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Peregrine Falcon Research and Management Program in New Jersey, 2011

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Tiercel nesting at Forsythe National Wildlife Refuge that fledged from Sedge Island Wildlife Management Area in 2000. Photo by K. Clark.

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

Project Summary:

In 2011 the New Jersey peregrine falcon population remained nearly steady at 24 known pairs, with average nesting success. One nest site was made unavailable in 2011 but another site was reactivated after being displaced last year. Two pairs were likely active in Newark and Kearny (as determined by finding recent fledglings) but their locations were unknown. In general, nest success was a little lower than previous years, but remained well above the level needed to maintain a stable population.

Statewide, 14 pairs nested on towers and buildings, six on NJ bridges, and four on cliffs. Of 14 pairs on coastal structures and buildings, 11 nested successfully, producing 24 young for a rate of 1.71 young per active nest on towers and buildings. This is the average (1.78) recorded since 1986 when the population stabilized. Of six pairs using NJ bridges, New Jersey monitored three pairs spanning the NJ-PA border: the Betsy Ross, Burlington-Bristol and Tacony-Palmyra raised four, four and two young, respectively. One new bridge, in Belmar, was unsuccessful; other bridge nests in northern NJ were not monitored so their occupancy and outcome were unknown.

The peregrines on the natural cliff habitat dropped back by one to four pairs. For the first time since 2008, two pairs successfully fledged two young each. A third nest site was occupied by ravens but the falcons, active about a half-mile away, apparently failed.

We donated eleven peregrine nestlings to West Virginia where they were released at a mountain hack site at the New River Gorge near Beckley. Peregrines from prior releases in WV have been resighted nesting on a quarry cliff in northern WV, and on a bridge in southern WV; with a few sightings elsewhere on cliffs. This may be the last year for WV's hacking project.

We banded all but five of the 35 known young produced at 18 successful nests, using both a federal band and a bicolor band with an alpha-numeric code. Two young were inaccessible at an oil refinery site, two fledged from hard-to-reach cliff site, and one fledged prior to discovery from a salt marsh osprey nest.

We collected six 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 2011 we continued to use remote, motion-activated cameras to photograph peregrines at nests. Using this method we read the leg bands on 19 breeding adults at nine nest sites (three adults were identified at one site). An additional nine adults were identified using optics. The oldest birds identified were a 15 year old female at Ocean Gate (a nest that failed in 2011 and has produced just two young in the last four years) and a 12 year old male nesting at Swan Bay WMA. The information that these identifications provide is immensely 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 24 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 24 young, for a productivity rate of 1.71 young per active nest. Of six pairs on bridges, four were known to have produced ten young, for a rate of 2.50 young/active nest (Fig. 2); however, two of those young died post-fledging on the bridge roadways. Some previously occupied bridges (e.g., Hackensack, Newark Bay, Trenton) were not tracked. Four nest territories were occupied at the natural cliff habitat in northeastern

NJ, and two of them fledged two young each, the first time since 2008. Ravens occupied one nest site used by peregrines last year.

All but five of the 38 young produced were banded with a black-anodized federal band and a black/green bicolor auxiliary band for future identification (Table 2). Two young could not be reached at a cliff nest; and three young fledged unbanded from one industrial site and one osprey nest (discovered in June).

The nest atop 101 Hudson Street in Jersey City remained a highlight for New Jersey peregrine watchers. The pair began incubation 4 April and hatched three on 6 May; an inspection one week later showed the third chick to be impaired and he was removed and transferred to Tri-State Bird Rescue & Research. He was later deemed non-releasable and was transferred to a local wildlife educator. The other two young fledged successfully in late June and their post-fledging success was documented locally by volunteer peregrine watchers. Their observations were documented in Nestbox News online (http://njfishandwildlife.com/peregrinecam/jcp-2011nestnews.htm).

For a sixth year, we donated peregrine nestlings to the New River Gorge hack site in West Virginia. A total of ten young (six from bridges, two from coastal tower, and two found in Newark and Kearny as recent fledglings) 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 nine more using optics, at 16 sites. Of 29 birds re-sighted as nesting adults in NJ, 23 had been observed in 2009. Of the six birds observed for the first time and replacing other birds, four were males and two were females. Two of these previously-unrecorded males were both seen at the Manahawkin nest: an 11-year old from Brigantine and a two year old from Swan Bay; it's likely the two-year old was not the dominant male there, but it is unusual for a second male to be tolerated, and this nest failed this season. Also interesting was the move of the 2010 male from Heislerville to Sea Isle City this season after the Heislerville nest box was closed down. Of three adults in pairs not previously observed, only one was banded and identifiable. In total, five (two females and three males [excepting the second male at one nest]) were new birds in 13 established pairs, representing a

