PEREGRINE FALCON DISPERSAL AND HABITAT IMPRINTING (1994-2013)

BY

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ABSTRACT

Following the DDT-induced population collapse in the mid-twentieth century, peregrine falcons were extirpated throughout Pennsylvania. As a result of decades of recovery efforts, peregrine falcon populations have experienced rapid growth, and their populations are still expanding. Yet, the majority of occupied nest sites are no longer on cliff sites along major river corridors, but rather on anthropomorphic structures, such as bridges, buildings and smokestacks. This study focuses on the recovering peregrine falcon (*Falco peregrinus*) population in eastern North America. This study examines peregrine falcons' proclivity for habitat imprinting on anthropomorphic structures for breeding. The study also examines sex-biased differences in dispersal from banding to breeding site.

Archival data from the Pennsylvania Game Commission's (PGC) Peregrine Falcon Research Management Program annual reports, 1994-2013, were used to assess peregrine behavior. Female peregrine falcons showed significantly longer average dispersal distances (243.7 km, n=54) than males (111.2 km, n=32). Peregrine falcons banded on anthropomorphic structures showed statistically significant nesting preferences to urban structures, however not absolute (n=87). These findings have important management implications for meeting Pennsylvania's targeted population goals for endangered species delisting. Since a primary component of recovery is to increase cliff nest sites, the findings may assist in efforts to identify suitable sites and determine limiting factors to achieve the targeted population recovery.

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BACKGROUND AND LITERATURE REVIEW

Habitat imprinting and dispersal are important behaviors in the lives of animals, however in most species; these behaviors are poorly understood (Walters 2000; Clark et al. 2004; Faccio et al. 2013). Habitat imprinting is defined as a young bird's innate preference for a location or object derived from recognition at birth or learning early in life. Understanding possible nesting preferences is important for endangered species management of peregrine falcons, a species of conservation concern that nests on a variety of objects (e.g. cliffs, bridges, smokestacks) in different locations (Faccio et al. 2013). Prior to the DDT-induced population crash, notably by dichloro-diphenyl-trichloroethane (DDT) and its breakdown product dichloro-diphenyl-dichloroethylene (DDE), Pennsylvania's peregrine falcons nested primarily on cliffs overlooking the Delaware, Susquehanna and Juniata rivers and their tributaries (Fig. 1 and Table 1) (Poole 1964). Today, peregrine falcons nest mainly on anthropomorphic structures, often in nest boxes within cities. This urban nesting behavior contradicts the population's recovery goal for delisting that emphasizes breeding on cliffs rather than in urban areas. Analyzing patterns in nesting site preferences may further an understanding of habitat and nest site selections.

Nest Site Preferences

Research provides evidence regarding habitat imprinting by peregrine falcons. Some bird species, including peregrine falcons and other raptors, imprint to nest, such that future nest type preference are influenced by natal experiences and may influence future nest site selection (Immelmann 1975, White et al. 2002, Stamps and Swaisgood 2007). Peregrine falcons show high fidelity to nest sites, and these favored locations are often used by a succession of adults (Pagel 1989, Ratcliffe 1993).

According to a 2002 study, the author and colleagues attribute the modern preference of peregrine falcons nesting on urban structures to the captive-release breeding program (White et al. 2002). During the captive-release or hacking program, hack boxes were placed on urban structures, to reduce predation. Given that peregrine falcons are highly territorial with a high degree of mate and site loyalty, the recovery effort may have ultimately imprinted peregrine falcons to urban structures (Ratcliffe 1993, White et al. 2002).

