

**VIRGINIA PEREGRINE FALCON MONITORING AND
MANAGEMENT PROGRAM: YEAR 2006 REPORT**



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

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Virginia Department of Transportation
The Nature Conservancy
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Center for Conservation Biology

Front Cover: *Young falcon hatched 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 increased to 22 pairs during the 2006 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 22 resident pairs. Nesting structures included 10 peregrine towers, 7 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 73 eggs and 51 chicks that survived to fledging age. Reproductive rate was 2.3 chicks/occupied territory and 2.7 chicks/active territory. Of 17 clutches that were followed completely from laying to fledging, only 50 of 69 (72.5%) of eggs hatched. Of these 50 chicks, 49 (98%) survived to banding age and 48 (96%) fledged successfully.

The largest number of birds ever translocated in the state was moved from the coast to the mountains during the 2006 breeding season. As in recent years, birds were hacked from Hawksbill in Shenandoah National Park. In addition, a new hack site was created in the New River Gorge through a partnership with the National Park Service and West Virginia Department of Natural Resources. Birds used in hacks reflected the same source of birds from bridge sites that have been used in recent years and 5 chicks from lower Delmarva towers. The breeding season of 2006 represents a shift in the management of this population to utilize a portion of the productivity to fuel targeted hacks in the mountains. This strategy meets the objective of both repopulating the mountain range and reducing impacts to sensitive waterbirds. Efforts in future years should continue to support the establishment of a breeding pair within the New River Gorge and should establish the infrastructure and partnerships necessary for 2 additional hack sites in Virginia.

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 1950's, and into the 1960's 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 1960's.

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 2006, 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 two mountain hawk sites (Hawksbill in Shenandoah National Park and the New River Gorge). Most of the effort was focused on the coastal plain where the majority of breeding pairs occur.

Nest Site Surveys

Between 1977 and 2006 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 2006 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 (i.e. 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 wks 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 – Shawn Padgett with brood on reserve ship (*Bryan Watts*), reserve ship (*Shawn Padgett*), adult female (*Shawn Padgett*), Craig Stihler and Matt Varner (*Lorrie Sprague*), New River Gorge hack box (*Matt Varner*), James River brood (*Bryan Watts*), clutch on Stony Man (*Alan Williams*).

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 or red and black, alpha-numeric auxiliary band on the left leg. FWS bands used in Virginia during the 2006 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, 22 supported resident pairs. These included 10 peregrine towers, 7 bridges, 1 shack remnant on the seaside of the Delmarva (Deterioration of the Elkins Marsh shack and the Wachapreague shack has led to the establishment of towers to replace these structures), 1 high-rise building, 1 reserve ship, and 1 natural cliff face (Table 2).

Breeding Results

Virginia supported 22 known breeding pairs of Peregrine Falcons during the 2006 breeding season including 21 on the Coastal Plain and 1 in the mountains (Figure 1). Three 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 Elkins Marsh Shack where the mate appeared to be lost early in the year, West Norfolk that

has been erratic in recent years for unknown reasons, and Elkins Chimney where the female has not produced eggs in many years.

Table 1. Catalog of nesting structures established for Peregrine Falcons in Virginia (1977-2005). Table gives year of establishment and whether or not the site was checked for Peregrine Falcon activity during the 2006 breeding season. Dashed lines indicate that the structure is no longer present.

Site Code	Location Description	Structure Type	Year Est.	Checked 2006
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	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	-----

Table 1 - continued. Catalog of nesting structures established for Peregrine Falcons in Virginia (1977-2005). Table gives year of establishment and whether or not the site was checked for Peregrine Falcon activity during the 2006 breeding season. Dashed lines indicate that the structure is no longer present.

Site Code	Location Description	Structure Type	Year Est.	Checked 2006
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	Upsher 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
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 2006 breeding season.

