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## Peregrine Falcon Research and Management Program in New Jersey, 2010

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Photo by K. Clark taken at a nest site in Paulsboro found in 2010.  
This male, with leg band \*8/\*W, originally fledged from the Jersey City nest in 2003.

**Program Objective:** *To maintain, monitor and protect the Peregrine Falcon (Falco peregrinus anatum) population in New Jersey.*

### **Project Summary:**

In 2010 the New Jersey peregrine falcon population remained nearly steady at 25 known pairs, with generally good nesting success. One new pair was reported in 2010 at a site where they may have nested undetected since 2007. There were five occupied territories in cliff habitats, but none was successful.

Statewide, 14 pairs nested on towers and buildings, six on NJ bridges, and five on cliffs. Of 14 pairs on coastal structures and buildings, 13 nested successfully, producing 34 young for a rate of 2.42 young per active nest on towers and buildings. This is above the average of 1.78 recorded since 1986 when the population stabilized. New Jersey monitored four pairs on bridges spanning the NJ-PA border: pairs on the Betsy Ross and Walt Whitman bridges raised zero and three young, respectively; pairs at Burlington-Bristol and Tacony-Palmyra bridges produced four and one young, respectively. Other bridge nests in northern NJ were not monitored so their occupancy and outcome were unknown.

The peregrines on the natural cliff habitat increased to five pairs. Only one territory, furthest south on the cliffs, remained unoccupied and we suspect this pair nests on the NY side of the George Washington Bridge. Despite mild weather conditions, none of the five pairs was successful in fledging young. Two pairs laid second clutches after their first failed, but the second attempts also failed. There were no major storms that would account for this complete failure at the cliffs.

We donated nine peregrine nestlings to West Virginia where they were released at a mountain hawk site at the New River Gorge near Beckley. This project has already shown success: NJ peregrines from previous releases have been sighted nesting in southern and northern WV, advancing the goal of reestablishing peregrines in the historic Appalachian Mountain range.

We banded all but one of the 42 young produced at 18 nests, using both a federal band and a bicolor band with an alpha-numeric code. One young fledged before banding.

We collected five addled eggs from three sites for future analysis. The study of contaminants in mid-Atlantic eggs that was published in the journal *Environmental Contamination and Toxicology* (Clark et al. 2009) showed that coastal NJ eggs were of special concern in terms of elevated levels of PCBs and DDT compounds, and warrant continued study.

In 2010 we continued to use remote, motion-activated cameras to photograph peregrines at nests. Using this method we were able to read the leg bands on 19 breeding adults at ten nest sites. An additional ten birds were identified using optics. The additional information that these identifications provide is valuable for relating peregrine origin and age to nest success, site fidelity, and turnover rate in the population.

**Background:** The decline of the peregrine falcon in the eastern U.S. has been linked to persistent organochlorine pesticide contamination. The eastern population plunged from an estimated 350 active sites in the 1930's and 1940's to no active breeding birds in 1964 or 1975. Recovery work began in 1975 after the U.S. ban on DDT. The NJ Division of Fish and Wildlife and the Peregrine Fund first hacked falcons in 1975 at Sedge Islands Wildlife Management Area in Barnegat Bay, and expanded to several more sites until pairs established territories. Wild nesting first occurred at Forsythe National Wildlife Refuge in 1980 and expanded slowly until 1993, when the population stabilized. In New Jersey, one recovery goal is *consistent, successful nesting by eight to ten pairs*. While there have been 8-10 pairs successful since 1999 (disregarding the variable bridge sites), we also need to attain population stability in historic and protected nest sites. The reestablishment of peregrines in the Palisades cliffs in 2003 was the beginning of a more complete recovery, but nest success at the cliffs has been low and erratic. We also remain concerned about the effects of persistent organochlorine contaminants on the population. New Jersey coastal peregrines continue to have some of the heaviest loads of DDE and mercury (Clark et al. 2009). Our work to track life history and nest success, along with contaminant exposure, will help identify effects on the population. Annual monitoring includes tracking nests, banding young, and improving conditions at nest sites to enhance productivity.