In 2013, Faccio and colleagues published a 20-year investigation of peregrine falcon dispersal throughout New England (Faccio et al. 2013). The study looked at movement patterns, dispersal, mortality causes and survivorship using data from band recoveries and encounters. The study showed that peregrine falcons had a "strong preference to settle at nest sites similar to those from which they fledged" (Faccio et al. 2013). For example, in the study out of 31 peregrine falcons fledging from cliff sites, 81% became cliff nesters (Faccio et al. 2013). In a 2015 study of 152 peregrine falcon nest sites, Gahbauer and colleagues found similar results. In Ontario, 97% of birds hatched in urban habitats also bred in cities (Gahbauer et al. 2015). This is consistent with an earlier result indicating that 91% of peregrine falcons from eastern Canada returned to habitat similar to that where they were raised or released (Holroyd and Banasch 1990).

Habitat selection also includes the concept of natal habitat preference induction (NHPI). The NHPI suggests that when dispersers experience a favorable condition in their natal habitat, difficulty may arise when identifying other quality, yet unfamiliar habitats (Stamps and Swaisgood 2007). The NHPI further suggests that dispersers prefer to settle in familiar kinds of habitat with familiar cues for survival and individual fitness.

Sex-Biased Dispersal Distances

To better understand habitat imprinting, it also is important to comprehend dispersal. Herein, dispersal is defined as the movements of fledged peregrine falcons from banding site to their eventual nesting site. Investigating peregrine falcons dispersal patterns is essential, since dispersal significantly contributes to genetic structure, survivorship and population trends (Faccio et al. 2013). Understanding dispersal patterns also is important to detect population changes and to develop effective, long-term management strategies such as delisting endangered species with population increases (Gadgil 1971; Paradis et al. 1998; Calabuig et al. 2008; Faccio et al. 2013).

Walters (2000) noted that "dispersal behavior represents one of the remaining frontiers of avian population biology." Dispersal behavior, a fundamental feature of the peregrine falcon, is poorly understood. Without a thorough understanding of avian dispersal behavior and habitat selection, problems can arise in other research areas, such as studying habitat fragmentation or other landscape change studies (Walters 2000).

Among peregrine falcons and other bird species, females tend to disperse further than males (Tordoff and Redig 1997; Katzner et al. 2012). Aside from any possible sex-biased dispersal differences (Fig. 2, 3 and 4), individual birds may vary dispersal distance based upon personality (Swingland 1983). For example, certain types of individuals, like aggressive or bold birds, may be more likely to settle in unfamiliar habitats than other more timid individuals (Watters and Meehan 2007). As such, these "bold" birds may be more likely to dispersal longer distances and nest in cliff sites, rather than urban areas.

Observations, radio and satellite telemetry have increased knowledge of dispersal, movement patterns and migratory pathways, yet few studies have examined natal dispersal (Faccio et al. 2013). There are numerous reasons that male and female peregrine falcons disperse different distances, including but not limited to finding mates, body size, inbreeding avoidance, or characteristic of a higher density population (Wakamiya and Roy 2009) (Fig. 2, 3, 4; Table 2). Sex-biased dispersals also may occur to avoid competition for mates or reduce territorial resource competition (Restani and Mattox 2000, Höner et al. 2007, Sternalski et al. 2007). Since male peregrine falcons typically acquire and defend nest sites, female movements and dispersal may be influenced by possible breeding opportunities (Greenwood 1980, Newton and Mearns 1988, Restani and Mattox 2000, Wightman and Fuller 2006). Tordoff and colleagues (2003) suggest that female peregrine falcon dispersal distances may be greater as they are searching for unmated males for breeding, while males may settle at the nearest suitable nest site.

Female raptors, such as white-tailed sea eagles (*Haliaeetus albicilla*), often disperse longer distances than males (Whitfield et al. 2009). Sex-specific dispersal patterns, though, are not so evident in other raptors, including Bonelli's eagles (*Hieraaetus fasciatu)* (Cadahía et al. 2005), Spanish imperial eagles (*Aquila adalberti*) (Ferrer 1993) and Northern goshawks (*Accipiter gentilis)* (Wiens et al. 2006). In peregrine falcons, females have a larger body size, weighing 750-1,120 grams, than males, weighing 550-660 grams. The larger body size may be a factor in longer dispersal distances, since birds with larger body sizes tend to disperse farther (Paradis et al. 1998).

