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Virginia Peregrine Falcon monitoring and management program: Year 2007 report

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**VIRGINIA PEREGRINE FALCON MONITORING AND
MANAGEMENT PROGRAM: YEAR 2007 REPORT**



**Center for Conservation Biology
College of William and Mary**

VIRGINIA PEREGRINE FALCON MONITORING AND MANAGEMENT PROGRAM: YEAR 2007 REPORT

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The Virginia Department of Game and Inland Fisheries
(Wildlife Diversity Program)
National Aeronautics and Space Administration
National Park Service
United States Fish and Wildlife Service
Virginia Department of Transportation
The Nature Conservancy
Dominion
Center for Conservation Biology

Front Cover: *Young falcon takes flight in New River Gorge. Photo by Matt Varner.*



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EXECUTIVE SUMMARY

The Peregrine Falcon (*Falco peregrinus*) was believed to be extinct as a breeding species in Virginia by the mid-1960s. Intensive management efforts since the late 1970s have resulted in a known breeding population that has now exceeded 20 pairs. However, all but one of the known breeding pairs currently nests on artificial structures and reproductive performance continues to be erratic. The primary objective of this program is to continue to monitor population trends and to improve reproductive performance through active management. The ultimate goal of the program is to recover a population that is self-sustaining.

The Virginia breeding population supported 20 known pairs during the 2007 breeding season. Since 1982 the population has exhibited a steady recovery with an average doubling time of 5.4 years. Fifty-eight nesting structures were surveyed for Peregrine Falcon activity during the breeding season. The survey documented 20 resident pairs. Nesting structures included 10 peregrine towers, 6 bridges, 1 shack remnant on the seaside of the Delmarva, 1 high-rise building, 1 reserve ship, and 1 natural cliff face. Eighteen falcon pairs made breeding attempts producing 66 eggs and 52 chicks that survived to fledging age. Reproductive rate was 2.6 chicks/occupied territory and 2.9 chicks/active territory. Of 16 clutches that were followed completely from laying to fledging, 46 of 62 (74.2%) of eggs hatched. Of these 52 chicks, 52 (100%) survived to banding age and 52 (100%) fledged successfully.

Thirty-eight young falcons representing more than 73% of the chicks produced in the state were translocated from the coast to the mountains during the 2007 breeding season. This included 15 females and 23 males. Thirteen of these chicks originated on bridges that have a history of poor fledging success. The remaining 25 chicks were from towers along the Delmarva Peninsula (20), a ship in the James River Reserve Fleet (3), an office building in Richmond (2). Birds collected from territories were transported to Hawksbill in Shenandoah National Park, the New River Gorge, and Breaks Interstate Park. Nine birds were hacked at Hawksbill, and 15 at the New River Gorge, and 14 at Breaks Interstate Park. The management strategy initiated in 2006 to utilize productivity along the Delmarva to fuel targeted hacks in the mountains was continued in 2007. This strategy meets the objective of both repopulating the mountain range and reducing impacts to sensitive waterbirds.

BACKGROUND

Context

The original population of Peregrine Falcons in the eastern United States was estimated to contain approximately 350 breeding pairs (Hickey 1942). From published records and accounts, there have been 24 historical Peregrine eyries documented in the Appalachians of Virginia (Gabler 1983). Two additional nesting sites were documented on old osprey nests along the Virginia portion of the Delmarva Peninsula (Jones 1946). Throughout the 1950s, and into the 1960s, Peregrine Falcon populations throughout parts of Europe and North America experienced a precipitous decline (Hickey 1969). A survey of 133 historic eyries east of the Mississippi River in 1964 failed to find any active sites (Berger et al. 1969). The Peregrine Falcon was believed to be extinct in Virginia as a breeding species by the early 1960s.

As part of a national effort to restore the eastern Peregrine population, the Virginia Department of Game and Inland Fisheries, Cornell University, and the College of William and Mary initiated a hacking program for Virginia in 1978. The program involved the release of captive-reared Peregrines with the hope that these birds would re-colonize the historic breeding range. Between 1978 and 1993, approximately 250 young falcons were released in Virginia. Since the close of this program, captive-reared Peregrines have been released on a limited basis within the state. Such releases have involved more targeted projects. Beginning in 2000, wild-reared falcons have been translocated from coastal breeding sites to mountain release sites. Such movements have taken advantage of young produced from sites where fledging success is known to be poor.

The first successful nesting of Peregrines Falcons in Virginia after the DDT era occurred in 1982 on Assateague Island. Since that time, the breeding population has continued a slow but steady increase. The size of the known breeding population within the coastal plain has now exceeded 20 pairs. However, both hatching rate and chick survival remain somewhat erratic. An analysis by the U.S. Fish and Wildlife Service in the early 1990's of addled eggs collected in Virginia, showed levels of DDE, Dieldrin, and egg-shell thinning that have been shown previously to have an adverse impact on reproduction. An additional problem that has been suspected but not fully quantified is that the turnover rate of breeding adults appears to be high. At present, the long-term viability of the Virginia population in the absence of continued immigration from surrounding populations remains questionable. Continued monitoring and management of this population is needed to ensure that the population will continue to recover.

