 has grown with a total of 10 pairs in 1988 (Table 7).

The production of young by nesting peregrines in Virginia is consistent with or better than the parameters utilized in the population model and better than the eastern population in general (Gilroy, 1987). The model is a useful predictor of population growth. The known number of adult pairs appears to be near that predicted by the model, although there likely are unknown pairs which would increase the total.

Since releases are no longer planned for the coast, a fundamental question exists as to the viability of this population. At three barrier island sites in Virginia, there has been clear evidence of mate loss followed by rapid replacement of that individual. This also has occurred at other sites in the east (Marty Gilroy, personal communication), suggesting that there are surplus individuals available to enter the breeding population. In Virginia, reproduction appears adequate to provide replacements but as seen in Table 6, there is considerable movement involved.

An adequate evaluation of this population probably can be made only after several years in which no further artificial introduction of young has been made in the East.

Management Considerations

It is essential that disturbance during the breeding season be minimized. Since most of the breeding pairs are located on the barrier islands, the future of those islands is critical. There are increasing pressures for human use of the islands. The extent to

which this can be controlled is important to the continued success of peregrines in that habitat.

The most important limiting factor is adequate nesting sites. The original hack towers continue to be the most important sites on the coast. It is essential that they be repaired and kept in a state of good maintenance into the future.

New sites on unusual structures such as buildings and bridges must be identified and adequate management, such as nest box installation, implemented.

JOB IV-C - To operate a peregrine falcon trapping and banding station at Fisherman Island and at Wise Point on the Eastern Shore of Virginia.

TRAPPING STATIONS

Peregrine trapping was conducted at Wise Point, Fisherman Island, and Kiptopeke Beach during September and October. A total of 16 peregrines was captured at these sites, none of which previously had been banded, thus no hacked birds or progeny of hacked birds were captured during these trapping activities.

JOB IV-D - To make detailed studies of non-breeding peregrine falcons at nest sites to determine possible causes of non-breeding status of birds at these sites.

Pairs at Hog, Fisherman, and Parramore Islands were observed in order to determine possible reasons why pairs at these sites consistently fail to attempt nesting. The male at Parramore appears to be a subadult, possibly explaining non-breeding in 1988. The pair at Hog Island appears to be very sensitive to disturbance, and is disturbed a great deal. It may not be nesting for that reason.

The non-breeding pair at Fisherman consists of full adults. A pair has been present at Fisherman for several years with no attempt at nesting. The male of this pair has changed at least twice during this period. Attempts to capture the female for identification have been unsuccessful. Further attempts will be made to capture this individual for examination.

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TARGET DATE FOR COMPLETION: Continuing

STATUS OF PROGRESS: On Schedule

SIGNIFICANT DEVIATIONS IN PROGRESS: None

RECOMMENDATIONS: Continue Study

COST THIS SEGMENT: Federal $26,041.50 State $8,680.00 Total $34,722.00

PREPARED BY: Mitchell A. Byrd
Rudy Cashwell
Karen Terwilliger

APPROVED BY: Jack W. Raybourne
Chief, Division of Game

Robert W. Duncan
P. R. Coordinator

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