Site Code	Location Description	Occ Terr	Active Nest	Eggs	Chicks Hatched	Band Age	Fledg
PEFA-02	Cobb Island Tower	Y	Y	4	4	4	4 ¹
PEFA-05	Metompkin Island Tower	Y	Y	4	2	2	2
PEFA-06	Wallops Island Tower	Y	Y	4	3	2	2
PEFA-09	Watts Island Tower	Y	Y	4	≥3	3	3
PEFA-12	Hyslop Marsh Tower	Y	Y	3	0	0	0 ²
PEFA-16	Elkins Marsh Chimney	Y	N	-----	-----	-----	-----
PEFA-17	Elkins Marsh Tower	Y	N	-----	-----	-----	-----
PEFA-18	Wachapreague Shack	Y	Y	3	3	3	3
PEFA-22	James River Bridge	Y	Y	4	4	4	4 ³
PEFA-23	Berkley Bridge	Y	Y	3	2	2	2
PEFA-24	Ben Harrison Bridge	Y	Y	4	3	3	3 ⁴
PEFA-25	Mills Godwin Bridge	Y	Y	4	3	3	3 ⁵
PEFA-26	West Norfolk Bridge	Y	N	-----	-----	-----	-----
PEFA-27	Norris Bridge	Y	Y	4	4	4	4 ⁶
PEFA-28	Stony Man, SNP	Y	Y	4	0	0	0 ⁷
PEFA-34	Mockhorn Island tower	Y	Y	4	3	3	3
PEFA-36	Upsher Bay tower	Y	Y	4	4	4	4
PEFA-56	River Front Plaza	Y	Y	4	4	4	4 ⁸
PEFA-60	Chesapeake Bay Bridge	Y	Y	4	0	0	0 ⁹
PEFA-62	Gull Marsh Tower	Y	Y	4	3	3	3
PEFA-63	Godwin Island Box	Y	Y	4	4	4	4 ¹⁰
PEFA-64	James River Ghost Fleet	Y	Y	4	4	4	4 ¹¹
Total		22	19	73	53	52	52

¹2 young translocated to New River Gorge and released.

²eggs appeared to be predated.

³3 young translocated to Shenandoah National Park, remaining chick fledged but later disappeared and likely killed on bridge.

⁴2 young translocated and fostered to pair at Stony Man, remaining chick fledged but later hit by truck on bridge.

⁵3 young translocated to New River Gorge and released.

⁶3 young translocated to New River Gorge and released.

⁷4 eggs flooded in storm, 2 young translocated from Ben Harrison Bridge fledged successfully.

⁸2 young translocated to Shenandoah National Park, 1 or remaining males picked up in Richmond with broken wing several weeks after fledging.

⁹male lost early in season.

¹⁰3 young translocated to New River Gorge and released.

¹¹4 young translocated to New River Gorge and released.