Objectives

The objectives of this project were 1) to track the recovery of the breeding population of Peregrine Falcons in Virginia (both in terms of the size and distribution of the breeding population and the number of young produced), 2) to evaluate the success

of past and present management techniques used with the breeding population, 3) to improve productivity of nesting pairs through active management, and 4) to increase our understanding of Peregrine Falcon natural history in the mid-Atlantic region.

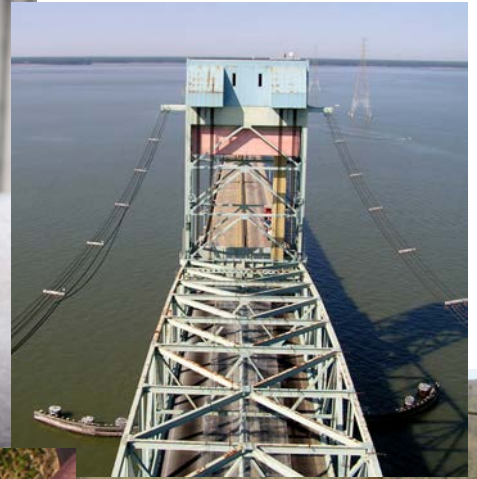
METHODS

Geographic Focus

In 2007, the geographic scope of this project included breeding locations within the coastal plain, the only known mountain nesting site (Stony Man in Shenandoah National Park), and three mountain hawk sites (Hawksbill in Shenandoah National Park, New River Gorge, and Breaks Interstate Park). Most of the effort was focused on the coastal plain where the majority of breeding pairs occur.

Nest Site Surveys

Between 1977 and 2007 more than 60 structures have been established specifically for breeding Peregrine Falcons within the coastal plain of Virginia (Table 1, Figure 1). Nearly all of the structures that survived to the 2007 breeding season were checked for evidence of resident falcons. An initial survey of breeding structures was conducted between 1 March and 15 April. All surveys of towers and boxes along the Delmarva Peninsula and fringe of the western shore were surveyed from the air using a Cessna 172, high-wing aircraft. Fly bys were conducted at low altitude to flush attending adults and to view the inside of nest boxes for activity. The number of adults attending sites and/or activity within the nest box was recorded. Remaining sites on bridges or within urban areas were surveyed on the ground for occupation and activity. Sites that were confirmed to have Peregrine activity were monitored with 2-5 additional ground visits to document breeding activity, to band young and to document fledging success. A breeding territory was considered to be "occupied" if a pair of adult Peregrines was resident during the breeding season. Nests were considered to be "active" if eggs or young were detected (Postupalsky 1974). Complete breeding information (e.g. clutch size, hatching rate) could not be obtained for a small portion of active sites due to poor access. However, fledging rate was determined for all active sites. Nest sites were visited approximately 2 weeks after projected fledging date to determine fledging success. This time threshold was developed from Satellite tracking data (2001-2002) that indicates a pulse of mortality just prior to fledging and in the 2 weeks following fledging (Watts et al. 2002).



Photos from top left to right – Mitchell Byrd on reserve ship (*Bryan Watts*), reserve ship (*Shawn Padgett*), Shawn Padgett in snooper truck (*Bryan Watts*), Richmond female (*Bryan Watts*), James River Bridge (*Bryan Watts*), Ben Harrison Bridge male (*Bryan Watts*), new hack box at Breaks Interstate Park (*Rolf Gubler*).

Banding

An attempt was made to band all chicks surviving to banding age (21-32 d). Chicks were banded with a U.S. Fish and Wildlife Service lock-on, aluminum tarsal band on the right leg and a bi-colored, green and black, alpha-numeric auxiliary band on the left leg. FWS bands used in Virginia during the 2007 breeding season were anodized green. Band size 6 and 7 were used for male and female chicks respectively. Auxiliary bands were applied with two pop rivets.

Translocations

Over the past several years, some breeding sites on bridges have been known to experience low fledging rates. Observations indicate that losses occur during initial flight attempts or when chicks are near fledging age. Numerous chicks have been lost in the water during early flights when they are unable to fly back up to nest structures. Other chicks have flown down to the roadbed and been killed by automobiles. In order to improve survivorship for high-risk sites, a program was initiated to translocate chicks to mountain release sites. Chicks are typically removed from nest sites, transported to mountain sites, and released using standard hacking techniques (Sherrod et al. 1981). In keeping with the objectives of facilitating the re-colonization of the historic mountain range and reducing the impacts of the breeding Peregrine population on sensitive waterbirds (Long and Watts, unpublished data), chicks were taken from selected nesting sites along the seaside of the Delmarva Peninsula to be hacked from high priority mountain sites.