### **Results and Discussion**

There were 25 occupied sites checked during the nesting season (Table 1), all of which were known or suspected to be active (with eggs). Fourteen pairs on towers and buildings continued to be the core of the nesting population, producing 34 young, for a productivity rate of 2.42 young per active nest. Of six pairs on bridges, four were known to have produced eight young, for a rate of 2.00 young/active nest (Fig. 2). Some previously occupied bridges (e.g., Hackensack, Newark Bay, Trenton) were not tracked. Five nest territories were occupied at the natural cliff habitat in northeastern NJ, the most we have observed, but none of the nesting pairs was known to produce any young this year.

All but one of the 42 young produced were banded with a black-anodized federal band and a black/green bicolor auxiliary band for future identification (Table 2).

The nest atop 101 Hudson Street in Jersey City remained a highlight for New Jersey peregrine watchers. The pair began incubation in early April and succeeded in raising four young that we banded May 25. One of the fledglings was injured shortly after fledging, but was treated at the Raptor Trust and released two weeks later. Another fledgling fractured her wing in mid-July, an injury that kept her at the Raptor Trust until late October, when she was returned to Jersey City. As in 2009, volunteer peregrine watchers documented the fledglings for weeks after fledging, during which time the young learned to fly and hunt with their parents in the skies above Jersey City. Their observations were documented in Nestbox News online (<http://njfishandwildlife.com/peregrinecam/jcp-2010nestnews.htm>).

For a fifth year, we donated peregrine nestlings to the New River Gorge hack site in West Virginia. A total of nine young (one from a building, four from bridges and four from coastal towers) were delivered to and hacked at the New River Gorge hack site. Information on the hack site can be found at: <http://www.nps.gov/neri/naturescience/peregrine.htm>. Moving young from the coastal population, where production is well above the minimum needed for population stability supports the recovery of the peregrine in the entirety of its range in the region, and specifically the southern Appalachian Mountains where peregrine nesting is still lacking.

### **Recoveries**

We re-sighted 19 breeding birds using a remote camera, and ten more using optics, at 19 sites. Of 29 birds re-sighted as nesting adults in NJ, 21 had been observed in 2009. Of the eight birds observed for the first time, three were at sites where no birds had been identified before. Thus, five (two females and three males) were new birds in 13 established pairs, representing a 19% turnover, something we are able to estimate with this resighting method. New breeding birds were recent fledges from Swan Bay, Ocean Gate, Sedge Island and Tuckahoe. An unusual find was a ten-year old male from CT that replaced the male in Elizabeth. Three newly-sighted birds (previously undocumented or at new sites) originated from Rhode Island, Pennsylvania, and Jersey City. The Jersey City bird, a male fledged in 2003, was probably nesting in Paulsboro for the last few years; his sister has been nesting in Elizabeth since 2005.

We were able to identify two falcons nesting at cliff sites. One female was the same bird observed in the second half of the 2009 season, a NY fledge from 2007. The other was a female that fledged from a bridge in Rhode Island in 2004. Both were paired with unbanded males.

- The female with \*P/\*G (black/*red*) band, which fledged from coastal Virginia, continued to nest at the Atlantic City Hilton (since 2002). She laid five eggs, but only two hatched.
- A female peregrine (1687-02852) that had been banded in Dividing Creek in 2010 was recaptured at a banding station in October 2010, in Assateague, Maryland.
- A female peregrine (987-95689), banded at Heislerville in 2007, was resighted in September, 2010 at Plum Island National Wildlife Refuge.
- At the nest in Manahawkin, the five-year old female nesting in March and April was apparently replaced by a two-year old female by mid-May. The nest failed, which was likely related to this takeover. The new female had fledged from a power plant nest site in CT in 2008.

**Conclusions:** The peregrine population increased slightly in 2010, and nest success and productivity were generally good. Nest success was about average at 68% and 1.79 young/active site of non-bridge sites (towers, buildings and cliffs). Across all sites (including bridges), 25 sites (16 successful) fledged 42 young, for a rate of 1.68 young/active site. In general, most coastal sites did well; losses to parasitic flies were minimized due to treatment of young hatchlings at some coastal sites, and the nest maintenance we performed last winter. The complete failure at the cliff nests, however, was very disheartening, and we could not attribute those failures to specific weather events that caused past losses. Closer observation is needed to determine the cause of those failures.

We plan to continue the investigation of contaminants in unhatched, salvaged eggs, as well as the close monitoring of nesting pairs to detect problems. New research suggests the high levels of brominated fire-retardant chemicals (polybrominated diphenyl ethers) found in peregrines may affect adult peregrine nesting behavior and nest success, which certainly bears watching in NJ.

