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ACADIA NATIONAL PARK
RESOURCE MANAGEMENT DIVISION

**EASTERN
PEREGRINE FALCON
REINTRODUCTION PROGRAM
1984
SUMMARY REPORT
THE PEREGRINE FUND**

CORNELL UNIVERSITY LABORATORY OF ORNITHOLOGY
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ITHACA, NEW YORK 14850

EASTERN PEREGRINE FALCON REINTRODUCTION PROGRAM
1984 SUMMARY REPORT

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I. Introduction

This report summarizes the work conducted by The Peregrine Fund, at the Cornell Laboratory of Ornithology to propagate and coordinate the release of peregrine falcons (Falco peregrinus) in the eastern United States in 1984. Section II contains summaries and discussions of the release work in the mid-Atlantic Coastal Region, the northern and southern Appalachians. A summary of the sightings of adult peregrines and nesting activity is contained in Section III. Section IV contains the results of the experimental removal of first clutches of eggs from wild nesting pairs. The remainder of this report contains the individual accounts prepared by the release site attendants.

II. Reintroduction Summary

One hundred and twenty-four peregrines were released at 25 eastern locations in 1984 (Table 1). This brings the total of peregrines placed for release in the East to 635. One hundred and nineteen (96 percent) reached independence, this is the highest survival rate in ten years.

Not only was this the best year in the field, but the production of 124 young at our breeding facility was the largest number we have raised. Tighter control of the incubation regime, and a higher percentage of live quail in the diet of the adults as well as good fortune all seem to have contributed to our record production. The 124 peregrines raised include seven from eggs obtained from three pairs in New Jersey (see Section IV).

All released birds and wild young were banded with black anodized Fish and Wildlife Service bands and yellow color bands with black numbers.

Mid-Atlantic Coastal Region Summary

A total of 65 young peregrines were added to the coastal population this year (Tables 1 & 2). Wild pairs produced 25 young and an additional 40 birds were released at towers. Twenty-four were hacked and 16 were fostered to wild pairs. All the hacked birds survived to dispersal. Irregular observations of fostered birds indicated that all had survived at least to fledging.

We were fortunate this year to have had no instances of harassment of hacked falcons by returning sub-adults or adults. Each year as the population of adults increases (see Section III) and more sites are occupied it becomes increasingly difficult to find towers to use for hacking. Adults were seen at Cobb Island and Russell Island, Virginia, but they caused no difficulties. Two other towers, Smith Island, Maryland and Parramore Island, Virginia were built during the spring and were not visited by adults. Plans for the coastal region in 1985 are to hack young at unoccupied towers and to foster young to pairs with broods of less than four.

Northern Appalachians

Seventy-six young were released in the northern region by hacking at ten cliff sites and one urban site. Five young were lost, including two from the Burnt Mountain Vermont site, both of which were probably killed by a great horned owl although only one was found. Three of the six young hacked in Boston, Massachusetts were lost; one died after flying into a window, one was killed by an aircraft and the third was found with a broken wing and is being held in captivity. The cliff sites used this year included two sites in the Adirondacks, three in Vermont and two in New Hampshire. The northern region was expanded to include Maine where three sites were operated for the first time this year.

There was a substantial increase in the number of sightings of returning peregrines in the region this year (Table 3, cf. Figures 1 and 2). Birds were seen at four sites but fortunately they did not interfere with the releases. Plans are to continue releasing young in the northern region as long as the evidence indicates that progress is being made.

Southern Appalachians

During the past few years there has been much interest on the part of the representative agencies of this area in beginning a peregrine restoration program. The Recovery Team had earlier recommended that a new full-scale regional program not be initiated until more progress had been made toward reaching the recovery goals in the two primary regions. It was decided however, that one or two test releases could be undertaken in 1984 and 1985 with the idea that a larger scale program would be started in 1986. Because of our production this year, two groups of young were available for release. Two sites were chosen, one in North Carolina and the other in Tennessee. There were no major problems although the four young at the Tennessee site dispersed earlier than average. One or two sites will be used again in 1985 depending upon circumstances in the two primary release regions and upon the availability of captive-produced young.

III. Returning Peregrines and Nesting Activity

The sightings of peregrines at eastern locations during the spring and summer of 1984 are summarized in Table 3 and Figure 1. Sixty seven individuals were seen and by the end of the summer 27 pairs could be accounted for. Sixteen pairs attempted to nest (there may have been others not under observation) and 12 were successful and produced 30 young (Table 2). These nesting statistics are nearly double those for 1983 and indicate that the eastern population is increasing at a healthy rate.

All nesting pairs except one in Montreal were located in the Atlantic Coastal Region. If the current rate of increase in nesting pairs continues we anticipate that the Eastern Recovery Plan goal of 20-30 nesting pairs in the coastal region will be reached next year. Not only are most of the existing towers being occupied by pairs but we are continuing to see dispersal to other structures for nesting. In 1983 we saw the first bridge nesting pairs, two in the New York City area and one in the Chesapeake Bay. This year we intensified searching efforts and recorded six pairs on bridges. Four of these pairs attempted to nest but only two were successful.

Last year we reported that Scarlett, resident on the U.S.F. & G. building in Baltimore since 1978, had finally attracted an unbanded mate. During the past five years Scarlett raised 18 fostered young but this year she produced four of her own. In early September she was found sick in Baltimore and died shortly afterward. It appears that she died from a yeast infection related to a throat injury, but the final necropsy results are not yet available. Four days after Scarlett's death a sub-adult female was seen in Baltimore and has since formed a pair bond with the male. Both have been seen repeatedly in the nest scrape. Such a rapid mate replacement is particularly encouraging because it is indicative of a healthy population with surplus individuals available to fill vacant territories. This replacement female is a wild reared falcon produced by a pair on the Sea Isle City, New Jersey tower in 1983.

We manipulated the pair at South Marsh Island, Maryland this year and salvaged an unsuccessful nesting attempt. Maryland Wildlife Administration biologists had the pair under observation during courtship and incubation, but the expected hatch date passed and there were no young. The nest was found to contain only one egg for which we substituted two young kestrels. The adults adopted them and a week later we exchanged the kestrels for peregrine chicks. The pair succeeded in raising four young.

A total of 17 sub-adult and adult peregrines were observed in the northern region in 1984 (Figure 1). There were six pairs but only the Montreal nest was successful. Local observers read the band numbers and we learned that the male was released in the Adirondacks and the female in Vermont, both in 1982. The only other northern pair that we knew about in the spring was at Franconia Notch, New Hampshire. Observers there had weather related problems and were uncertain as to whether the pair actually nested. The other pairs, three in the Adirondacks, and one in Vermont were not discovered early enough in the season to determine whether they attempted to nest.

The total of 17 individuals seen in the northern region this year was an encouraging increase from eight in 1983 and this indicates that the population of released peregrines is growing. However, the rate of increase is slower than has occurred in the coastal region. Reasons for this are probably related to the lower prey availability in the mountains and the difficulty we have in locating falcons in difficult terrain. It is important that we step-up the search effort in the spring so we can make a reasonable evaluation of the releases. This is especially true during the next two years when significant numbers of birds released in the north during 1982-1984 will become sexually mature.

Since we began concentrating releases in the northern Appalachians in 1981 the survival through the release phase has been about 95 percent, well above the program average of 80 percent. This high survival rate along with the fact that there has been a slow increase in the number of returning adults indicates that release efforts should be continued in the northern region. The Recovery Team has reviewed these results and has recommended that release efforts be continued until a regional population goal of 20-30 nesting pairs is achieved.

Table 4 contains a summary of peregrine nesting in the eastern United States and Canada since 1979. There have now been 38 documented nesting attempts, 82 percent have been successful and 81 young hatched. It is encouraging to see the population increasing each year while maintaining a healthy reproductive rate of over two young per nesting attempt. Over the past few years the breeding population has nearly doubled every two years and if this current rate of increase continues we could see over 100 breeding pairs in four more years.

IV. Experimental Removal of Eggs from Wild Breeding Pairs.

After our low production of 63 captive young in 1983 we began considering ways to increase the number of peregrines available for release. We had already begun to utilize birds raised at our other facilities as well as those from falconers. We decided to test the technique of obtaining eggs from the new wild breeding population through forced re-nesting or double clutching. This management technique is routinely used with great success in the western states to increase the production of young. Accordingly we proposed to the U.S. Fish and Wildlife Service, the Eastern Peregrine Recovery Team, and several state agencies that we be allowed to remove first clutches from pairs that had previously nested successfully. The New Jersey Division of Fish, Game and Wildlife authorized the removal of first clutches from four pairs that had nested successfully in 1983.

Our plan was to obtain the eggs approximately one week after completion of the clutch in order to maximize hatchability and to allow for re-nesting. A field assistant, Mike Maurer, was hired to monitor the pairs so the eggs could be obtained at the appropriate time and to document the second nesting attempts. Pairs were present at each of the four candidate sites when observations began in March. The male of one of these pairs, at Brigantine NWR, disappeared later in March so we were left with only three pairs from which to obtain eggs.

Three clutches totaling 11 eggs were collected and transported back to Ithaca in a portable incubator by commercial or private aircraft. Ten of the eggs were fertile and seven hatched. Five of these young were released by hacking and two were fostered to breeding pairs. Only two of the pairs re-nested and the two young produced by the pair at Tuckahoe, New Jersey disappeared at three weeks of age for unknown reasons. Raccoon predation was suspected. The pair at Barnegat NWR (Manahawkin) was observed copulating two days after removal of the first clutch but they did not re-lay. Other details from each site are summarized in Table 5. Unhatched eggs and shell fragments were sent to Patuxent for analysis.

This experimental double clutching was done not only to increase production of young, but also to test the technique itself and to learn what would be required if it was to be attempted on a larger scale. We learned that this activity requires careful field work to ensure that the eggs are obtained at the appropriate time. Production from the first clutches and re-nesting attempts was 11 young, so our manipulations did not result in a large increase in productivity. The Recovery Team reviewed these results and has recommended that we continue with this work. There are still questions about the effects of forcing the pairs to raise young later than normal during lower prey availability and when they are more likely to be disturbed by increased human activity. These questions need to be answered before any conclusions can be drawn.

Table 1

1984 EASTERN PEREGRINE REINTRODUCTION SUMMARY

Location	No. Falcons Released/Method	No. Lost	Cause	No. Dispersed Normally	
ATLANTIC COASTAL REGION					
Russell Is., VA	6	hacking	0	-	6
Cobb Is., VA	5	hacking	0	-	5
Parramore Is, VA	7	hacking	0	-	7
Smith Is., MD	6	hacking	0	-	6
Great Fox Is., VA	2	fostering	0	-	2
Chincoteague, VA.	2	fostering	0	-	2
South Marsh Is., MD	4	fostering	0	-	4
Clay Is., MD	1	fostering	0	-	1
Swan Bay, NJ	2	fostering	0	-	2
Sedge Is., NJ	2	fostering	0	-	2
Heislerville, NJ	1	fostering	0	-	1
Sea Isle City, NJ	2	fostering	0	-	2
	40 (32%)	0			40 (100%)
SOUTHERN APPALACHIANS					
Grandfather Mtn., NC	4	hacking	0	-	4
Smoky Mtn. Nat'l Pk, TN	4	hacking	0	all yg. dispersed somewhat early	4
	8 (6%)	0			8 (100%)
NORTHERN REGION					
Silver Lake, NY	10	hacking	0	-	10
Azure Mtn. NY	6	hacking	0	-	6
White Rocks, VT	7	hacking	0	-	7
Mt. Horrid, VT	7	hacking	0	-	7
Burnt Mtn. VT	6	hacking	0	great horned owls	4
Owl's Head, NH	5	hacking	0	-	5
Square Mtn., NH	10	hacking	0	-	10
Acadia Nat'l Pk, ME	7	hacking	0	-	7
Fletcher Bluff, ME	6	hacking	0	-	6
Horse Mtn., ME	6	hacking	0	-	6
Boston, MA	6	hacking	3	impact injuries	3
	76 (61%)	5			71 (93%)
TOTAL	124	5			119 (96%)

Table 2

1984 EASTERN PEREGRINE NESTING SUMMARY				
Location	No. Young Hatched	No. Young Fostered	Hatch Date	Other Details
1. Great Fox Is., VA	2	2	14 May	
2. Chincoteague, VA	2	2	22 June	
3. Baltimore, MD	4	0	7 April	
4. Clay Is., MD	3	1	4 May	
5. Chesapeake Bay Bridge, MD	3	0	5 May	1 yg found dead washed up on shore
6. Swan Bay, NJ	2	2	2 May	
7. Sedge Is., NJ	2	2	17 May	
8. Heislerville, NJ	3	1	17 May	
9. Tuckahoe, NJ	2	0	24 May	1st clutch removed, renested, yg disappeared at 3 wks. of age
10. Sea Isle City, NJ	2	2	10 June	1st clutch removed, renested
11. Throg's Neck Bridge, NY	3	0	12 June	
12. Montreal, P.Q.	2	0	10 May	
13. South Marsh Is., MD	0	4	-	-eggs laid, no hatch, 4 yg fostered
14. Manahawkin, NJ	0	0	-	-1st clutch removed, no renesting
15. Tuckerton, NJ	0	0	-	-eggs laid, failed to hatch
16. Commodore Barry Bridge, NJ	0	0	-	-eggs laid, failed to hatch
16 attempts			1.87 young/attempt	
12 (80%) successful	30	16	2.5 young/successful attempt	

Table 3 SIGHTINGS OF PEREGRINES AT EASTERN LOCATIONS, SPRING-SUMMER 1984

Southern Locations	No.	Details
Great Fox Is., VA	2	pair, 2 natural & 2 fostered young raised
Chincoteague, VA	2	pair, 2 natural & 2 fostered young raised
Fisherman's Is., VA	2	pair, courtship & copulation observed, no nesting
Cobb Is., VA	2	adult male & female seen on separate occasions
Russell Is., VA	1	single adult female at hack-site
Baltimore, MD	2	Scarlett & unbanded adult male produced & raised 4 yg.
Clay Is., MD	2	pair, 3 natural & 1 fostered young raised
Chesapeake Bay Bridge, MD	2	pair, 3 natural young raised
South Marsh Is., MD	2	pair, 4 fostered young raised
Swan Bay, NJ	2	pair, 2 natural & 2 fostered young raised
Sedge Is., NJ	2	pair, 2 natural & 2 fostered young raised
Heislerville, NJ	2	pair, 3 natural & 1 fostered young raised
Tuckahoe, NJ	2	pair, 1st clutch removed, 2 yg from 2nd clutch disappeared
Sea Isle City, NJ	2	pair, 1st clutch removed, 2 natural & 2 fostered yg raised
Manahawkin, NJ	2	pair, 1st clutch removed, no re-nesting
Tuckerton, NJ	2	pair, eggs laid, failed to hatch
Commodore Barry Bridge, NJ	2	pair, eggs laid, failed to hatch
Outerbridge Crossing, NJ	2	pair, attempt suspected but not confirmed
Betsy Ross Bridge, NJ	2	pair, subadults, no nesting observed
Ocean Gate, NJ	2	pair, subadult female, no nesting observed
Brigantine NWR, NJ	1	male of resident pair disappeared in March
Atlantic City, NJ	3	adult female on bridge, adult female on casino, male seen on casino once.
Driscoll Bridge, NJ	1	unbanded subadult female
Egg Is., NJ	1	subadult female
Delaware Memorial Br., DE	2	pair, no nesting observed
Throg's Neck Bridge, NY	2	pair, 3 young raised
Verrazano Bridge, NY	1	adult male
	50	21 pairs, 8 singles
Northern Locations	No.	Details
Chapel Pond, NY	2	pair, adult male, subadult female
Wilmington Notch, NY	2	pair, scrapes found
Button Bay, NY	2	pair found in July
Azure Mtn. NY	1	subadult male released at Azure in 1983
Silver Lake, NY	2	two adults seen on separate occasions
Willoughby Lake, VT	2	pair discovered in July
Mt. Horrid, VT	1	subadult male released at Horrid in 1983
Franconia, NH	2	pair, nesting never confirmed
Square Mtn., NH	1	adult male present at hack-site, fed young
Montreal, P.Q.	2	pair, 2 young raised, male released at Silver Lake, NY in 1982, female released at Burnt Mtn., VT in 1982.
	17	6 pairs, 5 singles
	67	27 pairs, 13 singles

Table 4

EASTERN PEREGRINE NESTING SUMMARY, 1979 - 1984

Year	Location - Type	Outcome	Total
1979	New Jersey - tower	failed, egg predation	1 attempt 0 young
1980	New Jersey - tower	1 young	3 attempts 6 young
	New Jersey - tower	3 young	
	Quebec - cliff	2 young	
1981	New Jersey - tower	2 young	4 attempts 10 young
	New Jersey - tower	3 young	
	New Jersey - tower	3 young, killed by raccoon	
	New Hampshire - cliff	2 young	
1982	New Jersey - tower	2 young	5 attempts 12 young
	New Jersey - tower	3 young	
	New Jersey - tower	4 young	
	New Jersey - tower	failed, female disappeared	
	Virginia - tower	3 young	
1983	New Jersey - tower	1 young	9 attempts 23 young
	New Jersey - tower	3 young	
	New Jersey - tower	4 young	
	New Jersey - tower	4 young	
	Maryland - tower	2 young	
	Maryland - bridge	failed late in incubation	
	New York - bridge	2 young	
	New York - bridge	3 young	
	Virginia - tower	4 young	
1984	New Jersey - tower	2 young	16 attempts 30 young
	New Jersey - tower	2 young	
	New Jersey - tower	2 young	
	New Jersey - tower	2 young	
	New Jersey - tower	3 young	
	New Jersey - tower	failed	
	New Jersey - tower	1st clutch removed, no re-nesting	
	New Jersey - bridge	failed	
	Maryland - tower	3 young	
	Maryland - bridge	3 young	
	Maryland - building	4 young	
	Maryland - tower	failed	
	Virginia - tower	2 young	
	Virginia - tower	2 young	
	New York - bridge	3 young	
	Montreal - building	2 young	
Total	38 attempts	31 successful (82%)	81 young hatched
			2.14 young/attempt
			2.62 young/successful attempt

Table 5

1984 EASTERN PEREGRINE DOUBLE CLUTCHING SUMMARY

Location	First Nesting			Second Nesting		
	No. Eggs	Date Obtained	No. Fertile	No. Hatched	Disposition	Date Hatched
Tuckahoe, NJ	4	2 April	4	2	hacked Acadia NP, ME	25 May
Barnegat NWR, NJ (Manahawkin)	3	8 April	2	1	fostered Swan Bay, NJ	na
Sea Isle City, NJ	4	14 April	4	2	3 hacked in Vermont 1 fostered to Great Fox Island, Va	10 June
TOTAL	11		10	4		

yg disappeared at 3wks of age

copulation observed 2 days after 1st clutch removed

2 captive reared yg fostered

* Interval from removal of first clutch to start of second clutch

Figure 1

PEREGRINE SIGHTINGS - SUMMER 1984

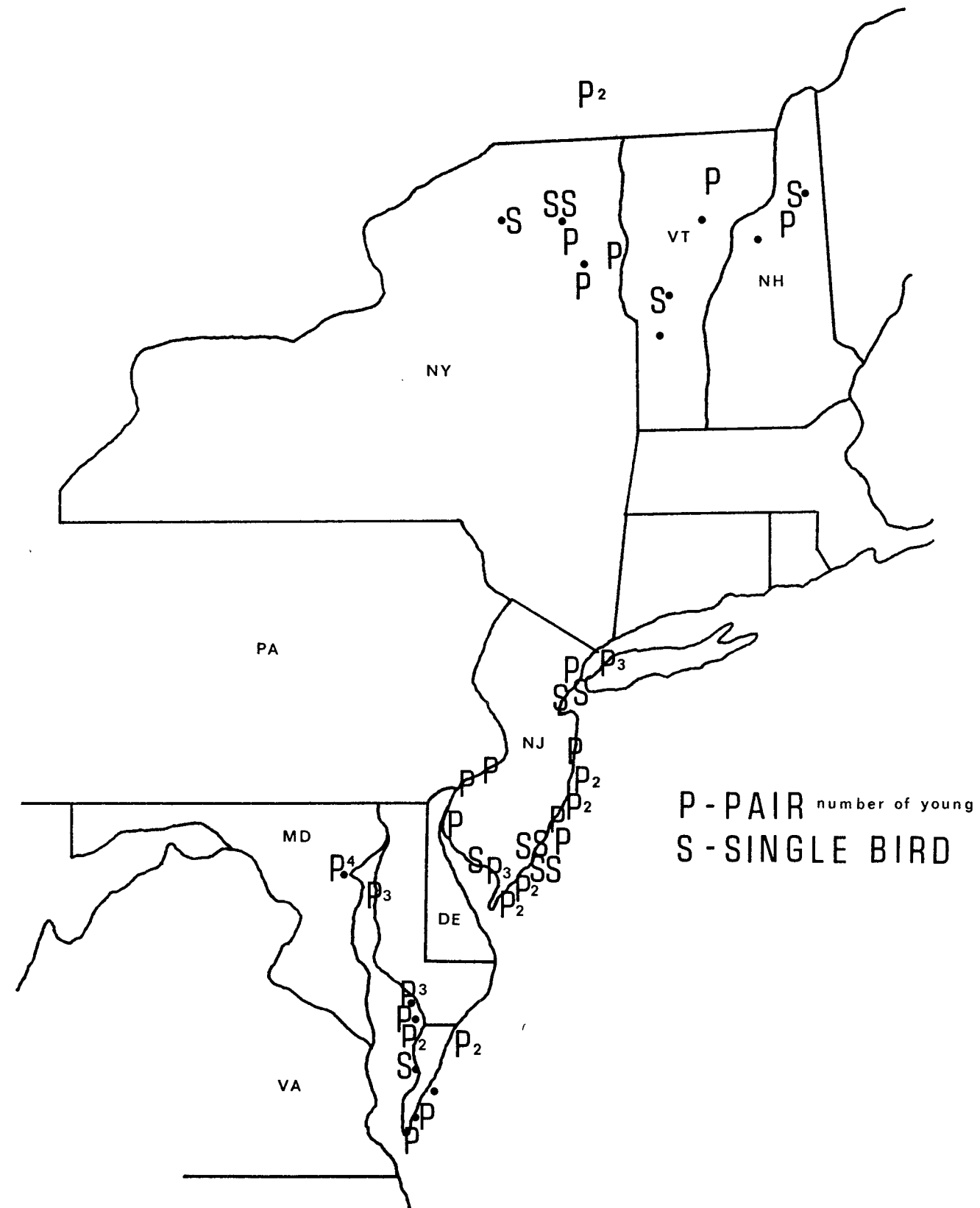
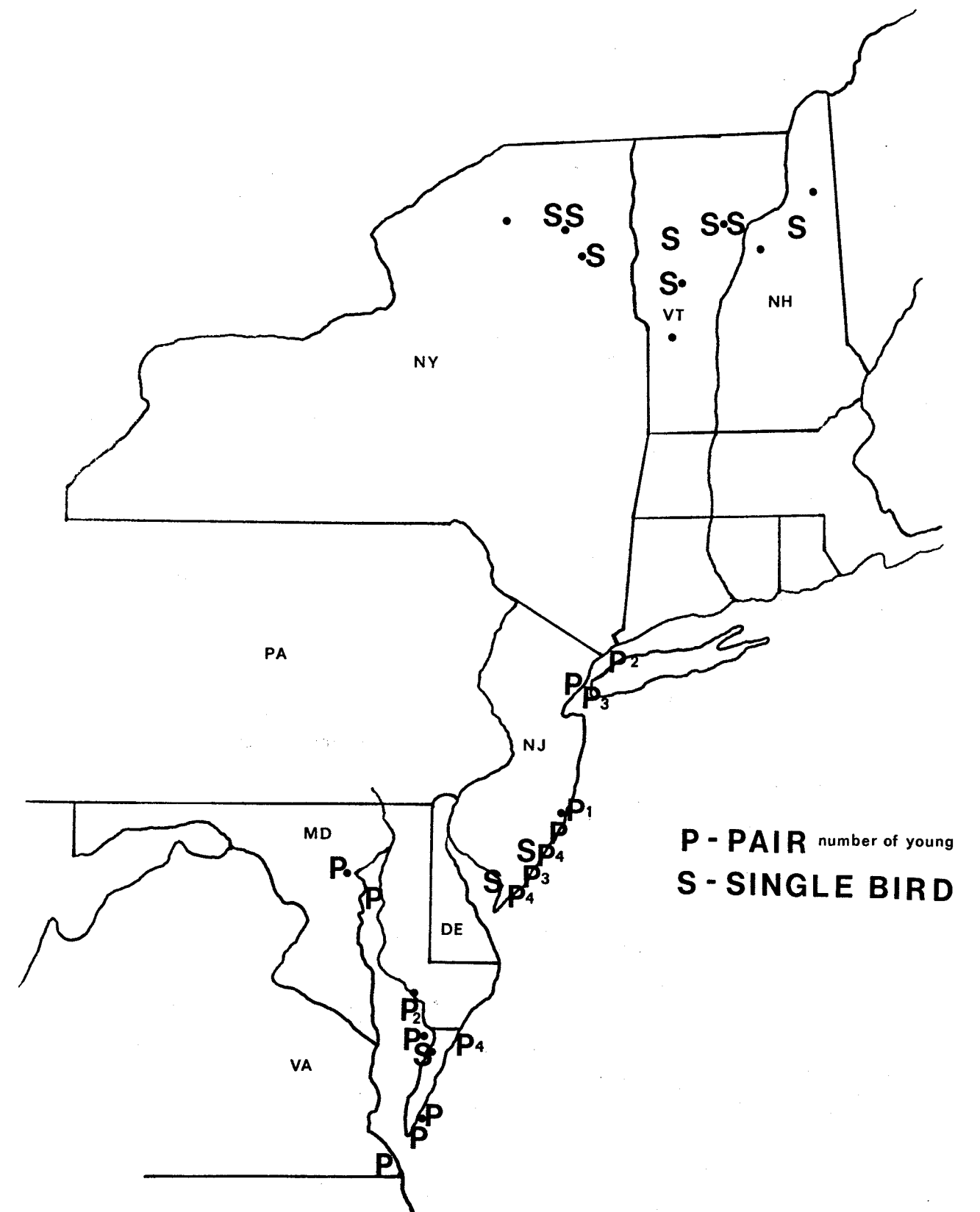


Figure 2

PEREGRINE SIGHTINGS - SUMMER 1983



ACKNOWLEDGMENTS

The Eastern Peregrine Falcon Reintroduction Program is a cooperative project that involves numerous federal and state agencies and private organizations and individuals. Those listed below provided support in 1984 and without their involvement the Reintroduction Program would not be a success. Jim Weaver, Bill Heck, Victor Hardaswick, Peter Harrity and Phyllis Dague deserve credit for the management of the breeding facility. Special thanks to Michele Barclay for assisting in the feeding of the young falcons. Jack Barclay and Marty Gilroy, with assistance from Mike Maurer, coordinated the field work.