RESULTS

Site Surveys

Fifty-eight nesting structures were surveyed for Peregrine Falcon activity during the breeding season (Table 1). Only one structure that is still standing was not surveyed and it is within the territory of a pair nesting on a nearby structure. Of the sites with known occupation, 20 supported resident pairs. These included 11 peregrine towers, 6 bridges, 1 high-rise building, 1 reserve ship, and 1 natural cliff face (Table 2).

Breeding Results

Virginia supported 20 known breeding pairs of Peregrine Falcons during the 2007 breeding season including 19 on the Coastal Plain and 1 in the mountains (Figure 1). Two of these pairs were not documented to produce eggs such that there were only 18 active territories (Table 2). Pairs not making breeding attempts included Wallops Island tower, where a new tower was built, and West Norfolk Bridge, which has been erratic in recent years for unknown reasons.

Table 1. Catalog of nesting structures established for Peregrine Falcons in Virginia (1977-2004). Table gives year of establishment and whether or not the site was checked for Peregrine Falcon activity during the 2007 breeding season. Dashed lines indicate that the structure is no longer present.

Site Code	Location Description	Structure Type	Year Est.	Checked 2007
VA-PEFA-01	Fisherman's Island Tower	Peregrine Tower	1980	Y
VA-PEFA-02	Cobb Island Tower	Peregrine Tower	1978	Y
VA-PEFA-03	Hog Island Tower	Peregrine Tower	1977	Y
VA-PEFA-04	Paramore Island Tower	Peregrine Tower	1982	-----
VA-PEFA-05	Metompkin Island Tower	Peregrine Tower	1982	Y
VA-PEFA-06	Wallops Island Tower	Peregrine Tower	1981	Y
VA-PEFA-07	Chincoteague Tower	Peregrine Tower	1979	Y
VA-PEFA-08	Great Fox Island Tower	Peregrine Tower	1981	Y
VA-PEFA-09	Watts Island Tower	Peregrine Tower	1997	Y
VA-PEFA-10	Finney's Island Tower	Peregrine Tower	1997	Y
VA-PEFA-11	Tangier Island Water Tower	Nest Box	1999	-----
VA-PEFA-12	Hyslop Marsh Tower2T	Peregrine Tower	1995	Y
VA-PEFA-13	Saxis Marsh N. Tower	Peregrine Tower	1996	Y
VA-PEFA-14	Saxis Marsh S. Tower	Peregrine Tower	1998	Y
VA-PEFA-15	Parker Marsh Tower	Peregrine Tower	1997	Y
VA-PEFA-16	Elkins Marsh Chimney	Nest Box	1995	Y
VA-PEFA-17	Elkins Marsh Shack	Nest Box/Tower	1997/2004	Y
VA-PEFA-18	Wachapreague Shack	Peregrine Tower	1994/2000	Y
VA-PEFA-19	James River Ghost Ship 1	Moth Ball Fleet	1987	Y
VA-PEFA-20	Coleman Bridge Box	Nest Box	1989	Y
VA-PEFA-21	Norfolk Southern RR Bridge	Bridge	1992	N
VA-PEFA-22	James River Bridge	Nest Box	1991	Y
VA-PEFA-23	Berkley Bridge	Nest Box	1996	Y
VA-PEFA-24	Benjamin Harrison Bridge	Nest Box	1996	Y
VA-PEFA-25	Mills Godwin Bridge	Nest Box	1996	Y
VA-PEFA-26	West Norfolk Bridge	Nest Box	1996	Y
VA-PEFA-27	Norris Bridge	Nest Box	1989	Y
VA-PEFA-28	Little Stony Man, SNP	Natural Cliff Face	-----	Y
VA-PEFA-29	Old Rag, SNP	Natural Cliff Face	-----	Y
VA-PEFA-30	Back Bay Tower	Peregrine Tower	1982	-----
VA-PEFA-31	Plum Tree Island Tower	Peregrine Tower	1998	Y
VA-PEFA-32	Plum Tree Island Box	Nest Box	1990	Y
VA-PEFA-33	Saxis Marsh W. Tower	Peregrine Tower	1998	Y
VA-PEFA-34	Mockhorn Island Tower	Peregrine Tower	1997	Y
VA-PEFA-35	Tangier Island Tower	Peregrine Tower	2000	-----
VA-PEFA-36	Upshur Bay Tower	Peregrine Tower	2000	Y
VA-PEFA-37	Silver Beach Range Tower	Nest Box	1997	Y
VA-PEFA-38	Hawksbill Mountain	Natural Cliff Face	-----	Y
VA-PEFA-39	Concrete Ships	Nest Box	1995	Y
VA-PEFA-40	Chesapeake Substation	Nest Box	1998	Y
VA-PEFA-41	Holiday Inn VA Beach	Nest Box	1997	Y