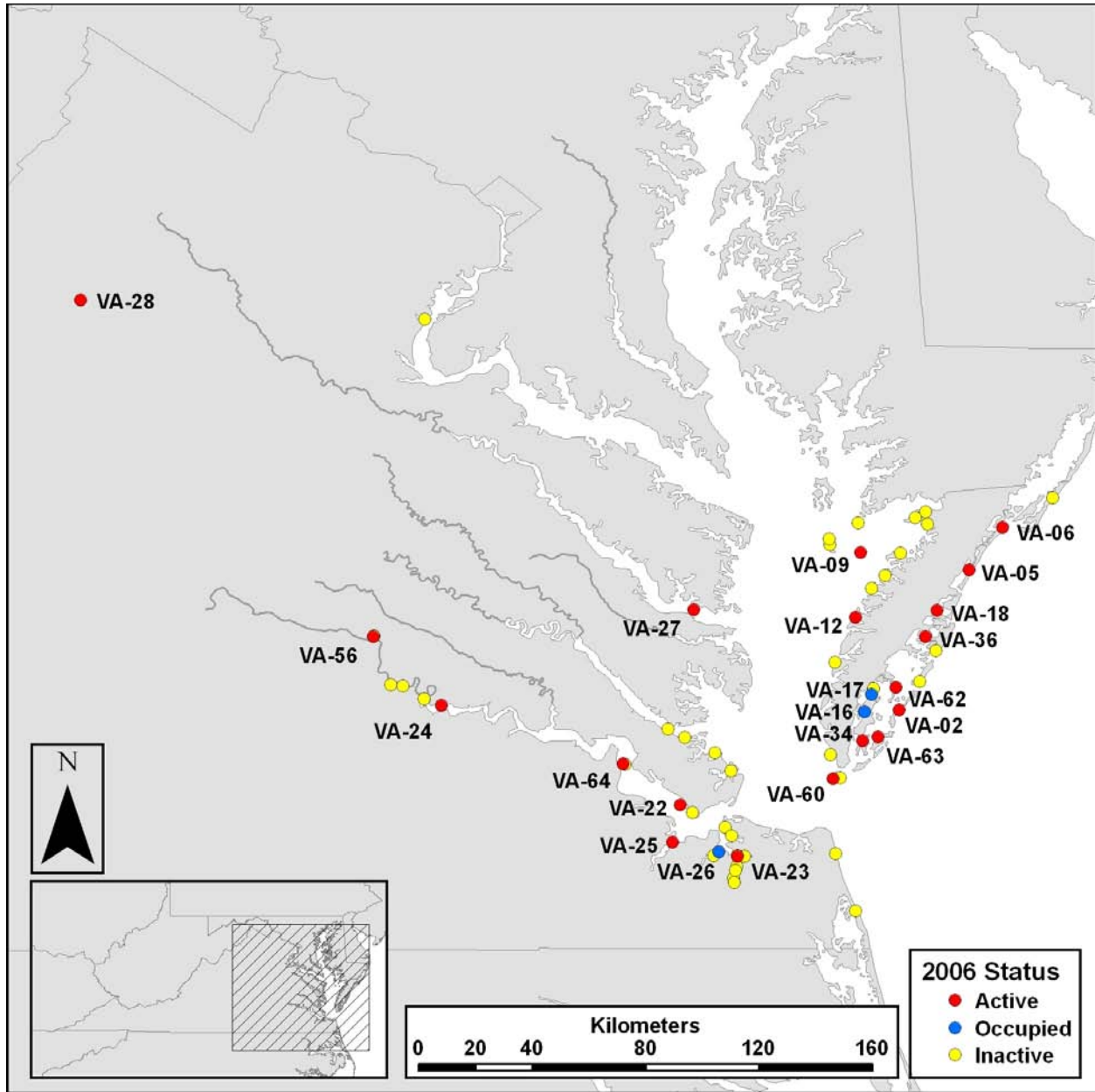


Figure 1. Map of nesting structures for Peregrine Falcons surveyed during the 2006 breeding season. Colors refer to activity status.

The 18 falcon pairs that made breeding attempts produced 73 eggs, at least 53 of which hatched. Fifty-two of these chicks survived to banding and 51 survived to fledging age. Fledging success was 2.3 chicks/occ terr and 2.7 chicks/act terr. It should be noted that much of the chick production resulted from management actions taken during the breeding season. Twenty-one (41.2%) of the 51 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 2006 breeding season, hatching and fledging rates were similar to recent years. Of 17 clutches that were followed completely from laying to fledging, only 50 of 69 (72.5%) of eggs hatched. Of these 50 chicks, 49 (98%) survived to banding age and 48 (96%) fledged successfully. No eggs hatched from 3 complete clutches including pairs nesting on Hyslop Marsh, Stony Man, and Chesapeake Bay Bridge. The Hyslop Marsh clutch appeared to be predated early in the season. The clutch on Stony Man was in a depression on the cliff with poor drainage and the eggs were flooded during a strong rain storm. The male was lost early in the season on the Chesapeake Bay Bridge and this likely resulted in the female abandoning the clutch. One of the chicks hatched on Wallops Island disappeared shortly after hatching. One of the males translocated to the New River Gorge for hacking was killed by a female in the hack box before release.

Banding

All of the falcon chicks (N = 52) that survived to banding age were fitted with both FWS and alpha-numeric bands. This included 31 females and 21 males (Table 3).

Table 3a. List of band codes for peregrine falcon chicks banded in Virginia during the 2006 breeding season (males).