Federal Agencies: U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Army Materiel Development and Readiness Command, Barnegat National Wildlife Refuge, Brigantine National Wildlife Refuge, Bombay Hook National Wildlife Refuge, Chincoteague National Wildlife Refuge, Great Smoky Mountain National Park, Green Mountain National Forest, Martin National Wildlife Refuge, Acadia National Park, Tennessee Valley Authority, and the White Mountain National Forest.

State Agencies: Baxter State Park, Maine, Delaware Division of Fish and Wildlife, Maine Department of Inland Fisheries and Wildlife, Maryland Wildlife Administration, Massachusetts Division of Fisheries and Wildlife, New Hampshire Fish and Game Department, New Jersey Division of Fish, Game and Wildlife, New York Department of Environmental Conservation, North Carolina Wildlife Resources Commission, Tennessee Wildlife Resources Agency, Vermont Fish and Game Department, and the Virginia Commission of Game and Inland Fisheries.

Organizations: Audubon Society of New Hampshire, AT&T Long Lines Stations at Ocean Gate and Manahawkin, New Jersey, Chesapeake Bay Foundation, College of the Atlantic, College of William and Mary, Deep Creek Gun Club, Grandfather Mountain North Carolina, International Paper Company, MacDonald Raptor Research Centre, McGill University, Maryland Toll Facility Administration at the Chesapeake Bay Bridge, Museum of the Hudson Highlands, Roanoke Bird Club, Port Authority of New York and New Jersey, Triborough Bridge and Tunnel Authority at Verrazano Narrows and Throg's Neck Bridges, U.S. Fidelity and Guaranty Company, Vermont Institute of Natural Science and the Virginia Coast Reserve of the Nature Conservancy.

Individuals: In Maine; Al Hutchinson and Tim Bowman of the Department of Inland Fisheries and Wildlife, Carroll Schell of Acadia National Park, Ray Owen of the University of Maine-Orono, William Drury and Peter Duley of the College of the Atlantic and Scott Kenniston. In Maryland; Mike Harrison at Martin National Wildlife Refuge, Gary Taylor, Steve Dawson and Bradley Elby of the Maryland Wildlife Administration, John Barber at the U.S.F. & G. Co. in Baltimore. Bill Seegar at Aberdeen Proving Ground; In New Hampshire, John Lanier of the White Mountain National Forest, Rene Bollengier of the U.S. Fish and Wildlife Service, Tom Sears, Carol Smith of the Audubon Society of New Hampshire, and Joe Brigham. In New Jersey, Pete McLain and Warren Kell of the Division of Fish, Game and Wildlife, Staff at Brigantine National Wildlife Refuge,

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We again enjoyed the cooperation of the U.S. Fish and Wildlife Service Regional office and Endangered Species Coordinator Paul Nickerson and the Eastern Peregrine Falcon Recovery Team and the Team Leader Eugene McCaffrey. Finally thanks is due to the release site attendants whose hard work in the field made this program a success.

Grandfather Mountain, North Carolina. Prepared by Dan Audet and D. Bryant Tarr.

1. Personnel at Site. Dan Audet, 10801 Joyceton Court, Largo, Maryland 20772. D. Bryant Tarr, 10 Shepard Terrace, Madison, Wisconsin 53705.

2. Description of the Site. Grandfather Mountain is a cliff site located off Route 105 in Linville, North Carolina about one and one half hours north of Asheville. The mountain is privately owned by Mr. Hugh Morton. The hack-box is located on a 200 foot cliff at approximately 5500 feet in elevation. The cliff is predominately surrounded by coniferous forest with the lower elevation consisting of mixed deciduous forest.

This was the first time this site was used and it was the first Southern Appalachian (Blue Ridge Mts.) site ever used for release of peregrine falcons (Falco peregrinus).

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Beave	M	816-67410/R	Yellow 11/L	21 May 32 days old
Artie	M	816-67411/L	Yellow 12/R	21 May 35 days old
Ev	F	987-73331/R	Yellow 75/L	21 May 34 days old
Shadow	F	987-73332/L	Yellow 76/R	21 May 35 days old

4. Pre-release Details. All four birds behaved normally and there were no unusual events.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Beav	M	1 June 1002	43 days	1 day 1½ hrs.	6 ¼ hrs.
Artie	M	1 June 1002	46 days	7 ¼ hrs.	17 hrs.
Ev	F	1 June 1002	45 days	2 days 5 hrs.	2 ¾ hrs.
Shadow	F	1 June 1002	46 days	1 day 20¼ hrs.	14 hrs.

The release was delayed three days because of high winds. All birds fledged normally with the exception of Ev who apparently fledged because she was frightened by a hang glider flying overhead. She did, however, return to the box safely two and three quarters hours later apparently unaffected by the incident.

6. Hunting Behavior. By Day 6 of the release all of the birds were capturing insects in flight. On Day 10 an unidentified tiercel was seen pursuing a chimney swift (Chaetura pelagica). Later the same day, an unidentified peregrine forced down an American crow (Corvus branchyrhynchos) into the forest canopy. A common nighthawk (Chordeiles minor) was forced down into the trees on Day 17 by one tiercel and one falcon. By Day 21 of the release all four peregrines were ranging too far from observation points for any hunting behavior to be observed. After alternate day feeding was started on Day 36, swifter and more serious attempts were made at prey when no food was present at the box.

7. Roosting Behavior. For the first two weeks after the release all four birds roosted in or near the box. By the fourth week the birds were roosting on several cliffs visible from the hack-box. Until week five all the birds were roosting together; after week five roosting behavior became difficult to record as the birds were roosting out of sight.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Beave	M	9 July	10 July	82 days	39 days
Artie	M	5 July	6 July	81 days	35 days
Ev	F	4 July	9 July	83 days	38 days
Shadow	F	7 July	7 July	82 days	36 days

Each bird was gone from two to five consecutive days and then returned before actual dispersal. One (unidentified) bird was seen by a hang glider pilot seven miles south of the site on 9 July.

9. General Evaluation of Falcons.

Beave - This youngest tiercel was the least seen bird and the most unpredictable. At one point in the hacking period he was not seen for five consecutive days, after which he returned and apparently became a "free-loader".

Artie - the most advanced and aggressive bird throughout the hacking period. Artie was involved in almost every tail-chase and was, by far, the most likely candidate for interactions with non-prey species which wandered into the area. He chased everything that flew including: turkey vulture (Cathartes aura); red-tailed hawk (Buteo jamaicensis); broad-winged hawk (Buteo platypterus); sharp-shinned hawk (Accipiter striatus); northern raven (Corvus corax); and hang gliders!

Ev - this falcon was the slowest to develop and she was extremely vocal. Ev could easily be identified by voice alone; she was a real screamer. This dark falcon was definitely the most subordinate, usually the object of a tail-chase rather than the aggressor. Ev was rarely seen chasing any species of bird.

Shadow - this falcon was the quickest to avoid humans. She was more aggressive than Ev and about the same as Beave.

In general, the most common intra-specific interactions occurred between Artie and Shadow or Beave and Ev. These interactions discontinued the week before dispersal.

10. Unusual Incidents. The daily appearance of hang gliders above the mountain brought mixed and changing reactions from the birds. As mentioned above Ev was apparently frightened into her first flight. When gliders were present during the first two weeks alarm calls were given by all the birds. Artie, being the most aggressive, would chase the hang gliders. It was apparent that after the first two weeks the birds became accustomed to the gliders and from this time on followed them without alarm.

During the last week of the hacking period Robert Branch reported that a peregrine was seen "interacting" with a remote controlled model airplane. The "pilot" attempted to keep the plane above the bird to prevent injury. The mission was accomplished as there were no injuries to either party!

11. General Evaluation of Site. Nineteen hundred and eighty four was the first time this site had been used. There were few owls and no mammalian predators to speak of and we feel Grandfather Mountain is an excellent location for hacking falcons. Human disturbance is minimal and the site provides many good observation points.

Lack of communication was, by far, the biggest problem with this site. Some form of radio communication is needed for two reasons. First, keeping safety in mind, two-way radios would reduce response time in any emergency, human or avian. Second, radio communication would be

very helpful in coordinating events. Without radios it was impossible for us to know, for example, when Marty Gilroy was going to arrive, or if chickens were ready to be picked up, or if a state official was going to drop in to see the birds, etc.

In addition to the present equipment we recommend that the attendants have available to them these two items: a "sun shower"; and several more water collecting containers.

We also strongly suggest that the attendants make arrangements for people to help them carry supplies up the mountain when they first arrive. We had no such arrangement and spent the first three days packing up equipment.

12. Equipment. Left at the site was one water collection container; one shovel; canvas material for a blind; the hack-box; food chute and one cooler. Left in care of Randy Johnson, Back Country Manager: one spotting scope; one tripod; one supply tent and one tarp.

13. Acknowledgements. We would like to thank Randy and Betsy Johnson for mail service, food, showers, and general hospitality; Hugh Morton for the use of his mountain; Jack Barclay for help and advice; Marty Gilroy for words of wisdom, Puerto Rican beans, and "Moon Pies"; Robert Branch for assorted help and cold beverages; everyone from the North Carolina Wildlife Resources Commission who helped make this site possible; the hang glider pilots for help with sightings; WASU comedy hour for Sunday night entertainment; and the Grandfather Mountain staff for cooperation and general support of the project.

Greenbrier Pinnacle, Tennessee. Prepared by Rick Knight and Robert L. Shumate.

1. Personnel at Site. Richard L. (Rick) Knight, 804 North Hills Drive, Johnson City, Tennessee 37601. Robert L. Shumate, 817 Jefferson Street, Wrightview Estate #25, Cookeville, Tennessee 38501.

2. Description of Site. Greenbrier Pinnacle is in the northern part of the Great Smoky Mountains National Park and is east of Gatlinburg off Highway U.S. 321. The hack-box is atop a 100 foot cliff at approximately 4000 feet in elevation. The box faces southwest, with a view of Mount LeConte (elevation 6593 ft.). The observation point is above and to the left of the box at about 4200 feet, and is on the main trail up the mountain. The slope above the box is a dry ridge and cove dominated by Table-Mountain Pine (Pinus pungens), Pitch Pine (P. rigida), and Chestnut Oak (Quercus prinus), with a thick understory of Mountain Laurel (Kalmia latifolia) and Rosebay Rhododendron (Rhododendron maximum). The forest below the cliff is comprised primarily of Tulip Poplar (Liriodendron tulipifera), Northern Red Oak (Q. rubra), Red Maple (Acer rubrum), and Chestnut Oak. This is the first Peregrine Falcon (Falco peregrinus) hack-site in Tennessee, with 1984 as its first use.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
BlackR	F	617-22620/R	Yellow 112/L	31 July 31 days old
BlackL	F	617-22621/L	Yellow 114/R	31 July 31 days old
Orange	F	617-22622/L*	Yellow 115/R	31 July 32 days old
Green	F	617-22623/L**	Yellow 116/R	31 July 34 days old

* orange tape on black anodized federal band.

** lime green tape on black anodized federal band.

4. Pre-release Details. On 6 August the falcons vocalized when a Red-tailed Hawk (Buteo jamaicensis) passed within their view. The falcons ate well.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
BlackR	F	10 August 1315	41 days	1 day, 21.25 hrs.	0.75 hrs.
BlackL	F	10 August 1315	41 days	?	?
Orange	F	10 August 1315	42 days	1 day, 21.5 hrs.	2.25 hrs.
Green	F	10 August 1315	44 days	?	?

All four falcons left the box and had found the food by 1400 hrs. (0.75 hrs. after release). After eating, they spent the rest of the afternoon perched around the box, exercising their wings and hopping around. No flights were made. A hard rain began at 1900 hrs. and all four falcons remained at the box till dark. At dawn the next day (11 Aug.), only three birds (Green, Orange, BlackR) were visible. Fog made morning observation difficult. One falcon, either Green or BlackL, was seen in flight in mid-morning. Orange and BlackR stayed at the box all day. In the early afternoon, one falcon (Green or BlackL) flew by the box twice, then out of sight around the mountain. Green was at the box feeding at 1800 hrs. BlackL was not seen for certain all day. Green, orange, and BlackR were at the box feeding at dawn the following day (12 Aug.). Green flew at 0830 hrs., BlackR at 1030 hrs., and Orange at 1045 hrs., just as the fog moved into the area. BlackR was back at the box feeding at 1115 hrs. Fog blocked observations for most of the afternoon. Orange and BlackR were at the box at 1300 hrs. At 1800 hrs., we noted a falcon perched in a large dead pine halfway up the slope from the box, but couldn't identify it till 1945 hrs., it was BlackL.

6. Hunting Behavior Considerable fog during the first week after release made observation difficult and possibly delayed flight and hunting development. Sibling pursuit, pursuit of vultures and hawks, and butterfly hunting were all first observed on the fourth day after release (14 Aug.). Orange and BlackR were the first engaged in sibling pursuit. By day six this was the main pastime of all four falcons. BlackR was the first to pursue vultures. Soon all four were participating in this activity, which advanced from brief tail chases to stoops. Green was the first observed making passes at butterflies, but none were captured. The first capture of a butterfly occurred on day seven. This type of hunting was mostly "turn-ups" at chance encounters, but by week three after release some short stoops were made at butterflies and dragonflies. A falcon was first noted making passes at swaying tree tops on day seven. On day nine, Orange was observed carrying a small unidentified object. Afterwards, falcons were occasionally seen carrying twigs or pine cones. A falcon carrying a stick was pursued by another falcon on day twenty and the following day a falcon caught a small branch in mid-air which another falcon dropped. Pursuit of potential vertebrate prey was first seen on day seven, as Green made a brief tail-chase of a Chimney Swift (Chaetura pelagica). On day twelve, one falcon made a short opportunistic stoop at a Black-throated Blue Warbler (Dendroica caerulescens) that flushed from near the observation point. The warbler escaped by dropping back into the forest. On day fifteen, two falcons made a brief tail-chase after a Chimney Swift. It should be noted that beginning on day fourteen the falcons spent much of the day out of our sight.

Bill Cook, National Park Service, reported seeing a Peregrine falcon chasing a Mourning Dove (Zenaidura macroura) in farmland at Pittman Center, just north of the hack-site, on 2 September, day 23. At this time Green had been absent two days and could have easily wandered there. The other falcons were accounted for near the site.

7. Roosting Behavior All four falcons roosted around the box the first night and three roosted there the following two nights. BlackL roosted in the pine snag on 12 August. For the rest of the first week to ten days they all roosted on or around the box. After this, they roosted out of sight, mainly to the right of the box.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
BlackR	F	5 Sept.	5 Sept.	67 days	26 days
BlackL	F	5 Sept.	5 Sept.	67 days	26 days
Orange	F	7 Sept.	8 Sept.	71 days	29 days
Green	F	31 Aug.	31 Aug.	65 days	21 days

Orange was absent 4-5 September, but returned on 6 September at 1700 hrs. She fed at the box that evening and the following morning and stayed in the area till 1230 hrs. on 8 September. The site was closed on 12 September.

9. General Evaluation of Falcons BlackR was the most vocal and most curious. She was very aggressive toward Orange. BlackL was somewhat a loner. Orange was the slowest in flight development and was the tamest. She usually fed earlier than the others. Green developed flight skills earliest, possibly an age factor. She was the most aggressive toward vultures and hawks.

Overall, they all developed well and appeared capable of catching prey when last seen.

10. Unusual Incidents The local Common Ravens (Corvus corax) altered their use of the cliff after the falcons were released. They were a common sight prior to release, but became scarce shortly afterwards. Oddly, no raven/falcon interaction was observed. The ravens had begun to resume use of the cliff by the time the site was closed.

11. General Evaluation of the Site The site is on an adequate cliff, above the normal range of Great Horned Owls (Bubo virginianus), and in a remote section of the park. The availability of prey is rather low. Although 63+ species of birds were observed in the immediate area, many of these are small woodland birds not often encountered above the forest canopy. Also, it should be noted that we were at the site as fall migration began. More birds were available as potential prey during this time. The area northwest of the park, with its open farmland and larger rivers, offers greater prey availability. Nesting falcons could easily hunt there and return to eyries in the park.

The main weakness of the site is visibility. We had just one good observation point, described earlier. It has a good view of the box and slope above the box, sufficient for watching the falcons eat and make their early flights. The area below the box is not visible from this point. There are other rock outcroppings below this observation point, but they are too close to the box. The falcons spotted us immediately and became excited when we tried to use these spots. There are no points to the right of the box from which you can see it. Of the many snags and rock outcrops used as perches, most are partially blocked from our view making individual identification difficult. A valuable asset is the spring nearby. Although this is the most visited national park, the trail up Greenbrier Pinnacle has an average of only ten hikers per week during the summer.

Despite plentiful sign and occasional sightings of Black Bear (Ursus americanus) in the area, we saw no evidence that they had been around the hack-box or our camp.

Overall, we consider this a good hack-site and recommend its continued use.

12. Equipment The following items were returned to: Tennessee Wildlife Resources Agency - a two-way radio and two plastic coolers; National Park Service - a two-man tent, rope, and a pack frame; TWRA and NPS - assorted small tools; Bob Hatcher (of TWRA) - a copy of S.K. Sherrod's book "Behavior of Fledgling Peregrines"; Tennessee Technological University Biology Department - one spotting scope and one pair of binoculars. Left at the site were two bear-proof food barrels provided by NPS, and the hack-box, food chute, and extra cable and barbed wire.

13. Acknowledgements We would like to thank the following for their contribution and support: Bill Yambert and Bob Hatcher of TWRA; Ro Wauer, Stu Coleman, Dave Whitehead (now with TWRA), Bill Cook, George Minnigh and several volunteers of NPS; Jack Barclay and Marty Gilroy of The Peregrine Fund; Gary Henry of U.S. Fish and Wildlife Service; Don Hammer of the Tennessee Valley Authority; Ken Dubke and Angela Davis of the Tennessee Ornithological Society.

Bird List

duck sp.	Carolina wren
*Black vulture	Winter wren
*Turkey vulture	Golden-crowned kinglet
Osprey	Blue-gray gnatcatcher
*Sharp-shinned hawk	Veery
Cooper's hawk	Swainson's thrush
Red-shouldered hawk	Wood thrush
Broad-winged hawk	American robin
*Red-tailed hawk	Gray catbird
*American kestrel	Brown thrasher
Ruffed grouse	Cedar waxwing
Greater yellowlegs	Solitary vireo
Rock dove	Red-eyed vireo
Barred owl	Tennessee warbler
Common nighthawk	Northern parula
*Chimney swift	Chestnut-sided warbler
Ruby-throated hummingbird	Magnolia warbler
Downy woodpecker	*Black-throated Blue warbler
Hairy woodpecker	Black-throated Green warbler
Northern flicker	Blackburnian warbler
Pileated woodpecker	Yellow-throated warbler
Eastern wood-pewee	Black-and-white warbler
Tree swallow	American redstart
*Cliff swallow	Worm-eating warbler
Barn swallow	Ovenbird
Blue jay	Hooded warbler
American crow	Canada warbler
Common raven	Scarlet tanager
Black-capped chickadee	Rose-breasted grosbeak
Carolina chickadee	Rufous-sided towhee
Red-breasted nuthatch	Dark-eyed junco
Brown creeper	American goldfinch

*denote interaction with falcons

Parramore Island, Virginia. Prepared by Jeffrey R. Sabol

1. Personnel at Site. Jeffrey R. Sabol, P.O. Box 1195, Leesburg, Virginia 22075. Wade Walker, Box H, Willis Wharf, Virginia 23486.

2. Description of Site. Parramore Island is a typical mid-Atlantic barrier island located in Accomac county on the Eastern Shore of Virginia. Slightly over eight miles in length, it is situated between Wachapreague Inlet and Quinby Inlet. The hack-site is located approximately 1.5 miles from the southern tip in the unforested back-dune environment. Predominant dune/marsh flora of the area include: Spartina alterniflora of the low marsh, S. patens, Distichlis spicata, Salicornia sp., and Atriplex sp. of the high marsh/dune borders. Hardwood forest occurs at an approximate distance of 3.5 miles from the southern tip of the island. A line of derelict telephone poles runs north/south in the open marsh from the tower to the hardwood forest and provides numerous perching spaces. A houseboat was anchored in the back-bay area of the island to serve as housing and an observation platform for the attendants.

Parramore Island provides abundant prey species and wide, open hunting space for peregrine falcons. Migratory shorebirds and passerines will greatly increase numbers of prey species seasonally. Mammalian predators include foxes, racoons and mink. The year 1984 was the first that the Parramore site was used for hacking Cornell falcons.

3. History and Details of Young

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
M133	M	816-67465/L	Yellow 133/R	6 July 31 days old
F153	F	987-73393/R	Yellow 153/L	6 July 34 days old
F154	F	987-73394/R	Yellow 154/L	6 July 35 days old
F155	F	987-73395/R	Yellow 155/L	6 July 33 days old
F156	F	987-73396/R	Yellow 156/L	6 July 31 days old
F157	F	987-73397/L	Yellow 157/R	6 July 33 days old
F158	F	987-73398/R	Yellow 158/L	6 July 33 days old

4. Pre-release Details. On 6 July, 1984 at 1630, seven young peregrine falcons were placed in the hack-box by Hans Gabler and Jeff Sabol. Eight quail were halved and fed to the eyases at 2000. From 7 July to 15 July, food rations varied from 14 to 17 sectioned quail per day depending on the size of the food birds. On 16 July, the day before release, the peregrines did not receive food.

Throughout the pre-release period falcon F158 displayed a food-begging tendency. This behavior was aimed at siblings, attendants, passing birds and the food chute. Since no persistent begging was directed toward the hack attendants, it was concluded that a lasting human-food association was not formed.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
M133	M	17 July 1420	42 days	25 hrs. 55 min.	1 hr. 15 min.
F153	F	17 July 1420	45 days	51 hrs. 10 min.	15 min.
F154	F	17 July 1420	46 days	51 hrs. 10 min.	58 min.
F155	F	17 July 1420	44 days	51 hrs. 10 min.	2 hours
F156	F	17 July 1420	42 days	43 hrs. 28 min.	2 min.
F157	F	17 July 1420	44 days	43 hrs. 14 min.	38 min.
F158	F	17 July 1420	44 days	27 hrs. 20 min.	18 min.

The release was attended by Hans Gabler. A two day supply of food was provided inside the hack-box and all seven peregrines walked out and began feeding immediately upon attaining freedom. No flying occurred on the first day. M133 and F158 made strong maiden flights on the afternoon of the second day. Falcons F156 and F157 fell off the tower but began steady flight in mid-air on the morning of the third day. Falcons F153, F154 and F155 were flushed from the tower on the third day when the attendants had to replenish the food supply. Their initial flights were, however, smoothly executed. All birds were flying and landing competently by day 5, July 21.

6. Hunting Behavior. No successful prey capture was observed during the post-release period. The location and development of hunting behavior was largely undetermined as the peregrines spent much time out of the area after day 15, August 1. Observation distances often rendered positive identification of individuals impossible.

M133, on day 9, age 50 days old, was observed tail-chasing and making shallow stoops at a Louisiana heron (*Hydranassa tricolor*) driving it to the ground near the tower. The tiercel then ceased pursuit and perched on the tower. Later in the hack, M133 was occasionally observed making steep but unsuccessful stoops at gulls. On day 38, M133 was observed with a full crop after an absence of three days.

F156 and F158, on day seven, were observed tail-chasing a laughing gull (*Larus atricilla*).

F155, at age 57 days, was observed tail-chasing a green heron (*Butorides striatus*) over an estimated distance of one mile along the dunes. After making several passes at the heron, F155 returned to the tower.

F154, age 80 days was observed with a full crop after a one day absence.

These sightings were the only identified prey-related observations obtained. On day 10, however, three unidentified birds were seen tail-chasing a Louisiana heron. Occasional short tail-chasing by unidentified falcons was observed during the later days of the hack. Only M133 and F154 were seen with full crops after substantial absences.

7. Roosting Behavior. From the day of release until day 24, all seven birds roosted exclusively on the tower. After day 24 various peregrines began spending nights away from the tower. By day 33 all of the birds had spent at least one night away from the hack-site. When roosting in the area, the young falcons invariably utilized the tower. Roost locations not in the vicinity of the tower were not determined.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
M133	M	21 August	23 August	79 days	37 days
F153	F	25 August	25 August	84 days	39 days
F154	F	25 August	26 August	86 days	40 days
F155	F	23 August	23 August	81 days	37 days
F156	F	23 August	23 August	79 days	37 days
F157	F	25 August	25 August	83 days	39 days
F158	F	20 August	20 August	78 days	34 days

9. General Evaluation of Falcons. Until day 15 all the peregrines remained on the tower or close by, making only short flights, catching insects and playing on the ground. On day 16 M133 made the first trip and within a week all were spending days away from the tower, returning at night to feed. First trips were made to nearby Revel Island; later trips were made to the northern end of Parramore and then to other islands.