Likewise, there are costs and benefits to peregrine's long- or short-range dispersal, as described below (Table 2). For long-range dispersers, dispersal can be dangerous with

opportunities for territorial battles, collisions or other chances for injury or mortality. Long-distance dispersal may lead to delayed breeding for some individuals searching for a nest site and mate. In merlins (*Flaco columbarius*), birds with historically poor reproductive success have longer dispersal distances (Wiklund 1996). Also, long-distance dispersals may be a characteristic of a higher density population, indicating reaching carrying capacity (Wakamiya and Roy 2009).

Short-range dispersing peregrine falcons tend to have reduced genetic diversity and suffer a greater mortality rate based upon the site (Table 1). Short-range dispersal may indicate a lower density population (Wakamiya and Roy 2009) and individual energetic limitations (Orians and Wittenberger 1991). Individuals from a low-quality habitat in poor physiological condition were shown to be less selective in choosing a breeding location resulting in shorter dispersal distances (Muller et al. 1997, Danchin et al. 1998, Bjorksten and Hoffmann 1998b; Hanley et al. 1999, Brown et al. 2000, Davis 2008). Conversely, short-range dispersals have a number of benefits as well, such as abundant resources for prey and reproduction (Paradis et al. 1998). Short-range dispersers are familiar with the local environment increasing predator recognition (Yoder et al. 2004).

Historical Background

Prior to the population crash of the 1950s, the eastern population of peregrine falcon (*Falco peregrinus anatum)* was estimated at 350 nesting pairs (Hickey 1942). Based upon reports from oologists there were 44 historical nest sites in the state (Fig. 1; Table 1) with a breeding population of roughly 40-50 pairs (Brauning et al. 2013). Of these nest sites, all were located on cliff ledges, often along major river corridors (Fig. 1; Table 1), excluding one urban nest site on the City Hall building in Philadelphia (McMorris 2014).

Between 1959 and 1987, there were no known nests in the state; by about 1960, peregrine falcons were extirpated from most of the eastern United States (Enderson 1965; Hickey 1969). However, a series of recovery efforts allowed the successful reintroduction of peregrine falcons back into the state beginning in 1976 (McMorris 2014).

- Passage of the federal Endangered and Threatened Species Act in 1970.
- DDT was banned in 1972.
- Passage of Pennsylvania's Endangered Species Act in 1978.
- The Peregrine Fund's experimental captive breeding and release program in the eastern United States in 1974.

Young were released through hacking programs using propagation stock primarily from falconers' birds of mixed genetic origin, including peregrine falcon subspecies from around the world (Cade and Temple 1977; Barclay and Cade 1983). Since the majority of peregrine falcons released in the eastern United States were not from pure *anatum* stock, the eastern population is to some extent genetically distinct from the historic population and may differ in behavior (Temple 1988, Peadkall 1990). From 1975-1992, the Peregrine Fund released more than 1,000 peregrine falcons in the eastern United States (Peregrine Fund 1992). More than half of the releases occurred at coastal towers and on urban buildings (Brauning et al. 2013).

According to the Brauning and colleagues peregrine falcon recovery and management plan (2013), in Pennsylvania, the first reintroduction attempts in 1976 – 1977, were on historic cliff sites near Towanda, in Bradford County, northeastern Pennsylvania. The subsequent second and third attempts took place on an abandoned bridge abutment in the Susquehanna River at Dauphin Narrows, Dauphin County. However, all nestlings from the three attempts perished from predation, likely by great horned owls (*Bubo virginianus*). As a result of these and other

similar losses, peregrine falcon releases ceased at cliff sites where owl predation was perceived to be a risk. Hacking resumed in 1981 in Pennsylvania when four peregrine falcon young were successfully hacked on a building in downtown Philadelphia.

