



Records of New Jersey Birds



June through August, 2009 — Volume XXXVI, Number 1

Reestablishment of Peregrine Falcon (<i>Falco peregrinus</i>) on Lower Hudson River Cliffs, New Jersey, USA	2
Kathleen E. Clark* and Linn Pierson†	
SUMMER 2009 FIELD NOTES	7
50 YEARS AGO	21
Don Freiday	



**Editor,
Records of New
Jersey Birds**
Don Freiday

**Editor, Regional
Reports**
Scott Barnes

Contributors
Kathleen E. Clark
Don Freiday
Linn Pierson

Regional Editors
Rick Radis, Northwest
Patrick Belardo,
Piedmont
Scott Barnes, N. Coast
Steve Sobocinski,
Lower Delaware Valley
Vince Elia, S. Coast

Records of New Jersey Birds
June through August,
2009, Volume XXXVI,
Number 1, quarterly.
Published online by the
New Jersey Audubon
Society. General office:
9 Hardscrabble Road,
Bernardsville, NJ 07924.
Editorial office: CMBO,
600 Rte 47 N, Cape
May Court House,
NJ 08210. Tel. (609)
861-0700; e-mail:
don.freiday@njaudubon.
org. No parts of this maga-
zine may be reproduced
by any means without
the written consent of
New Jersey Audubon
Society.

Records of New Jersey Birds
is now available online on
the New Jersey Audubon
Society website.

Design and layout by
Middle Mountain
Designs.

Reestablishment of Peregrine Falcons (*Falco peregrinus*) on Lower Hudson River Cliffs, New Jersey, USA

by KATHLEEN E. CLARK* AND LINN PIERSON†

Summary

The Peregrine Falcon (*Falco peregrinus anatum* Bonaparte) was extirpated from the eastern United States by the early 1960s due to the impact of organo-chlorine pesticides. The eastern peregrine population was restored through the release of captive-bred birds, and the species was removed from the U.S. List of Endangered and Threatened Wildlife in 1999. We document another milestone: the return of this species to its historic habitat on cliffs along the Hudson River in northeastern New Jersey. In 2002 one pair established a territory and attempted to nest. In subsequent years we found up to four territories occupied, but estimate that six to eight nest territories might be suitable and eventually support the full restoration of this population.

Introduction

The eastern U.S. population of Peregrine Falcon (*Falco peregrinus anatum*) was estimated at 350 pairs prior to 1940 (Hickey 1942), but dropped precipitously after the introduction of DDT in the mid-1940s. The peregrine appeared to be extirpated from the eastern U.S. by 1964 (Berger et al. 1969), and its recovery began with the U.S. ban of DDT and an intensive restoration effort led by the Peregrine Fund, Inc. (Cade 2003). Listed as endangered on the U.S. Federal List of Endangered and Threatened Wildlife (50 CFR 17.11-17.12) in June 1970, the species was removed from the federal list on August 25, 1999. It remains listed as state-endangered in the northeast and mid-Atlantic states (except in NH, where it is state-threatened, and VT, where it is S2, "state rare"). The peregrine has been restored to much of its historic range in the east, with exception of the southern Appalachians in Virginia and West Virginia, and smaller parts of the range in the mid-Atlantic states.

South of the New England states, the initial attempts at reintroducing Peregrine Falcons at natural cliff habitats, by means of hacking (the human-assisted release of young falcons), failed due to high levels of predation, primarily by Great Horned Owls (*Bubo virginianus*). Consequently, the hacking of young falcons, particularly in the mid-Atlantic states, was shifted to man-made towers in coastal marshes where prey was

plentiful and predators were few. This recovery work was successful in restoring a breeding population of peregrines in most of the eastern states, including New Jersey, where the first nesting by restored peregrines took place in 1980 at Forsythe National Wildlife Refuge (Cade 2003).

