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Virginia Peregrine Falcon monitoring and management program: Year 2012 report

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**VIRGINIA PEREGRINE FALCON MONITORING AND
MANAGEMENT PROGRAM: YEAR 2012 REPORT**



**Center for Conservation Biology
College of William and Mary
& Virginia Commonwealth University**

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Project Partners:

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

Front Cover: *Hatch-year peregrine on Assateague Island, MD. Banded as a nestling at Possum Point, VA in 2012 with band black over green 14/AV. Photograph by Allen Sklar (NPS).*



The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

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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, most 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 22 known pairs during the 2012 breeding season. Since 1982, the population has exhibited a steady recovery with an average doubling time of 5.4 years. Fifty-three nesting structures were surveyed for Peregrine Falcon activity during the 2012 breeding season. Occupied nesting structures included 9 peregrine towers and 2 fishing shack on the Delmarva Peninsula; 5 bridges, 1 power plant stack, and 1 high-rise building in the coastal plain; and 4 natural cliff sites in the mountains. Nineteen falcon pairs made breeding attempts producing 65 eggs and 53 chicks that survived to fledging age. The reproductive rate was 2.5 chicks/occupied territory and 2.9 chicks/active territory.

Ten falcons representing 25% of the chicks produced in the state were translocated from the coast to the mountains during the 2012 breeding season. This included 4 females and 6 males. All translocated chicks originated on bridges that have a history of poor fledging success. Birds collected from bridge territories were transported to Hogback Mountain in Shenandoah National Park and released in a hacking program.

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. Since the program began in 2000, over 215 wild-reared falcons have been translocated from coastal breeding sites in Virginia to mountain release sites in Virginia and West Virginia. 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 Virginia now exceeded 20 pairs (Figure 1). However, both hatching rate and chick survival remain somewhat erratic in both the coastal and mountain breeding populations. 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.