Only M133 and F156 displayed aggressive defense of the tower by stooping ospreys (*Pandion haliaetus*) and harriers (*Circus cyaneus*). The other falcons seemed apathetic toward intruders and were observed perched on tower cross-pieces while osprey deposited material on the hack-box roof. Harriers were allowed to hunt unchallenged in the tower vicinity.

10. Unusual Incidents. On four separate occasions immature peregrines, not members of the Parramore hack group, were observed in the area. On the first visit, 12 July, five days before release, a falcon was chased from the tower cross-pieces by attendants. During other visits, all after release, the intruder attacked the Parramore birds, fortunately without inflicting injuries. On the last two visits the attacker was driven from the area by M133. Identification of the intruding peregrines was not obtained and it is not known if the visitors were different birds or the same returning individual.

No other unusual incidents occurred and all the peregrines were believed to have reached independence.

11. General Evaluation of the Site. Parramore Island is a good site for hacking peregrine falcons. There is an abundance of food species, perching sites and open spaces for hunting. Mammalian predators could be a problem if the birds roosted on the ground. If the tower is unoccupied next season, the Parramore site should receive consideration for another hack.

12. Equipment. A pair of binoculars and a spotting scope, on loan from the College of William and Mary, were returned to Dr. Byrd at the college. An 18 foot boat with 35hp motor, three gas tanks and three life jackets were left with Hans Gabler.

13. Acknowledgements We would like to thank; Dr. Mitchell Byrd and Hans Gabler for co-ordinating and supervising the peregrine re-introduction program in Virginia, The Nature Conservancy for their great cooperation and the Virginia Commission of Game and Inland Fisheries for its support. We would like to extend a special thanks to Eastern Shore residents Hank and Sara for their interest and help in making this hack successful.

Russell Island, Virginia. Prepared by Rudolph F. Cashwell, Jr. and Jeffrey R. Sabol.

1. Personnel at Site. Rudolph F. Cashwell, Jr., 608 Saddlehorn Drive, Chesapeake, Virginia 23322. Jeffrey R. Sabol, P.O. Box 1195, Leesburg, Virginia 22075.

2. Description of Site. Russell Island is a salt marsh island in the Chesapeake Bay on the upper eastern shore of Virginia. Surveyed to be 580 acres the island lies between the channels of Deep Creek and Chesconnessex Creek in Accomac County. Predominant marsh flora include Spartina patens, S. alterniflora, Distichlis spicata and Juncus roemerianus. An approximately 600m long by 60m wide strip of dry land supporting thick vegetation forms the eastern end of the island. Predominant flora species in this area include Baccharis halimifolia, Juniperus virginiana, Pobina psuedo-acacia, Quercus sp. and Rhus radians. Observations were made from a tall willow oak (Quercus phellos) situated near the western end of this vegetation. A hunting lodge near the eastern end provided housing for the attendants. The conventional hack tower stands in the marsh to the west of the observation point and opens to the east.

Russell Island provides an abundance of prey for it is utilized by a variety of shorebirds, waterfowl and passerines as a feeding and nesting area. Migrating birds greatly enhance prey species selection. Mammalian predators include raccoons, foxes, otters and mink. This site was successfully used to hack peregrines in both 1982 and 1983.

3. History and Details of Young

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
F70	F	987-73315/L	Yellow 70/R	8 May 33 days old
F71	F	987-73321/R	Yellow 71/L	8 May 35 days old
F72	F	987-73322/R	Yellow 72/L	8 May 34 days old
M 4	M	576-92199/R	Yellow 4/L	8 May 35 days old
M 5	M	576-92200/L	Yellow 5/R	8 May 30 days old
M 7	M	816-67406/R	Yellow 7/L	8 May 33 days old

4. Pre-release Details. On 8 May, 1984 at 1630, six young peregrine falcons were placed in the hack-box by Jack Barclay. Twelve quail were halved and fed to the young at 1715. From 9 May food rations varied from 10 to 15 quail per day, depending on the size of the birds. On 17 May, two days before release, half-rations were administered and on 18 May food was withheld altogether.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
F70	F	19 May 1420	44 days	27 mins.	29 hrs. 30 mins.
F71	F	19 May 1420	46 days	25 mins.	25 hrs. 54 mins.
F72	F	19 May 1420	45 days	39 hrs.56 mins.	01 min.
M 4	M	19 May 1420	46 days	37 mins.	02 mins.
M 5	M	19 May 1420	41 days	26 hrs.37 mins.	36 mins.
M 7	M	19 May 1420	44 days	39 hrs.56 mins.	01 min.

The release was attended by Hans Gabler. A two day supply of food was provided inside the hack-box at the time of release. All six peregrines walked out and began feeding upon release. High winds swept two of the falcons, F70 and F71, from the platform when the birds began exercising their wings. The first flights of these two birds therefore consisted merely of a fluttering descent to the ground beneath the tower. F70 and F71 spent the first night on a log under the tower and did not exhibit strong flight until late afternoon on Day 2. The other

peregrines made smooth maiden flights within a few days and were flying well by Day 4.

6. Hunting Behavior. No determined pursuit of prey was observed during the post-release period. The location of the hunting behavior and the development of such behavior was undetermined. Observation distance and sun angle often rendered positive identification of individuals impossible. Individual accounts are as follows:

On day 15, M 4 was observed tail-chasing a green heron (Butorides striatus), causing it to dive into a pond near the tower. Once the heron entered the water no further pursuit was attempted.

On day 3, M 5 was observed hopping along the tower after a starling (Sturnus vulgaris) which had landed there. M 5 did not pursue once the starling took to flight. On day 6 this tiercel made a short tail-chase of a barn swallow (Hirundo rustica).

Falcon F70 flew from the tower on day 35, after eating half a quail, and tail-chased a tern and then a laughing gull (Larus atricilla) before leaving the area.

These were the only identified pursuits of prey. However, on day 10 a tiercel was seen making a short tail-chase of a herring gull (Larus argentatus). Late in the hack unidentified peregrines, male and female, were seen making occasional short tail chases of gulls as the peregrines entered or departed the hack area. None of the young were observed with prey and none were seen with full crops after long absences.

7. Roosting Behavior. From the day of release until day 19 all six birds roosted exclusively on the tower. The only exceptions were F70 and F71 which spent their first night on a log beneath the tower. After day 19 various peregrines began spending nights away from the tower and by the last week most of the peregrines roosted away from the tower. When in the area the peregrines invariably roosted on the tower. Roost locations not on Russell Island were not determined.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
F70	F	23 June	23 June	79 days	35 days
F71	F	27 June	27 June	85 days	39 days
F72	F	21 June	21 June	78 days	33 days
M 4	M	29 June	29 June	87 days	41 days
M 5	M	20 June	20 June	73 days	32 days
M 7	M	17 June	17 June	73 days	29 days

9. General Evaluation of Falcons. All the peregrines tended to stay near the tower and fly little while in the hack area for the first three weeks. Two tiercels often made shallow stoops at the attendants when they fed. During the first two weeks of release it became necessary to visit the tower several times a day and feed the birds by different methods to ensure that the peregrines did not associate the attendants with food. By the third week of release the peregrines began spending most of the day away from the area and food was then placed in the box when the birds weren't within sight. These actions ensured that the peregrines did not associate food with humans.

The peregrines were very aggressive toward other birds of prey such as osprey (Pandion haliaetus) and harriers (Circus cyaneus). The peregrines would aggressively tail-chase these birds away from the tower. On several occasions late in the hack period, unidentified

peregrines stooped and tail-chased harriers away from the marsh. The only true stoops observed were directed towards the harriers in the area. Due to the distance no individual post-fledgling behavior was noted.

10. Unusual Incidents. On 8 May an adult female peregrine falcon was seen on the tower. This occurred just before the young peregrines were placed in the hack-box and the falcon was not seen again. On 13 May and again on 23 June a great horned owl (Bubo virginianus) was seen during daylight near the tower. Both times the owl was driven from the area by mobbing birds and the attendants. The owl was not seen or heard in the area at any other time and was believed to be a non-resident.

No other unusual incidents occurred and all the peregrines were believed to have reached independence.

11. General Evaluation of the Site. Russell Island is a good site for hacking peregrine falcons. The site provides a good supply of prey species and there have been no predator problems during the three years Russell Island has been utilized. The hunting lodge provides excellent housing for the attendants.

12. Equipment. A pair of binoculars and a spotting scope, on loan from the College of William and Mary, were left with Hans Gabler. A 14 foot boat with a 25 hp. motor and two gas tanks, on loan from the Virginia Game Commission, were also left with Hans Gabler.

13. Acknowledgements We would like to thank; Dr. Mitchell Byrd and Hans Gabler for coordinating and supervising the peregrine reintroduction program in Virginia, the Deep Creek Gun Club for the use of their property and the Virginia Commission of Game and Inland Fisheries for its financial support. We would like to extend a special thanks to the Cutchin family for their special assistance and interest in this project.

Cobb Island, Virginia. Prepared by Robert Cross and Scott Durkin.

1. Personnel at Site. Robert R. Cross, 12721-17 Nettles Drive, Newport News, Virginia 23606. Scott Durkin, 6144 Bardu Avenue, Springfield, Virginia 22152.

2. Description of Site. Cobb Island, approximately 9 km in length, with it's width ranging from 200 M to 1.5 km, is one of the many islands which compose the barrier island chain off the eastern shore of Virginia. Cobb Island itself is situated between Hog Island to the north and Wreck Island to the south; and, is located 13 km east of Oyster, Virginia which is in Northampton County.

There is an open beach habitat which is approximately 75 M wide and extends continuously the entire length of the eastern side of the island. The remainder of the island's habitat consists of primary dune, salt marsh, and tidal flats. Some upland habitat characterized by tall shrubs and fresh water ponds exists on the north end of Cobb Island.

The hack tower is located at the southern end of the island which is mostly salt marsh and tidal flats with little or no upland habitat. The predominant vegetation in the area of the hack-site consists of Spartina alterniflora, Spartina patens, Salicornia spp., and Iva frutescens. The hack-box faces to the southwest so as to be shielded from severe northeast storms.

Two structures, both abandoned Coast Guard stations, exist in the area of the hack tower. The older of the two structures which is collapsed and uninhabitable is located 400 m southwest of the hack tower. The second structure, a large three story building in good condition, is located 200 m west of the hack tower. This building was utilized as an observation post and housing for the hack-site attendants. A third structure, approximately 500 m from the hack tower, exists on nearby Little Cobb Island. All three structures were often used as perch sites for released eyasses. A row of old telephone poles extending the length of the island also provides convenient perches for eyasses. One telephone pole, located 150 m southwest of the hack tower, supports a large osprey nest; however, the pair of ospreys occupying this nest were unsuccessful in their breeding efforts this year.

Cobb Island has been used as a hack-site for peregrine falcons every year since 1978 with the exception of 1982 when a pair of adult peregrines were seen regularly at the site.

Cobb Island's abundance of bird life, including many species of gulls and terns, skimmers, long-legged waders, and a variety of shorebirds and passerines, provides excellent chase and prey for peregrines. A minimum of human intrusion further enhances the desirability of Cobb Island as a hack-site for peregrine falcons.

3. History and Details of Young

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Mr.T.	M	816-67407/R	Yellow 8/L	18 May 32 days old
Rebel	M	816-67408/L	Yellow 9/R	18 May 35 days old
Fiver	M	816-67409/R	Yellow 10/L	18 May 32 days old
Hildred	F	987-73329/R	Yellow 73/L	18 May 33 days old
Beulah	F	987-73330/L	Yellow 74/R	18 May 34 days old

4. Pre-release Details. On 18 1984 at 1330, five eyasses were placed in the hack-box by Hans Gabler. The birds were fed a total of eight quail per day through the food chute from 18 May to 27 May. Daily observations revealed little or no food scraps left after feeding. On 29 May, food was withheld in anticipation of release planned for 29 May.

However, a storm front with heavy rain and strong northwest winds hit Cobb Island on 29 May causing postponement of release until May 31. On 29 May and 30 May, the eyasses were fed a total of five quail per day. An adult tiercel was spotted in the area of the hack-site on the afternoon of 24 May and in the morning of 25 and 26 May. There was no observable reaction to the adult tiercel on the part of the eyasses in the hack-box; and, each time the adult appeared, he was frightened away by the attendants. No identification band was seen on the adult at this time; though, it appeared to be the same tiercel each time.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Mt.T.	M	31 May 1535	45 days	unknown*	unknown
Rebel	M	31 May 1535	48 days	1 minute	4 hrs. 55 min.
Fiver	M	31 May 1535	45 days	3 hrs. 55 min.	19 hrs. 25 min.
Hildred	F	31 May 1535	46 days	2 hrs. 10 min.	14 hrs. 55 min.
Beulah	F	31 May 1535	47 days	- -	4 hrs. 26 min.

*This eyas fledged after dark on the day of release and returned to the hack-box at 2044 the following day.

An adult tiercel was spotted by attendants at 1835 on the day of release, 31 May. The wild tiercel landed on the hack tower platform while two eyasses were present. Alarm calls were given by the eyasses. The wild tiercel then harassed two young on the tower by performing a series of shallow stoops upon them. No physical contact was made by the adult, and no injuries resulted from his aggression. After landing again on the hack tower platform, the wild tiercel proceeded to chase falcon 74 and tiercel 10 from nearby perches, forcing both birds down into the surrounding marsh. Some physical contact was made on these two young, but, only to the tailfeathers and with very little force. Both eyasses were located visually on the ground by attendants and determined to be unhurt. The wild tiercel left at 2030 and is believed to be the same adult spotted earlier before release.

Falcon 74 bolted from the hack-box immediately upon release followed by tiercel 9. Only one falcon, 73 showed a great deal of difficulty in achieving flight. Her initial flight from the hack tower is best described as a fall to the ground directly beneath the tower. She then hopped to a short perch placed beneath the tower where she spent the night.

6. Hunting Behavior. All the young engaged in some intraspecific tail-chasing, footing, and carrying of inanimate objects as early as 3 June, day 4 at 49 days old. The earliest instance of interspecific chase occurred on 5 June when tiercel 9, 51 days old, was observed giving chase to a snowy egret until the egret was forced to ditch in shallow water in order to escape. Willets were the most common object of interspecific chase. On 7 June tiercel 8, 55 days old was seen tail-chasing a willet; and on 8 June, the falcon 74, age 51 days old was also seen tail-chasing a willet. A laughing gull was chased by eyas 10 on 7 June. Falcon 73 performed a shallow stoop on a tri-colored heron on 10 June, 54 days old.

Most hunting behavior occurred in the early morning and late afternoon hours. At no time were any actual kills witnessed by attendants; although, full crops were seen on tiercel 8 and 10 when they returned to the tower after extended absences. On 28 June tiercel 8, 73 days old, was observed making a full stoop on a boat-tailed grackle flying over open water. The attack was unsuccessful.

The duration of interspecific chase was usually brief; however, on 17 June four young gave chase to large flocks of herring gulls, laughing gulls, black skimmers as well as oystercatchers and egrets for approximately ten minutes on Little Cobb Island.

All eyasses developed normal hunting behavior. The tiercels seemed to develop their flying skills earlier than the falcons and subsequently developed their hunting behavior earlier also. Tiercel 8 was the quickest to develop proficient hunting skills; while, 74 took the longest.

7. Roosting Behavior. Tiercel 9 preferred to roost away from the hack tower, usually on an old telephone pole within 150 m of the tower. Often, he would carry his food away from the tower to such a perch before eating. This eyas tended to roost alone throughout the hacking period. All the young spent much time roosting alone during the first two days after release; but, as their flying skills increased, so did their gregariousness.

The tiercels 8 and 9, and the falcons 73 and 74 spent most of their roosting time together. From 2 June to 5 June, these four birds roosted primarily on the roof and cupola of the old Coast Guard station located 400 m southwest of the hack tower. From 7 June to 12 June they spent most roosting time on or near the hack tower, possibly to avoid confrontations with local ospreys which were using the old Coast Guard station as a roost. From 13 June to final dispersal, their primary roosting site was the roof of a small house on Little Cobb Island, 75 m due west of Cobb Island.

The young were often seen roosting on the beach, especially after giving chase to shore birds or on days when strong winds were in effect. On 22 June, four eyasses spent most of the day roosting beneath the hack tower platform where they were shielded from strong easterly winds by a piece of plywood which had been placed there for that reason.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Mr.T.	M	28 June	28 June	73 days	28 days
Rebel	M	2 July	3 July	81 days	33 days
Fiver	M	10 July	10 July	85 days	40 days
Hild.	F	12 July	12 July	88 days	42 days
Beau.	F	27 June	28 June	75 days	28 days

9. General Evaluation of Falcons. Although the falcons were several days ahead of the tiercels in final development of the flight feathers, the tiercels became proficient flyers and hunters sooner, spending more of their time in the air and ranging further from the site than the falcons. Both falcons were highly aggressive when feeding, often taking quail away from the others. Consequently, the tiercels often waited for the opportunity to feed when there were no falcons present or carried their food away from the tower. All young showed well developed flying and hunting skills by the time of their dispersal. The falcon 73 was, however, still somewhat dependent on quail for food up to the time she was last seen on 12 July. All young showed normal fear of human presence, flying from the roost giving their alarm call whenever human intruders approached too closely.

10. Unusual Incidents. Tiercel 9 developed a habit of landing in an osprey nest soon after his release. He landed there six times from 20 May to 21 May. Each time he was chased away by the ospreys. No injuries resulted.

On nine separate occasions an adult tiercel was spotted in the area of the hack-site. On 3 June, the adult entered the hack-box and took a quail while one eyas was present on the tower platform. Interaction between the adult and the eyas was always limited to short chases and shallow stoops resulting in no injuries to the eyas. An aluminum federal band was seen on the right leg of the adult on 3 June. No color band was present.

11. General Evaluation of Site. Cobb Island is an ideal release site for peregrine falcons. The beaches and marshes of Cobb provide more than ample flying space for young eyasses. There are adequate perches and roosting sites available. A wide variety and high density of prey species is also present. Predators are non-existent on Cobb Island with the possible exception of an occasional otter.

Cobb Island is also an ideal work site for the hack attendants. The housing is dry and comfortable and offers an excellent vantage point for observations. A constant light wind keeps the temperature and the insects at comfortable levels. Human interference is almost negligible. Some problems arose due to the lack of direct radio communication with the mainland. This is the only possible and necessary suggestion to improve this site.

12. Equipment. An 18 foot aluminum boat, 35 HP outboard motor, three life preservers, propane refrigerator, Coleman stove, tool kit, and six five gallon water jugs were all returned to Hans Gabler upon completion of the work.

13. Acknowledgements. Appreciation is expressed to Dr. Mitchell Byrd, Hans Gabler, M. Lee Payne, the Nature Conservancy and R&C Seafood.

Bird List

Common loon
 *Brown pelican
 *Double crested cormorant
 *Great blue heron
 Green-backed heron
 *Little blue heron
 Cattle egret
 *Great egret
 *Snowy egret
 *Tri-colored heron
 *Black-crowned night heron
 Yellow-crowned night heron
 *Glossy ibis
 White ibis
 *Black duck
 Surf scoter
 Red-breasted merganser
 *Northern harrier
 *Osprey
 Peregrine falcon
 *Clapper rail
 *American oystercatcher
 Semipalmated plover
 Piping plover
 Black-bellied plover
 Whimbrel
 *Willet
 Spotted sandpiper
 Short-billed dowitcher
 Red knot
 Sanderling
 Semipalmated sandpiper
 Western sandpiper
 Least sandpiper
 White-rumped sandpiper
 Dunlin
 *Great black-backed gull
 *Herring gull
 *Laughing gull
 *Gull-billed tern
 *Forster's tern
 Common tern

*Common in the area of hack-site

*Least tern
 *Royal tern
 Sandwich tern
 Caspian tern
 *Black skimmer
 Mourning dove
 Yellow-billed cuckoo
 *Barn owl
 Common nighthawk
 Belted kingfisher
 Common flicker
 *Eastern kingbird
 Great crested flycatcher
 Eastern phoebe
 Acadian flycatcher
 Eastern wood pewee
 Tree swallow
 Bank swallow
 *Barn swallow
 Cliff swallow
 *Fish crow
 House wren
 Mockingbird
 Gray catbird
 Brown thrasher
 Starling
 Northern parula
 Magnolia warbler
 Blackpoll warbler
 Prairie warbler
 Common yellowthroat
 Wilson's warbler
 American redstart
 Eastern meadowlark
 *Red-winged blackbird
 *Boat-tailed grackle
 Rose-breasted grosbeak
 Indigo bunting
 American goldfinch
 Rufous-sided towhee
 *Seaside sparrow
 *Song sparrow

Smith Island, Martin Wildlife Refuge, Cambridge, Maryland.
Prepared by Marion Pratt.

1. Personnel at Site. Marion Pratt, Box 444, Marshfield, Massachusetts 02050.

2. Description of Site. Martin Wildlife Refuge is a satellite refuge of Blackwater National Wildlife Refuge in Cambridge, Maryland. It represents the 4,400-acre northern portion of Smith Island, off the eastern shore of Chesapeake Bay in Somerset County. The refuge is comprised of one large island and several surrounding smaller ones. The entire area is a conglomeration of saltmarsh, tidal creeks, and several spots of high land. Dominant species of vegetation include saltmarsh cordgrass (*Spartina alterniflora*), saltmeadow hay (*Spartina patens*), saltgrass (*Distichlis spicata*), and needlerush (*Juncus roemerianus*). High-tide bush (*Iva frutescens*), groundsel bush (*Baccharis halimifolia*), honeysuckle (*Lonicera sp.*), wax myrtle (*Myrica cerifera*), red cedar (*Juniperus virginiana*), and loblolly pine (*Pinus taeda*) grow on the higher areas of land.

Numerous species of herons, egrets, shore birds, and passerines are present during the summer months. There are approximately 50 active osprey (*Pandion haliaetus*) nests widely scattered on the refuge, as well as several inhabited fox dens. The hacking tower is located at the northwest end of the refuge, fifty meters from the water, facing the town of Ewell, 1.5 miles south south-west across the water. The tower was built in the spring of 1984 for the first release of peregrine falcons (*Falco peregrinus*) in July, from Martin Refuge.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Tahu	M	576-92197/L	Yellow 2/R	9 July 33 days old
Bakir	M	576-92198/L	Yellow 3/R	9 July 32 days old
Hadjia	F	987-73367/R	Yellow 111/L	9 July 31 days old
Ghzel	F	987-73369/R	Yellow 162/L	9 July 33 days old
Mehara	F	987-73370/R	Yellow 163/L	9 July 32 days old
Rahil	F	987-73371/R	Yellow 165/L	9 July 31 days old

4. Pre-release Details. All six birds were healthy and showed rapid development. Rahil, who had a broken talon on the inner toe of her right foot, was not seen favoring the foot during the pre-release period, nor after her release. While being held in the hack-box, Tahu(Tahullah) and Ghzel were the most active and vocal, while Mehara and Rahil were the most sedentary and quiet.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Tahu	M	19 July 1045	43 days	1 hour	20½ hrs.
Bakir	M	19 July 1045	42 days	21 hours	1 day 4 hrs to 1 day 22 hrs.**
Hadjia	F	19 July 1045	41 days	1 day 7hrs.	5 min.
Ghzel	F	19 July 1045	43 days	3 hours	23 hrs.
Mehara	F	19 July 1045	42 days	21½ hours	2½ hrs.
Rahil	F	19 July 1045	41 days	1 day 7 hrs.	1 day 1 hr. to to 1 day 19 hrs.** 1 day 14 hrs.

** severe thunderstorms interrupted observations.

Several minutes after the birds were released, Tahu(Tahullah) walked out from behind the hide and began to eat immediately, followed soon after by Bakir. Two hours later, the four females emerged from the box screaming, and began to eat.

6. Hunting Behavior. The peregrines were observed crabbing and making shallow stoops at each other from day two until 33, after which they were rarely seen together. They seemed equally adept at chasing prey over needlerush, on the open water, down tidal creeks, and along the bay-side beaches of the refuge.

Tahu(Tahullah) was observed tail-chasing a laughing gull (*Larus atricilla*) on day 18, at 61 days of age. On day 23, at age 66, he pursued an unidentified swallow, twisting and turning in an extremely agile manner. Immediately afterward he made shallow stoops on a second unidentified swallow, displaying marked maneuverability. At 77 days of age, on day 34, he was observed knocking a laughing gull into the water, not seeming to have injured it. He scattered a large flock of laughing gulls and herring gulls (*Larus argentatus*) by diving into it on day 39, 82 days old.

Bakir was seen on day ten, tail-chasing a herring gull, at 52 days of age. On day 14, 56 days old, he dove at several laughing gulls. He was seen diving at an immature herring gull on day 43, when he was 85 days old.

Hadjia was first observed pursuing prey on day 46, at 87 days of age. She had come to the tower, and, finding no chickens, screamed at length. Flying down to the water, she made a short tail-chase of a black duck (*Anas rubripes*), three unidentified swallows (flying up at them from underneath), and a herring gull, without success.

Ghzel made a fierce dive at an immature laughing gull when she was 62 days old, on day 19.

Mehara briefly chased an unidentified swallow on day 44, at 86 days of age.

Rahil, 56 days old on day 15, was seen tail-chasing three willets (*Catoptrophorus semipalmatus*). On day 30, at 71 days of age, she made a short tail-chase of a flock of unidentified sandpipers.