In 1987, the first nesting attempt was discovered during an inspection of the Walt Whitman Bridge in Philadelphia (Cade and Dague 1987). Although these eggs failed to hatch, nestlings were found on the nearby Girard Point Bridge in Philadelphia in 1987. In 1988, pre-fledging age young were discovered near the base of the Commodore Barry Bridge and in 1989, young were discovered on the Walt Whitman Bridge both in Philadelphia.

A slow, steady expansion of the population was assisted by supplemental releases coordinated by the PGC between 1993-1998 to bolster the nesting population and promote the use of historic cliff sites (McMorris 2014). A total of 59 birds were released onto buildings in Allentown, Harrisburg, Reading and Williamsport (Brauning 1999). Along with the hacking program and peregrine releases, the PGC installed nest boxes, a common avian management tool, on urban structures to increase the population size and stability (Brauning et al. 2013).

From 1992-1998 territorial pairs in the eastern United States grew about 10% annually and averaged more than one young per nest (USFWS 1999). By 1998, when the eastern United States' breeding population reached 193 nesting pairs, de-listing was proposed (USFWS 1999). In August 1999, the peregrine falcon was delisted from the federal Endangered and Threatened Species List (USFWS 1999). However, peregrine falcons are still listed as a state-endangered species and protected under the Pennsylvania Game and Wildlife Code.

The peregrine falcon exemplifies a species that was extirpated, reintroduced, and is rapidly expanding back into its former range (Katzner et al. 2012). In the 2014 nesting season in

Pennsylvania, 43 known nests produced at least one young, mirroring historical numbers prior to the pesticide-induced population crash (Brauning et al. 2013). Of these 43 nest sites, six were located on cliffs, and 24 (56%) were successful in raising one or more birds to fledge (McMorris 2014).

The peregrine falcon was federally endangered but with population improvements was delisted in 1999. It remains on the Pennsylvania endangered species list until population goals can be met. The goals stated in the recovery plan are the following:

- Initiate legal delisting when population is secure; namely when the total number of cliff-nesting pairs plus 25% of the pairs on man-made structures equals half of the historic total (22), at least half of the pairs produce fledglings, and productivity equals more than 1 fledgling per nest, for at least 3 consecutive years;
- Identify and minimize threats to nesting peregrine falcons to promote population recovery in suitable habitat;
- Increase recreational opportunities for the enjoyment of peregrine falcons (Brauning et al. 2013).

As evidenced by the recovery goals listed above, a higher ecological value is placed on cliff-nesting birds. However, urban peregrine falcons benefit greatly from a reduced risk of great horned owl predation and abundant prey that is available throughout the year. Prey abundance is widely considered to be positively correlated with the density of breeding peregrines (Beebe 1960, Nelson and Myres 1976, Ratcliffe 1993). There are a multitude of high perches and potential nest ledges on anthropogenic structures that fit the ecological role of natural cliffs creating novel nest sites (Cade and Bird 1990, Redig and Tordoff 1996, Gahbauer et al. 2015).

There is a higher density of breeding birds for mates (Kauffman et al. 2003). Nesting on particular urban structures, such as buildings, may be more productive, than other urban structures (Fig. 5). For example, Gahbauer et al. (2015) concluded in a survey of 152 eastern nest sites, that among urban areas, productivity was 37% higher on buildings than other urban structures, although there was no difference in mean productivity between urban and cliff habitats. From Pennsylvania's ten year recovery plan, Brauning and colleagues (2013) concluded that while productivity varies considerably among nest sites, from 2009-2011, occupied urban sites for at least three years, productivity averaged more than two young per year. Cliff sites have been too few to permit accurate comparison, but productivity averaged more than one young per occupied nest (Fig. 5).

Urban birds face different threats and limiting factors than those at cliff sites, and significant consequences can arise impacting nesting success (Table 3) (Gahbauer 2008). Urban nest sites can be problematic as they are prone to nest site disturbances, face fledging hazards and other limiting factors described below. Human assistance to actively manage urban nest sites is required for maintenance needs to minimize nest site disturbances caused by building or bridge repair and maintenance. In many cities, volunteers often rescue fledglings that collide with buildings or become grounded that may impact the fledgling's survival rate and ultimately the population's growth rate.