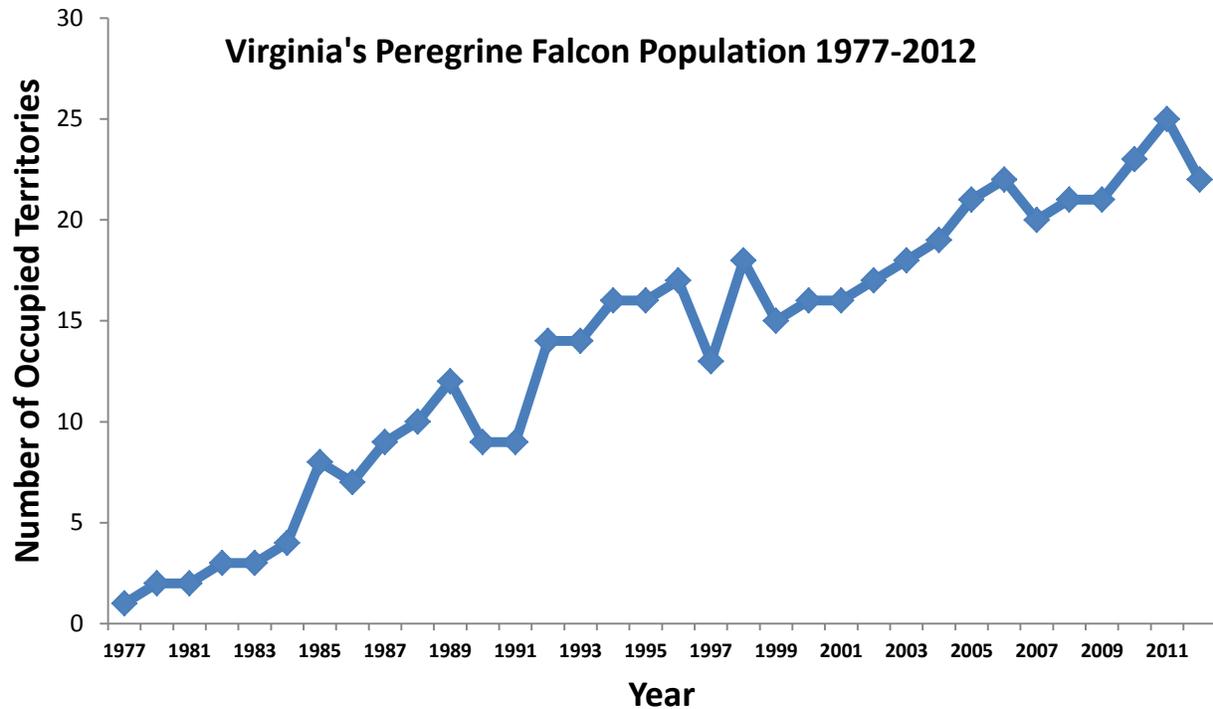


Figure 1. Breeding population of Peregrine Falcons in Virginia 1977-2012.

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 2012, the geographic scope of this project included 18 breeding locations within the coastal plain, 4 mountain cliff nesting sites, and 1 mountain hawk site at Hogback Mountain in Shenandoah National Park (Figure 2). Most of the effort was focused on the coastal plain where the majority of breeding pairs occur. In addition, breeding pairs documented by project partners at VDGIF (Harding 2012) and NPS (R. Gubler pers. comm.) are included in the state wide totals.

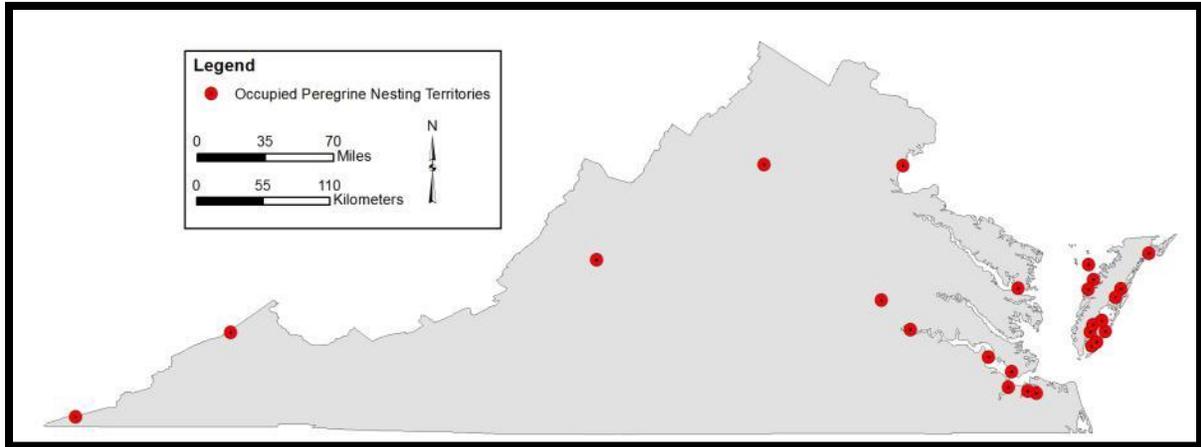


Figure 2. Map of territories monitored during the 2012 breeding season.

Nest Site Surveys

Between 1977 and 2009, more than 60 structures were established specifically for breeding Peregrine Falcons within the coastal plain of Virginia (Table 1). An effort was made to check all of the existing structures on the coastal plain that survived to the 2012 breeding season for evidence of resident falcons. An initial survey of breeding structures on the coastal plain was conducted between 1 March and 30 April by foot or boat. 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. Mountain sites were monitored by project partners.

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 when possible. 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. 2011).

Banding

An attempt was made to band all chicks surviving to banding age (18-32 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, alphanumeric auxiliary band on the left leg. USFWS bands used in Virginia during the 2012 breeding season were anodized



green. Band size 6 and 7a were used for male and female chicks respectively. Auxiliary bands were applied with two pop rivets.



Shawn Padgett with lone chick from Ben Harrison Bridge.



Shawn Padgett and Barbara Slatcher band chicks removed from the Norris Bridge with assistance from VDOT.

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 chicks were hacked from a high priority mountain site in Shenandoah National Park. Only chicks from bridge nests were removed for the hacking program because of limited space in the hack box. Nestlings on the Eastern Shore were left to fledge at their natal sites.