Table 1. Continued

Site Code	Location Description	Structure Type	Year Est.	Checked 2007
VA-PEFA-42	Possum Point Substation	Nest Box	1998	Y
VA-PEFA-43	Newport News City Hall	Nest Box	1993	Y
VA-PEFA-44	Elizabeth River Substation	Nest Box	1998	Y
VA-PEFA-45	Cargill Grain Elevator	Nest Box	1993	Y
VA-PEFA-46	Lafayette Bridge	Nest Box	1998	Y
VA-PEFA-47	North Elkins Shack	Nest Box	1994	Y
VA-PEFA-48	Churchland Bridge	Nest Box	1999	Y
VA-PEFA-49	Yorktown Substation	Nest Box	1998	Y
VA-PEFA-50	Jordan Bridge	Nest Box	1995	Y
VA-PEFA-51	Campostella Bridge	Nest Box	1998	Y
VA-PEFA-52	I-64 Bridge	Nest Box	1999	Y
VA-PEFA-53	ALCOA Bridge	Nest Box	1999	Y
VA-PEFA-54	I-295 Bridge	Nest Box	2001	Y
VA-PEFA-55	Dominion Building	Nest Box	2000	Y
VA-PEFA-56	River Front Plaza	Nest Box	2002	Y
VA-PEFA-57	BB&T Building	Nest Box	1984	Y
VA-PEFA-58	Russell Island	Peregrine Tower	1982	-----
VA-PEFA-59	Bermuda Hundred	Nest Box	1998	Y
VA-PEFA-60	Chesapeake Bay Bridge	Nest Box	2004	Y
VA-PEFA-61	Tappahannock Bridge	Nest Box	2004	Y
VA-PEFA-62	Gull Marsh	Peregrine Tower	2004	Y
VA-PEFA-63	Godwin Island Box	Nest Box	2004	Y
VA-PEFA-64	James River Ghost Ship 2	Moth Ball Fleet	-----	Y

Table 2. Summary of productivity results for Peregrine Falcon pairs in Virginia during the 2007 breeding season.

Site Code	Location Description	Occ Terr	Active Nest	Eggs	Chicks Hatched	Band Age	Fledg
PEFA-02	Cobb Island Tower	Y	Y	4	?	3	3 ¹
PEFA-05	Metompkin Island Tower	Y	Y	3	1	1	1
PEFA-06	Wallops Island Tower	Y	N	0	0	0	0
PEFA-09	Watts Island Tower	Y	Y	4	3	3	3 ²
PEFA-10	Finney's Island Tower	Y	Y	4	3	3	3 ³
PEFA-16	Elkins Marsh Chimney	N	N	-----	-----	-----	-----
PEFA-17	Elkins Marsh Tower	Y	Y	4	4	4	4 ⁴
PEFA-18	Wachapreague Shack	Y	Y	4	4	4	4 ⁵
PEFA-22	James River Bridge	Y	Y	5	5	5	5 ⁶
PEFA-23	Berkley Bridge	Y	Y	4	1	1	1
PEFA-24	Ben Harrison Bridge	Y	Y	4	2	2	2 ⁷
PEFA-25	Mills Godwin Bridge	Y	Y	4	3	3	3 ⁸
PEFA-26	West Norfolk Bridge	Y	N	-----	-----	-----	-----
PEFA-27	Norris Bridge	Y	Y	?	3	3	3 ⁹
PEFA-28	Stony Man, SNP	Y	Y	3	0	0	0 ¹⁰
PEFA-34	Mockhorn Island tower	Y	Y	3	3	3	3 ¹¹
PEFA-36	Upshur Bay tower	Y	Y	4	3	3	3 ¹²
PEFA-56	River Front Plaza	Y	Y	4	4	4	4 ¹³
PEFA-60	Chesapeake Bay Bridge	N	N	0	0	0	0
PEFA-62	Gull Marsh Tower	Y	Y	4	3	3	3 ¹⁴
PEFA-63	Godwin Island Box	Y	Y	4	4	4	4 ¹⁵
PEFA-64	James River Ghost Fleet	Y	Y	4	3	3	3 ¹⁶
Total		20	18	66	52	52	52

¹2 young translocated to Breaks Interstate Park and released.

²2 young translocated to Shenandoah National Park and released.

³2 young translocated to Shenandoah National Park and released.

⁴3 young translocated to Shenandoah National Park and released.

⁵3 young translocated to New River Gorge and released.

⁶5 young translocated to New River Gorge and released.

⁷2 young translocated to New River Gorge and released.