Peregrine nesting in the early 1980s in New Jersey was limited to the same towers that had been hack sites. These proved successful as nest sites, and the population grew slowly from one pair in 1980 to 10 pairs by 1990. The first building nest-site (an oceanfront hotel in Atlantic City) was occupied in 1985 by an unmated female, and became an active nest site in 1988. Around the same time, peregrines began nesting on many major bridges on the lower Delaware River, including the Walt Whitman and Betsy Ross near Philadelphia. By 2000 the New Jersey population numbered 16 pairs, occupying 8 salt marsh



Peregrine Falcons resumed nesting on the Palisades in 2002 after being extirpated; in 2006 5 territories were occupied. 24 Mar 2009. Photo/Herb Houghton

COVER PHOTO: *Peregrine Falcon over the Palisades, 20 Mar 2009. Photo/Herb Houghton*

towers, 2 buildings, and 6 bridges (KEC unpubl. data). Productivity since 2000 has been generally good, ranging from 1.9 young per active nest on towers, 2.4 young per nest on buildings, and 1.3 young per nest on bridges (KEC unpubl. data). At these rates of productivity the population can be expected to continue to grow.

At the same time that New Jersey's population has been growing, the number of nests in nearby New York City has been expanding. Peregrines have nested on buildings in Manhattan since 1943 (Herbert and Herbert 1965), prior to the population decline. But after restoration began in the Northeast and mid-Atlantic states, >1980, peregrines occupied buildings and bridges around the city in increasing numbers in a domain of few predators and high prey (especially Rock Pigeon, *Columba livia*) populations. Improving nest ledges on buildings and bridges by providing nest trays or boxes has supported and promoted successful peregrine nesting (White et al. 2002, <<http://www.dec.ny.gov/animals/7059.html>>).

Prior to 1940, there were 9–11 pairs of Peregrine Falcons in New Jersey (Table 1). The study by Herbert

and Herbert (1965) of the Hudson River eyries (or nests) is the most thorough and informative source for historic nesting in northeastern New Jersey. They described 6 eyries as “situated on steep traprock cliffs with open, exposed ledges above the talus slope.” They documented 2 additional eyries in abandoned quarries, possibly not in the cliffs per se. They further described that “four, possibly five” of these sites met Hickey’s (1942) description of “first-class peregrine cliffs,” “ecological magnets” occupied by peregrines no matter what the level of disturbance.

Methods

We surveyed cliff habitat in the New Jersey section of the Palisades Interstate Park, Bergen County, each spring beginning in 2001. The cliff faces were observed from points above and below, at a distance to avoid any disturbance to nesting birds. A minimum of four hours of observation occurred at cliffs determined to be unoccupied. Observation points at the base of the cliffs were at river level where vegetation did not obstruct our view. The survey in 2005 included one trip by boat to observe the northern section of cliffs,



Table 1. Peregrine Falcon occupied territories and nests in New Jersey, pre-1940 to 1979 and 2001-2008.

Location	Lower Hudson River	Delaware River	Atlantic Coast	Lower Delaware River	Urban Centers
Site type	Cliffs	Cliffs	Man-made Towers	River Bridges	Buildings
<1940	≥6 ^a	4 ^b	NA	0	0
1940 – 1955	6-8 ^a	3 ^b	NA	0	NA
1956 – 1979 ^c	0	0	0	0	0
2001 ^d	1	0	10	3	2
2002	1	0	10	3	2
2003	2	1 ^e	10	3	2
2004	2	1 ^e	10	3	2
2005	3	0	10	3	3
2006	4	0	10	3	3
2007	4	0	10	3	3
2008	2	0	10	3	3

^a Herbert and Herbert 1965

^b Berry 2003

^c Berger et al. 1969

^d 2001-2008: KEC (unpubl. data)

^e McMorris and Brauning 2005

Table 2: Occupancy and productivity of Peregrine Falcon nests in the lower Hudson River cliffs, NJ, USA, 2001-2008. Active = pair laid eggs/number of young produced; Territorial = pair resident but did not lay eggs.

Territory	Fort Lee	Englewood	Tenaflly	Alpine	State Line	Mean prod. (young/attempt), all sites
No. ledges known	2	2	1	3	4	
Year						
2001					Territorial	0.00
2002					Active/0	0.00
2003		Active/0	Active/0	Active/1		0.33
2004		Active/unk	Unk	Active/2		1.00
2005	Active/4		Active/1	Active/3	Active/1	2.25
2006	Active/2	Active/0	Unk	Active/1	Active/>1	>/= 1.00
2007	Active/0		Active/0	Active/2	Active/0	0.50
2008			Unk	Active/2	Active/1	1.50
Mean prod. (young/	2.00	0.00	0.33	1.83	>/=0.60	

but in general we could observe the full extent of suitable habitat from ground-based locations.