Nest Disturbances

Nesting peregrine falcons are vulnerable to a variety of disturbances. Bridge and building maintenance are concerns particularly during the pre-laying, incubation and fledging periods of the breeding season when it is critical to minimize disturbances to avoid nest abandonment (Brauning et al. 2013). Urban peregrine falcons also may become too familiar

with humans and associated cues in habitat (sounds, structural features) making adults less protective of nest sites and young (Stamps and Swaisgood 2007). The Pennsylvania Game Commission (PGC) coordinates with building, bridge and plant managers and negotiates restrictions to reduce disturbances that could result in nest failure or abandonment. While, two-thirds of Pennsylvania building or bridge-owners with nest sites have agreements in place or are in negotiations to reduce nest disturbances, 25% of these nests failed or were abandoned as a direct result of disturbance (Brauning et al. 2013).

Fledging Hazards

Urban nest sites, particularly on bridges, are often confining and lack space for young birds to fledge safely. Building fledges are at risk of colliding with buildings and power lines or landing in streets (Pennsylvania Department of Environmental Protection 2015). In a study from southern Ontario, 44% of peregrine falcons raised on urban structures were rescued soon after fledging (Gahbauer et al. 2012). Newly-fledged young from bridge sites often are found in rivers and can easily drown. Beginning in 1984, peregrine falcons nested on some of the tallest bridges in the state (Cade and Dague 1987). By the late 1990s, peregrine falcons began nesting on much lower bridges, including several that are 60 feet or less above the river level (Brauning et al. 2013). This is problematic since Katzner and colleagues (2012) concluded that fledglings from low bridges were prone to higher mortality than other urban nest sites due to collisions with vehicles or drowning.

Disease and Toxins

Urban peregrine falcon nestlings are susceptible to trichomoniasis, a protozoan infection acquired from rock pigeon (*Columba livia*), a frequent prey species. Infected nestlings are

unable to overcome the infection during development and starvation results from a blocked esophagus. Urban peregrine falcons are exposed to environmental toxins, such as polychlorinated biyphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) and lead. Secondary contact with avicides used for pigeon control is a potential concern (Brauning et al. 2013).

Urban Nest Site Benefits

While urban peregrine falcons face the above-mentioned hazards, there are a number of benefits for urban birds. Urban birds face reduced avian and mammalian predation. Great horned owl predation was the primary reason for discontinuing hacking on cliffs and using urban sites for releases during the recovery program (Barclay 1988). While species richness is typically lower than in rural areas, the total biomass is often higher (Beissinger and Osborne 1982, Blair 1996, Marzluff et al. 2001). This is largely due to the high abundance of certain generalist species that thrive in cities, such as rock pigeon, European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*) (Adams et al. 2006). Urban areas have ample prey abundance throughout the year (Kauffman et al. 2003) and a higher density of breeding birds for mates (Kauffman et al. 2003). With increased urban development, there are abundant, well-sheltered and protected nesting opportunities (Gahbauer 2008). Bridges, buildings, quarries, smokestacks, lighthouses and power plants mimic the ecological role of cliffs by providing high, inaccessible ledges for nesting and large open areas for hunting near major rivers.

Cliff Nests

Historically, most of the peregrine's hunting focused on open areas along rivers or above the forest canopy (Fig. 1; Table 1). Peregrine falcon populations may have benefited from large-

scale logging in the late 1800s and early 1900s that opened hunting areas and increased prey availability (Brauning et al. 2013). To date, many historic cliff sites no longer meet the habitat requirements for nesting. Vegetation encroachment through secondary succession has degraded possible cliff nesting sites. The increased vegetation reduces nesting habitat quality (Watts 2006).