⁸3 young translocated to Breaks Interstate Park and released.

⁹3 young translocated to New River Gorge and released.

¹⁰eggs predated by raccoon.

¹¹2 young translocated to Shenandoah National Park and released.

¹²2 young translocated to New River Gorge and released.

¹³1 young translocated to Breaks Interstate Park and released.

¹⁴2 young translocated to Breaks Interstate Park and released.

¹⁵3 young translocated to Breaks Interstate Park and released.

¹⁶3 young translocated to Breaks Interstate Park and released.

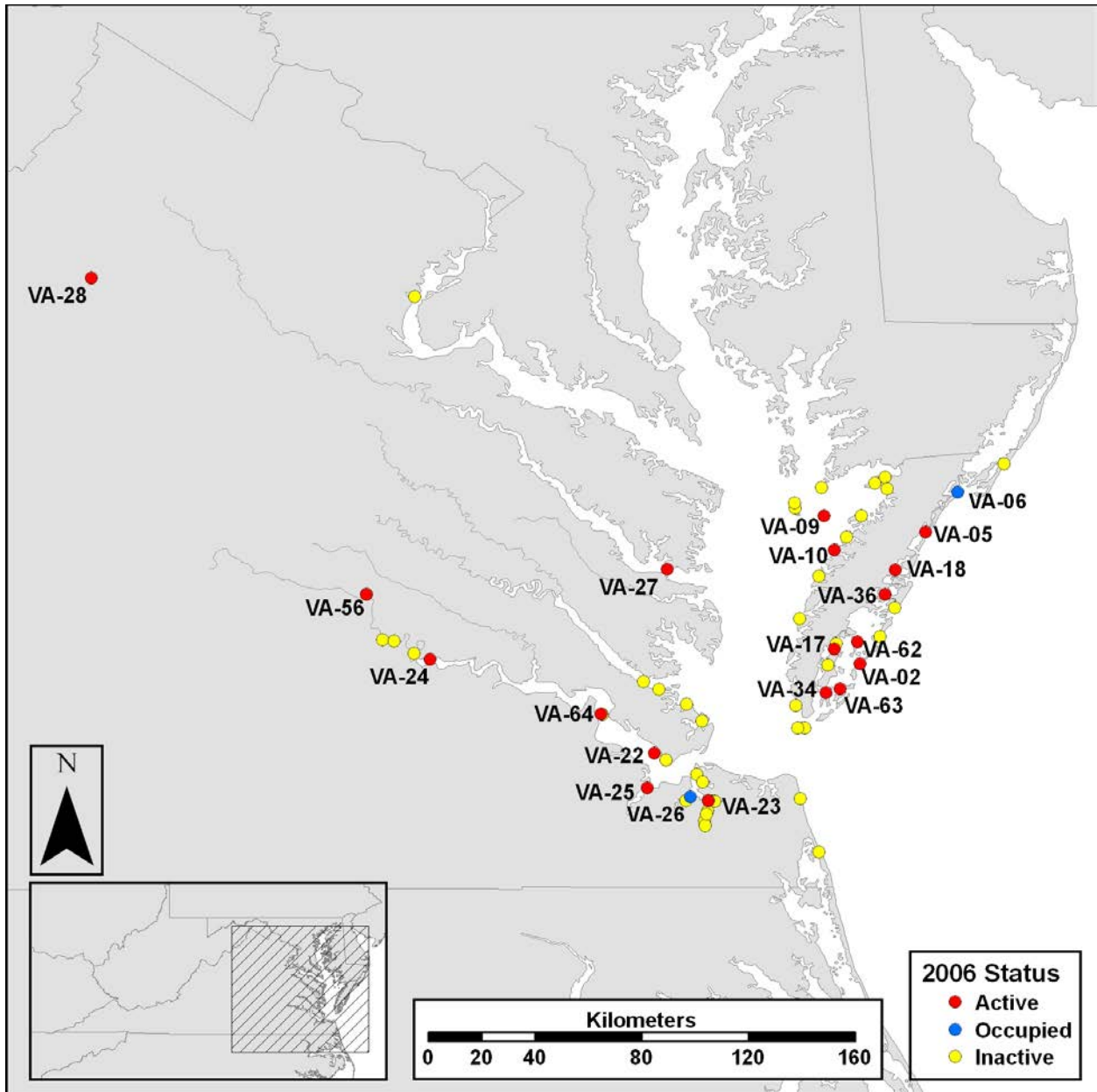


Figure 1. Map of nesting structures for Peregrine Falcons surveyed during the 2007 breeding season. Colors refer to activity status.

The 18 falcon pairs that made breeding attempts produced 66 eggs, at least 52 of which hatched. All of these chicks survived to fledging age. Fledging success was 2.6 chicks/occ. territory and 2.89 chicks/act. territory. It should be noted that much of the chick production resulted from management actions taken during the breeding season. Thirty-eight (73.1%) of the 52 chicks known to fledge were the result of translocations. Many of these birds would most likely have been lost if left in place.