FWS Band	A-N Band	Location	Date
Males			
2206-81627	00/W	Berkley Bridge	5-28-06
2206-81628	01/W	James River Bridge	5-14-06
2206-81629	02/W	James River Bridge	5-14-06
2206-81630	03/W	Riverfront Plaza	5-17-06
2206-81631	04/W	Ben Harrison Bridge	5-17-06
2206-81632	05/W	James River Ghost Fleet	5-24-06
2206-81633	06/W	Norris Bridge	5-24-06
2206-81634	07/W	Norris Bridge	5-24-06
2206-81636	08/W	Upsher Bay Tower	5-29-06
2206-81637	09/W	Upsher Bay Tower	5-29-06
2206-81638	10/W	Watts Island Tower	5-29-06
2206-81639	11/W	Watts Island Tower	5-29-06
2206-81640	12/W	Wachapreague Shack	6-17-06
2206-81641	13/W	Godwin Island Shack	6-21-06
2206-81642	14/W	Mills Godwin Bridge	6-22-06
2206-81643	15/W	Mills Godwin Bridge	6-22-06
2206-81644	16/W	Godwin Island Shack	6-22-06
2206-81645	17/W	Godwin Island Shack	6-22-06
2206-81646	18/W	Godwin Island Shack	6-22-06
2206-81647	19/W	Cobb Island Tower	6-22-06
2206-81648	90/S	Wallops Island Tower	7-3-06

Table 3b. List of band codes for peregrine falcon chicks banded in Virginia during the 2006 breeding season (females).

FWS Band	A-N Band	Location	Date
Females			
1807-02712	05/V	Berkley bridge	5-28-06
1807-02713	06/V	James River Bridge	5-14-06
1807-02714	07/V	James River Bridge	5-14-06
1807-02715	08/V	Ben Harrison Bridge	5-17-06
1807-02716	09/V	Riverfront Plaza	5-17-06
1807-02717	10/V	Riverfront Plaza	5-17-06
1807-02718	11/V	Riverfront Plaza	5-17-06
1807-02719	12/V	Ben Harrison Bridge	5-17-06
1807-02720	13/V	James River Ghost Fleet	5-24-06
1807-02721	14/V	James River Ghost Fleet	5-24-06
1807-02722	16/V	James River Ghost Fleet	5-24-06
1807-02723	17/V	Norris Bridge	5-24-06
1807-02724	18/V	Norris Bridge	5-24-06
1807-02725	19/V	Upsher Bay Tower	5-29-06
1807-02726	20/V	Upsher Bay Tower	5-29-06
1807-02727	21/V	Watts Island Tower	5-29-06
1807-02728	22/V	Mockhorn Island Tower	6-1-06
1807-02729	23/V	Mockhorn Island Tower	6-1-06
1807-02730	24/V	Mockhorn Island Tower	6-1-06
1807-02731	25/V	Gull Marsh Tower	6-1-06
1807-02732	26/V	Gull Marsh Tower	6-17-06
1807-02733	27/V	Gull Marsh Tower	6-17-06
1807-02734	28/V	Wachapreague Shack	6-17-06
1807-02735	29/V	Wachapreague Shack	6-17-06
1807-02736	30/V	Metompkin Tower	6-17-06
1807-02737	31/V	Metompkin Tower	6-17-06
1807-02738	32/V	Cobb Island Tower	6-21-06
1807-02739	33/V	Cobb Island Tower	6-21-06
1807-02740	34/V	Mills Godwin Bridge	6-22-06
1807-02741	35/V	Cobb Island Tower	6-21-06
1807-02742	36/V	Wallops Island Tower	7-3-06

Translocations

Twenty-two young falcons were translocated to be fostered or hacked during the course of the 2006 breeding season (Table 4). This included 12 females and 10 males. Eleven of these chicks originated on bridges that have a history of poor fledging success. The remaining 11 chicks were from towers along the Delmarva Peninsula (5), a ship in the James River Reserve Fleet (4), an office building in Richmond (2).

Table 4. Summary of translocation activities for Peregrine Falcons in Virginia during the 2006 breeding season.