Field-Site Description

Our surveys focused on the cliffs within the Palisades Interstate Park between Fort Lee and State Line in Bergen County, New Jersey. The cliffs are a columnar diabase, and range from 122 m to 183 m in height above the Hudson River. Vegetative cover on the cliff face ranges from sparse (<10% stunted trees or grasses in few available ledge outcroppings) to approximately 50% vegetative cover where accumulation of talus has lessened the slope and allowed vegetation to take hold. In some areas the cliff extends vertically nearly from river level, but along most of the 15-km length, there is forest between the Hudson River and the base of the cliff. Winter freeze and thaw action causes changes in the columnar rock by expanding fissures resulting in occasional rockslides. Such slides have produced expansive talus slopes near the base of the cliffs in much of the park.

Results

In 2001 we observed the first territorial pair of peregrines on the Palisades cliffs (Table 2). The pair was first observed in December 2000 engaged in courtship behaviors (aerial displays by the tiercel [male] and occasional prey provisioning to the female) in the northern, State Line, section of the park. The

pair was still actively courting in February 2001 when a new, juvenile female came into the territory and attempted to court the tiercel. The original, adult female was not seen after March 2001 and no nesting attempt was made that season. The juvenile female (color marked as a nestling in Pennsylvania in 2000) was not seen after May 2001.

In 2002 a pair was observed on a territory in the State Line section of the cliffs. The pair laid four eggs on 12 April and on 15 May, near the time of expected hatching, a heavy rainstorm flooded the nest ledge. The following day one cracked egg remained at the nest, and was gone one day later. This pair remained in the nest area for several weeks before their bond to the nest faded.

In the 2003 season, a pair established a territory in the Alpine area, approximately 4.5 km south of State Line. The pair was successful in fledging one young in late June. A second pair occupied a new nest ledge in the Englewood section, approximately 7.5 km south of Alpine. The nest could not be seen, but based on pair behavior incubation proceeded for 35 days before failing. The following year, the pair at Alpine nested again, but on a different ledge in the same territory and was successful in fledging two young. The Englewood territory was occupied for a second season, but the pair was again unsuccessful.

In 2005 the territory at Alpine was occupied for a third season using the same ledge as 2004, and

fledged three young. The Englewood territory was not occupied, but a pair appeared <3 km north in Tenafly. A fourth territory in the Fort Lee section was occupied and that pair fledged four young. We suspect this pair relocated to the Fort Lee cliff after nesting on the George Washington Bridge (0.75 km to the south) in previous years that spanned 1994–2004. A fifth territory was occupied in the State Line section, previously occupied in 2002; this new pair fledged one young.

In 2006 there were 5 occupied territories: Alpine, Englewood, Tenafly, Fort Lee and State Line (Figure 1). Three were successful in fledging 1–2 young each, but the Englewood site failed to produce yet again. In 2007, 4 territories were occupied, but an April 15 nor'easter storm with 20 cm of rain caused the failure of 3 nests. One nest, Fort Lee, survived with small nestlings, but failed one week later, presumably due to aerial predation. One pair (Alpine) renested and produced two young that fledged in late June.

In 2008, only two territories were known to be occupied, a decline of 50% from the previous year.



Figure 1. Map of the study area in northeastern New Jersey.

Only the Alpine nest, successful in 2007, remained active at the same ledge. The other known nest was at a new location near the most northern territory. Both nests were successful, but likely suffered losses of nestlings or eggs during nor'easter rain storms on May 9 and 12.

Discussion

As the Peregrine Falcon population has increased in the mid-Atlantic states, competition for suitable nest sites, such as elevated structures near water, has grown. The return of nesting peregrines to historic Hudson River cliff eyries is the result of an outgrowth of the expanding peregrine population breeding in the surrounding region, particularly those nesting on man-made sites. Since that time, the cliff-nesting population has grown to four pairs and seems likely to increase. The full restoration of this area's historic peregrine population, six to eight pairs, seems likely given the availability of suitable cliff habitat and the growing peregrine population in the region.