RESULTS

Site Surveys

Fifty-three nesting structures were surveyed for Peregrine Falcon activity during the breeding season (Table 1). Of the sites with known occupation, 22 supported resident pairs. Occupied nesting structures included 9 peregrine towers and 2 fishing shack on the Delmarva Peninsula; 5 bridges, 1 power plant stack, and 1 high-rise building in the coastal plain; and 4 natural cliff sites in the mountains. (Table 2).

Table 1. Catalog of nesting structures established for Peregrine Falcons in Virginia (1977-2009). Table gives year of establishment and whether or not the site was checked for Peregrine Falcon activity during the 2012 breeding season. Dashed lines indicate that the structure is no longer present.

Site Code	Location Description	Structure Type	Year Est	Checked 2012
VA-PEFA-02	Cobb Island Tower	Peregrine Tower	1978	Y
VA-PEFA-06	Wallops 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-12	Hyslop Marsh Tower	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 Tower	Nest Box/Tower	1997/2004	Y
VA-PEFA-18	Wachapreague Shack Tower	Peregrine Tower	1994/2000	Y
VA-PEFA-20	Coleman Bridge Box	Nest Box	1989	Y
VA-PEFA-21	Norfolk Southern RR Bridge	Bridge	1992	Y
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 ^b
VA-PEFA-29	Old Rag, SNP	Natural Cliff Face	----	Y ^b
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 ^e
VA-PEFA-36	Upsher Bay Tower	Peregrine Tower	2000	Y
VA-PEFA-37	Silver Beach Range Tower	Nest Box	1997	N
VA-PEFA-38	Hawksbill Mountain	Natural Cliff Face	----	Y ^b

Site Code	Location Description	Structure Type	Year Est	Checked 2012
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-48	Churchland Bridge	Nest Box	1999	Y
VA-PEFA-49	Yorktown Substation	Nest Box	1998	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 ^c
VA-PEFA-56	River Front Plaza Building	Nest Box	2002	Y ^c
VA-PEFA-57	BB&T Building	Nest Box	1984	Y ^c
VA-PEFA-58	Russell Island Tower	Peregrine Tower	1982	N
VA-PEFA-59	Bermuda Hundred	Nest Box	1998	Y
VA-PEFA-61	Tappahannock Bridge	Nest Box	2004	Y
VA-PEFA-62	Gull Marsh Tower	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	-----	----- ^d
VA-PEFA-65	Craddock Neck	Peregrine Tower		Y
VA-PEFA-66	Hoffler Building Virginia Beach	Nest Box	2009	Y
VA-PEFA-67	White Rocks	Natural Cliff Face	2010	Y ^b
VA-PEFA-68	Big House Mountain	Natural Cliff Face	-----	Y ^c
VA-PEFA-69	Breaks Interstate Park	Natural Cliff Face	-----	Y ^c
VA-PEFA-70	Pamunkey Bridge	Bridge	-----	Y

^a Nest monitored by NASA.

^b Nest monitored by NPS.

^c Nest monitored by VDGIF.

^d Boat sold by USDOT. New location of falcons unknown.

^e Raccoon in nest tower. Falcons not present.

Table 2. Summary of productivity results for Peregrine Falcon pairs in Virginia during the 2012 breeding season.

Site Code	Location Description	Occ Terr	Active Nest	Eggs	Hatched	Band Age	Fledged Successfully
VA-PEFA-02	Cobb Island Tower	Y	Y	4	4	3 ^a	3
VA-PEFA-06	Wallops Island Tower	Y	Y	2	2	0 ^b	0
VA-PEFA-09	Watts Island Tower	Y	Y	3	0		
VA-PEFA-10	Finney's Island Tower	Y	Y	3	3	3	2
VA-PEFA-12	Hyslop Marsh Tower	Y	Y	4	4	4	0
VA-PEFA-16	Elkins Marsh Chimney	Y	Y	4	4	4	3
VA-PEFA-17	Elkins Marsh Shack Tower	Y	Y	4	4	4	4
VA-PEFA-18	Wachapreague Shack Tower	Y	Y	4	4	4	3
VA-PEFA-22	James River Bridge	Y	Y	4	4	4	3 ^c
VA-PEFA-23	Berkley Bridge	Y	Y	>=3	>=3	3	2 ^d
VA-PEFA-24	Benjamin Harrison Bridge	Y	Y	3	3	1	1
VA-PEFA-27	Norris Bridge	Y	Y	>=3	>=3	3	2 ^e
VA-PEFA-28	Little Stony Man, SNP	Y	Y	>=2	>=2	>=2	2
VA-PEFA-36	Upsher Bay Tower	Y	Y	4	>=3	3	2
VA-PEFA-42	Possum Point Substation	Y	Y	4	2	2	2
VA-PEFA-52	I-64 Bridge	Y	Y	4	4	4	1 ^f
VA-PEFA-56	River Front Plaza Building	Y	Y	4	3	3	2 ^g
VA-PEFA-62	Gull Marsh Tower	Y	Y	4	4	4	4
VA-PEFA-63	Godwin Island Box	Y	Y	2	2	2	2
VA-PEFA-67	White Rocks	Y	? ^h				
VA-PEFA-68	Big House Mountain	Y	? ^h				
VA-PEFA-69	Breaks Interstate Park	Y	? ^h				
		22	19	65	58	53	38