No kills by any of the six peregrines were witnessed during the hacking period, but on day 22, the remains of a large praying mantis (*Mantidae sp.*) were found at the base of an osprey nest platform. On day 27, an immature yellow-crowned night heron (*Nyctanassa violacea*) was found dead at the base of the tower, and on day 30, an immature seaside sparrow (*Ammodramus maritima*) was found dead in the same area. Both were unmarked. It is possible that they had been knocked dead by a peregrine arriving at or leaving from the tower.

An alternate-day feeding schedule was initiated on day 46 to encourage the peregrines to increase their hunting activity and disperse.

7. Roosting Behavior. The first three weeks after release, most of the peregrines roosted on the hacking tower and the three unoccupied osprey nest platforms at the base of the tower. Several spent an occasional night on the beaches of the bay side of the refuge, the favored spot being a spit of land surrounded on three sides by water and covered with grassy hummocks and driftwood perches. Bakir is believed to have roosted several times on the refuge's tall observation tower two miles from the hacking tower. When the six grew more independent of each other, it was more difficult to determine where they roosted, but several were seen flying singly, just before dark, into the isolated

stands of trees one-half and one mile, respectively, from the hacking tower.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Tahu	M	2 Sept.	2 Sept.	88 days	45 days
Bakir	M	31 August	5 Sept.	90 days	48 days
Hadjia	F	2 Sept.	3 Sept.	87 days	46 days
Ghzel	F	24 August	25 August	80 days	37 days
Mehara	F	1 Sept.	1 Sept.	86 days	44 days
Rahil	F	13 August	18 August	71 days	30 days

After the departure of the hack-site attendant on 8 September, two chickens were placed on the tower every three days by refuge manager Mike Harrison, to ensure the availability of food for Hadjia, Bakir, and Tahu(Tahullah) in the event of their return.

9. General Evaluation of Falcons. Tahu(Tahullah, the smallest and most agile flier of all six peregrines, stayed in close contact with Ghzel, his sister, for the first few days after release. He was seen making spectacular stoops and claspings talons with an immature marsh hawk (Circus cyaneus) at 66 days of age. Later, he was observed diving at a great blue heron (Ardea herodias). Quite aggressive toward the ospreys, he was the least tame peregrine.

Bakir, mobbed by crows (Corvus spp.) during his first flight, chased by a purple martin (Progne subis) three days afterward, and by barn swallows (Hirundo rustica) on day seven, soon became aggressive and quick in the air. He was seen once stooping at a great egret (Casmerodius albus), and at 77 days of age displayed intense aggression toward Tahullah, flying fiercely at him, pushing him off an osprey nest platform. It was the only act of aggression witnessed among the six peregrines. Bakir showed no tendency toward tameness.

Hadjia, the smallest female and darkest bird, was by far the tamest of all. A consistently good eater, she spent more time at the tower than any of the others. She was a graceful flier, but lacked the power so obvious in the other females, and was the slowest to develop hunting skills. At 53 days of age, she was seen diving at a great egret.

Ghzel, a strong and aggressive flier, was often seen swooping down the length of tidal creeks, diving at herons and egrets. Aggressive toward the ospreys, she was observed crabbing with an immature marsh hawk when she was 62 days old. A curious and vocal falcon, she investigated human visitors on the refuge, but never allowed anyone to approach closely while she was perched.

Mehara was the largest and blondest of the six peregrines. Initially slow and awkward, she soon became the most powerful flier, if less agile than her siblings. She was seen diving at snowy egrets (Egretta thula) and yellow-crowned night herons. She was very independent and never allowed humans to approach closely.

Rahil, the lone of the group, spent the least time at the tower. She was a vocal bird, allowing fairly close approach by humans. She was seen swooping at a yellow-crowned night heron and a little blue heron (Florida caerulea).

10. Unusual Incidents. On day 11, a seventh peregrine was observed crabbing briefly with Mehara over the marsh, too far away to be identified. On day 16, a strange peregrine, perhaps the same bird, was seen with all the others on the tower. Again, it could not be determined whether it was an adult or juvenile bird, but it is likely that it was a young peregrine from either South Marsh or Fox Island, considering the ready acceptance of it by the other six.

On the 19th day after release, five peregrines were observed diving repeatedly at something large hidden in the needlerush by the beach, this may have been a fox.

11. General Evaluation of the Site. Due to the respect of the local people for the status of the refuge and refuge-related activities, there was no human interference with the hacking procedure.

The abundance of prey and surprising lack of problems with the resident foxes, numerous nesting ospreys, and nearby adult peregrines nesting on South Marsh and Fox Islands combined to make isolated Martin Refuge an extremely favorable hack-site this year. It is possible however, that with a peregrine release earlier in the season, the osprey would be more aggressive in defense of their younger offspring.

12. Equipment. Borrowed from Blackwater National Wildlife Refuge and left at Ewell were: one boat and motor, one pair of hip boots, one life jacket, and one eight-foot freezer.

13. Acknowledgements. Many grateful thanks are extended to the U.S. Fish and Wildlife Service and to the Maryland Wildlife Administration for their organizational, financial, and personnel contributions. I greatly appreciated the use of the FWS visitor center in Ewell and the boat. Thanks are due to William Giese and Richard Webster for delivering that boat from Blackwater. I thank Jack Barclay for bringing the peregrines and for his friendly advice. I appreciated the help of Steve Dawson, Bradley Eby, and Danny Harrison on release day. Steve and Bradley's frequent and timely deliveries of chickens were invaluable. I am indebted to Yvonne Harrison for her hospitality, and to all Smith Islanders for sharing with me their unmatched friendliness and their peaceful and beautiful community. Finally, very special thanks to Mike Harrison, without whose frequent help, advice, and extensive knowledge of the refuge and its waters, there would not now be six more peregrines flying in the east.

Silver Lake Mountain, Clinton County, New York. Prepared by Kathleen O'Brien and Nick Pouder.

1. Personnel at Site. Kathleen O'Brien, 178 Central Avenue, Troy, N.Y. 12180, and Nick Pouder, Greenwich Road, Bedford, N.Y. 10506.

2. Description of Site. The Silver Lake Mountain hack-site is located at an elevation of 2200 feet on the south slope of the east/west running Silver Lake/Poter Mountain Range. The land is owned by International Paper Company and lies within the Town of Black Brook in southwestern Clinton County, New York.

The upper southern slope consists of steep rock outcroppings with the predominant vegetation being red pine (Pinus resinosa), white pine (Pinus strobus), blueberry (Vaccinium sp.), and lichen. Beech-birch-maple forest predominates on the northern slopes, the lower southern slopes, and most of the valley below. The northern slope is less steep and descends into a large swamp. There are a few open field areas on the valley floor. Visible from the site are Taylor and Mud Ponds, Silver Lake and Union Falls Reservoir, and Whiteface and Catamount Mountains.

3. History and Details of Young.

Name	sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Pippin	M	816-67436/R	Yellow 37/L	8 June 33 days
Denver	M	816-67437/L	Yellow 38/R	8 June 33 days
Windsor	F	987-73355/R	Yellow 99/L	8 June 35 days
Zephyr	F	987-73356/L	Yellow 100/R	8 June 35 days
Coby	F	987-73357/L	Yellow 101/R	8 June 34 days
Niagara	F	987-73358/R	Yellow 102/L	8 June 34 days
Gold	F	987-73359/L	Yellow 103/R	8 June 33 days
Hope	F	987-73360/R	Yellow 104/L	8 June 31 days
Bridger	F	987-73361/L	Yellow 105/R	8 June 31 days
DoRight	F	987-73362/R	Yellow 106/L	8 June 33 days

4. Pre-release Details. There were two possible sightings of immature peregrines (Falco peregrinus) in the fields in the valley within a week of the birds being placed in the box, but no sightings anywhere near the box site itself. The birds vocalized at the occasional turkey vultures (Cathartes aura) which passed by and aircraft but otherwise pre-release was uneventful.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Pippin	M	18 June 1445	43 days	1 hour	1 hr. 50 min.
Denver	M	18 June 1445	43 days	2 hr. 55 min.	1 hour
Windsor	F	18 June 1445	45 days	1 hour	1 hour
Zephyr	F	18 June 1445	45 days	1 hour	1 hour
Coby	F	18 June 1445	44 days	1 hr. 15 min.	30 min.
Niagara	F	18 June 1445	44 days	2 hrs. 15 min.	10 min.
Gold	F	18 June 1445	43 days	23 hrs. 15 min.	55 min.
Hope	F	18 June 1445	41 days	23 hrs. 15 min.	3 hrs. 35 min.
Bridger	F	18 June 1445	41 days	22 hrs. 45 min.	4 hrs. 5 min.
DoRight	F	18 June 1445	43 days	2 hrs. 25 min	20 min.

By the day of release most of the birds were showing restless activity, flapping wings and occasionally leaping at the cage bars. Just prior to release Marty Gilroy placed white tape on the federal bands of birds 99 and 100. Because of the number of birds and the distance at which we were forced to observe, exact times of flight were difficult to determine. At least three birds flew almost immediately on release but it was not possible to see who they were. The times to

flight were recorded when a bird was identified away from the box or when it was positively identified as it left the box. Within three hours seven birds had made flights (101 and 106 made more than one flight by the end of the day). By 1400 on the next day the remaining three birds had flown.

On the day of release an immature goshawk (Accipiter gentilis) was observed crabbing with one of the peregrines. On 21 June, three days after release, an unidentified hawk was seen briefly crabbing with a peregrine who was vocalizing.

6. Hunting Behavior. The day after release some of the peregrines were engaging in tail-grabbing. This play continued and became more exciting as the birds grew more agile and began very fast chases and sharp maneuvers along the cliffs. Chases were generally accompanied by vocalization, usually from the pursued bird. Turkey vultures were often targets for harassment. Twice on the 11th day after release a peregrine was seen diving on one of a group of three osprey (Pandion haliaetus) passing along the cliff and on the 34th day a peregrine was seen diving on an immature red-tailed hawk (Buteo jamaicensis) at some distance from the box.

It is interesting to note that northern ravens (Corvus corax) were occasionally seen along the cliffs, but after the peregrines were released they disappeared. Then when the peregrines began to spend most of the day away from the area flocks of ravens would be seen frequently. On the morning of 18 July, 30 days after release, one unfortunate raven was harassed through the trees on the cliff by several peregrines.

The first interest in potential prey was observed on 22 June, the 4th day after release by Zephyr (49 days old) who followed a small bird until it reached the safety of the trees. Other unsuccessful small bird chases were observed on the 7th, 9th, and 15th days after release, but the participants were not identified. On the 9th day, 27 June, two peregrines were also seen harassing a herring gull (Larus argentatus). Thirteen days after release a butterfly "kill" was made. On 29 July, 41 days after release, two peregrines were seen, one of whom may have had a kill or a cached chicken. On 30 July, the 42nd day after release and the last day any peregrines were seen, one was seen diving into a field near Black Brook, but the outcome was not observed.

7. Roosting Behavior. For the first two weeks after release the birds were roosting in snags on the west and east ends of the cliffs and on the cliffs themselves, but after the second week they were roosting pretty much on just the cliff faces. The cliffs to the west of the boxes seemed a favorite area. Often they would push or intimidate each other from a roost. Late evening chasing games were often played in this area.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Birdger	F	18 July	18 July	71 days	30 days
Gold	F	19 July	19 July	74 days	31 days
DoRight	F	23 July	23 July	78 days	35 days
Denver	M	23 July	23 July	78 days	35 days
Zephyr	F	23 July	23 July	80 days	35 days
Windsor	F	20 July	24 July	81 days	36 days
Coby	F	19 July	24 July	80 days	36 days
Pippin	M	23 July	24 July	79 days	36 days
Hope	F	21 July	26 July	79 days	38 days

All the birds dispersed normally. By 30 June, 12 days after release, the birds were spending the majority of the day out of sight except in the early morning and the evening. As has been said earlier, the last time any of the birds were seen was away from the site, on 30 July, 42 days after release.

On 24 July, 36 days after release, we started alternate day feeding, which we believe encouraged some of the birds to finally disperse. Pippin had been coming back after one or two days away but after he came back and found no food on 24 July he did not return again. Niagara also would be gone for two days in a row and then turn up again, but after arriving on 26 July and finding no food she did not return. Hope was considered dispersed (she was gone for four days) when she also returned on 26 July, but finding no food she just sat at the box screaming with Niagara. That Bridger was the first to disperse was a surprise because she was one of the youngest birds (four days younger than the oldest) and was a slow starter at release.

9. General Evaluation of Falcons. Pippin was the most active bird before release and was flapping his wings and leaping at the bars long before any of the others. He was a skillful flier but disappointingly slow to disperse. Niagara was named for her loud voice which she used the instant she spotted anyone at the peep holes in the box, while she was being chased in the air, and any other time. She and Coby were the most aggressive birds and both picked up the disturbing habit of repeatedly swooping on the attendants despite shouts and shirt-waving. Gold and Windsor were very tolerant of humans until repeated deliberate flushings made them more leery. Windsor was often seen in the company of Niagara or Coby. Bridger and Hope were the slowest to develop and often landed when being chased by the other birds or did not take part in games when all the others were doing so. They were often the first to arrive to feed. The other birds developed normally but did not seem to have very distinctive personalities.

10. Unusual Incidents. On 17 July, 29 days after release, at 1500, a falcon with adult plumage arrived at the box. After looking around briefly she flew off with a scrap of chicken, but it was possible to see that she had a dark band on the right leg and possibly a yellow band on the left. She was immediately chased off by one of the immature birds. An adult appeared again at 1740 and was seen to have a gap of missing feathers in its tail. This bird was immediately and viciously driven off by Hope (age 70) and another immature bird. An adult with only a black band on the right leg was seen feeding at the box on 21 July and seen near the box on 22 July. It is not certain if these were the same or different birds-the last one seen had a much paler breast than the first.

On the morning of 22 July two small black bear cubs (Ursus americanus) were turned back from entering the attendants' camp. The sow was seen in the vicinity of the hack-boxes a few minutes later and took some old chicken scraps and the fresh chickens from the front of the box. Later that day and the next they stole chickens from the cooler.

Both hack-boxes suffered damage after release from porcupines, one of them severely enough to question its reuse. One incident which didn't have to do directly with the project but was of intense annoyance to the attendants was the theft of a soda and the flattening of two of the state truck tires by person or persons unknown.

11. General Evaluation of the Site. The site provides for excellent viewing of the peregrines along the cliffs and out over the valley. The hardwood forest on the north side prevented any observations in that direction. The variety of habitat and the proximity of the open lakes and fields would seem to provide the young birds with ample hunting areas. Peregrines were sighted several times at Taylor Pond and over the Dupreys' fields.

Problems with the feeding chute almost certainly was one of the factors which caused some of the birds to be so tame. Although they never food begged they often stayed airborne around the boxes when we had to fix the chute and began to feed as soon as we left. Perhaps a drop box would be less trouble, or a chute made all in one piece or made from longer and fewer sections of pipe to reduce kinks where chickens get stuck.

This year's releases bring the total for this site to 34. It is not surprising therefore that there were sightings of older birds this year and last year. Fortunately the adults were no problem, but returning birds may become more frequent as past hacked birds reach sexual maturity and this should be considered before deciding to use the site again. Whether it is used for hacking again or not, the area should be watched for nesting activity on the excellent cliffs along the entire mountain system.

12. Equipment. Returned to DEC Region 5 was one canvas tent, one dome tent, two five gallon water containers, one knife, two coolers, one pulley, one cotton rope, one plastic tarp, one solar shower, mosquito netting, hammer and nails, spotting scope, 60X eyepiece, one roll marking tape, two walkie-talkies, one shovel, first-aid kit, DEC vehicle, one garbage can. Left at the site were two hack-boxes, one garbage can, four pieces plastic pipe, four pieces plastic pipe plunger.

13. Acknowledgements. We would like to thank Ken Kogut, Ed Grant and Jon Kopp of DEC Region 5 for their support. Thanks also to secretary Joanne McGrain for her help with paperwork and her concern over our (many) blackfly bites. We wish to thank Jack Barclay and Marty Gilroy of The Peregrine Fund for their help, especially to Marty for his expertise at release and for macaroni and cheese in the rain. We are indebted to Gordon Bushey at Taylor Pond for coffee and soda, swims and conversation. We are grateful as well to Patty Swain of the Camp Colby Staff and Brett Falcon of Peru, N.Y. for their fine company, encouragement and excellent meals as well as the use of showers and laundry machines. We would like to thank the Duprey family and International Paper Company for the use of their lands. Finally we would like to thank Barbara Loucks and the DEC Endangered Species Unit for giving us a chance to participate in this project and experience these great birds.

Bird List

*Peregrine falcon	Ruby-throated hummingbird
*Osprey	Spotted sandpiper
*Red-tailed hawk	*Herring gull
*Goshawk	Ruffed grouse
Merlin	Barn swallow
*Turkey vulture	Chimney swift
*Northern raven	Eastern peewee
Barred owl	Red-eyed vireo
Common crow	Solitary vireo
Scarlet tanager	Black-capped chickadee
Rose-breasted grosbeak	Ovenbird
Robin	Dark-eyed junco
Hermit thrush	Black-throated green warbler
Veery	Black-throated blue warbler
Eastern bluebird	Blace-and-white warbler
Bluejay	Blackburnian warbler
Yellow-shafted flicker	Nashville warbler
Downy woodpecker	American redstart
Hairy woodpecker	Myrtle warbler
Cedar waxwing	White-throated sparrow
Red-breasted nuthatch	American goldfinch
White-breasted nuthatch	
Brown creeper	
*interspecific reaction with the peregrines	

APPENDIX

The following areas were checked for possible nesting or other signs of peregrines.

6/2/84	Catamount Mtn. weather hot and clear. South cliffs examined from below for approximately 1.5 hours. No signs of peregrines but brief sighting of red-tailed hawk. Poke O' Moonshine Examined cliffs from below and hiked trail to fire tower to view from above for approximately two hours. No signs of peregrines.
6/3/84	Catamount Mtn. weather warm, overcast. Again examined cliffs from below for short time, then hiked trail to saddle below highest peak. Examined south cliffs for two hours. No signs of peregrines.
6/5/84	Baker Mtn. weather hot and clear. Hiked trail to top of cliffs and watched for three hours. No signs of peregrines but saw two osprey.
6/6/84	Avalanche Pass weather hot, overcast, thunderstorm in afternoon. Hiked trail to Avalanche Lake and examined cliffs from below for approximately one hour. No signs of peregrines.

Note- possible red-tailed hawk nest west of hack-box site on Silver Lake Mtn. An immature bird seen almost daily during July, calling and once seen begging for food from an adult.

Azure Mountain, Santa Clara, New York. Prepared by Colleen Bauer and Lori Garbus.

1. Personnel at Site. Colleen Bauer, Hayesburg Road, Brant Lake, New York 12815. Lori Garbus, 18 Williams Street, Garfield, New Jersey 07026.

2. Description of Site. Azure Mountain is located in the northwestern portion of the Adirondack Park in Franklin County. The site is approximately seven miles south of Santa Clara and fourteen miles northwest of Paul Smith's. The mountain summit is at an elevation of 2518 feet and is a steep three-quarter mile hike.

The hack-box was positioned on the southern face of Azure on a granite cliff, overlooking Swamp Pond, Ben's Pond and McCavanaugh Pond. Most of the surrounding area is owned by St. Regis Paper Company and McCavanaugh Pond Club. The site was a historical peregrine eyrie, and this is the second time the site is being used as a release site.

The tree species located on the mountain were mostly mixed hardwoods including paper birch (Betula papyrifera), red and sugar maple (Acer rubrum and Acer saccharum) and beech (Fagus grandifolia). Other vegetation on the summit included blueberry (Vaccinium sp.) and choke cherry (Prunus virginiana).

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Chucker	M	816-67438/R	Yellow 39/L	8 June 29 days old
Ace	M	816-67439/L	Yellow 40/R	8 June 30 days old
Gill.	M	816-67440/L	Yellow 41/R	8 June 30 days old
Sprout	F	987-73363/L	Yellow 107/R	8 June 31 days old
Bertha	F	987-73364/R	Yellow 108/L	8 June 29 days old
Boom	F	987-73365/R	Yellow 109/L	8 June 30 days old

4. Pre-release Details. The hack-box was set up on 4 June 1984 with the use of New York Department of Environmental Conservation's helicopter. Jack Barclay arrived on 8 June with six peregrines ranging in age from 29-31 days. At 1500 hours, the birds were placed in the box. They were fed one chicken per falcon per day. While in the box, the birds vocalized at passing turkey vultures (Cathartes aura), tree swallows (Iridoprocne bicolor) and several aircraft. All birds appeared to be restless two days before release, with Ace jumping and flapping at the front of the box.

5. Release Details

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return To Box
Chucker	M	20 June 1410	41 days	20 hours	immediate
Ace	M	20 June 1410	42 days	2 hours	14 hours
Gill.	M	20 June 1410	42 days	20 hours	immediate
Sprout	F	20 June 1410	43 days	20 hours	immediate
Bertha	F	20 June 1410	41 days	1 day 19 hrs.	immediate
Boom	F	20 June 1410	42 days	20 hours	immediate

Marty Gilroy worked on the release. Within the first hour, all birds were out of the box. At 1935 on 20 June, Ace followed and vocalized at some turkey vultures. One turkey vulture had been circling close to the chickens so Marty decided to shoot a flare at it to discourage any type of food parasitism. It seemed to work as the turkey vulture left immediately and we had no further problems with them. The evening of 21 June, Ace and Sprout interacted in flight. Ace also chased after tree swallows that same evening. By 23 June, flight interaction increased. On 22 June, a subadult peregrine arrived at 0925.

6. Hunting Behavior. On 26 June, Chucker tried to catch an unidentified insect. On 27 June, a youngster tail-chased a turkey vulture. This practice became a common occurrence because of the large population of turkey vultures in the area. Later on, the falcons rarely chased the turkey vultures and seemed to spend more time chasing each other. On 28 June, Sprout and Boom Boom chased after Colorado (the sub-adult that returned from last year) as he flew off with a chicken. They tried grabbing the chicken and caused him to drop it. On 4 July (day 14) a youngster chased a flying insect in the order Odonata. These attempts at catching prey increased over the following days and the falcons actually caught and consumed the insects.

More advanced hunting skills were observed on 6 July when Sprout tried to chase a fighter plane! A more serious attempt was observed shortly afterwards when she chased a song bird, but no kill was made. Another hunting behavior that occurred was the foot to foot aerial transfer of a chicken on 8 July (day 18). Colorado took a chicken and a youngster chased after him and the foot to foot transfer was made. The aerial transfer of chickens became a common practice until we started tying the food down on 14 July (day 24).

No actual kills were observed, however, the falcon's hunting behavior seemed to develop well. The surrounding areas seems to be abundant in available prey, although we were unable to observe many chases. The falcons were rarely seen in the area after the first two weeks except when they came in to feed every day.

7. Roosting Behavior. Unlike the previous year, no perch poles were provided at the site. The falcons roosted on the rocks directly above the box for the first week after release. After this initial period, the peregrines seemed to prefer to roost on several ledges located almost directly below our observation point. The falcons generally roosted in groups of two or three, and on rare occasions, they roosted in a group of six. Unlike last year, the falcons made extensive use of the fire tower. They used the tower as a perching place after feeding and during breaks from flying.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age when Last Seen	No. of Days After Release
Chuck	M	13 July	13 July	64 days	23 days
Ace	M	21 July	21 July	73 days	31 days
Gill.	M	16 July	16 July	68 days	26 days
Sprout	F	16 July	16 July	69 days	26 days
Bertha	F	23 July	23 July	74 days	33 days
Boom	F	5 July	7 July	59 days	17 days

Boom Boom dispersed 7 July and according to Jack Barclay, she seemed to be on the border-line of survival. On 16 July, Gill. (Gilligan) and Sprout gorged themselves on chickens and never returned. On 21 July, Ace started to eat a chicken but was scared away by a raccoon and he never returned. Bertha was the last to disperse on 23 July after taking what remained of a chicken carcass to a secluded perch. No falcons were spotted 24 July (day 34) through 26 July (day 36) and the site was closed on 27 July (day 37).

9. General Evaluation of Falcons. After release, the falcons flew together, but afterward they separated into small groups when flying.

Chucker, the youngest tiercel, was usually the first falcon to arrive to eat every day. He was often in Boom Boom's company while flying and several times experienced a difficult time in landing during windy conditions. Chucker was the second falcon to disperse.

Ace was the first falcon to fledge and was a competent flier. He was always in Bertha and Sprout's company and they often engaged in mock combat and tail-chasing. Despite the fact that he was the first to fledge, he was one of the last to disperse.

Gilligan was occasionally seen with Boom Boom and Chucker while flying but generally was seen alone. He fledged the same day as Sprout.

Sprout, the oldest falcon, seemed to be the most advanced in aerial maneuvers. At first, she would often perch very close to us, but this behavior quickly stopped. She was associated with Ace and Bertha during aerial battles and often initiated these interactions.

Bertha, the youngest female was the last to fledge. She was associated with Ace and Sprout and also seemed to have a dislike for Colorado. She would always chase Colorado away when he perched near where the food was placed out. Bertha was the last to disperse. Two times before dispersal, she left for two days and returned on the third day.

Boom Boom was very much a loner and was rarely seen, except when she came in to eat. She was the first to disperse.

During feeding, there seemed to be no hierarchy. However, none of the youngsters would let Colorado eat until they were well into eating or done eating.