During the 2007 breeding season, hatching and fledging rates were similar to recent years. Of 16 clutches that were followed completely from laying to fledging, 46 of 62 (74.2%) of eggs hatched. Of these 52 chicks, 52 (100%) survived to banding age and 52 (100%) fledged successfully. No eggs hatched from eggs on Stony Man. Two sets of eggs were laid and predated by a mammalian predator. The male was lost before the season at the Elkins Chimney site and did not appear to be replaced. The male was also lost before the season on the Benjamin Harrison Bridge but was replaced quickly and the pair nested successfully.

Banding

All but one of the falcon chicks (N = 52) that survived to banding age were fitted with both FWS and alpha-numeric bands. This included 25 females and 25 males (Table 3). The single chick not banded was hatched on Metompkin Island tower.

Table 3a. List of band codes for female Peregrine Falcon chicks banded in Virginia during 2007 breeding season.

FWS Band	A-N Band	Location	Date
Females			
1807-02743	37/V	Berkley Bridge	6-3-07
1807-02744	38/V	James River Bridge	6-18-07
1807-02745	39/V	Norris Bridge	6-18-07
1807-02746	40/V	Elkins Marsh	5-23-07
1807-02747	41/V	Watts Island	5-23-07
1807-02748	42/V	Elkins Marsh	5-23-07
1807-02749	43/V	James River Ghost Fleet	5-30-07
1807-02750	44/V	James River Ghost Fleet	5-30-07
1807-02751	45/V	James River Ghost Fleet	5-30-07
1807-02752	16/U	Mills Godwin Bridge	5-30-07
1807-02753	17/U	Mills Godwin Bridge	5-30-07
1807-02754	19/U	Wachapreague Shack	5-31-07
1807-02755	20/U	Upshur Bay Tower	5-31-07
1807-02756	Z/40	Wachapreague Shack	5-31-07
1807-02757	Z/41	Wachapreague Shack	5-31-07
1807-02758	Z/42	Mockhorn Island Tower	6-7-07
1807-02759	Z/43	Godwin Island Shack	6-7-07
1807-02760	Z/44	Cobb Island Tower	6-7-07
1807-02761	Z/45	Finney's Island Tower	6-20-07
1807-02762	Z/46	Finney's Island Tower	6-20-07
1807-02763	Z/47	Finney's Island Tower	6-20-07
1807-02764	Z/48	Gull Marsh Tower	7-23-07
1807-02765	Z/49	Riverfront Plaza	7-27-07
1807-02766	60/Z	Riverfront Plaza	7-27-07
1807-02767	61/Z	Riverfront Plaza	7-27-07

Table 3b. List of band codes for male Peregrine Falcon chicks banded in Virginia during 2007 breeding season.

FWS Band	A-N Band	Location	Date
Males			
2206-81649	91/S	James River Bridge	6-18-07
2206-81650	92/S	James River Bridge	6-18-07
2206-81651	93/S	James River Bridge	6-18-07
2206-81652	94/S	James River Bridge	6-18-07
2206-81653	95/S	Norris Bridge	6-18-07
2206-81654	96/S	Norris Bridge	6-18-07
2206-81655	97/S	Elkins Marsh	5-23-07
2206-81656	98/S	Elkins Marsh	5-23-07
2206-81657	99/S	Watts Island	5-23-07
2206-81658	X/02	Watts Island	5-23-07
2206-81660	X/03	Mills Godwin Bridge	5-30-07
2206-81661	X/04	Wachapreague Shack	5-31-07
2206-81662	X/05	Upshur Bay Tower	5-31-07
2206-81663	X/07	Upshur Bay Tower	5-31-07
2206-81664	X/12	Ben Harrison Bridge	5-31-07
2206-81665	X/14	Mockhorn Island Tower	6-7-07
2206-81666	X/15	Mockhorn Island Tower	6-7-07
2206-81667	X/17	Cobb Island Tower	6-7-07
2206-81668	X/20	Cobb Island Tower	6-7-07
2206-81669	X/21	Godwin Island Shack	6-7-07
2206-81670	X/22	Godwin Island Shack	6-7-07
2206-81671	X/23	Godwin Island Shack	6-7-07
2206-81672	X/24	Ben Harrison Bridge	5-31-07
2206-81673	X/25	Gull Marsh Tower	7-24-07
2206-81674	X/26	Gull Marsh Tower	7-24-07
2206-81675	X/27	Riverfront Plaza	7-27-07

Translocations

Thirty-eight young falcons were translocated to be hacked during the course of the 2007 breeding season (Table 4). This included 15 females and 23 males. Thirteen of these chicks originated on bridges that have a history of poor fledging success. The remaining 25 chicks were from towers along the Delmarva Peninsula (20), a ship in the James River Reserve Fleet (3), an office building in Richmond (2).