19% turnover. New breeding birds were recent fledges from Swan Bay, Brigantine and CT. An unusual find was an 11-year old male from Brigantine that replaced a younger male at Manahawkin, even though he contended with a two-year old male and the nest failed this year. Another unusual entry for this year was the observation of a 15-year old female nesting at Ocean Gate, although the nest failed this year and produced just two young in the last four years, a result that is likely to be related to her age. The next-oldest birds observed were a 13-year old female at Atlantic City, and a 12-year old male at Swan Bay. Average age of known-age males and females was 7.6 years and 7.3, respectively.

- One female at a cliff site was confirmed as the same bird as previous two seasons, a NY fledge from 2007; she continued to be paired with an unbanded male.
- The female with *P/*G (black/red) band, which fledged from coastal Virginia, continued to nest at the Atlantic City Hilton (since 2002). For a second season she laid five eggs but only two hatched.
- One female (M/*S [black/red]) was observed in a pair nesting on the Brooklyn Detention Complex. NY; she fledged from Jersey City in 2004.
- An adult male was spotted at the Verizon building in White Plains, NY; he had been banded with X/82 (black/green) at the Alpine cliff nest in 2008.
- A peregrine banded last year in Tuckahoe was found dead in Northfield, NJ in March, 2011, having hit a house window.

Conclusions: The peregrine population remained steady in 2011, and nest success and productivity were adequate and on par with the long term average (Figure 1). Across all sites – towers, building, bridges and cliffs – nest success was 75% and produced 1.46 young/active site. The tower and building nest sites are the consistent center of the population in NJ, without which the population would fluctuate widely year to year. Management of nest sites, mainly to provide safe, undisturbed situations for the birds, continues to be the predominant factor in a stable and productive population. Nest success at cliff sites was a great improvement over recent years, but the difficulty of watching these nests and identifying failures continues.

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 legacy 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.

Table 1. Site-specific results of peregrine falcon nesting in New Jersey, 2011.

Name	Occupied	Active	Eggs	Yng Hatched	Yng@ BandAge	Yng Fledged	Comments
Sedge Island WMA Tower	Y	Y	Unk	1	1	1	
Forsythe NWR/Brigantine Tower	Y	Y	3	3	2	2	1 hatchling died @1 d; Carnus fly infestation
Forsythe NWR/Barnegat Tower	Y	Y	4	1	1	1	Coll 2 eggs
Marmora WMA / Sea Isle Tower	Y	Y	4	1	1	1	Coll 2 broken eggs
Great Bay WMA/ water tower	single	N					
Heislerville WMA Tower	N/A						Box removed; set 5/2 @prison
Egg Island WMA Tower	Y	Y	4	4	4	4	3 transferred to WV
Swan Bay WMA Tower	Y	Y	4	2	2	2	
Tuckahoe WMA Tower	Y	Y	3	1	1	1	Coll. 2 eggs
Ocean Gate (AT&T) Tower	Y	Y	≥2	0	0	0	Unknown interference?
Stone Harbor marsh	Y	Y	3	3	3	3	
Margate marsh	Y	Y	Unk	Unk	Unk	≥1	Ospr nest 167-B-16; not banded
Hilton/The Grand Casino	Y	Y	5	2	2	2	Coll 2 eggs
101 Hudson, Jersey City	Y	Y	4	3	2	2	1 removed @1wk, rehabbed & unreleasable
Newark –*Unknown location*	U					1	Found, rehabbed, WV
Elizabeth-Union Co. Court House	Y	Y	3	3	3	3	
Sewaren building	U	U					
Refinery (Greenwich-Paulsboro)	Y	Y	unk	2	2	2	Not banded
SUBTOTAL TOWERS & BUILDINGS	***14***	***14***		***26***	***24***	***26***	
Natural Site C-1 (Alpine)	Y	Y	4	2	2	2	Banded 6/6
Natural Site C-2 (South)	Y	Y	Unk	≥2	2	2	Not banded
Natural Site C-3 (South)	N	N					
Natural Site C-4 (North)	Y	Y	Unk	0	0	0	
Natural Site C-5 (Tenafly)	PO	PA	?	?	0	0	
SUBTOTAL NATURAL SITES	***4***	***4***		***4***	***4***	***4***	
G. Washington Br. (Hudson River)	Y	Y					NY side/NY monitored
Betsy Ross Br. (Delaware River)	Y	Y	4	4	4	4	3 transferred to WV; 4th died on roadway
Walt Whitman Br. (Delaware R.)	Y	Y	?	3	3	3	PA
Ben Franklin Br. (Delaware River)	Y	Y	?	4	4	4	PA
NJ-PA Turnpike (Delaware River)	Y	Y	?	3	3	3	PA
Tacony-Palmyra (Delaware River)	Y	Y	?	2	2	2	1 died on roadway
Burlington-Bristol (Delaware R.)	Y	Y	4	4	4	4	3 transferred to WV
Rt 78-Scudders Falls Bridge	Y	Y	?	?			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	?	?	?	?	Unknown outcome
Route 35/Belmar Bridge	Y	Y	?	?	0	0	
SUBTOTAL BRIDGES	***6 (NJ)***	***6***		***6***	***≥8***	***≥8***	
TOTALS (NJ only)	**24**	**24**		**36**	**≥38**	**≥38**	**(incl. 11 yng to WV)**