^a One chick died shortly after hatching.

^b Egg shells found in nest. Assumed chicks died after hatching.

^c All 4 young translocated for hacking. One did not fledge successfully during hacking.

^d One chick euthanized at The Wildlife Center of Virginia for genetic abnormality (stunted growth). Two other chicks translocated for hacking.

^e All 3 young translocated for hacking. One did not fledge successfully during hacking.

^f One young translocated for hacking. Three too old to catch and did not fledge successfully.

^g Third chick died shortly after fledging after colliding with a building.

^h Unknown breeding status.

Breeding Results

Virginia supported 22 known breeding pairs of Peregrine Falcons during 2012 (Table 2). The 19 falcon pairs that were documented making breeding attempts produced 65 eggs, at least 58 of which hatched. Only 53 chicks were documented to survive to fledging age. The reproductive rate was 2.5 chicks/occupied territory and 2.9 chicks/active territory (Figure 4). Of 18 clutches that were followed completely from laying to fledging, 56 of 63 (88.8%) eggs hatched, 51 of the 56 (91.1%) chicks survived to banding age, and 36 of 51 chicks (70.6%) fledged successfully.

- The I-64 bridge (VA-PEFA-52) nest was active for the first time during the 2012 breeding season. Construction crews found four young in the nest box while installing scaffolding under the bridge. The chicks were close to fledging age and only one was translocated for hacking. The other three could not be safely accessed and did not survive fledging. This nest is difficult to access for banding and chicks will likely fledge on site in future years.
- The pair using the Hoffler Building (VA-PEFA-66) continue to use the site only in winter and leave by late April.
- The pair on the Benjamin Harrison Bridge (VA-PEFA-24) moved their nest from the bridge structure on the west tower back to the nest box on the east tower. The one chick was banded and left on site where it fledged successfully.
- The youngest chick on the James River Bridge (VA-PEFA-22) was removed from the nest, hydrated and fed at a local rehabber, and later hacked with its siblings.
- The ship that the JRRF (VA-PEFA-64) pair nested on was sold and removed from the fleet. It is unknown if they nested in a new location on one of the other ships in the ghost fleet.
- The nest box at Mockhorn Island (VA-PEFA-34) had a raccoon in it and no sign of falcons.
- The nest tower at Watts Island is close to being lost to erosion on the island (pers. comm. and image R. Boettcher, VDGIF).