Table 4. Summary of translocation activities for Peregrine Falcons in Virginia during the 2007 breeding season.

FWS Band#	Hatch Site	Date Collected	Translocation Site
1807-02744	James River Bridge	6-18-07	New River Gorge
1807-02745	Norris Bridge	6-18-07	New River Gorge
1807-02748	Elkins Marsh	5-23-07	Shenandoah, NPS
1807-02749	James River Ghost Fleet	5-30-07	Breaks Interstate Park
1807-02750	James River Ghost Fleet	5-30-07	Breaks Interstate Park
1807-02751	James River Ghost Fleet	5-30-07	Breaks Interstate Park
1807-02752	Mills Godwin Bridge	5-30-07	Breaks Interstate Park
1807-02753	Mills Godwin Bridge	5-30-07	Breaks Interstate Park
1807-02754	Wachapreague Shack	5-31-07	New River Gorge
1807-02755	Upshur Bay Tower	5-31-07	New River Gorge
1807-02756	Wachapreague Shack	5-31-07	New River Gorge
1807-02757	Wachapreague Shack	5-31-07	New River Gorge
1807-02762	Finney's Island Tower	6-20-07	Shenandoah, NPS
1807-02763	Finney's Island Tower	6-20-07	Shenandoah, NPS
1807-02765	Riverfront Plaza	7-27-07	Breaks Interstate Park
2206-81649	James River Bridge	6-18-07	New River Gorge
2206-81650	James River Bridge	6-18-07	New River Gorge
2206-81651	James River Bridge	6-18-07	New River Gorge
2206-81652	James River Bridge	6-18-07	New River Gorge
2206-81653	Norris Bridge	6-18-07	New River Gorge
2206-81654	Norris Bridge	6-18-07	New River Gorge
2206-81655	Elkins Marsh	5-23-07	Shenandoah, NPS
2206-81656	Elkins Marsh	5-23-07	Shenandoah, NPS
2206-81657	Watts Island	5-23-07	Shenandoah, NPS
2206-81658	Watts Island	5-23-07	Shenandoah, NPS
2206-81660	Mills Godwin Bridge	5-30-07	Breaks Interstate Park
2206-81663	Upshur Bay Tower	5-31-07	New River Gorge
2206-81664	Ben Harrison Bridge	5-31-07	New River Gorge
2206-81665	Mockhorn Island Tower	6-7-07	Shenandoah, NPS
2206-81666	Mockhorn Island Tower	6-7-07	Shenandoah, NPS
2206-81667	Cobb Island Tower	6-7-07	Breaks Interstate Park
2206-81668	Cobb Island Tower	6-7-07	Breaks Interstate Park
2206-81669	Godwin Island Shack	6-7-07	Breaks Interstate Park
2206-81670	Godwin Island Shack	6-7-07	Breaks Interstate Park
2206-81671	Godwin Island Shack	6-7-07	Breaks Interstate Park
2206-81672	Ben Harrison Bridge	5-31-07	New River Gorge
2206-81673	Gull Marsh Tower	7-24-07	Breaks Interstate Park
2206-81674	Gull Marsh Tower	7-24-07	Breaks Interstate Park
2206-81675	Riverfront Plaza	7-27-07	Breaks Interstate Park

The birds removed from towers were taken from one of the highest density breeding areas in Virginia and where concern for the impact of peregrines on beach and colonial nesting birds is the highest. The nest site chosen on the reserve ship was in a doorway that was lower than the surrounding structure making it unlikely that the birds could fledge without falling into the water. The Richmond pair has a history of poor fledging success due to the amount of structure in the territory. The two females that were left at the site fledged successfully.

Birds collected from territories were transported to Hawksbill in Shenandoah National Park, the New River Gorge, and Breaks Interstate Park. Nine birds were hacked at Hawksbill, and 15 at the New River Gorge, and 14 at Breaks Interstate Park.

DISCUSSION

The Virginia breeding population of Peregrine Falcons declined by approximately 10% between 2006 and 2007. This decline reflects the loss of a male that was not replaced on the Elkins chimney site and the apparent loss of the Fisherman Island pair. This site has supported a resident pair almost continuously since 1980. No new territories were discovered in 2007.

The reproductive rate measured in 2007 was the highest since 1988 when the population had only 5 active nests and 35% higher than the mean since 1981. The hatching rate in 2007 was consistent with what has been documented over the past several years. Fledging rate was the highest recorded in the past decade. However, the elevation in the fledging rate was, at least in part, due to the large number of birds translocated for hacking.