10. Unusual Incidents. On 22 June (day 2) a subadult peregrine interacted with our falcons. The subadult was identified as Colorado (Federal Band # 576-92195) who was released from the site last year. During the first few days, Colorado swooped at our falcons forcing them to remain low to the ground. Colorado also took several chickens during this time period. By 25 June, he did not seem to act as aggressive toward our birds and the same day, one youngster chased him away. From then on, the youngsters did not allow him to dominate them and often were seen flying with him. Colorado stayed for the entire hacking period, but this did not seem to have any adverse effect on our birds. In fact, his presence may have increased our birds' hunting and flying abilities and may therefore have aided in their dispersal.

Another incident was the appearance of a raccoon on 9 July at the box. It tried twice to take a chicken away. The raccoon was eventually trapped on 12 July and released approximately 30-40 miles away. On 16 July, a young raccoon attempted to take a chicken and was scared away. There were no problems after that, although no chicken parts remained at the days' end. Unlike last year, there were no sightings of fox.

11. General Evaluation of Site. Azure Mountain seems to be a good site to hack falcons. The large open cliff face and surrounding area offer excellent viewing for observation of falcons. The observation point is not very far from the box and identification of the birds was fairly easy.

Last year, the attendants had many hikers on the mountain as it is a popular mountain to hike. They suggested that the trail be closed if the site was to be used again, and this was done. The restricted signs and trail closed signs seemed to discourage many hikers. Last

year there were 304 hikers visiting in a six week period, and we only had a total of 37 hikers visiting in an eight week period.

The main disadvantage of this site was the occurrence of predators on the mountain, mostly raccoons.

12. Equipment. Returned to the Department of Environmental Conservation, one state truck, two garbage cans, first aid kit, nails, hammer, knife, spotting scope, tripod, metal cooler, plastic cooler, tarp, restricted and closed signs, hav-a-heart trap, locks and keys, screwdrivers, shovel, topographic maps and a rope.

Left at the site was the hack-box, four sections of PVC pipe, and three sections of food chute plungers.

13. Acknowledgements. We would like to thank Marty Gilroy from The Peregrine for help in the release of the birds. We would like to thank Mr. and Mrs. Alan Lee and the staff at Dickinson Center for their valuable assistance and friendship. Thanks to Ed Grant of Region 5 office and to the Meacham Lake campsite for use of the showers. Thanks to Mr. Goodrow of the St. Regis Falls campsite for use of their showers at any time. Special thanks to Tom Brownell for his trout dinners, and most of all his friendship and company. Very special thanks to Vance Gilligan of Region 5 office for all the help, support and friendship he offered. In our appreciation of all that he has done for us, we decided to name a bird after him.

Appendix

At DEC's request, we hiked several peaks in the Adirondacks to check for the presence of peregrine falcons. Listed below are the peaks checked and sightings of peregrines.

Whiteface Mountain: We drove to the top of Whiteface on 2 June 1984 and observed for three hours but no peregrines were sighted. We asked employees whether they had heard of any sighting but none were known.

Hurricane Mountain: On 3 June 1984 we hiked Hurricane Mountain. Upon reaching the summit, we observed the surrounding area for four hours but no falcons were sighted. However, we were not in the actual hack-site area which was used in previous years.

Snowy Mountain: We hiked Snowy Mountain in a thunderstorm on 6 June 1984. We observed no peregrine falcons, but saw whitewash on a surrounding cliff; we were unable to identify what had made it.

Wallface Mountain: Upon reaching Wallface on 5 June 1984, we set up the spotting scope in Scotts Field and observed from there. We remained there for three hours but saw no signs of falcons.

Chapel Pond: On 7 June 1984 we reached Chapel Pond and set up the spotting scope and for four hours watched the cliffs for peregrines, but saw nothing. However, a week later, peregrine activity was reported by Ed Grant of the Region 5 office.

Bird List

Turkey vulture
Sharp-shinned hawk
Red-tailed hawk
Ruffed grouse
Great blue heron
Barred owl
Chestnut-sided warbler
Ruby-throated hummingbird
Common flicker
Pileated woodpecker
Yellow-bellied sapsucker
Hairy woodpecker
Downy woodpecker
Barn swallow
Tree swallow
Blue jay
Common raven
Common crow
Black-capped chickadee
White-breasted nuthatch
American robin
Hermit thrush
Swainson's thrush
Veery
Golden-crowned kinglet
Cedar waxwing
Red-eyed vireo
Black and white warbler
Yellow-rumped warbler
Black-throated green warbler
Ovenbird
Scarlet tanager
Purple finch
White-throated sparrow
Rose-breasted grosbeak
Common loon
Eastern phoebe
White-crowned sparrow
Slate-colored junco
Northern oriole

Mammal List

Raccoon
Eastern chipmunk
White-tailed deer
Black bear

Burnt Mountain, Groton State Forest, Vermont. Vermont Institute of Natural Science Peregrine Falcon release site operated in cooperation with The Vermont Fish and Wildlife Department. Prepared by Joel Schmutz and Donna Crossman.

1. Pernonnel at Site. Donna J.P. Crossman, Vermont Institute of Natural Science, Woodstock, Vermont 05091. Joel Schmutz, 303 Pearl Street, Apt. 4, Burlington, Vermont 05401.

2. Description of Site. This is the third year that this site was used to release peregrine falcons. To assure the site's security and the falcons' safety, the Vermont Institute of Natural Science requests that the exact location of this station be kept confidential.

This site is an extensive granite cliff face (approx. 0.33 mile) which rises vertically 350 feet above the forest canopy. The hack-box was positioned facing southwest, overlooking a 65-acre pond some 700 feet below. The elevation of the mountain is 2128 feet.

A fantastic view stretches 180° from east to west, and includes Camel's Hump and the Green Mountains to the west, and the White Mountains of New Hampshire to the east. Between the two horizons are endless, rolling tree-covered hills and mountains. An active beaver pond, a series of beaver meadows, the pond, and a small farm 1.5 miles away offer the only open habitat in the valley below.

Intensive logging coupled with a severe fire in the early 1900's eliminated the coniferous forest which once predominated. Remnant red spruce-balsm fir-tamarack (Picea rubens-Abies balsamea-Larix laricina) stands surround the wetter sites around the beaver areas and large pond. The valley is now composed of mixed hardwoods including white and yellow birch and sugar and red maple (Acer saccharum and A. rubrum) with scattered northern red oak (Quercus rubra) and quaking aspen (Populus tremuloides). A dense growth of striped maple (A. pensylvanicum) comprises a majority of the understory.

Vegetation on the mountain itself is mostly second growth hardwoods with sugar maple and white and yellow birch dominating, and American beech (Fagus grandifolia) and red maple as subdominants. Red spruce is found along the edges. The understory is largely sugar and striped maple.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Lass.	M	816-67463/R	Yellow 131/L	3 July 32 days old
Magnum	M	816-67464/R	Yellow 132/L	3 July 34 days old
Gretch.	F	987-73389/L	Yellow 149/R	3 July 32 days old
Opal	F	987-73390/L	Yellow 150/R	3 July 32 days old
Jade	F	987-73391/L	Yellow 151/R	3 July 33 days old
Tour.	F	987-73392/L	Yellow 152/R	3 July 30 days old

4. Pre-release Details. Jack Barclay placed four falcons and two tiercels in the hack-box at 1330 on 3 July. Jade was the most aggressive of the group as they were placed in the hack-box. During this period, Magnum(Magnum, P.F.) seemed to be the most attentive to what was going on outside the box and the first to detect our presence at the peep hole. He favored a spot on the right end of the perch log where he would gaze out the front of the box for hours. Lass.(Lassiter) was the most active in the box and by 8 July would regularly run around the perch log, jumping on and off the log, and on several occasions, on other birds perched on the log. The birds were fed six chickens each morning around 0800. The weather was cool, rainy, and windy. It rained seven

out of eight days the birds were in the box. All birds seemed to develop and behave normally. Two turkey vultures flew not more than 50 feet from the ledge on 6 July and none of the birds responded vocally. The peregrines were curious about insects and down feathers blowing around in the box.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Lass.	M	11 July 0830	40 days	1 day 3½ hrs.	immediately
Magnum	M	11 July 0830	42 days	immediately	1 day 5½ hrs.
Gretch.	F	11 July 0830	40 days	2 days	1 hour
Opal	F	11 July 0830	40 days	1 day 8 3/4 hrs.	½ hour
Jade	F	11 July 0830	41 days	4 days	6 hours
Tour.	F	11 July 0830	38 days	2 days	2 hours

The release was carried out smoothly by Marty Gilroy. Magnum P.F. bolted from the box and the remainder of the birds emerged more cautiously over the next hour. At 1055 a Red-tailed hawk (Buteo jamaicensis) flew over the hack-box twice and called loudly once. Because a Red-tailed hawk had preyed upon one or two Peregrine falcons during the 1981 season, the situation was alarming for the attendants, though there was no incident. At 1200 rain began which kept up until 0830 on 12 July, soaking all the birds. They remained on the ledge (with the exception of magnum, P.F.) until the sun dried their feathers and they were prepared to fly. Magnum, P.F. was seen at 1410 on 12 July, alleviating our fears that the Red-tailed hawk had killed him during the rainstorm.

6. Hunting Behavior. Normal flight development was observed for all the peregrines. All were tail-chasing, crabbing, and engaging in mock combat regularly. At times they footed pieces of bark, moss, and leaves and flew away with them. All of them caught insects, especially dragonflies, regularly. No kills were witnessed, but the following attempts were made: Tree swallow (Iridoprocne bicolor), by an unidentified peregrine; Barn swallow (Hirundo rustica), by Gretchen at 47 days of age; and American robin (Turdus migratorius) by Magnum, P.F. at 79 days of age.

7. Roosting Behavior. An assortment of roosting sites appeared to be used this year. There are several smaller ledges and depressions just below the hack ledge where whitewash made it plain the areas were roost sites. Favorite roosts were at the base of a clump of white birches on the hack ledge and in a large white pine (Pinus strobus) west of the hack ledge. Again this year, remains of chickens were found on the west end of the cliffs leading us to believe that this area was also used for roosting.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Tour.	F	31 July	3 August	61 days	23 days
Gretch.	F	5 August	5 August	65 days	25 days
Opal	F	14 August	14 August	74 days	34 days
Lass.	M	15 August	15 August	75 days	35 days
Jade	F	15 August	15 August	76 days	35 days
Magnum	M	20 August	25 August	87 days	45 days

Tourmaline was killed by a great horned owl (*Bubo virginianus*) on 3 August and Gretchen was last seen on 5 August, making her survival questionable. See Unusual incidents for details. Lassiter, Opal, and Jade dispersed on 14 and 15 August, coinciding with unseasonable cold weather. Magnum, P.F. remained at the site, free-loading until 25 August.

9. General Evaluation of Falcons. All the birds developed normally. Individual differences are described below. The tiercels favored carrying their chicken from the ledge and the falcons seemed more content to eat on the ledge. During the second week of August, we began to tie the chickens to the ledge. The chickens sometimes disappeared without a trace, leading us to believe they were being taken by a mammal rather than a peregrine.

Magnum, P.F. - He was the star of the group, the first to fly, the first to fly off with a chicken (at 1700 on 12 July), and the first to chase after other birds flying too close to the cliff. Because he was first, he was often alone. He was the instigator, or catalyst, in playing/chasing activities among the birds. He remained at the site one week longer than the other birds because of the free meals, rather than because he was slow to develop.

Lassiter - He was a larger tiercel than Mgnum and was not quite as much of a loner. During July he spent more time around the ledge with the falcons than in the air with Magnum. He was expert at catching insects by 46 days.

Gretchen - She was an aggressive, strong flier when she disappeared. She was seen chasing a barn swallow at 47 days. Though she seemed well-prepared for independence, her disappearance coincided with the appearance of the great horned owl. She was last seen at 65 days of age, and her fate is unknown.

Opal - She was the most visible bird, sometimes returning to the hack ledge three times each day. She persistently food-begged from the other birds. She was the most aggressive around the food, guarding hers and chasing the others from theirs.

Jade was the last bird to venture from the hack ledge - it took her four days to make her first flight. She was often seen with Opal in the air and on the hack ledge. She was second only to Opal in the frequency and amount of chicken she ate. Jade was the only bird to consistently use the top of the hack-box as a perch. She was darkly colored and more heavily streaked than the other peregrines.

Tourmaline - She was a good flyer and successfully caught insects before her death.

10. Unusual Incidents. Tourmaline was preyed upon on 3 August. Though the kill was not witnessed, a great horned owl was observed perched on a dead stump in the beaver meadow below, consuming prey. The owl remained at the stump for at least three hours. Magnum, P.F. and an unidentified female were perched at the edge of the swamp, and at one point Magnum flew directly over the owl, though no vocalizations or interactions occurred. Further investigation revealed a peregrine wing and remains on the stump where the owl was perched. Tourmaline was the only perergine unaccounted for after we observed the owl. Gretchen disappeared on 5 August, two days after Tourmaline. Although Gretchen was five days older than Tourmaline when she disappeared, she may have suffered the same fate. Young peregrine falcons remain susceptible to great horned owl predation throughout the entire hack period. The great

horned owls are not known to nest in the area and were not present during the 1983 or 1983 hack periods.

11. General Evaluation of the Site. Except for the inexplicable appearance of the horned owl, the site ran smoothly. Before the site is used next year, VINS will check for evidence of nesting great horned owls and red-tailed hawks in the area. Avian predators have been the only problem at this site. There was only one party of rock climbers this summer, and they were convinced to scale out of sight of the hack ledge.

12. Equipment. Borrowed and returned: one two-way radio from Merle Dailey; lantern, and assorted camping equipment from Jean Crossman; pup tent from Chris Fichtel; spotting scope, tripod and binoculars from VINS. Jean Crossman donated a 7'X14' supply tent. Joseph Gagnon donated the lumber for the tent platforms. Perry Armstrong of Armstrong's Sugar Hours loaned five 60 gallon drums for water. Left at the site was the hack-box, food chute, rain collection gear, chicken cooler, and hardware.

13. Acknowledgements. Heartiest thanks to Joel Schmutz who volunteered to be a hack-site attendant for the entire summer. Also thanks to Sally Laughlin, Director of VINS and Ben Day and Jim Stewart, of the Vermont Fish and Wildlife Department for arranging the helicopter lift and the use of Groton State Forest; to Merle Dailey and Catherine Hamlin for their help and concern; to the volunteers who spent time attending the falcons - Betty Rist, Priscilla McQuade, Liz and Bob Hall; to Arthur Gilman for the T-bone steak and raspberries; and to Chris Fichtel, Director of Research at VINS, for F.W.N. and all the good food and cheer he brought with him on the weekends. We would especially like to thank Jack Barclay, Marty Gilroy and everyone at the "hawk barn" for their guidance, advice and cooperation throughout the summer.

Bird List

Wood duck	Cedar waxwing
American black duck	Solitary vireo
Mallard	Red-eyed vireo
Common goldeneye	Chestnut-sided warbler
Turkey vulture	Black-throated blue warbler
Northern goshawk	Yellow-rumped warbler
Red-tailed hawk	Black-throated green warbler
American kestrel	Blackburnian warbler
Ruffed grouse	American redstart
Great horned owl	Ovenbird
Barred owl	Northern waterthrush
Chimney swift	Common yellowthroat
Ruby-throated hummingbird	Canada warbler
Belted kingfisher	Scarlet tanager
Yellow-bellied sapsucker	Rose-breasted grosbeak
Downy woodpecker	Chipping sparrow
Hairy woodpecker	Song sparrow
Northern flicker	Swamp sparrow
Eastern wood-pewee	White-throated sparrow
Least flycatcher	Dark-eyed junco
Eastern phoebe	Bobolink
Great crested flycatcher	Red-winged blackbird
Eastern kingbird	Common grackle
Tree swallow	Northern oriole
Barn swallow	Purple finch
Blue jay	White-winged crossbill
Common raven	American goldfinch
Black-capped chickadee	Evening grosbeak
Red-breasted nuthatch	
White-breasted nuthatch	
Brown creeper	
Winter wren	
Golden-crowned kinglet	
Veery	
Hermit thrush	
Wood thrush	
American robin	

Mt. Horrid, Goshen, Vermont, prepared by Will Staats & Sean P. Gallagher.

1. Personnel at Site. Sean P. Gallagher, 33 Roberts Pond Lane, Chicopee, Massachusetts 01020 and Will Staats, Old College Farm Road, Middlebury, Vermont 05753.

2. Description of Site Mount Horrid overlooks Vermont Rte. 73 at the Goshen-Rochester town line. Approximately a quarter mile of broken cliff (elev. 2900') on Mt. Horrid faces in a southerly direction. The cliffs look out at Goshen Mt. (elev. 3292') which is covered with unbroken northern-hardwood forest. There is a beaver flowage 2-3 acres in size at the base of the Mt. Horrid cliff adjacent to Rte. 73. Forest cover in the immediate area of the cliff is composed of a mix of balsam fir (Abies balsamea), red spruce (Picea rubens), white birch (Betula papyrifera) and mountain ash (Sorbus americana). Blueberries (Vaccinium sp.) grow along the cliff edges. The hack-box is positioned atop an approximately 110 foot high face on the eastern end of the cliff. This is the third year Mt. Horrid has been used as a hack-site.

3. History and Details of Young

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age	Placed in Box
121	F	987-73377/R	Yellow 121/L	11 June	31 days old
122	F	987-73378/L	Yellow 122/R	11 June	31 days old
123	F	987-73379/R	Yellow 123/L	11 June	30 days old
124	F	987-73380/L	Yellow 124/R	11 June	29 days old
125	F	987-73381/R	Yellow 125/L	11 June	30 days old
126	F	987-73382/L	Yellow 126/R	11 June	30 days old
127	F	987-73383/R	Yellow 127/L	11 June	30 days old

4. Pre-release Details On 11 June Jack Barclay and Dr. Tom Cade arrived with seven falcons at 1545. Four chickens were placed in the hack-box with the falcons. For the remainder of the prefledgling period we fed them 6 chickens, cutting one in half to insure all had something to eat. By 17 June we were feeding whole, uncut chickens to the young falcons who had no difficulty tearing their own food.

The falcons developed normally, and seemed eager for release by 23 June, all jumping at the walls, flapping their wings and climbing the bars. On 12 June, upon approaching the hack-box we flushed an adult peregrine off the perch pole. The young falcons were heard food begging towards this adult.

5. Release Details

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
121	F	25 June 1102	45 days	1 hr. 12 min.	1 day 46 min.
122	F	25 June 1102	45 days	immed.	1 day 6 hrs 44 min
123	F	25 June 1102	44 days	unknown	(ret. 27 June 1040)
124	F	25 June 1102	43 days	1 day 4 hrs 43 min	3 hrs. 20 min
125	F	25 June 1102	44 days	immed.	1 day 6 hrs 41 min
126	F	25 June 1102	44 days	1 day 3 hrs 47 min	30 sec.
127	F	25 June 1102	44 days	1 day 7 hrs 15 min	14 hrs 17 min

6. Hunting Behavior The first observed hunting behavior involved insect chases. On 2 July (Day 8) 123 was seen making a short flight after a butterfly which it missed. By 6 July all the falcons had become adept at catching and eating insects on the wing. Also on this date 121 left its perch and flew directly at what appeared to be a warbler flying above the trees. The chase lasted only a few seconds, ending when the warbler entered the forest cover. On 10 July (Day 16) 121 made two short stoops at a chimney swift (Chaetura pelagica) over

the valley east of the cliff. The swift escaped unharmed. At 1030, 12 July (Day 18) an unidentified falcon stooped abruptly behind a rock outcropping and reappeared chasing a small bird at high speed for approximately 30 seconds, quickly turning and tail chasing it over the beaver ponds and Rte. 73. No kill was noted. On 2 August (Day 39) 121 made two unsuccessful attempts at capturing tree swallows (Iridoprocne bicolor). Both attempts seemed clumsy and "half-hearted." Both swallows were perched in dead snags over the beaver pond.

We believed the presence of the adult at the site was a deterrent to hunting behavior. The immature falcons concentrated their efforts on food begging and tail chasing the adult when it was in the vicinity of the cliff.

7. Roosting Behavior Initially the falcons roosted in the vicinity of the hack-box on the ledge within 30 feet to either side of it. By the end of two weeks they were utilizing other rock croppings in the area, particularly the cliff 200 yards west of the hack-box. This ledge can be seen immediately to the right, when facing south from the "observation rock" near camp. We also found that at least two falcons were roosting on a rock shelf of the Long Trail lookout.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of days After Release
121	F	1 August	2 August	83 days	38 days
122	F	3 August	3 August	84 days	39 days
123	F	29 July	29 July	78 days	34 days
124	F	3 August	3 August	82 days	39 days
125	F	28 July	28 July	77 days	33 days
126	F	3 August	3 August	83 days	39 days
127	F	24 July	24 July	73 days	29 days

9. General Evaluation of Falcons Falcon 121 seemed to enjoy flying, fledging the first day of release. This falcon was often the first to take up a chase with the adult sometimes giving a very characteristic choking cry. It was 121 who first exhibited the more advanced hunting behavior of chasing small birds.

Falcon 122 was something of a "loner" spending much of it's time away from the hack-box. When it did appear it usually came in with a dazzling stoop. Other than the stoops we really did not notice any outstanding characteristics of 122.

Falcon 123 and 124 were similar in appearance with rather dark plumage on the chest and head. Their personalities differed markedly however. Falcon 124 was stoical, often sitting at one place for hours seemingly uninterested in the events occurring around her. Falcon 123, on the other hand, was the most vocal, always food begging the loudest and longest to the adult and hack-mates.

Falcon 125 was easily recognized by her very light breast, creamy throat and squarish, well-defined maller strips. She flew immediately upon the initial release and proved a good flyer within the first few days. She was also the first falcon to fly off with a chicken and feed away from the box.

Falcon 126 was similar to 122 for the fact it was rather non-descript. There is very little we can say about it.

Falcon 127 had thin maller strips and a very blonde head. She seemed to have a strong affinity for the box, usually the first falcon by it in the morning or roosting near in the evening. She was, however, the first falcon to disperse. The most aggressive falcon, 127 would stoop at us when we placed out chickens, was the first to initiate crabbing and often drove the adult from the hackboard. She could not resist leaving her perch to chase a passing falcon.

10. Unusual Incidents On 27 June the adult peregrine appeared flying in from the west and landed momentarily on the perch pole. Later we were able to recognize that it was actually a sub-adult by the presence of the immature feathers throughout the plumage. It had a single federal band on the left leg. There was no colored band on the right. After many hours in the blind we were able to read the last five digits on the band which were 92188 and the first digit of the sequence, a 5. From this information we determined that it was #80, a tiercel released from this site in 1983. The entire federal band number is 576-92188. We nicknamed this falcon "Opus." "Opus" was present every day during the hack period and we always placed out a chicken for him. He would almost always fly in from the west. We spotted him one day roosting on a snag at the summit of Cape Mt., north on the Long Trail. He would feed most generally in early morning or late afternoon when the immatures were not present, or if they were he would attempt to drive them off. He was never successful. Although he became more tolerant of the immatures, sometimes perching on the pole with them, the young falcons would food beg and tail chase him to the very end of the hack period. Though we feel he may have deterred them from hunting behavior we felt "Opus" was instrumental in sharpening the flying skills of the young falcons as they chased him about learning to match the stoops, rolls and other aerial maneuvers.

On one occasion, when approached by a young falcon "Opus" exhibited a strange "bowing" behavior, tipping his beak to the ground 6-7 times in rapid succession while giving guttural-chipping calls. The approaching immature was food begging loudly and caused "Opus" to fly. On 30 July a young, frisky snowshoe hare (Lepus americanus) scared "Opus" away from the hackboard and was observed eating chicken feathers, much to our amusement.

11. General Evaluation of the Site We feel the Mt. Horrid hack-site worked out very well. Opportunities for observation of the falcons are available at numerous locations along the cliff. Over the course of 8 weeks we had only 21 unwanted visitors, most of them climbing up the cliffs from below. We recommend that future hack-site attendants make an effort at keeping the trail into camp discrete. Although coyotes were heard frequently in the vicinity of Horrid Brook and black bear tracks were noted ½ mile from camp, we had no predator problems.

Since this is the second year there was a returning adult to this site, we would like to extend the following suggestions on obtaining the federal band number. A blind should be built behind the hack-box before the falcons are released. A dark cloth or canvas, large enough to extend across the trail opening to conceal the approach of attendants is desirable. A hole should be cut in the blind to accommodate the scope mounted on a tripod. The perch pole is most visible attached to the left side of the hack-box. The hackboard should be secured to the pole so that the falcons will not pull it over the cliff. The presence of the returning adult was very encouraging to us and made our stay here all the more exciting.

12. Equipment Borrowed from the Peregrine Fund: wall tent and tarp; 25 power spotting scope and tripod, one cooler, one padlock and keys.

Borrowed from the Rochester Ranger District U.S.F.S.: bow saw, brush axe, shovel, backboard, 2-5 gallon water jugs and walkie-talkie.

13. Acknowledgments We would like to thank Tom Striker and his crew of the Ranger District who helped carry up our supplies and set up camp. Thanks to Marty Gilroy for his company and aid in releasing the birds. A big thanks to Wayne Kingsley for bringing us chickens from Wallingford and the use of his freezer for their storage. For his concern and interest we thank Carlos Pinto of the Rutland U.S.F.S. office. We would especially like to thank Tom Hill and his "penny-whistle" renditions and Floyd Schultz for his company, advice, and a good meal!