Table 2. Band numbers of peregrine falcons banded at New Jersey nest sites in 2011. Auxiliary markers are black over green.

Band number	Color band	Date	Location	Sex	Comments
1687-02858	00/AN	19-May-11	Tacony-Palmyra Bridge	F	
1687-02859	01/AN	21-May-11	Swan Bay	F	
1687-02860	02/AN	21-May-11	Swan Bay	F	
1687-02861	03/AN	25-May-11	Union Co. Courthouse	F	
1687-02862	04/AN	25-May-11	Union Co. Courthouse	F	
1687-02863	05/AN	25-May-11	Union Co. Courthouse	F	
1687-02864	06/AN	31-May-11	Jersey City	F	
1687-02865	07/AN	1-Jun-11	Burlington-Bristol Br	F	
1687-02866	08/AN	26-Jun-11	Burlington-Bristol Br	F	Transported & hacked in WV
1687-02867	09/AN	26-Jun-11	Burlington-Bristol Br	F	Transported & hacked in WV
1687-02868	10/AN	2-Jun-11	Sedge Island	F	
1687-02869	11/AN	2-Jun-11	Forsythe-Manahawkin	F	
1687-02870	12/AN	26-Jun-11	Egg Island/Dividing Cr	F	Transported & hacked in WV
1687-02871	13/AN	6-Jun-11	Palisades-Alpine	F	
1687-02872	14/AN	8-Jun-11	Betsy Ross Bridge	F	Killed on bridge roadway, 7/10/11
1687-02873	15/AN	29-Jun-11	Betsy Ross Bridge	F	Transported & hacked in WV
1687-02874	16/AN	29-Jun-11	Betsy Ross Bridge	F	Transported & hacked in WV
1687-02875	17/AN	10-Jun-11	Tuckahoe	F	
1687-02876	18/AN	18-Jun-11	Stone Harbor	F	
1687-02877	19/AN	22-Jun-11	Forsythe-Brigantine	F	
1687-02878	20/AN	11-Jul-11	Newark area	F	Found grounded; rehabbed TRT. Transported & hacked in WV
2206-75817			Band Destroyed		
2206-75818	16/AC	19-May-11	Tacony-Palmyra Bridge	F	Killed on roadway, 7/20/11
2206-75819	17/AC	31-May-11	Jersey City	M	
2206-75820	18/AC	26-Jun-11	Burlington-Bristol Br	M	Transported & hacked in WV
2206-75821	19/AC	3-Jun-11	A.C. Hilton	M	
2206-75822	00/AM	3-Jun-11	A.C. Hilton	M	
2206-75823	01/AM	26-Jun-11	Egg Island/Dividing Cr	M	Transported & hacked in WV
2206-75824	02/AM	4-Jun-11	Egg Island/Dividing Cr	M	Transported to TRBRR
2206-75825	03/AM	4-Jun-11	Egg Island/Dividing Cr	M	
2206-75826	04/AM	6-Jun-11	Palisades-Alpine	M	
2206-75827	06/AM	29-Jun-11	Betsy Ross Bridge	M	Transported & hacked in WV
2206-75828	07/AM	10-Jun-11	Sea Isle City	M	
2206-75829	08/AM	18-Jun-11	Stone Harbor	M	
2206-75830	09/AM	18-Jun-11	Stone Harbor	M	
2206-75831	10/AM	22-Jun-11	Forsythe-Brigantine	M	
2206-75832	11/AM	11-Jul-11	Kearny area	M	Found grounded; rehabbed TRT. Transported & hacked in WV

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