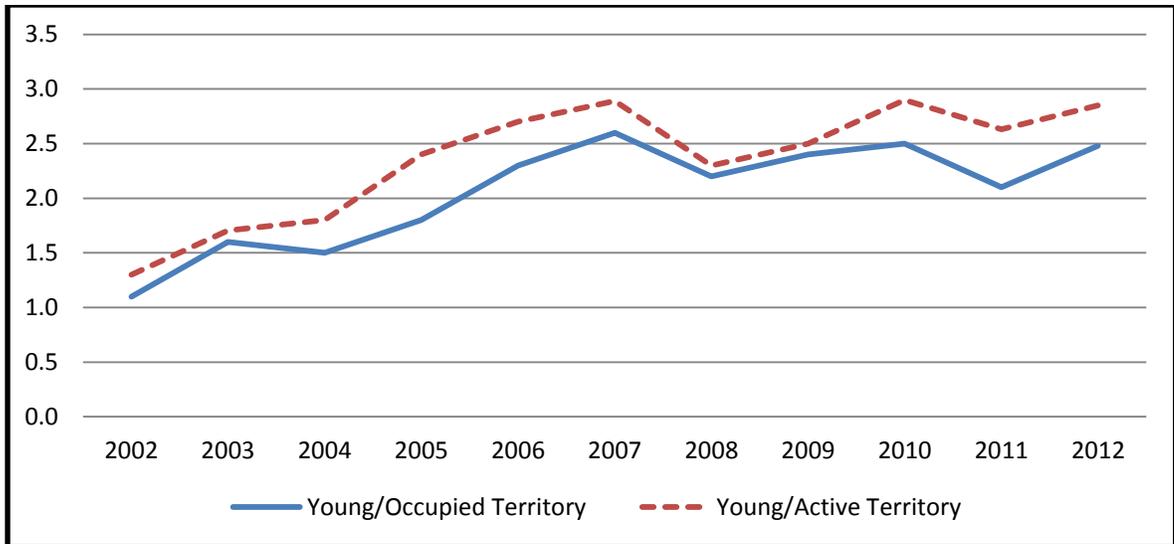


Figure 4. Productivity rates of Peregrine Falcon nests in Virginia.

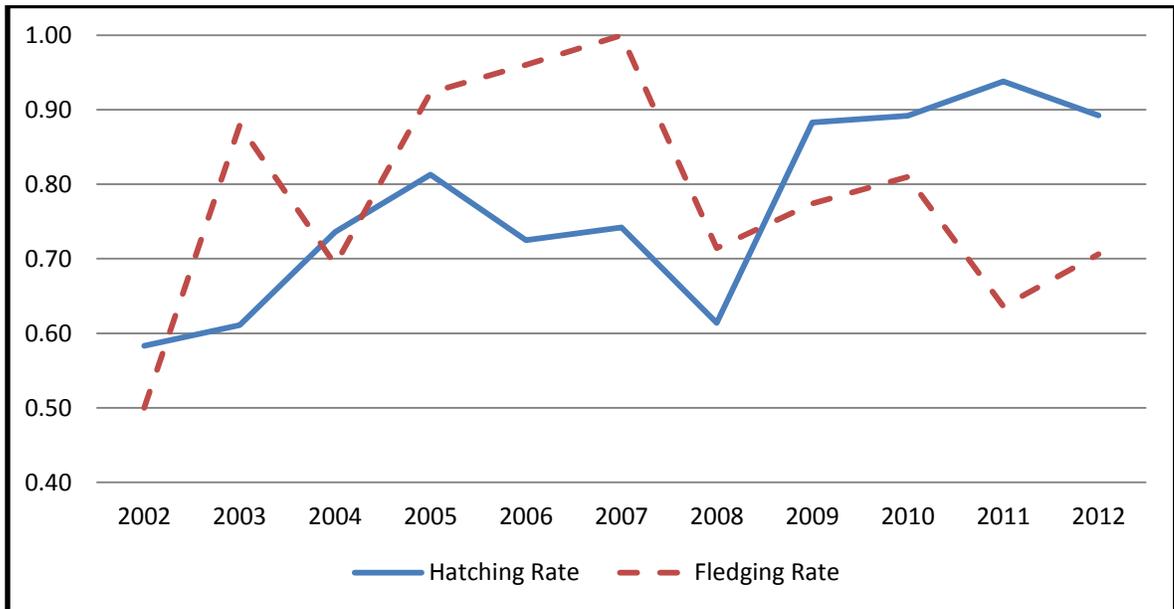


Figure 5. Hatching and fledging rates of Peregrine Falcon nests in Virginia.

Banding

All falcon chicks that survived to banding age were fitted with both USFWS and alpha-numeric bands. This included 26 females and 21 males (Tables 3a and 3b).

Table 3a. List of band codes for female peregrine falcon chicks banded in Virginia during the 2012 breeding season.