Management of nesting pairs and nest sites is essential to maintain peregrines in New Jersey. Bridge-nesting birds are especially vulnerable to nest-site problems, and many other pairs occupy human-constructed sites. With site management and the cooperation of bridge and building staff, these sites can contribute to population viability and stability.

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***We remember Linn Pierson*** who was dedicated to the restoration of peregrines in New Jersey, and whose donation continues to support this work.

**References:**

Clark, K.E., Y. Zhao, and C. Kane. 2009. Organochlorine pesticides, PCBs, dioxins, and metals in postterm peregrine falcon (*Falco peregrinus*) eggs from the Mid-Atlantic states, 1993–1999. Arch. Environ. Contam. Toxicol. 57:174-184.



Female falcon at the Walt Whitman Bridge in May, 2010.

Table 1. Site-specific results of peregrine falcon nesting in New Jersey, 2010.

Name	Occup.	Active	Eggs	Yng Hatched	Yng@ BandAge	Yng Fledged	Comments
Sedge Island WMA Tower	Y	Y	3	2	2	2	Treated for flies ~3 d old
Forsythe NWR/Brigantine Tower	Y	Y	4	3	3	3	Coll 1 egg
Forsythe NWR/Barnegat Tower	Y	Y	3	0	0	0	
Marmora WMA / Sea Isle Tower	Y	Y	4	3	3	3	Coll 1 egg; 2 yng to WV
Great Bay WMA/ water tower	single	N					One ad obs. in May
Heislerville WMA Tower	Y	Y	4	4	4	4	2 yng to WV
Egg Island WMA Tower	Y	Y	4	4	4	4	Treated for flies ~3 d old
Swan Bay WMA Tower	Y	Y	4	3	3	3	Coll 1 egg/broken on collection
Tuckahoe WMA Tower	Y	Y	3	2	2	2	
Ocean Gate (AT&T) Tower	Y	Y	2	1	1	1	Not banded
Stone Harbor marsh	Y	Y	Unk	2	2	2	
Margate marsh	N	N					
Hilton/The Grand Casino	Y	Y	5	2	2	2	1 to WV; Coll 3 egg
101 Hudson, Jersey City	Y	Y	4	4	4	4	1 rehab'd > fledging; released 11/10
Newark -Broad St bldg.	U	U					
Elizabeth-Union Co. Court House	Y	Y	4	4	4	3	1 died at fledging
Sewaren building	U	U					
Refinery (Greenwich-Paulsboro)	Y	Y	unk	>1	1	1	Nestling/nest found in July
<b>SUBTOTAL TOWERS &amp; BUILDINGS</b>	14	14		35	35	34	
Natural Site C-1 (Alpine)	Y	Y	4	0	0	0	
Natural Site C-2 (South)	Y	Y	?	?	0	0	2 attempts
Natural Site C-3 (South)	N	N					
Natural Site C-4 (North)	Y	Y	? & 4	0	0	0	2 attempts
Natural Site C-5 (Tenafly)	Y	Y	?	?	0	0	
<b>SUBTOTAL NATURAL SITES</b>	5	5			0	0	
G. Washington Br. (Hudson River)	Y	Y	?	?	2	2	NY side/NY monitored
Betsy Ross Br. (Delaware River)	Y	Y	4	0	0	0	Wind destroyed nest
Walt Whitman Br. (Delaware R.)	Y	Y	4	3	3	3	2 to WV
Ben Franklin Br. (Delaware River)	Y	Y	?	>2	2	2	PA
NJ-PA Turnpike (Delaware River)	Y	Y	?	3	3	3	PA
Tacony-Palmyra (Delaware River)	Y	Y	?	1	1	1	
Burlington-Bristol (Delaware R.)	Y	Y	4	4	4	4	2 to WV
Rt 78-Scudders Falls Bridge	Y	Y	?	?	3	3	PA
Brigantine Bridge (A.C.)	N	N					
Vince Lombardi - NJTP Bridge	U	U					
Secaucus-Kearny NJTP Bridge	U	U					
Newark Bay Br. (NJTP or Conrail)	Y	Y	?	?	?	?	Conrail bridge
Trenton RR Bridge	U	U					
Route 3 Br./Hackensack (NJDOT)	Y	Y	?	?	?	?	
<b>SUBTOTAL BRIDGES</b>	6 (NJ)	6		8	>8	>8	
<b>TOTALS (NJ only)</b>	25	25		43	>43	42	(incl. 9 yng to WV)

<sup>1</sup> Identified as Carnidae (*Carnus hemapterus*)

Table 2. Band numbers of peregrine falcons banded at New Jersey nest sites in 2010. Auxiliary markers are black over green.