FWS Band#	Hatch Site	Date Collected	Translocation Site
1807-02713	James River Bridge	5-14-06	Hawksbill, SNP
1807-02714	James River Bridge	5-14-06	Hawksbill, SNP
1807-02717	Riverfront Plaza	5-17-06	Hawksbill, SNP
1807-02718	Riverfront Plaza	5-17-06	Hawksbill, SNP
1807-02719	Ben Harrison Bridge	4-26-06	Stony Man, SNP ¹
1807-02720	James River Ghost Fleet	5-24-06	New River Gorge
1807-02721	James River Ghost Fleet	5-24-06	New River Gorge
1807-02722	James River Ghost Fleet	5-24-06	New River Gorge
1807-02723	Norris Bridge	5-24-06	New River Gorge
1807-02724	Norris Bridge	5-24-06	New River Gorge
1807-02740	Godwin Bridge	6-22-06	New River Gorge
1807-02741	Cobb Island	6-21-06	New River Gorge
2206-81628	James River Bridge	5-14-06	Hawksbill, SNP
2206-81631	Ben Harrison Bridge	4-26-06	Stony Man, SNP ¹
2206-81631	James River Ghost Fleet	5-24-06	New River Gorge
2206-81634	Norris Bridge	5-24-06	New River Gorge
2206-81642	Mills Godwin Bridge	5-22-06	New River Gorge
2206-81643	Mills Godwin Bridge	5-22-06	New River Gorge
2206-81644	Godwin Island	5-22-06	New River Gorge
2206-81645	Godwin Island	5-22-06	New River Gorge
2206-81646	Godwin Island	5-22-06	New River Gorge
2206-81646	Cobb Island	5-22-06	New River Gorge

¹Bird was fostered to natural site at Stony Man and raised by resident pair.

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. Modification of this location is needed to improve the likelihood of fledging successfully. The Richmond pair has a history of poor fledging success due to the amount of structure in the territory. The male that was left at the site fledged successfully but was later recovered on the VCU campus with a broken wing and transported to a rehabilitation facility. Young birds within these urban centers seem to have a high frequency of collisions.

Birds collected from territories were transported to Hawksbill and Stony Man in Shenandoah National Park and the New River Gorge. The 2 birds from the Ben Harrison Bridge were fostered to the pair on Stony Man after the storm flooded the clutch. These birds were only a few days old and were accepted and raised successfully by the resident pair. Five birds were hatched at Hawksbill and released on

2 June. The remaining 15 birds were hacked by the National Park Service with assistance by West Virginia DNR from a high-quality site within the New River Gorge.

DISCUSSION

The Virginia breeding population of Peregrine Falcons increased to 22 pairs during the 2006 breeding season. Since the first modern breeding in 1982, the population has exhibited a steady recovery with an average doubling time of 5.4 years. The population has increased by 4 pairs since 2003. The single new territory discovered appeared to represent the formation of a new territory on the James River Reserve Fleet. Workers on the fleet reported the birds in early April. The Center for Conservation Biology was contacted about a potential pair on 13 April, 2006 and upon investigation located a 4-egg clutch in a doorway of a reserve ship. A prior pair on a different ship maintained an active territory within the fleet between 1987 and 1997 but there has been no evidence of any activity since that time.

The reproductive rate measured in 2006 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 2006 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.

Re-establishment of the breeding population within the historic range in the mountains of Virginia continues to be disappointing. A systematic helicopter survey of more than 240 exposed rock surfaces in Virginia and West Virginia during the spring and summer of 2005 resulted in the discovery of no new breeding sites in Virginia (Watts and Padgett, unpublished data). This result seems to argue for a change in hacking strategy from the broadcast hacking efforts of the 1980s and 1990s to more targeted hacking with the intent of establishing pairs within specific, high-quality sites. The formation of the breeding territory on Stony Man was the direct result of hacking efforts in recent years.

Consistent with the objective of re-establishing a viable breeding population within the historic mountain range of Virginia is the use of coastal productivity to fuel targeted hacks in priority sites. 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 breeding season of 2006 represents a shift in the management of this population to utilize a portion of the

productivity to fuel targeted hacks in the mountains. 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 2006 breeding season. As in recent years, birds were hacked from Hawksbill in Shenandoah National Park. In addition, a new hack site was created in the New River Gorge through a partnership with the National Park Service and West Virginia Department of Natural Resources. Birds used in hacks reflected the same source of birds from bridge sites that have been used in recent years and 5 chicks from lower Delmarva towers. Efforts in future years should continue to support the establishment of a breeding pair within the New River Gorge and should establish the infrastructure and partnerships necessary for 2 additional hack sites 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 flooded during a spring storm. The problem of exposure and drainage has caused nest failures within other Virginia mountain sites during the 1990s. In this case, young chicks were fostered to the site, adopted by the pair, and raised successfully. The donor pair nests on the Ben Harrison Bridge, a site that has poor fledging success. This intensive management approach should continue in the future when feasible until the mountain population is self sustaining.

During the 2006 season, 5 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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