Bird List

Red-tailed hawk	Dark-eyed junco
Red-shouldered hawk	American goldfinch
Broad-winged hawk	Pileated woodpecker
Sharp-shinned hawk	Hairy woodpecker
Cooper's hawk	Red-eyed vireo
Goshawk	Warbling vireo
Peregrine falcon	Killdeer
Kestrel	Kingfisher
Raven	Song sparrow
Turkey vulture	Robin
Barred owl	Veery
Ruby-throated hummingbird	Hermit thrush
Mockingbird	Wood thrush
Catbird	Gray-cheeked thrush
Grackle	Ovenbird
Red-winged blackbird	Least flycatcher
Blue jay	Olive-sided flycatcher
Yellow-shafted flicker	Eastern phoebe
Tree swallow	Trail's flycatcher
Barn swallow	Black-capped chickadee
Chimney swift	Brown-headed cowbird
Magnolia warbler	Winter wren
Blackpoll warbler	Mourning dove
Yellow-rumped warbler	Red-breasted nuthatch
Black-throated blue warbler	White-breasted nuthatch
Black-throated green warbler	Great blue heron
Yellow warbler	Rock dove
American redstart	Herring gull
Nashville warbler	Rusty blackbird
Black & white warbler	Starling
Bay-breasted warbler	Rufus-sided towhee
Rose-breasted grosbeak	Bobolink
Evening grosbeak	Scarlet tanager
Indigo bunting	Baltimore oriole
Crow	White-throated sparrow
Eastern kingbird	Chipping sparrow
	Great-crested flycatcher

White Rocks, Wallingford, Vermont. Prepared by Cheryl Fimbel and Nell Newman.

1. Personnel at Hack Site. Cheryl Fimbel, Rt. 4, Box 172, Califon, NJ 07830. Nell Newman, 59 Coleytown Rd., Westport, Conn. 06880.

2. Description of the Site. White Rocks is a cliff site located three miles east of Wallingford, Vermont, in the Manchester District of the Green Mountain National Forest. This is its fourth year as a hack-site location, having previously been used in 1977, 1982, and 1983. Prior to these years, in the 1950's it was known to be an eyrie for peregrine falcons (*Falco peregrinus*). The White Rocks cliffs are made up mostly of exposed metamorphic quartzite rock. This formation rises 1000 feet above the valley floor to a total elevation of 2200 feet. The surrounding woodlands are coniferous forests (red spruce and hemlock) above, graduating into mixed hardwoods (birch, maple, and aspen) at the lower elevations. The valley below is primarily a mixed hardwood forest broken up by scattered cultivated fields, bogs, ponds, and Route 7. The human element is very much in evidence at this site as the cliffs are a popular climbing area and there is a Forest Service picnic ground located to the northwest of the base of the cliffs. In addition, the Long Trail/Appalachian Trail passes within ¼ mile of the hack-box location.

3. History and details of Young.

Name	Sex	Fed Band#/Leg	Color Band#Leg	Date & Age Placed in Box
Ethel	F	987-73374/R	Yellow 118/L	11 June 31 days old
Diana	F	987-73375/L	Yellow 119/R	11 June 33 days old
Amiga	F	987-73376/L	Yellow 120/R	11 June 32 days old
Jamus	M	816-67450/L	Yellow 51/R	11 June 31 days old
Spike	M	816-67451/R	Yellow 55/L	11 June 31 days old
Fred Jr.	M	816-67452/R	Yellow 56/L	11 June 32 days old
Loki	M	816-67453/L	Yellow 58/R	11 June 34 days old

4. Pre-release Details. None.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Ethel	F	21 June 0930	41 days	1 hr.- 45 min.	1 hr. - 30 min.
Diana	F	21 June 0930	43 days	7 hrs.-10 min.	35 min.
Amiga	F	21 June 0930	42 days	8 hrs.-15 min.	1 hr. - 5 min.
Jamus	M	21 June 0930	41 days	9 hrs.-10 min.	5 min.
Spike	M	21 June 0930	41 days	unknown	unknown
Fred Jr.	M	21 June 0930	42 days	30 min.	20 min.
Loki	M	21 June 0930	44 days	35 min.	2 hrs. - 40 min.

Just prior to release all the tiercels showed signs of restlessness, such as flying against the bars and side of the hack-box. The release was supervised by Mike Mauer on a sunny morning with a light breeze. Following the release, all birds were most interested in flapping and spreading their wings, with feeding being of secondary importance. By 2100 of day one, all but Spike had fledged. Upon returning to our observation post at 0500 of day two we spotted Spike flying to the hack-box and can only presume that he fledged over night at some time.

6. Hunting Behavior. From day five following release, all of the falcons had begun to catch insects on the wing. It is most likely that these were dragonflies which were abundant at the site. Fourteen days after release, on 4 July, an unidentified male falcon was first observed chasing prey. The prey was a small passerine, most likely a yellow-rumped warbler (*Dendroica coronata*). The falcon was unsuccessful. On the 23rd day after release, Spike was seen stooping off of the perch pole at an unidentified passerine which he also did not catch. The only other falcon observed chasing prey was Jamus, who on day 32 following the release put in three fantastic flights after two chimney swifts (*Chaetura pelagica*), a tree swallow (*Iridoprocne bicolor*), and a small passerine. Each time he flew hard and fast, but the prey eluded him.

7. Roosting Behavior. From day one following the release it was noted that the falcons were not roosting in the hack-box. For the first week we noticed them on the surrounding cliffs at dawn where they presumably spent the night. Later on, they were observed at dawn in the trees at the base of the cliff below the hack-box. However, on more than one occasion, falcons were observed playing on the air currents after the sun set at such far distances that they were merely black dots on the horizon. This would suggest that they roosted a fair distance from the hack-box as well. Falcons were observed leaving the hack-box at dusk and arriving at dawn in groups as well as singly.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Ethel	F	18 July	18 July	68 days	27 days
Diana	F	18 July	18 July	70 days	27 days
Amiga	F	19 July	21 July	72 days	30 days
Jamus	M	28 July	28 July	78 days	37 days
Spike	M	28 July	28 July	78 days	37 days
Fred Jr	M	24 July	24 July	75 days	33 days
Loki	M	28 July	28 July	81 days	37 days

The three females were the first to disperse, though they were among the younger members of the group. All birds dispersed at a reasonable age and not owing to any unusual circumstances, so we have reason to believe that the birds were successful.

9. General Evaluation of Falcons. Throughout the hacking period, Ethel was not as gregarious as the other birds. From the beginning, immediately following release, she tended to remain in one location for most of the day, whether it was at the hack-box or away from it. She did not seem as confident as the other birds; however, she was among the first to disperse which was a surprise to us.

Diana was a veritable tyrant who loved to stir up trouble. She usually instigated the screaming and often pecked at others' beaks and tails around the hack-box. She was the warriest of all the birds. She was also the first to leave the hack-box with a chicken.

Amiga was the most gregarious of all birds, generally observed in aerial play with the other falcons. She was the most curious and was often diving at attendants and circling close above.

Jamus was the most aggressive of all the falcons. He was also very curious, stooping at the attendants as well as just observing. Just prior to dispersing he appeared to be the most adept on the wing.

Spike and Fred Jr. both progressed through the hacking period in a normal fashion with no outstanding characteristics.

Loki was very aggressive and playful in the beginning of the release period. He was also the most agile flyer upon release. He became quite independent, spending less time than the others in the vicinity of the hack-box.

It should be noted that no birds exhibited any food begging behavior toward the attendants, nor did they appear very tame at any time.

10. Unusual Incidents. On day 17 following the release, a blue jay (*Cyanocitta cristata*) knocked Spike out of a perch tree and then proceeded to occupy the empty perch site. Spike simply flew away, never retaliating.

11. General Evaluation of the Site. The White Rocks cliff site, in so far as it has been operating successfully for four seasons, continues to prove itself as an excellent hack-site location. No threatening predators were observed during the hacking period, and prey species appear to be readily available. Easy access to the site and human comforts such as a close water source, shade, magnificent view, friendly community etc. make this a desirable location for the human element, the attendants, as well.

The timing at this site is somewhat critical however, due to the large number of people that visit the cliffs. An early release, such as took place this season (21 June), is best as there was a marked increase in the number of visitors to the site after the Fourth of July holiday.

12. Equipment. Borrowed from The Peregrine Fund: 10x12 canvas wall tent and tarp; cooler; 25x spotting scope and tripod. Borrowed from the U.S. Forest Service; two five gallon water jugs; bow saw; axe; shovel and a radio.

13. Acknowledgements. We would like to thank Mike Mauer for an enjoyable and successful release. Thanks to Terry Villanueva for her friendship, support, and strong back, as well as the Manchester District of the USFS for their cooperation in this effort. John Cormier, our on-site photographer, deserves a special thanks for his many visits and innumerable goodies. We thank Chip for his companionship and fresh trout. Also we appreciated Mrs. Holden and her farm fresh eggs. And finally a warm thanks to Mr. and Mrs. Dolt. Where would we have been without their hot showers, cold lemonade and hearty friendship?

Bird List

*c Turkey vulture	Tree swallow
Goshawk	*c Blue jay
Cooper's hawk	Common raven
Sharp-shinned hawk	Common crow
Marsh hawk	c Black-capped chickadee
Red-tailed hawk	White-breasted nuthatch
Red-shouldered hawk	Red-breasted nuthatch
Broad-winged hawk	Brown creeper
*Osprey	House wren
American kestrel	Winter wren
Ruffed grouse	Catbird
*Great blue heron	American robin
Killdeer	c Hermit thrush
American woodcock	Swainson's thrush
Rock dove	Veery
Mourning dove	Golden-crowned kinglet
Barred owl	c Cedar waxwing
*c Chimney swift	Starling
Belted kingfisher	*c Yellow-rumped warbler
Common flicker	Black-throated blue warbler
Pileated woodpecker	Blackburnian warbler
Yellow-bellied sapsucker	Ovenbird
Hairy woodpecker	Yellowthroat
Eastern kingbird	American redstart
Barn swallow	Red-winged blackbird
Common grackle	Baltimore oriole
Scarlet tanager	Rose-breasted grosbeak
Purple finch	American goldfinch
c Dark-eyed junco	c White-throated sparrow
Song sparrow	

c denotes common in hack-site area

* denotes interspecific interactions

Owl's Head, Glencliff, New Hampshire. Prepared by Suzanne Apellaniz and Barry Kiester.

1. Personnel at Site. Susanne Apellaniz, 24 Buckeye Road, Glen Cove, New York 11542. Barry Keister, R.D. #4, Box 140, Middleburg, Pa. 17842.

2. Description of Site. Owl's Head is a south facing 800 foot cliff on the shoulder of Blueberry Mountain. It is located a mile and a quarter from the village of Glencliff, New Hampshire. The cliff abuts the White Mountain National Forest in the southwestern portion of the forest. Vegetation directly below the cliff consists of Beech Birch Maple forest type. Beyond that there is a cow pasture and a hayfield with Oliverian Brook running through the center of the fields. The brook empties into Oliverian Pond which is slightly west of the cliff. The vegetation on the cliff consists of red pine, northern red oak, paper birch, American mountain ash and red spruce. Huckleberries, blueberries, and chokeberry comprise the majority of the understory.

The hack-box is on a wide grassy ledge approximately 700 feet above the valley floor. Small oak trees are on either side of the box. Eighty feet above the hack-box is a ledge that provides a direct view of the box. Another ledge 100 feet above and to the east of the hack-box offers an unobstructed view of the immediate area except to the west of the cliff. Visibility to the west is mostly obscured by trees and outcropping of the cliff.

3. History and Details of Young

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Ernie	M	816-67444/L	Yellow 45/R	12 July 31 days old
Karen	F	987-73373/R	Yellow 167/L	12 July 33 days old
Ruby	F	617-22613/L	Yellow 169/R	12 July 33 days old
Anna	F	987-73372/R	Yellow 166/L	12 July 34 days old
Curry	F	987-73400/R	Yellow 168/L	12 July 34 days old

4. Pre-release Details. None.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Ernie	M	20 July 1030	39 days	1 hr. 30 min.	27 hrs.
Karen	F	20 July 1030	41 days	4 hrs. 30 min.	22 hrs.
Ruby	F	20 July 1030	41 days	30 hrs.	1 min.
Anna	F	20 July 1030	42 days	57 hrs.	11 hrs. 30 min.
Curry	F	20 July 1030	42 days	---	---

By 1130 of release day all four falcons were perched on one of the poles that had been set up. At 1200 the tiercel appeared from the box and fledged within minutes. Until his return, Ernie stayed in the immediate area, flying by frequently. He appeared adept on the wing but wary of our presence, which kept him from landing at the box. Karen fledged three hours later, also staying in the local area. Curry walked out of our view, but we feel she fledged on the day of release. She was not observed at the box until noon the next day. Ruby made a short flight on 21 July, in the vicinity of the box. The next day she was ranging as far as the other three. Anna fledged the evening of 22 July. She returned early the next morning.

6. Hunting Behavior. The first intraspecific play was noticed in the two oldest birds, Curry and Anna, who were observed chasing each other 23 July. By 25 July four peregrines would interact together at the same time, and all the peregrines were engaging in intraspecific play.

The first time all five peregrines engaged in intraspecific play was 31 July. After this date the five interacted together on almost a day-to-day basis.

Anna was the first falcon observed interacting with a prey species as she scattered a small flock of blue jays (Cyanocitta cristata) on 25 July. An unidentified peregrine falcon was observed chasing swallows (Hirundinidae Family) on 28 July. Swallows commonly flew over the far eastern side of the cliff and were often chased after this date. On 31 July Karen flew from the hack-box and scattered a small flock of blue jays which were flying just above the forest canopy at the base of the cliff. An unidentified peregrine falcon chased a few cedar waxwings (Bombycilla cedrorum) on 8 August. None of the pursuits of prey species seemed prolonged or serious. The only kills noted were the frequent capturing of insects of the Order Odonata after their first week on the wing.

In interactions with non-prey species the falcons seemed to advance from a state of fear to one of assuredness. Initially, if a large bird appeared the peregrines would react by giving an alarm call and seeking the security of the cliff. However, on 30 July two peregrines were observed to make short stoops on a red-tailed hawk (Buteo jamaicensis). Thereafter, any bird flying in the vicinity was a fair candidate for harassment.

7. Roosting Behavior. Being a cliff site, exact determination of roosts was difficult. Activity in the first three weeks on the wing, especially around dusk, centered around the area at the eastern end of the cliff at heights above the hack-box. It is felt that the birds roosted in this area. After this time, destinations seemed more scattered and it is unknown exactly where they did roost. We feel that up until the fifth week on the wing the birds were roosting somewhere on the cliff face.

The five birds regularly began leaving the box after their evening feeding and roosting on the cliff by day two after release, 22 July.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Ernie	M	25 August	25 August	75 days	36 days
Karen	F	20 August	20 August	72 days	31 days
Ruby	F	19 August	19 August	71 days	30 days
Anna	F	20 August	21 August	74 days	32 days
Curry	F	23 August	23 August	76 days	34 days

Ruby and Karen dispersed prior to the alternate-day feedings which began on 21 August. The last day all five peregrines were observed at the hack-box was 19 August.

On 23 August two competent birders saw three peregrine falcons unsuccessfully chase a small flock of common mergansers (Mergus merganser) in the vicinity of Oliverian Pond. In the same week there were two separate unconfirmed reports of peregrine falcons chasing passerines in Warren and Glencliff. This would seem to suggest that the peregrine falcons were still in the vicinity although not returning to the hack-box.

9. General Evaluation of the Falcons. The two oldest falcons, Anna and Curry, were the tamest. Both would go almost immediately to the food during pre-release feedings, whereas the other three would be upset for a longer period of time. On several occasions early in the post-release period both Anna and Curry would land as close as fifteen feet from an attendant, and neither would flush easily. They seemed unwary of our presence, but neither exhibited any foodbegging behavior toward us. However, their tameness quickly diminished with time.

Ruby was an unusually large, vocal falcon. She was constantly watching us and seemed wary of our presence.

Karen was somewhat aggressive. She often stole chickens that other peregrines were eating.

Ernie was the most submissive peregrine. The females always stole his food and he rarely put up a fight. Like Ruby he was constantly vocalizing because he was wary of our presence. Also, Ernie tended to shy away from interacting in the air with more than one falcon at a time. Curry was trapped and released at a raptor banding station at Cape May, N.J. on 26 September 1984.

On the whole all five falcons acted as a group up until dispersal. New activities and adventures were done by all; they would feed and leave to roost together, and spend time in the same general vicinities.

10. Unusual Incidents. The hacking process went smoothly and without incident.

11. General Evaluation of the Site. The nine years of use at Owl's Head have proven this site to be a good one. No adult peregrine falcons have been returning and causing problems. The hack-box is located on a ledge that is inaccessible to most predators. Also, the ledges on the cliff provide an encompassing view of the surrounding area.

We suggest that a first-aid kit be supplied at this hack-site. Also, it would be helpful to have walkie-talkies so that messages could be communicated to the attendants on the cliff from people down below.

12. Equipment. Five water jugs, one spotting scope, tripod and Coleman stove were returned to The Peregrine Fund. One 30-gallon plastic garbage can and one 10x10 tarp was left at the site. There are two new hack-boxes at the site. The barred front is in poor condition and should be replaced. One of the PVC tubes for the food chute is bent and may need to be replaced.

13. Acknowledgements. We would like to thank John Lanier, Jack Barclay, Dave and Carol of the Forest Service along with the YCC people for helping set up the new hack-box and site; Marty Gilroy for setting up the food chute and making the cliff site safer; Gloria and Lester Hotz of Manchester, Mass. for their hospitality, friendship, and knowledge of birds. Many thanks to Bill House and Andra Avens for their company, assistance, and feasts. Much appreciation and special thanks to Tom Sears for his hospitality, generosity, and interest.

Bird List

Spotted sandpiper	*Cedar waxwing
*Common merganser	Myrtle warbler
Belted kingfisher	Blackburnian warbler
*Great blue heron	Black-throated blue warbler
Herring gull	Downy woodpecker
Barn swallow	Hairy woodpecker
Chimney swift	Yellow-shafted flicker
Yellow-billed cuckoo	Ruby-throated hummingbird
Mourning dove	Ruffed grouse
Rock dove	*Blue jay
Hermit thrush	Common crow
Robin	*Common raven
Scarlet tanager	*Turkey vulture
Starling	American kestrel
Red-winged blackbird	Northern harrier
Catbird	Goshawk
Northern junco	Broad-winged hawk
Eastern kingbird	*Red-tailed hawk
Black-capped chickadee	Red-shouldered hawk
	Barred owl

*denotes interspecific interaction

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Red-winged blackbird	Northern harrier
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*denotes interspecific interaction

Square Mountain, New Hampshire. Prepared by Michele Barclay and Joan Hagar.

1. Personnel at Site. Michele Barclay, 155 Brown Road, Groton, New York 13073. Joan Hagar, 812 Jenifer Street, Madison, Wisconsin 53073

2. Description of Site. Square Mountain, elevation 2700', is located northwest of Berlin and southwest of W. Milan. The site faces almost due south overlooking the Fifield Brook area, with a view to the south of the Presidential Range, to the west - Vermont's Seneca Mountains, and to the east - Maine's Mahoosuc Mountains. The hack-box was placed on a large granite ledge approximately 500' above the valley floor.

The habitat on the summit is predominately red spruce, balsam fir, and paper birch, with an understory of blueberry species. Below the cliff is dense forest consisting of birch and maple. Several clearcut areas can be seen from the cliff.

This was the fourth year of operation of the site.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Stalbrd	M	816-67454/R	Yellow 59/L	25 June 33 days old
Jericho	M	816-67459/L	Yellow 64/R	25 June 33 days old
Caleb	M	816-67460/R	Yellow 65/L	25 June 34 days old
Tug	M	816-67461/R	Yellow 129/L	25 June 35 days old
Willard	M	816-67462/R	Yellow 130/L	25 June 37 days old
Waumbek	F	987-73384/R	Yellow 128/L	25 June 32 days old
Cabot	F	987-73385/L	Yellow 136/R	25 June 35 days old
Pliny	F	987-73386/L	Yellow 137/R	25 June 36 days old
Tinker	F	987-73387/L	Yellow 138/R	25 June 36 days old
Jodrie	F	987-73388/L	Yellow 139/R	25 June 36 days old

4. Pre-release Details. On 25 June, during set-up, an adult tiercel (hereafter Ammonoosuc) was seen flying around the cliff. He was seen also the following times prior to release: 28 June, 1400, flying around the cliff and food-begging; 28 June, 1845, food-begging near cliff; 30 June, 1815, food-begging and flying near cliff. There was never any response from the young in the box at the appearance of the adult. It should also be noted that an adult peregrine was seen on a few occasions (a couple weeks prior to set-up) hunting at a local cliff swallow (*Hirundo pyrrhonota*) bank.

On 2 July Marty Gilroy set up a trapping station consisting of a bow-net, two dho-gazzas, two tethered pigeons. The adult was not seen that day.

On 3 July we put telemetry on Pliny and Cabot and placed them in a sky-kennel for release at 1230 in hope this would drawing the adult so we could determine his intentions towards the young. Pliny had removed the transmitter prior to coming out of the kennel and first fledged at 1250. Cabot did not fledge until 4 July (she was later trapped on 16 July for removal of the radio). No sign of the adult this day.

5. Release Details.					
Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Stalbrd	M	4 July 1600	42 days	w/in 24 hrs.*	w/in 48 hrs.*
Jericho	M	4 July 1600	42 days	w/in 24 hrs.*	w/in 48 hrs.*
Caleb	M	4 July 1600	43 days	immediately	w/in 48 hrs.*
Tug	M	4 July 1600	44 days	w/in 24 hrs.*	w/in 48 hrs.*
Willard	M	4 July 1600	46 days	w/in 24 hrs.*	w/in 72 hrs.*
Waumbek	F	4 July 1600	41 days	w/in 24 hrs.*	w/in 48 hrs.*
Cabot	F	3 July 1230	43 days	27.5 hrs.	w/in 48 hrs.*
Pliny	F	3 July 1230	44 days	20 min.	21.5 hrs.
Tinker	F	4 July 1600	45 days	w/in 24 hrs.*	w/in 72 hrs.*
Jodrie	F	4 July 1600	45 days	w/in 24 hrs.*	w/in 48 hrs.*

*Due to heavy rain and fog on 5 July we could not observe the birds.

By 6 July the birds were all flying well, crabbing together and exploring the cliff area.

At 1800 the adult, Ammonoosuc, arrived at the site with a "chup" and some cacking. He non-aggressively chased the young for a short time and generally appeared more agitated by our presence, swooping low and cacking. The young kept out of his way.

The pigeon/bow-net was once again readied, but the adult ignored it. By 7 July, Ammonoosuc was seen flying with and roosting in the vicinity of the box with the young, and was tolerant of the advances by the young. At 1945 he was seen carrying chicken around the cliff for several minutes as if to transfer before he disappeared around to the west.

6. Hunting Behavior. All the birds were catching and eating insects within the first week after release. Only one pursuit of prey was noted: On 20 July, Day 17, Stalbrd(Stalbird), with full-crop, half-heartedly chased a chimney swift (Chaetura pelagica) which playfully kept five feet in front of him until he gave up.

Ammonoosuc first transferred food to the young on 9 July, Day 6. This was an aerial transfer of chicken to Pliny. The following accounts were food transfers from Ammon. to young:

- 10 July - chicken to Tug on ledge
- 11 July - aerial transfer of chicken to Tug
- 19 July - aerial transfer of swallow species to Cabot and Jodrie
- 19 July - aerial transfer of dark-eyed junco (Junco hyemalis) to Cabot
- 20 July - aerial transfer of wild prey to Cabot
- 22 July - aerial transfer of wild prey to Cabot and later to an unidentified falcon
- 24 July - aerial transfer of wild prey to Pliny

We weren't certain where he went hunting, but he often came back with prey from the east or from around the west edge of the cliff.

Ammonoosuc was seen taking chickens from the ledge or box on several occasions but mainly during the first week of release. After that he caught and ate on his own and brought back portions of his kills to transfer to the young. After the first couple weeks he would transfer only to the falcons, food-begging and chupping as he did so.

He was seen eating at the box only once for about 15 minutes. Ammon. remained at the cliff until the birds dispersed and we left the site. He chupped and transferred food to Cabot daily during her last week at the site.

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He was seen eating at the box only once for about 15 minutes. Ammon. remained at the cliff until the birds dispersed and we left the site. He chupped and transferred food to Cabot daily during her last week at the site.

7. Roosting Behavior. For the first ten days to two weeks the birds were seen roosting regularly on the cliff during the day, along with Ammon. A favorite roost was the pair of snags to the west of the box and ledge. This was occupied more than any other spot during the initial period and became "the" spot to look for Ammon. After the first two weeks the birds mainly roosted and flew elsewhere, returning to the cliff face area for the couple hours around feeding time.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last seen	No. of Days After Release
Stlbrd	M	17 August+	17 August+	86 days	44 days
Jricho	M	5 August	5 August	74 days	32 days
Caleb	M	8 August	8 August	78 days	35 days
Tug	M	3 August	3 August	74 days	30 days
Wilrd	M	8 August	8 August	81 days	35 days
Wmbek	F	7 August	7 August	75 days	34 days
Cabot	F	14 August	14 August	85 days	42 days
Pliny	F	7 August	7 August	79 days	35 days
Tnker	F	7 August	7 August	79 days	34 days
Jodrie	F	7 August	7 August	79 days	34 days

*Stalbird - still free-loading when we closed down the site on 17 August. Several chickens were left at the box-site and a couple more were to be placed there again three days later.

Tinker was found dead with a broken wing on 19 August in Claremont, N.H. She had apparently hit a wire. Her carcass is in a freezer at the Fish and Wildlife Service.

9. General Evaluation of the Falcons.

Stalbird - As evident by his late dispersal, he enjoyed a good meal with the least amount of exertion. He never missed a meal until we went on every other day feeding (6 August, day 34) and he would often come in twice a day to eat, even later on in the hacking process. He was somewhat aggressive towards the ravens present at the cliff site, especially at feeding time.

Jericho - Not overly outstanding in ay special way. Was occassionally aggressive to the ravens (Corvus corax). He was the youngest tiercel to disperse.