Possible impediments to full occupation of this cliff habitat include human disturbance and predators. The level of human use of this area is significant due to the park's proximity to New York City and a dense human population in northern New Jersey. There is heavy seasonal use of the park's roads, trails and picnic areas. However, recreational rock climbing, a management issue in New York and New England cliff areas, is prohibited in the Palisades Interstate Park. The populations of subsidized predators such as raccoons, skunks and gulls are likely to be at higher levels now than 50 years ago due to the sizeable human population. These predators, as well as Great Horned Owls, could reduce nest success at some sites. Indeed, owl predation is suspected for the loss of <1 week old chicks at the Fort Lee site in 2007.

We suspect that weather can be an important factor influencing whether peregrine nesting is successful at cliffs. When compared to nesting success of peregrines on man-made structures in New Jersey, we believe weather is less important. In 2007, three cliff sites failed due to heavy rains in April, while no such losses were recorded on man-made structures. In 2008, two rainstorms in May probably reduced the success of the two cliff nests, and did cause mortality of two nestlings in an east-facing box on a Jersey City building. The eastern exposure of the New Jersey Palisades makes nest sites vulnerable to nor'easter storms that can be expected on an irregular basis during the most sensitive time of late incubation and 0–1 week post-hatching. Weather and predation may be expected to influence the choice of ledges used for nesting, and manipulation of ledges by biologists could improve some ledges in these respects.

Continued monitoring of this reestablished cliff-





Peregrine Falcon on cliff, Palisades Interstate Park, Bergen, New Jersey 20 Mar 2009. The columnar basalt cliffs range from 122 m to 183 m above the Hudson River. Photo/Herb Houghton

nesting population is necessary to determine its long term stability and possible management issues. It remains to be seen if the cliffs will be occupied at their historic density level, and if manipulation of nest ledges or vegetation may improve conditions for successful and sustained nesting.

Acknowledgments

This work is a posthumous one for Linn Pierson, and is dedicated to her memory. We thank the Palisades Interstate Park Commission staff and their police department for their stewardship. Thanks also to N. Slowik and K. Habermann for their observations at Greenbrook Sanctuary. Funding was provided by the New Jersey Tax Check-Off for Wildlife and Federal Aid to Endangered Species.

Literature Cited

- Berger, D.D., C.E. Sindelar, Jr., and K.E. Gamble. 1969. The status of breeding peregrines of the eastern United States. Pp. 165–173 In J.J. Hickey (Ed.). *Peregrine Falcon populations: their biology and decline*. Univ. of Wisconsin Press, Madison, WI. 596 pp.
- Berry, R.B. 2003. History and extinction of the Appalachian peregrine. Pp. 35–55, In T.J. Cade, and W. Burnham (Eds.). *Return of the Peregrine: A North American saga of tenacity and teamwork*. The Peregrine Fund, Boise, ID. 394 pp.
- Cade, T.J. 2003. Starting The Peregrine Fund at Cornell University and eastern reintroduction. Pp. 73–103 In T.J. Cade, and W. Burnham (Eds.). *Return of the Peregrine: A North American saga of tenacity and teamwork*. The Peregrine Fund, Boise, ID. 394 pp.
- Herbert, R.A., and K.G.S. Herbert. 1965. Behavior of Peregrine Falcons in the New York City region. *Auk* 82:62–94.
- Hickey, J.J. 1942. Eastern population of the Duck Hawk. *Auk* 59:176–204.
- McMorris, F.A., and D.W. Brauning. 2005. Project Annual Report: Peregrine Falcon Research/Management. Unpublished report. PA Game Commission, Harrisburg, PA.
- White, C.M., N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In A. Poole and F. Gill (Eds.). *The Birds of North America*, No. 660. The Birds of North America, Inc. Philadelphia, PA.
- * Kathleen E. Clark, New Jersey Division of Fish and Wildlife, 2201 Route 631, Woodbine, NJ 08270
Email: kathy.clark@hughes.net .
Telephone: 609-628-1605
- † Linn Pierson, formerly of Palisades Interstate Park Commission, New Jersey Section.
Deceased 2007.