Band	Alpha-numeric Band	Nest	Date
1807-65052	13/AV	Benjamin Harrison Bridge	4/26/2012
1807-65053	14/AV	Possum Point Substation	5/12/2012
1807-65055	16/AV	James River Bridge	5/15/2012
1807-65056	17/AV	James River Bridge	5/15/2012
1807-65057	18/AV	Norris Bridge	5/15/2012
1807-65058	19/AV	James River Bridge	5/24/2012
1807-65059	20/AV	Hyslop Marsh Tower	5/20/2012
1807-65060	21/AV	Hyslop Marsh Tower	5/20/2012
1807-65061	22/AV	Elkins Marsh Shack Tower	5/29/2012
1807-65062	23/AV	Elkins Marsh Shack Tower	5/29/2012
1807-65063	24/AV	Elkins Marsh Shack Tower	5/29/2012
1807-65064	25/AV	Elkins Marsh Chimney	5/29/2012
1807-65065	26/AV	Elkins Marsh Chimney	5/29/2012
1807-65066	27/AV	Elkins Marsh Chimney	5/29/2012
1807-65067	28/AV	Upsher Bay Tower	5/31/2012
1807-65068	29/AV	Upsher Bay Tower	5/31/2012
1807-65069	30/AV	Wachapreague Shack Tower	5/31/2012
1807-65070	31/AV	Wachapreague Shack Tower	5/31/2012
1807-65071	32/AV	Gull Marsh Tower	5/31/2012
1807-65072	33/AV	Finney's Island Tower	6/5/2012
1807-65073	35/AV	River Front Plaza Building	5/17/2012
1807-65074	36/AV	River Front Plaza Building	5/17/2012
1807-65086	46/AV	Finney's Island Tower	6/5/2012
1807-65087	47/AV	Cobb Island Tower	6/9/2012
1807-65088	48/AV	Cobb Island Tower	6/9/2012
1807-65089	49/AV	Cobb Island Tower	6/9/2012

Table 3b. List of band codes for male peregrine falcon chicks banded in Virginia during the 2012 breeding season.

Band	Alpha-numeric Band	Nest	Date
1126-11878	56/AS	Possum Point Substation	5/12/2012
1126-11879	57/AS	James River Bridge	5/15/2012
1126-11880	58/AS	Norris Bridge	5/15/2012
1126-11883	61/AS	Norris Bridge	5/15/2012
1126-11883	63/AS	Hyslop Marsh Tower	5/20/2012
1126-11884	62/AS	I-64 Bridge	5/24/2012
1126-11886	64/AS	Hyslop Marsh Tower	5/20/2012
1126-11887	65/AS	Elkins Marsh Shack Tower	5/29/2012
1126-11888	66/AS	Elkins Marsh Chimney	5/29/2012
1126-11889	67/AS	Upsher Bay Tower	5/31/2012
1126-11890	68/AS	Wachapreague Shack Tower	5/31/2012
1126-11891	69/AS	Wachapreague Shack Tower	5/31/2012
1126-11892	70/AS	Gull Marsh Tower	5/31/2012
1126-11893	71/AS	Gull Marsh Tower	5/31/2012
1126-11894	72/AS	Gull Marsh Tower	5/31/2012
1126-11895	73/AS	Godwin Island Box	6/5/2012
1126-11896	74/AS	Godwin Island Box	6/5/2012
1126-11897	75/AS	Finney's Island Tower	6/5/2012
1126-11898	76/AS	Berkley Bridge	6/11/2012
1126-11899	77/AS	Berkley Bridge	6/12/2012
1126-11905	83/AS	River Front Plaza Building	5/17/2012

Band Resights

Effort was made to identify individual breeding adults at each nest by reading band codes. Four adults were identified through video cameras on nests and direct observations with telescopes and digital cameras. In addition, one falcon was photographed on a high rise in Falls Church but the federal band number and origin were not known at the time of this report (Table 4).

Table 4. List of resighted banded falcons in Virginia in 2012.