Band	Aux Mkr	Date	Location	Sex	Comments
1687-02834	A/16	16-May-10	Swan Bay	F	
1687-02835	A/18	20-May-10	Tacony-Palmyra Bridge	F	
1687-02836	A/19	31-May-10	Heislerville	F	
1687-02837	00/AE	25-May-10	Jersey City	F	Frac. humerus 7/12/10. Raptor Trust; rel. 10/29/10
1687-02838	01/AE	25-May-10	Jersey City	F	
1687-02839	02/AE	25-May-10	Jersey City	F	
1687-02840	03/AE	25-May-10	Jersey City	F	
1687-02841	04/AE	25-May-10	Union Co. Courthouse	F	Died early fledging 6/15/10, on-site
1687-02842	05/AE	25-May-10	Union Co. Courthouse	F	
1687-02843	06/AE	25-May-10	Union Co. Courthouse	F	
1687-02844	07/AE	26-May-10	Walt Whitman Br	F	Removed and hacked in WV
1687-02845	08/AE	26-May-10	Walt Whitman Br	F	
1687-02846	09/AE	27-May-10	A.C. Hilton	F	
1687-02847	10/AE	31-May-10	Heislerville	F	
1687-02848	11/AE	2-Jun-10	Burlington-Bristol Br	F	Removed and hacked in WV
1687-02849	12/AE	2-Jun-10	Burlington-Bristol Br	F	
1687-02850	13/AE	2-Jun-10	Burlington-Bristol Br	F	
1687-02851	14/AE	7-Jun-10	Egg Island/Dividing Cr	F	
1687-02852	15/AE	7-Jun-10	Egg Island/Dividing Cr	F	Recap 10/05/10 Assateague,MD
1687-02853	16/AE	7-Jun-10	Egg Island/Dividing Cr	F	
1687-02854	17/AE	11-Jun-10	Forsythe-Brigantine	F	
1687-02855	18/AE	11-Jun-10	Forsythe-Brigantine	F	
1687-02856	19/AE	3-Jul-10	Stone Harbor	F	
1687-02857	none	22-Sep-10	Tuckahoe WMA	F	(HY) Recov injured Aberdeen, rehabbed TRAC.
2206-75798	77/W	16-May-10	Swan Bay	M	
2206-75799	78/W	16-May-10	Swan Bay	M	
2206-75800	79/W	31-May-10	Heislerville	M	Removed and hacked in WV
2206-75801	00/AC	25-May-10	Union Co. Courthouse	M	Resighted 8/2/10 in Metuchen backyard
2206-75802	01/AC	26-May-10	Walt Whitman Br	M	Removed and hacked in WV
2206-75803	02/AC	27-May-10	A.C. Hilton	M	Removed and hacked in WV
2206-75804	03/AC	28-May-10	Sea Isle City	M	Removed and hacked in WV
2206-75805	04/AC	28-May-10	Sea Isle City	M	Removed and hacked in WV
2206-75806	05/AC	28-May-10	Sea Isle City	M	
2206-75807	06/AC	31-May-10	Heislerville	M	Removed and hacked in WV
2206-75808	07/AC	2-Jun-10	Burlington-Bristol Br	M	Removed and hacked in WV
2206-75809	08/AC	7-Jun-10	Egg Island/Dividing Cr	M	
2206-75810	09/AC	11-Jun-10	Forsythe-Brigantine	M	
2206-75811	10/AC	14-Jun-10	Tuckahoe	M	
2206-75812	11/AC	14-Jun-10	Tuckahoe	M	
2206-75813	12/AC	11-Jun-10	Sedge Island	M	
2206-75814	13/AC	11-Jun-10	Sedge Island	M	
2206-75815	14/AC	3-Jul-10	Stone Harbor	M	
2206-75816	15/AC	13-Jul-10	Paulsboro	M	



Figure 1. Nesting and productivity of peregrine falcons in New Jersey, with comparisons between towers/buildings, cliffs, and bridges.