Caleb - Most aggressive tiercel towards the ravens and would be seen on several occassions to leave the box while eating to chase them again and again.

Tug - Only tiercel we noted receiving food transfers from Ammon. More wary than the other birds and he was off on his own a lot. Not overly aggressive towards the ravens.

Willard - Remained at the box more than any other tiercel, eating and roosting, and was hard to flush from ledge area when we fed. Rarely cacked at us. Least aggressive towards ravens. Passive to the point where he allowed ravens to chase him from the box.

Waumbek - Nothing outstanding or notable. Youngest falcon to disperse.

Cabot - Most aggressive towards us; whether we were feeding or sitting at the lookout, she would always cack and swoop low. She was also the most aggressive towards the ravens. She was more assertive when Ammon. came in with food to transfer and she therefore got a majority of his prey. She frequented the box and cliff more than any other falcon and never missed a feeding until we went to every-other-day

rations. She was noted following Ammon. on flights out over the valley to the east on a couple occasions. Towards the end of the hacking period she was often seen chasing and food-begging to Ammon. who chucked and transferred prey to her.

Pliny - Generally an 'average' falcon, nothing notable.

Tinker - Most passive of the falcons. Didn't chase ravens or even cack at them. Wasn't bothered by our presence at feeding times. Wouldn't be interested in the frequent raven chases at all and while eating on box when one flew in would tend to ignore it.

Jodrie - Loner. Didn't spend much time at the box area other than eating and would often try to fly off with the tied-down food rather than eat it there. First bird to be absent from feeding for any length of time (Day 27-30).

Overall, the ten young got on well together; there was not much aggressiveness with food between them. After the first week, the tiercels no longer food-begged to Ammon. and he in turn would cack at them in flight (only one incidence noted where he swooped low over a tiercel). The females would generally take to the air immediately when Ammon. showed up chugging and food-begging. Ammon. would usually initiate these chases. The young did not appear to overly bother the adult, except when he invited it.

It should be mentioned that we had almost a dozen ravens at our site which remained at the cliff and frequented the ledge and box for the last three weeks of the hacking period. The ravens often flew with the peregrines, crabbing, chasing etc. The peregrines would either act playfully towards them or aggressively, depending on the moods. The ravens eventually got bold enough to hop atop the box and eat chicken guts, sometimes when the falcons were there also.

Ammonoosuc - He was banded on his right leg with a silver USFWS band. There was no color band on his left leg. We were unable to read his band number so his origin is unknown. He was a very adept flier and fascinating to watch. Supplemented food to the young from the start - at first chicken from the box but later mostly with wild prey. Most of his attention was towards the falcons in which he would do a lot of chugging and food-begging. He generally showed up at the site every day with the young. He remained in the area even after most of the young had dispersed and was still at the site when we closed down. He continued to feed Cabot (the last falcon to disperse) until she left, then did a lot of food-begging and chugging and swooping on Stalbird (the last bird at the site). He always seemed anxious to transfer food to the young. One day he came in with prey to transfer, found no one in the area, and ate it himself.

10. Unusual Incidents. Other than the return of the adult tiercel (see #4) there were no unusual incidents.

11. General Evaluation of the Site. This was a beautiful site to hack peregrines! We never had any problems with hikers or predators. The only problem we did encounter was porcupine damage on our car. We remedied this by placing chicken wire around the whole car (left at a parking site in plastic bags).

7. Roosting Behavior. For the first ten days to two weeks the birds were seen roosting regularly on the cliff during the day, along with Ammon. A favorite roost was the pair of snags to the west of the box and ledge. This was occupied more than any other spot during the initial period and became "the" spot to look for Ammon. After the first two weeks the birds mainly roosted and flew elsewhere, returning to the cliff face area for the couple hours around feeding time.

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Stalbird - As evident by his late dispersal, he enjoyed a good meal with the least amount of exertion. He never missed a meal until we went on every other day feeding (6 August, day 34) and he would often come in twice a day to eat, even later on in the hacking process. He was somewhat aggressive towards the ravens present at the cliff site, especially at feeding time.

Jericho - Not overly outstanding in any special way. Was occasionally aggressive to the ravens (Corvus corax). He was the youngest tiercel to disperse.

Caleb - Most aggressive tiercel towards the ravens and would be seen on several occasions to leave the box while eating to chase them again and again.

Tug - Only tiercel we noted receiving food transfers from Ammon. More wary than the other birds and he was off on his own a lot. Not overly aggressive towards the ravens.

Willard - Remained at the box more than any other tiercel, eating and roosting, and was hard to flush from ledge area when we fed. Rarely cacked at us. Least aggressive towards ravens. Passive to the point where he allowed ravens to chase him from the box.

Waumbek - Nothing outstanding or notable. Youngest falcon to disperse.

Cabot - Most aggressive towards us; whether we were feeding or sitting at the lookout, she would always cack and swoop low. She was also the most aggressive towards the ravens. She was more assertive when Ammon. came in with food to transfer and she therefore got a majority of his prey. She frequented the box and cliff more than any other falcon and never missed a feeding until we went to every-other-day

rations. She was noted following Ammon. on flights out over the valley to the east on a couple occasions. Towards the end of the hacking period she was often seen chasing and food-begging to Ammon. who chipped and transferred prey to her.

Pliny - Generally an 'average' falcon, nothing notable.

Tinker - Most passive of the falcons. Didn't chase ravens or even cack at them. Wasn't bothered by our presence at feeding times. Wouldn't be interested in the frequent raven chases at all and while eating on box when one flew in would tend to ignore it.

Jodrie - Loner. Didn't spend much time at the box area other than eating and would often try to fly off with the tied-down food rather than eat it there. First bird to be absent from feeding for any length of time (Day 27-30).

Overall, the ten young got on well together; there was not much aggressiveness with food between them. After the first week, the tiercels no longer food-begged to Ammon. and he in turn would cack at them in flight (only one incidence noted where he swooped low over a tiercel). The females would generally take to the air immediately when Ammon. showed up chipping and food-begging. Ammon. would usually initiate these chases. The young did not appear to overly bother the adult, except when he invited it.

It should be mentioned that we had almost a dozen ravens at our site which remained at the cliff and frequented the ledge and box for the last three weeks of the hacking period. The ravens often flew with the peregrines, crabbing, chasing etc. The peregrines would either act playfully towards them or aggressively, depending on the moods. The ravens eventually got bold enough to hop atop the box and eat chicken guts, sometimes when the falcons were there also.

Ammonoosuc - He was banded on his right leg with a silver USFWS band. There was no color band on his left leg. We were unable to read his band number so his origin is unknown. He was a very adept flier and fascinating to watch. Supplemented food to the young from the start -at first chicken from the box but later mostly with wild prey. Most of his attention was towards the falcons in which he would do a lot of chipping and food-begging. He generally showed up at the site every day with the young. He remained in the area even after most of the young had dispersed and was still at the site when we closed down. He continued to feed Cabot (the last falcon to disperse) until she left, then did a lot of food-begging and chipping and swooping on Stalbird (the last bird at the site). He always seemed anxious to transfer food to the young. One day he came in with prey to transfer, found no one in the area, and ate it himself.

10. Unusual Incidents. Other than the return of the adult tiercel (see #4) there were no unusual incidents.

11. General Evaluation of the Site. This was a beautiful site to hack peregrines! We never had any problems with hikers or predators. The only problem we did encounter was porcupine damage on our car. We remedied this by placing chicken wire around the whole car (left at a parking site in plastic bags).

The chicken was conveniently located in a nearby barn at the beginning of the logging road; hot showers were easy to come by at the Kilkenny Guard Station; cold ice cream was to be found at the local W. Milan store; and water was never a problem with the frequent monsoons and brook half-way down the trail. It is recommended that some intensive spring watching be undertaken to watch for the returning adult tiercel and/or peregrine pair.

12. Equipment. Left at the site was one wall tent, three tarps, assorted plastic pieces and misc. ropes, two trash cans, one 55 gallon drum, assorted camp-made chairs, benches, "home entertainment center", reflector oven, two coolers, shovel, hammer, assorted nails and screws for hack-box. Left with J. Lanier: four 5 gallon and one 3 gallon water jugs. Returned to The Peregrine Fund: scope (needs mounting piece repaired) and tripod.

13. Acknowledgements. For contributing to the well-being of the falcons and attendants, we would like to thank the following people: John Lanier for organizing the set-up and taking-down operations; the NH Audubon people and YCC for undertaking these operations; Rene Bollinger for coming up with trapping bait; Alan Hagar for freezer space in his barn and for ice; Heidi Brough for hot showers, cake, t.p., and dog-sitting; Marty for his wonderful camp creations and educational "Knots 101" course. Finally we would like to acknowledge the Tinker Nortons for their friendly interest and refreshing ice cream.

Bird List

Cooper's hawk	Yellow-bellied sapsucker
Red-tailed hawk*	Downy woodpecker
Red-shouldered hawk	Eastern kingbird
Broad-winged hawk	Eastern phoebe
Osprey	Barn swallow
Peregrine falcon	Cliff swallow**
American kestrel	Blue jay**
Ruffed grouse	Common raven*
Mourning dove	Common crow
Chimney swift*	Black-capped chickadee
Ruby-throated hummingbird	Red-breasted nuthatch
Common flicker	Brown creeper
Winter wren	American robin
Hermit thrush	Swainson's thrush
Veery	Golden-crowned kinglet
Cedar waxwing	Starling
Solitary vireo	Red-eyed vireo
Black-throated blue warbler	Yellow-rumped warbler
Black-throated green warbler	Blackburnian warbler
Purple finch	Nashville warbler
Dark-eyed junco**	Bobolink
White-throated sparrow	Common grackle
Rose-breasted grosbeak	Evening grosbeak

*denotes interspecific prey interaction

**denotes prey species (wing of a blue jay found at box)

Fletcher Bluff, Amherst, Maine. Prepared by Nancy L. Rollins and Charles P. Terry.

1. Personnel at Site. Nancy L. Rollins, R.F.D. 2, Box 153 Orrington, Maine 04474. Charles P. Terry, 530 Essex Street, Beverly, Massachusetts 01915.

2. Description of Site. Fletcher Bluff in the town of Amherst is a south facing cliff located approximately 20 miles east of the city of Bangor. The hack-box was placed facing southeast on a ledge about 350 feet above the forest canopy. Two beaver ponds occupy the valley formed by Fletcher Bluff and Chick Hill.

The valley is composed of mixed hardwoods including American beech (*Fagus grandifolia*), sugar maple (*Acer saccharinum*), quaking aspen (*Populus tremuloides*), and white birch (*Betula papyrifera*), with red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), and eastern hemlock (*Tsuga canadensis*) along the stream and beaver ponds. The vegetation along the cliff top is primarily red spruce, white pine (*Pinus strobus*) and quaking aspen. The dominant understory species is blueberry (*Vaccinium sp.*).

This is the first year Fletcher Bluff has been used as a peregrine falcon hacking site.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age	Placed in Box
30	M	816-67429/R	Yellow 30/L	30 May	29 days old
31	M	816-67430/L	Yellow 31/R	30 May	28 days old
32	M	816-67431/L	Yellow 32/R	30 May	27 days old
94	F	987-73350/R	Yellow 94/L	30 May	30 days old
95	F	987-73351/L	Yellow 95/R	30 May	28 days old
96	F	987-73352/R	Yellow 96/L	30 May	28 days old

4. Pre-release Details. The young falcons fed well and developed normally. There were no unusual incidents prior to release.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
30	M	12 June 1310	42 days	21 min.	1 day 2 hrs.
31	M	12 June 1310	41 days	21 hours	7 hrs.
32	M	12 June 1310	40 days	21 hours	7 hrs.
94	F	12 June 1310	43 days	1 day 19 hrs.	17 hrs.
95	F	12 June 1310	41 days	5 hours	12 hrs.
96	F	12 June 1310	41 days	12 hours	2 hrs.

The three tiercels were the first to emerge from the box upon release. Number 30 fledged 21 minutes after the box was opened. He returned to the site the next day around noon. The remaining falcons practiced flying by facing into the 25-30 mph wind with spread wings. Number 94 did not leave the hack-box on the day of release.

6. Hunting Behavior. The first pursuit of prey was performed on 17 June (day 5) by #20 (age 48 days) who made an unsuccessful upwind stoop on a tree swallow (*Iridoprocne bicolor*). On 19 July (day 37) #32 was observed diving from a perch pole in pursuit of a blue jay (*Cyanocitta cristata*). No kills were witnessed. We were unable to discover where the falcons hunted when they ranged from the cliff site, although they were often seen returning to the site from the west.

The chicken was conveniently located in a nearby barn at the beginning of the logging road; hot showers were easy to come by at the Kilkenny Guard Station; cold ice cream was to be found at the local W. Milan store; and water was never a problem with the frequent monsoons and brook half-way down the trail. It is recommended that some intensive spring watching be undertaken to watch for the returning adult tiercel and/or peregrine pair.

12. Equipment. Left at the site was one wall tent, three tarps, assorted plastic pieces and misc. ropes, two trash cans, one 55 gallon drum, assorted camp-made chairs, benches, "home entertainment center", reflector oven, two coolers, shovel, hammer, assorted nails and screws for hack-box. Left with J. Lanier: four 5 gallon and one 3 gallon water jugs. Returned to The Peregrine Fund: scope (needs mounting piece repaired) and tripod.

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Chimney swift*	Black-capped chickadee
Ruby-throated hummingbird	Red-breasted nuthatch
Common flicker	Brown creeper
Winter wren	American robin
Hermit thrush	Swainson's thrush
Veery	Golden-crowned kinglet
Cedar waxwing	Starling
Solitary vireo	Red-eyed vireo
Black-throated blue warbler	Yellow-rumped warbler
Black-throated green warbler	Blackburnian warbler
Purple finch	Nashville warbler
Dark-eyed junco**	Bobolink
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The valley is composed of mixed hardwoods including American beech (*Fagus grandifolia*), sugar maple (*Acer saccharinum*), quaking aspen (*Populus tremuloides*), and white birch (*Betula papyrifera*), with red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), and eastern hemlock (*Tsuga canadensis*) along the stream and beaver ponds. The vegetation along the cliff top is primarily red spruce, white pine (*Pinus strobus*) and quaking aspen. The dominant understory species is blueberry (*Vaccinium sp.*).

This is the first year Fletcher Bluff has been used as a peregrine falcon hacking site.

3. History and Details of Young.

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32	M	816-67431/L	Yellow 32/R	30 May 27 days old
94	F	987-73350/R	Yellow 94/L	30 May 30 days old
95	F	987-73351/L	Yellow 95/R	30 May 28 days old
96	F	987-73352/R	Yellow 96/L	30 May 28 days old

4. Pre-release Details. The young falcons fed well and developed normally. There were no unusual incidents prior to release.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
30	M	12 June 1310	42 days	21 min.	1 day 2 hrs.
31	M	12 June 1310	41 days	21 hours	7 hrs.
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The three tiercels were the first to emerge from the box upon release. Number 30 fledged 21 minutes after the box was opened. He returned to the site the next day around noon. The remaining falcons practiced flying by facing into the 25-30 mph wind with spread wings. Number 94 did not leave the hack-box on the day of release.

6. Hunting Behavior. The first pursuit of prey was performed on 17 June (day 5) by #20 (age 48 days) who made an unsuccessful upwind stoop on a tree swallow (*Iridoprocne bicolor*). On 19 July (day 37) #32 was observed diving from a perch pole in pursuit of a blue jay (*Cyanocitta cristata*). No kills were witnessed. We were unable to discover where the falcons hunted when they ranged from the cliff site, although they were often seen returning to the site from the west.

7. Roosting Behavior. Generally the falcons roosted just out of our sight to the west of the hack-box. They were sometimes seen roosting in pairs or small groups. The birds frequently occupied bushy crevices along the cliff face. All the falcons seemed to favor two snags approximately 80 feet east of the hack-box.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
30	M	26 July	26 July	86 days	44 days
31	M	27 July	29 July	88 days	47 days
32	M	2 August	2 August	91 days	51 days
94	F	4 August	4 August	96 days	53 days
95	F	27 July	28 July	87 days	46 days
96	F	16 July	16 July	75 days	34 days

9. General Evaluation of Falcon. Number 30 developed into an agile flier. He was a dark bird and was often recognized chasing ospreys (*Pandion haliaetus*) out of the valley. Number 30 was a quiet, subordinate while feeding, frequently allowing other falcons to steal his chicken.

Number 31 was a very vocal blond peregrine. He was the most aggressive tiercel while feeding.

The smallest tiercel was #32. He was easily recognized by his high-pitched voice. He was also aggressive toward the passing ospreys and hawks.

Number 94 was the oldest peregrine. She was the last to fledge and the last to disperse. Although she was an excellent flier and often aggressive during flight, she was subordinate while feeding. She frequently flew off with her chicken to eat in a more secluded spot.

Number 95 was aggressive during feeding and renowned for stealing chickens from the other birds. Because of her large size she often appeared awkward when playing with the other birds.

The largest falcon was #96. She was the most aggressive bird while feeding and was the first to disperse.

10. Unusual Incidents. On 30 June ten turkey vultures (*Cathartes aura*) were observed circling the cliff site. Turkey vultures are rarely seen in large numbers in Maine.

11. General Evaluation of Site. Fletcher Bluff appears to be a good location for hacking peregrine falcons. The site is easily accessible and we had no problems with predators or uninvited people.

I would suggest that, in the future, different color number bands be used to aid in early identification.

12. Equipment. Returned to the Maine Department of Inland Fisheries and Wildlife; 9x12 tent, spotting scope and tripod, two 5 gallon water jugs, one 2 burner Coleman stove, first-aid kit, Honda CT 90 trail bike and gas can, axe, hammer, two flashlights, rain tarp, camp shovel and spade, two lawn chairs, and a Havahart trap.

13. Acknowledgements. The Peregrine Fund provided the falcon chicks, the technical expertise and the organizational impetus resulting in the success of this effort. Marty Gilroy of The Peregrine Fund is particularly thanked for supervising the release. We thank Tim Bowman for his efforts in all stages of the program. We also thank Mike Hudson, Dr. Ray Owen, Sue Woodward, Kurt Eilo, Sandy Lovett, Chris Swanson, and Scott Kenniston for their participation. Lee Sirabells is thanked for allowing us to leave equipment at his camp and for his overall interest.

The Webber Timberlands and Prentiss and Carlisle companies are deeply thanked for allowing the use of their land on Fletcher Bluff. John Knight, pilot with the Maine Forest Service, is acknowledged for his valuable role in accomplishing the helicopter supply drop.

The Fletcher Bluff hack-site was operated by the Nongame Project, Maine Department of Inland Fisheries and Wildlife and funded through Section 6, Endangered Species Act, U.S.F.W.S.

Bird List

Ruffed grouse	White-breasted nuthatch
Barred owl	Chimney swift
Common crow	Eastern pewee
Common raven	Black-caped chickadee
Great black-backed gull	Song sparrow
Herring gull	Turkey vulture
Black and white warbler	Osprey
Black-throated blue warbler	American redstart
Black-throated green warbler	Yellow-rumped warbler
Blue jay	Slate-colored junco
Red-shouldered hawk	Downy woodpecker
Broad-winged hawk	Northern harrier
Eastern phoebe	Ruby-throated hummingbird
Ovenbird	Great-crested flycatcher
Common flicker	Winter wren
Hermit thrush	Scarlet tanager
Pileated woodpecker	Purple finch
Belted kingfisher	Olive-sided flycatcher
Great blue heron	Chestnut-sided warbler
Night hawk	Sharp-shinned hawk
Red-eyed vireo	Black duck
White-throated sparrow	Tree swallow
American kestrel	Hairy woodpecker
Red-tailed hawk	Robin
Cedar waxwing	Rough-legged hawk
Swainson's thrush	Veery
Rose-breasted grosbeak	Goshawk
Common yellow-throat	

Mammal List

White-tailed deer	Raccoon
Moose	Coyote
Black bear	Beaver
Snowshoe hare	Bobcat
Deer mouse	Fisher
Porcupine	Short-tailed shrew
Red squirrel	

Horse Mountain, Maine. Prepared by Jeffrey Owen and James P. Favreau.

1. Personnel at Site. Jeffrey C. Owen, 26 Noyes Drive, Orono, Maine 04473. James P. Favreau, Three Elm Trailer Park, Lot 9, Topsham, Maine 04086.

2. Description of Site. Horse Mountain, elevation 1460 feet, is located in township T6R8 WELS and is within Baxter State Park. It lies south of the Mattagamon Gate to Baxter Park. The cliff site is located on the east side of the mountain. The hack-box was positioned on a cliff shelf approximately 75 feet below the peak and 800 feet above the valley floor. The box faced southeast, overlooking Mattagamon Lake.

At the base of the cliff and continuing up the mountain to the south of the hack-site is a forest of mixed hardwoods, comprised mainly of American beech (*Fagus grandifolia*), sugar maple (*Acer saccharinum*), red maple (*Acer rubrum*), yellow birch (*Betula lutea*), and white birch (*Betula papyrifera*). The understory is mainly young beech and striped maple (*Acer pensylvanicum*). The vegetative cover of the cliff top is stunted red spruce (*Picea rubens*) and white birch, with a dominant ground cover of low-bush blueberry (*Vaccinium angustifolium*) and sheep laurel (*Kalmia augustifolia*). Just to the south of the box are a few wind-blown, yet healthy, northern red oaks (*Quercus rubra*).

This is the first attempt at hacking peregrine falcons at this site.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Slim	M	816-67432/R	Yellow 33/L	8 June 35 days old
Lance	M	816-67433/L	Yellow 34/R	8 June 34 days old
Head.	M	816-67434/R	Yellow 35/L	8 June 35 days old
BabyB1.	M	816-67435/L	Yellow 36/R	8 June 33 days old
Screech	F	987-73353/R	Yellow 97/L	8 June 35 days old
Gen Jen	F	987-73354/L	Yellow 98/R	8 June 35 days old

4. Pre-release Details. On 8 June, Marty Gilroy, Randy Spencer, and Chuck Terry lugged the cage housing the six peregrine falcons up the 800 foot climb to the hack-site on Horse Mountain. Marty placed the four tiercels and two falcons into the hack-box while the attendants manned the doors to the cage and box. For the first day we fed the peregrines chopped-up quail and thereafter we fed them one chicken per falcon per day. No unusual incidents occurred during the pre-release period.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Slim	M	15 June 1530	42 days	5 hours	10 hrs. 15 min.
Lance.	M	15 June 1530	41 days	2 hours	13 hrs. 50 min.
Head.	M	15 June 1530	42 days	15 hrs. 50 min.	1 hr. 40 min.
BabyB1.	M	15 June 1530	40 days	18 hours	35 minutes
Screech.	F	15 June 1530	42 days	1 day 2 hrs.	20 minutes
Gen Jen	F	15 June 1530	42 days	20 hrs. 45 min.	3 hrs. 45 min.

6. Hunting Behavior. Barn swallows (*Hirundo rustica*), tree swallows (*Iridoprocne bicolor*), and cliff swallows (*Petrochelidon pyrrhonota*) were frequent visitors to the hack-site and they quickly became the targets of the falcons' first pursuits of possible prey. On Day 4 we observed both Slim and BabyB1. (Baby Blue) chasing and diving at swallows. On Day 5 Lance (Lancelot), age 45 days chased a swallow, and Head. (Headhunter), age 46 days followed a common merganser (*Mergus*

merganser) until the duck out-distanced him with a burst of speed.

The development of hunting behavior progressed smoothly and rapidly for the six peregrines. On day 3 of release Slim, age 44 days, Lancelot, age 43 days, and Headhunter, age 44 days tail-chased one another throughout the day in a very strong southerly wind. Jenny, age 44 days, soon joined in, flying with Slim for a few chases. The following day Screecher and Baby Blue joined in the fun and all the birds put on quite a show. Also on day 4 we observed Lancelot flying with a stick in his talons and Headhunter flew away from the box with a chicken grasped firmly beneath him.

On 20 June at 0900 an osprey (Pandion haliaetus) flew very near the hack-box and Lancelot left his perch and dove at the fish-hawk to drive him away. At 1130 the osprey returned and GenJen swooped at the bird. Day 6 was also the day that we watched Baby Blue and Headhunter make genuine, high altitude stoops at breath-taking speeds directly back to the box. That same day we observed the peregrines rearing back in flight, extending their legs, and closing their talons on what we suspected were insects. On Day 9 the peregrines were positively seen catching June beetles, dragonflies, and moths.

On Day 10 two of the birds joined talons and fell for a short distance before loosening their grasp. By day 14 the six peregrines were very impressive flyers, making quick short stoops at each other, flying low through the trees at the top of the cliff, and catching many insects and eating them while soaring on the wind. We also observed them grabbing the top-most leaves of the red oaks growing on the cliff and, once in a while, hanging upside down until the leaf broke free.

The only "prey" we saw the falcons eating were insects. We did not see any bird species captured during the hacking period.

7. Roosting Behavior. From Day 1 to Day 3 of release the six peregrines roosted along a narrow ledge about ten feet to the right of the hack-box. After Day 3 the tiercels tended to roost away from the box. During the evening of Day 3 Screecher roosted in a small depression directly in front of the hack-box and Jenny settled down alongside the front, right-hand corner of the box. After Day 5 the two females also roosted along the cliff away from the hack-box. Further observations of roosting behavior were difficult due to the sheerness of the cliff; however, a few times we observed a peregrine feeding and resting upon either of a pair of lower ledges about 200 yards north of and 100 feet below the hack-box.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Slim	M	17 July	17 July	74 days	32 days
Lance	M	16 July	17 July	73 days	32 days
Head.	M	23 July	24 July	81 days	39 days
BabyB1	M	20 July	20 July	75 days	35 days
Screch	F	24 July	24 July	81 days	39 days
GenJen	F	16 July	16 July	73 days	31 days

The last day that we saw all the birds at the site was 16 July, Day 32. Starting on Day 35 we tied down the chickens so we would be able to positively identify which peregrines were returning for food. We saw our last peregrines on 24 July, Day 40 and the site was officially closed on 28 July.