Date	USFWS	USFWS color	Color Band Code ¹	Color Band	Sex	Resight Location	Origin
4/21/2012	1807-02775	green	70/Z	black/green	F	Ben Harrison Bridge	VA
3/1/2012	2206-43454	green	*7/*C	black/green	M	James River Bridge	VA
1/2/2012	1807-02733	green	27/V	black/green	F	Cobb Island	VA
1/2/2012	2206-81686	green	X/37	black/green	M	Cobb Island	VA
7/11/2012	Unknown	Unknown	V/48	black/green	M	Falls Church, VA	unknown

¹ A * indicates the character is oriented horizontally on the band

Translocations

Ten young falcons were translocated to hacking sites during the course of the 2012 breeding season (Table 5). This included 4 females and 6 males. All of these chicks originated on bridges that have a history of poor fledging success. The sole hack site this year was at Hogback Mountain at Shenandoah National Park.

Table 5. Summary of translocation activities for Peregrine Falcons in Virginia during the 2012 breeding season.

Translocation Site	Band	Nest Site	Date Collected	Tape Color
SHENAHDOAH NP	1126-11879	James River Bridge	5/15/2012	blue
SHENAHDOAH NP	1126-11880	Norris Bridge	5/15/2012	red
SHENAHDOAH NP	1126-11883	Norris Bridge	5/15/2012	light red
SHENAHDOAH NP	1126-11884	I-64 Bridge	5/24/2012	silver
SHENAHDOAH NP	1126-11898	Berkley Bridge	6/11/2012	yellow
SHENAHDOAH NP	1126-11899	Berkley Bridge	6/12/2012	green
SHENAHDOAH NP	1807-65055	James River Bridge	5/15/2012	Purple ^a
SHENAHDOAH NP	1807-65056	James River Bridge	5/15/2012	pink
SHENAHDOAH NP	1807-65057	Norris Bridge	5/15/2012	dark pink ^a
SHENAHDOAH NP	1807-65058	James River Bridge	5/24/2012	white

^a Presumed not to have survived. Did not return to hack site after release.

Breeding pairs were documented in the mountains by the National Park Service Shenandoah National Park and In New River Gorge National Park. The Old Rag pair fledged at least 2 young in Shenandoah. In the New River Gorge, there was no falcon activity at the Endless Wall hack site but one falcon is consistently seen alone on the New River Gorge Bridge. The bird has not been identified but does have a green federal band indicating it is from Virginia. A pair made a breeding attempt at New River Gorge in Grandview at a crevice near the hack site. The nest failed for unknown reasons. The male is believed to be from the 2009 JRRF brood hacked in the gorge with band 1126-11812. This identification is based on colored tape on the alphanumeric band (black/silver).

Addled Eggs

Addled eggs were not collected during the 2012 breeding season. Eggs collected in previous years on this project were analyzed as part of a long term monitoring study of organochloride and polybrominated diphenyl ether contaminants by Da Chen and Rob Hale at the Virginia Institute of Marine Science (Chen et al 2008, Chen et al 2010).

DISCUSSION

The breeding population of Peregrine Falcons in Virginia has steadily increased since 1977. The number of breeding pairs in the state has leveled out to between 20-25 pairs over the last 5 years.

The reproductive rate increased in 2012 with the young per occupied territory and young per active territory continue within the range of the past 6 years. The 2012 productivity rates in Virginia were comparable to the average for peregrines in the Northeast US (2.1 young/active territory and 2.6/occupied territory; data collected by state wildlife agencies, USFWS *in litt.* 2009).

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 rates 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. Translocation of chicks from the Delmarva Peninsula was suspended in 2012 because of reduced space at the hack site. Priority was given to translocating chicks at bridge nests. This reduction in hacking effort is a result of hacked birds establishing breeding territories in Shenandoah NP and New River Gorge NP.

Nesting on natural cliff sites continues to be precarious. These nests have a history of problems from exposure, drainage, and depredation. Only one mountain nest was documented fledging young this year. The intensive management of the mountain falcon population through translocation and hacking should continue in the future until the mountain population is self-sustaining. The newly discovered pairs at White Rocks Breaks, and House Mountain are encouraging and future surveys of historic eyries should be considered to document additional breeding pairs.

Addled eggs will continue to be collected and analyzed in future years 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. These contaminants have been found in high level in falcon populations in the northeastern US and have the potential to affect avian productivity rates (Chen et al 2008, Chen et al. 2010, Potter 2004, Morse 1993, Weimeyer et al 1986).

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