The use of coastal productivity to fuel targeted hacks in priority sites is consistent with the objective of re-establishing a viable breeding population within the historic mountain range of Virginia. Fledging rate from the 7 bridge sites in the coastal plain has been very low. The translocation of these birds to the mountains is a good use of this production. Over the past decade, pairs along the lower Delmarva Peninsula have increased to a very high breeding density. This population exists completely on artificial structures and has been highly productive. Diet within this system is dominated by migrant shorebirds and nesting waterbirds that are themselves of conservation concern (Long, unpublished data). In recent years, concern about the impact of this breeding population on the management of waterbirds has increased. The management strategy initiated in 2006 to utilize productivity along the Delmarva to fuel targeted hacks in the mountains was continued in 2007. This strategy meets the objective of both repopulating the mountain range and reducing impacts to sensitive waterbirds.

The largest number of birds ever translocated in the state was moved from the coast to the mountains during the 2007 breeding season. A total of 38 birds representing more than 73% of the total production was moved to the mountains and released. As in 2006, birds were hacked from Hawksbill in Shenandoah National Park and the New River Gorge. In addition, a new hack site was created in Breaks Interstate

Park. Efforts in future years should continue to support the establishment of a breeding pair within the New River Gorge and the gorge in Breaks Interstate Park and should establish the infrastructure and partnerships necessary for at least 1 additional hack site in Virginia.

Nesting on natural cliff sites continues to be precarious. The 2005 breeding season was the first year since the late 1990s that a pair made a breeding attempt in the mountains. In 2006 the pair chose a fairly exposed shelf to lay and the clutch was washed out during a spring storm. The problems of exposure and drainage have caused nest failures within other Virginia mountain sites during the 1990s. In 2007, the pair laid 2 clutches that were predated. Trapping efforts during the early portion of the breeding cycle are planned for 2008. This intensive management approach should continue in the future when feasible until the mountain population is self sustaining.

During the 2007 season, 4 addled eggs were collected and transported to be analyzed in Rob Hale's lab at the Virginia Institute of Marine Science. This transfer represents a continuing effort to monitor contaminant levels in Virginia peregrines and to continue to explore the potential for this species to accumulate brominated fire retardants that remain on the market.

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LITERATURE CITED

- Berger, D. D., C. R. Sindelar, Jr., and K. E. Gamble. 1969. The status of breeding peregrines in the eastern United States, in J. J. Hickey ed., *Peregrine Falcon Populations: Their Biology and Decline*. University of Wisconsin Press. Madison, Wisconsin. Pp. 165-173.
- Gabler, J. K. 1983. The peregrine falcon in Virginia: Survey of historic eyries and reintroduction effort. Unpublished masters thesis, College of William and Mary, Williamsburg, VA. 81 pp.
- Hickey, J. J. 1942. Eastern population of the Duck Hawk. *Auk* 59:176-204.
- Hickey, J. J., Ed. 1969. *Peregrine Falcon Populations: Their Biology and Decline*. University of Wisconsin Press. Madison, Wisconsin.
- Jones, F. M. 1946. Duck Hawks of eastern Virginia. *Auk* 63:592.
- Morse, N. J. 1993. Contaminants in Peregrine Falcon (*Falco peregrinus*) eggs from Virginia, Maryland, and West Virginia. U.S. Fish and Wildlife Service report. Virginia Field Office, White Marsh, VA.
- Peakall, D. B., and L. F. Kiff. 1988. DDE contamination in Peregrines and American Kestrels and its effect on reproduction. In T. J. Cade, J. H. Enderson, C. G. Thelander, C. M. White, Eds. *Peregrine falcon populations: their management and recovery*. The Peregrine Fund Inc., Boise ID.
- Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria and terminology. *Raptor Research Report* 2:21-31.
- Potter, K. 2004. Polybrominated dephenyl ether flame retardants in peregrine falcon eggs from coastal Virginia and Maryland. Undergraduate Honors Thesis. College of William and Mary, Williamsburg, VA. 87 pp.
- Sherrod, S. K., W. R. Heinrich, W. A. Burnham, J. H. Barclay, and T. J. Cade. 1981. Hacking: A method for releasing peregrine falcons and other birds of prey. The Peregrine Fund, Inc. 62 pp.
- Watts, B. D., S. M. Padgett, M. A. Byrd, B. J. Paxton, and Jeffrey L. Cooper. 2002. FALCONTRAK: Year 2001 report. Center for Conservation Biology Technical Report Series. CCBTR-02-06. College of William and Mary, Williamsburg, VA. 46 pp.

Wiemeyer, S. N., R. D. Porter, G. L. Hensler, and J. R. Maestrelli. 1986. DDE, DDT and Dieldrin: residues in American Kestrels and relations to reproduction. U.S. Department of Interior, Fish and Wildlife Service Technical Report 6. Washington, D. C.