9. General Evaluation of Falcons. The peregrines all ate well during the post-fledging period and soon developed into strong fliers. Many times we observed five or six falcons flying at once, chasing and crabbing at each other and learning to master the wind.

Slim was the most restless while in the hack-box, head-bobbing and wing-flexing three days before release. He was a very proficient flier soon after fledging and was one of the first peregrines to tail-chase. Often we saw him fly over perched peregrines as if trying to entice others to fly with him.

Lancelot was the first to fledge and was a very skillful flier. On Day 6, age 46 days, he left his perch in a stoop on an osprey. He often flew through the oak trees on the ledge and would sometimes grab at the leaves, once hanging upside down trying to free a leaf from the top of one of the trees. This tiercel seemed the most tame of the six peregrines, flying close to the attendants and seemingly food-begging when he was hungry.

Headhunter tended to be the loner of the group. On Day 4 he was the first falcon to fly with a chicken and usually flew with his food thereafter. On Day 5 he chased a common merganser and on Day 28, age 69 days, he flew from his perch and stooped at a northern raven (Corvus corax).

Baby Blue was the youngest peregrine but developed quickly. He was one of the first birds to perform a high speed stoop and to chase a swallow at age 43 days. On Day 15 we observed Blue chasing a raven away from the box.

Generic Jenny was the first peregrine to disperse. She often left the site for a couple of days at a time, but always returned to the box to feed. She was as adept a flier as the tiercels and quickly tail-chased with them after fledging. On Day 27 at the age of 68 days Jenny flew out over the lake and sustained a chase of a broad-winged hawk (Buteo platypterus) until the hawk took cover in the woods.

Screecher was the slowest to develop, the last to fledge, and the last to disperse. She had a small patch of down on her head until age 47 days, which made her easy to distinguish from the other peregrines. She was sometimes aggressive towards the other falcons, pecking at them when they were near or stealing a chicken which another peregrine was already eating. We observed Screecher chasing a raven on Day 20 at the ripe old age of 70 days.

We observed unidentified peregrines stooping at a great blue heron (Ardea herodias), a northern harrier (Circus cyaneus), and numerous times at the five northern ravens which lived in the area. All the peregrines seemed protective of their "territory" on the cliff.

10. Unusual Incidents. Nothing unusual occurred at the Horse Mountain hack-site.

11. General Evaluation of the Site. The Horse Mountain hack-site is an excellent area for newly fledged peregrine falcons and we highly recommend that it be used for the next two years. The cliff has a prevailing southerly wind which this year's peregrines truly enjoyed and flew about in, sometimes six at a time. There were no problems with

predators or uninvited visitors. The only suggestion that we have is that a radio be supplied to the attendants so that contact could be made with the Mattagamon Gate House in the event of an emergency.

12. Equipment. Left at the site was: one dismantled hack-box with hardware, five 12 foot sections of PVC pipe, one homemade table, plywood flooring for the tent, and one trash can containing a wrench, hammer, axe, bowsaw, shovel, first-aid kit, plastic tarp, and the lock and key for the hack-box door.

Left in the care of Alan Hutchinson was: one spotting scope and tripod, one 9x12 tent with tarp, two coolers, four 5 gallon water jugs, one Coleman stove and lantern, one plastic backpack, two folding chairs, and numerous ice buckets.

13. Acknowledgements. First of all we would like to thank Al Hutchinson and the Maine Department of Inland Fisheries and Wildlife for giving us the opportunity to work with the peregrines. The Peregrine Fund is to be thanked for providing the falcon chicks, the technical expertise and the organizational impetus that resulted in the success of this effort. Thanks go to Don and Diana Dudley for their help with the mail and our grocery shopping. We would also like to thank Mr. and Mrs. Arthur Pratt and John Watson of Baxter State Park for their hospitality and support. Others from Baxter Park who contributed to the success of this project were Chris Drew, Gerald Merry, Buz Caverly, and Whit McEvoy of the Baxter Park Advisory Committee. Appreciation goes out to Mr. and Mrs. Scot Skinner for allowing us to store equipment at Scotty's Flying Service. We'd like to thank Marty Gilroy of The Peregrine Fund for delivering and releasing the peregrines. A special thanks goes to Tim Bowman for keeping the project organized and getting it off to a great start.

The Baxter Park Authority is thanked for the use of Horse Mountain as a release site. Lt. K Rigoulot and the crew of Brunswick NAS' search and rescue helicopter played an invaluable role by landing supplies at the hack-site. The many others who deserve acknowledgement for their efforts include Dr. Ray Owen, Mike Hudson, Kurt Eilo, Bernie Bernatowicz, and Betsy Scott.

The Horse Mountain hack-site was operated by the Nongame Project, Maine Department of Inland Fisheries and Wildlife and funded through Section 6, Endangered Species Act, USFWS.

Bird List

Common loon
Canada goose
American black duck
Common goldeneye
Common merganser
Herring gull
Common tern
Great blue heron
Spotted sandpiper
Ruffed grouse
Northern harrier
Broad-winged hawk
Osprey
American kestrel
Common nighthawk
Ruby-throated hummingbird
Pileated woodpecker
Common flicker
Yellow-bellied sapsucker
Hairy woodpecker
Eastern kingbird
Great-crested flycatcher
Eastern pewee
Least flycatcher
Olive-sided flycatcher
Cliff swallow
Barn swallow
Chimney swift
Northern raven
Gray jay
Winter wren
Swainson's thrush

Hermit thrush
Veery
Wood thrush
Cedar waxwing
Red-eyed vireo
Black-throated green warbler
Black-and-white warbler
Blackpoll warbler
Black-throated blue warbler
Magnolia warbler
Yellow-rumped warbler
Blackburnian warbler
American redstart
Nashville warbler
Common yellow-throat
Ovenbird
Red-winged blackbird
Brown-headed cowbird
Common grackle
Scarlet tanager
Northern junco
Purple finch
Evening grosbeak
Pine siskin
Rose-breasted grosbeak
White-throated sparrow
Tree swallow
American crow
Blue jay
Black-capped chickadee
American robin

Jordan Cliffs, Mount Desert Island, Acadia National Park, Maine.
Prepared by Peter Duley and Dave North.

1. Personnel at Site. Peter Duley, 7825 East Peckins Road, Lyons, Michigan 48851. Dave North, College of the Atlantic, Bar Harbor, Maine 04609.

2. Description of Site. Jordan Cliffs are located beneath the summit of Penobscot Mountain and above Jordan Pond. They have a vertical relief of approximately 550-600 feet. The cliffs face east and rise high above the canopy of largely yellow and paper birch (B. alleghaniensis, and Betula papyrifera), red spruce (Picea rubens), and striped maple (A. pennsylvanicum). Jack Barclay theorized that the elevation of this site would be sufficient to minimize the potential hazard of predation by great horned owls (Bubo virginianus), as great horned owls rarely forage above the canopy.

The understory at the summit of the cliffs consists largely of blueberries (Vaccinium augustifolium), sheep laurel (Kalmia augustifolia), mountain cranberry (Vaccinium vitis-idaea), and three-toothed cinquefoil (Potentilla tridentata). There is a small ravine between the summit of Penobscot and Jordan Cliffs where the hack-site attendants' camp was located. The vegetation in this area is a broken forest of birch, spruce, and striped maple.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age	Placed in Box
Homer	M	816-67427/R	Yellow 28/L	29 May	35 days old
Cirrus	M	816-67428/L	Yellow 29/R	29 May	35 days old
Althea	F	987-73345/R	Yellow 68/L	29 May	33 days old
Maggie	F	987-73346/L	Yellow 90/R	29 May	34 days old
Betty	F	987-73347/R	Yellow 91/L	29 May	30 days old
Jan	F	987-73348/L	Yellow 92/R	29 May	33 days old
Gapper	F	987-73349/R	Yellow 93/L	29 May	31 days old

4. Pre-release Details. This is the first year Jordan Cliffs has been used as a hacking location. On 21 May Marty Gilroy arrived to help us with the placement of the hack-box. A Coast Guard Helicopter delivered the hack-box and materials necessary to establish the camp.

Seven young eyases, two tiercels, and five females arrived with Jack Barclay and were placed in the Jordan Cliffs hack-box on 29 May, at approximately 1400 hours, the tiercels being more advanced than the females. The weather was very severe, overcast and raining heavily with gusts of wind from 50-60 mph. All of the peregrines appeared healthy, however, Jack Barclay told us to keep track of one of the females who did not seem as active as the others.

Feeding and development within the box progressed without incident, with all of the peregrines receiving some portion of the food. Activity during pre-release was limited to feeding, sleeping, wing-flapping, preening, and some social interactions.

5. Release Details. July 7, 1984. Approximate time: 1100 hours. Although release was a day later than scheduled, no eyases showed a strong restlessness to fledge. Upon release, several eyases took turns flapping at the opening of the box. Within forty-five minutes Homer, a tiercel, flew and went out of sight around the summit. Observers saw Homer flying around the summit a little later. The other eyases eventually jumped out onto the ledge but did not fly on the release date. On June 8, two unidentified eyases took short solo flights then landed on adjacent ledges and made hop-flights back to the

hack-site. Homer returned to feed in the late afternoon of that day. The exact time and frequency of flights and feeding for individual eyases could not always be made. This was due to dirty number bands and insufficient magnification of the scopes.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return to Box
Homer	M	7 June 1100	44 days	45 min.	1 day 15 hrs.
Cirrus	M	7 June 1100	44 days	1 day ? hrs.	Approx. 3 hrs.
Althea	F	7 June 1100	42 days	2 days ? hrs.	Approx. 3 hrs.
Maggie	F	7 June 1100	43 days	1 day ? hrs.	Approx. 3 hrs.
Betty	F	7 June 1100	39 days	2 days ? hrs.	Approx. 3 hrs.
Jan	F	7 June 1100	42 days	2 days ? hrs.	Approx. 3 hrs.
Gapper	F	7 June 1100	40 days	2 days ? hrs.	Approx. 3 hrs.

6. Hunting Behavior. The peregrines' interest in passing birds began quickly. On June 8, one unidentified peregrine swooped after a herring gull then returned immediately to the hack vicinity. June 10, in early evening, a peregrine tail-chased a raven. Shortly after that, a peregrine was seen casually following three embroiled mourning doves. Interactions with herring and black-backed gulls, ravens, and crows were the most numerous, becoming fairly frequent in July. There were several interactions with other birds of prey. On June 10, late morning, a peregrine flew and circled briefly with a red-tailed hawk. This behavior continued occasionally with red-tailed hawks, broad-wing hawks, and red-shouldered hawk. There were also a few peregrine/osprey interactions in which the peregrine flew aggressively after the osprey. And on July 25, an immature peregrine was reported to have engaged in similar behavior with a bald eagle approximately ten miles from the hack-site.

Actual attempts at prey capture began with insects which they caught and ate frequently. On June 15, Jan, 50 days old, flew off a ledge in pursuit of some tree swallows making the first observed attempt at possible prey capture. On June 23, an eyas was observed flying low over trees and then swooping after several small birds there. No prey kills were observed, however, attempts at prey capture increased with age and experience. All in all, thirteen attempts at prey capture were observed. The identified possible prey included juncos, swallows, mourning doves, and one cormorant. The regularity of attempted prey capture, as well as mock aerial battles, and interactions with other large birds leads us to believe that the peregrines developed a sound flying and hunting ability.

7. Roosting Behavior. Six perch poles were placed both on the hacking ledge and on adjacent ledges where attendants had good vantage points from which to observe the birds. The peregrines began making use of the perches around the hack-box after about the first week of release, 14 June. Previous to this, the birds spent time perched on the rocks placed around the ledge, where extensive wing exercising, short perch flights, and preening took place.

Once flight had developed, the birds often returned to a ledge directly below the hack-box to roost. Betty and Gapper, the two youngest birds, were often seen interacting together in this area. After a few exploratory flights had been made by all the birds, approximately 18 June, they began to roost most often on the southern, more remote portion of the cliffs. Their ages in days at this time were respectively, 55,55,53,54,56,53 and 51 days old. This area provided good hunting vantage points. The birds were also seen bathing in small seeps and drainages in this area. The cliffs on North Bubble Mountain to the northeast of Jordan Cliffs were also occasionally used.

8. Dispersal.

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Homer	M	26 July	26 July	93 days	49 days
Cirrus	M	13 July	15 July	82 days	38 days
Althea	F	26 July	26 July	91 days	49 days
Maggie	F	2 July	3 July	69 days	26 days
Betty	F	26 July	26 July	87 days	49 days
Jan	F	15 July	16 July	81 days	39 days
Gapper	F	23 July	23 July	86 days	46 days

On 27 June, Maggie, our most advanced female, 63 days of age, started ranging further from the area and being seen with less frequency. She was last seen feeding at the box on 2 July, and was not seen in the area after 3 July, age 69 days old. Cirrus, the largest of the tiercels, was last seen feeding at the box on 13 July and was not seen in the area after 15 July, age 82 days old. On the morning of 15 July, Jan was seen feeding heavily on chicken. On 16 July, at approximately 1100 hours, Jan circle-soared up, almost out of binocular range, and flew directly to the west. She was not seen again. Gapper was last seen feeding on chicken on 23 July at 86 days of age. This is also the day she dispersed from the area. The three remaining birds, Betty, Althea, and Homer were last seen on 26 July. Their ages respectively were 87, 91 and 93 days of age. The site was closed down on 2 August.

9. General Evaluation of Falcons. Homer, the oldest eyas. He initiated much of the mock battles amongst each other. Was seen chasing gulls most often. This tiercel showed strong competence and was probably the first to range away.

Cirrus, much like Homer but not as noticeable, seldom identified, but was seen on and off suggesting an independent and competent nature.

Maggie, a dark eyas with a more pronounced "helmet" than the other eyases. This falcon was quiet and reserved. Seldom identified.

Jan, a confident, well-proportioned falcon. This eyas was the first to be observed hunting.

Althea was rarely identified and not much is known about her. Her appearance and nature were most similar to Maggie.

Betty, was in the hack-box vicinity the most and was the most observed eyas. She was the youngest and the largest. She quite often screamed when the others flew by or approached. The other eyases yielded to her size and noise, making her a successful stealer of chicken. As a result, she became the most dependent eyas.

Gapper, the second youngest eyas, also seen often around the box. This falcon was large and lightly marked (like Betty). She showed more competence and less dominance than Betty.

10. Unusual Incidents. Homer, the smallest of the two tiercels, was rarely seen for a period of 20 days from 21 June, 58 days old at that time, to 10 July, 77 days old. From this point on he was seen regularly feeding at the box.

On 23 July, Betty, the largest, laziest, and most vocal of the birds unknowingly landed near a robins' nest. The adults were very persistent in their defense of the nest site, mobbing Betty for a period of approximately 20 minutes. The robins would occasionally make contact, provoking Betty to raise her foot in an attempt to grab one of the birds, however, no serious attempts were made. She eventually left the area, followed closely by the robins. She made no attempt at prey capture.

11. General Evaluation of Site. The site at Jordan Cliffs on Penobscot Mountain was chosen because it offered the highest cliff face, well above the forest canopy, virtually eliminating the hazards of predation by great horned owls. This site offered extensive hunting over Jordan Pond and excellent ledges for the placement of a hack-box.

We would make some suggestions for the improvement of the site. Marty Gilroy recommended that gravel, rather than pine boughs be used in the floor of the box, thus making identification of individual bands easier. Some oak branches on the south side of the hack ledge should be removed so there is a clear view of the entire ledge. The food chute should be camouflaged to make it less conspicuous.

12. Equipment. One canvas, four-man tent, Coleman stove and lantern, large canvas tarp, two large coolers, two five-gallon water containers, a Havahart trap, one park radio, our sleeping pad, two flashlights, and some polypropylene rope were all returned to the National Park Service; one spotting scope and tripod returned to Bill Drury; and four wooden storage boxes returned to the College of the Atlantic.

13. Acknowledgements. We would like to express our gratitude to Kyle Jones, Carroll Schell, and the whole Resources Management staff for all their help throughout the summer. We would also like to thank the many Park Rangers for helping out with transportation to and from the hack-site.

Bird List

White-throated sparrow	American kestrel
*Dark-eyed junco	Mourning Dove
Black-throated green warbler	Chimney swift
Nashville warbler	Red-breasted merganser
Tennessees warbler	Common merganser
Magnolia warbler	Common loon
American redstart	*Double-crested cormorant
Common yellowthroat	Hermit thrush
Black-throated blue warbler	Winter wren
Blue jay	Red-eyed vireo
Common nighthawk	American goldfinch
Eastern bluebird	Cedar waxwing
Tree swallow	Common grackle
Barn swallow	Gray jay
*Robin	Red-breasted nuthatch
Spotted sandpiper	Black-capped chickadee
*Raven	Ovenbird
Common crow	Rufous-sided towhee
*Herring gull	Hairy woodpecker
Laughing gull	Common flicker
Broad-winged hawk	Downy woodpecker
Red-shouldered hawk	Great blue heron
*Red-tailed hawk	Belted kingfisher
Sharp-shinned hawk	Least flycatcher
Goshawk	Eastern kingbird
Osprey	Yellow-bellied flycatcher
Bald eagle	White-winged crossbill
*peregrine falcon interactions.	

John McCormack Post Office and Court House, Boston, Massachusetts, prepared by Christine Cassidy and Arabella Lyon.

1. Personnel at Site. Christine Cassidy, 28 Richardson Avenue, Wakefield, Massachusetts, 01880, and Arabella Lyon, 211 Wachusett St., Boston, Massachusetts, 02130.

2. Description of Site. The John McCormack Post Office and Court House is located in Boston's financial district. The hack-box was placed on its roof, twenty three stories high. From this vantage, the eyasses viewed surrounding skyscrapers, the inner harbor, and the airport. Observations were made from a brick maintenance room, abutting the hack-box, and the thirty-ninth floor patio of the Bank of New England. From the bank, the hack-box, the McCormack roof, the harbor, the airport and much of the city's skyline can be seen. This was the first year of operation at this release site.

3. History and Details of Young.

Name	Sex	Fed Band#/Leg	Color Band#/Leg	Date & Age Placed in Box
Aber.	F	617-22614/R	Yellow 170/L	17 July 34 days old
Madrid	F	617-22615/R	Yellow 171/L	17 July 28 days old
Cairo	M	816-67467/L	Yellow 135/R	17 July 32 days old
Rio	M	816-67468/L	Yellow 140/R	17 July 33 days old
Dublin	M	816-67469/L	Yellow 141/R	17 July 32 days old
Sidney	M	816-67470/L	Yellow 142/R	17 July 30 days old

4. Pre-release Details. On 17 July at 1200 hours six peregrine falcons were placed in the hack-box by Jack Barclay who was assisted by the hack-site attendants and the Massachusetts Division of Fisheries and Wildlife. The falcons all ate and progressed well. Only Rio, 40 days, was seen trying to fly, flapping his wings and jumping.

5. Release Details.

Name	Sex	Date/Time Release	Age	Time to First Flt.	Return To Box
Aber.	F	26 July 0840	43 days	3 days 12 hrs.	11 hrs.
Madrid	F	26 July 0840	37 days	6 days 1 hr.	10 hrs.
Cairo	M	26 July 0840	41 days	2 days 1 hr.	5 hrs.
Rio	M	26 July 0840	42 days	- 12 hrs.	12 hrs.
Dublin	M	26 July 0840	41 days	- 11 hrs.	17 hrs.
Sidney	M	26 July 0840	39 days	1 day 14 hrs.	1 day 9 hrs.

All birds emerged from the hack-box by 0930. During the evening of 27 July, Sidney, 41 days, bolted from the roof. He returned on 29 July at 0700 (see unusual incidents).

6. Hunting Behavior. Due to the increasing range of the falcons, very little hunting behavior was observed. Four days after release, Dublin, 45 days, was spotted swooping down on chinmey swifts (*Chalcutura pelagica*). A tiercel circled with a gull on 8 August; no chasing seen. The first definite pursuit was seen on 15 August. Aberdeen, 63 days, left her perch on the post office to pursue a white bird. On 17 August a flicker (*Colaptes auratus*) was chased by an unidentified peregrine.

7. Roosting Behavior. During the fledging period, the peregrines roosted individually on the skyscrapers that surrounded the hack-site. When they became capable flyers, they flew out of view. Madrid was unusual in that she roosted on the lower balcony of the McCormack Building until 63 days of age.

8. Dispersal

Name	Sex	Date Last Seen Eating at Box	Date Last Seen at Site	Age When Last Seen	No. of Days After Release
Aber.	F	31 August	31 August	79 days	36 days
Madrid	F	*injured on 29 August and held			
Cairo	M	*died on 21 August			
Rio	M	6 September	9 September	87 days	45 days
Dublin	M	*15 September	15 September	92 days	51 days
Sidney	M	29 August	29 August	73 days	34 days

* Cairo flew into glass on 18 August and died at Tufts University on 22 August.

*Madrid was found injured 29 August and is still being treated for a broken wing at Tufts University.

*Dublin was trapped on 30 August for treatment of an injured leg and re-released on 9 September.

9. General Evaluation of Falcons. All six falcons interacted without aggression. Several times they flew close by, inspecting us or workmen on skyscrapers. They never begged food.

Madrid was the youngest bird, the last to fly, and therefore, the least dominant.

Aber.(Aberdeen) developed slowly and spent the least amount of time away from the hack-site. She seemed very dependent on the quail until the last few days before dispersal. Surprisingly, she was the first bird to disperse.

Rio developed his flight skills quickly. His bold behavior made him notable. Surprisingly, he was slow to disperse.

Sidney was definitely the most independent, people-shy falcon. He came to the hack-site for meals only.

Dublin was an independent, proficient flyer that developed quickly. After being held for treatment for 10 days and re-released he remained dependent on the quail for about another week.

10. Unusual Incidents. Dublin, 42 days, flew to roost just before dark and apparently missed his landing and fluttered to the street level. A parking garage attendant saw him walk across a driveway and hop up on a dumpster to roost at 2100 on 27 July. The Boston Police were called and they went to the McCormack Building and retrieved the federal security police. He was placed in a box and returned to the post office. Not knowing what to do or not to do, the building security breached our security and checked the roof. It is hypothesized that Sidney, 41 days, who had never flown, was frightened off the roof into the dark. Sidney could not be located, but returned at 0700 on 29 July. Dublin was re-released by Marty Gilroy and the attendants without incident on 28 July at 0600.

On 4 August Aberdeen, 52 days, had not been seen in twenty four hours. An attendant at the same garage reported her position near traffic there. When an attempt to capture her failed, she was flushed to a third floor window across the street. After twenty four hours she glided down the street and was successfully captured. She was examined and released on the roof; she ate ravenously and did not fly again until 7 August.

On 18 August Cairo flew into a pane of clear glass on the patio of the Bank of New England. Despite treatment by Dr. Sedgewick at Tufts University Veterinary School, he died 22 August, of a fractured 6th cervical vertebra and spinal cord damage. Also both wings and legs had been paralyzed.

Due to a power outage downtown on 23 August, the birds were fed 12 hours late. From that point, the birds seemed less dependent on this food source.

On 29 August, Madrid was found injured next to a runway by Logan International Airport's bird patrol. The bird was brought to Tufts for treatment of a broken radius and ulna. She is recovering well.*

On 27 August, Dublin was noticed to be limping. By 29 August his right leg was non-weight bearing. He was captured with a bow net and taken to Tufts for treatment and re-released on 9 September. Although x-rays were not conclusive it is thought that the pelvis may have had a small fracture. This bird was in the habit of visiting the airport with Madrid.** Recovery from the injury was complete.

11. General Evaluation of Site. Despite the loss of two birds and two injuries, this is a satisfactory site. The Bank of New England provides excellent viewing. The surrounding skyscrapers offer good perching and roosting sites. Both the Charles River Basin and the Boston Harbor are good hunting areas. The strong point of this urban site is the positive community response and assistance with observing. We received frequent telephone reports on the activities and locations of the falcons. We do recommend one of the hack-site attendants live in Boston to facilitate quick response to problems.

12. Equipment. Returned to the Audubon Society, one bow net; returned to Northeastern University, two coolers; returned to Massachusetts Fish and Wildlife, one spotting scope.

13. Acknowledgements. We would like to thank; Dr. Tom French and the Massachusetts Division of Fisheries & Wildlife; Massachusetts Audubon Society; Alan Poor, Gill Guthrie, the Federal Police at the McCormack Building; and the Bank of New England, especially Marc Rosenthal, Rosalee Burton, and Ruth Ann Burke, for their hospitality. Thanks also to the crew at the Arch Street Garage, the birds patrol at Logan Airport, Dr. Charles Sedgewick at Tufts School of Veterinary Medicine, Dr. Gwil Jones and Karen Driscoll at Northeastern University.

*Madrid was returned to Cornell University on 19 October for further rehabilitation.

**Remains of Sidney were found on a runway at Hanscom Field, 17 miles northwest of Boston on 29 August.

Bird List

Double-crested cormorant
Great Black-backed gull
Rock dove
Chimney swift
Tree swallow
Black & white warbler
Yellow warbler
House sparrow

American kestrel
Herring gull
Common nighthawk
Common flicker
Starling
Northern parula warbler
Scarlet tanager

*After the writing of this report, it was learned that Sidney was struck and killed by an airplane at Hanscom Field on 29 August. Sidney had last been seen feeding at the hack-site and then flying out over the harbor at 0800 that day. Hanscom Field is 17 air miles inland from the hack-site.