Cliff nesting peregrine falcons experience human nest disturbance as well, however, quite differently. Recreational rock climbers may disturb nests (Lanier and Joseph 1989). Nest sites can be impacted by weather-related problems, such as excessive rain washing out sites. There is a high prey abundance of diverse species possibly reducing exposure to trichomoniasis. Mammalian and avian predators prey on peregrine falcons, nestlings and eggs.

Because of the above-listed ecological threats and limiting environmental factors at urban sites, PGC considers urban nests of lower ecological value. The number of fledglings per nest site is the standard reproductive measure to calculate success and breeding productivity (Brauning et al. 2013). At most urban nest sites, fledges often die from urban environmental hazards unless rescued (Brauning et al. 2013). Annually, at the Rachel Carson State Office Building nest site in Harrisburg, fledges require rescue following collisions with buildings (Pennsylvania Department of Environmental Protection 2015). During a 13-year period, from 2000-2013, at a building site, there was 60% mortality. These data include actual deaths along with "potential" deaths, where the bird was rescued by volunteers because of a specific urban hazard (Brauning et al. 2013).

In setting a population recovery goal based upon the population size prior to the DDT crash, it is important to account for differences in cliff and urban nesting peregrine falcons, along with the population limiting environmental factors. Due to the high fledgling mortality, nest

insecurities, along with a lower amount of human assistance anticipated after delisting (Brauning et al. 2013), these limiting factors contribute to a 4-to-1 calculation, expressed in the equation below. This calculation is one component used to assess population growth for delisting in the state's recovery plan (Brauning et al. 2013). Legal delisting requires that three conditions are met for at least three consecutive years: (a) 22 occupied nests (as determined by the number of cliff nesters plus 25% of urban nesters); (b) a minimum of half of the occupied nests fledge young; and (c) more than one fledgling at each occupied nest. While this estimate takes into account the increased risks of urban sites, additional research is needed.

Cliff nest total + 25% (urban nest total) = Historic nest sites ÷ 2

Questions

The literature and historical background provides an ample basis for research to identify patterns in nest site selection and examining sex-biased differences in dispersal distances leading to the study's focal questions. Do peregrine falcon nestlings banded on urban structures disproportionately nest on urban structures at least 50% of the time? Do male and female peregrine falcon adults disperse different distances of at least 100 km?

JUSTIFICATION AND OBJECTIVES

Comparing present peregrine falcon with the historic population shows that the present peregrine falcons are unlike the historic residents by inhabiting primarily urban, rather than cliff sites. Further, the present population is no longer the eastern subspecies *anatum*, but of mixed genetic origin. According to Temple (1988), *anatum* genes contributed only 18% to the gene pool of the first 758 captive-released birds between 1975 and 1985, compared to 45% of *tundrus* genes.

Measuring dispersal distances and nest site preference patterns are important tools for endangered species management and possible delisting, yet require additional research (Fig. 4, 6 and 7). Understanding imprinting behavior provides insight to implement management initiatives, such as targeted cliff-side vegetation removal on cliffs; translocations or direct release onto cliffs; and nest site monitoring. Additionally, since nestlings on bridges may have higher mortality rates than on buildings, additional ongoing active management strategies will be required (Katzner et al. 2012). Peregrine falcon dispersal distances have a great effect on the population and the ability to expand from one region to another. It is important to continually monitor and understand dispersal distances and population trends.

METHODS

Data Sources

Archival data from PGC's annual peregrine falcon management reports and the United States Geological Survey's (USGS) Bird Banding Laboratory databases were used to identify differences in sex-biased dispersal distance patterns in a 13-state and Canadian province regional peregrine falcon population, along with identifying management implications for this endangered species. The data will present overall values to identify patterns in nest site preferences to anthropomorphic structures, along with endangered species management implications.

Study Design and Area

From 1994 - 2013, PGC employees, cooperating agency personnel and 200 volunteers annually intensely monitored nesting activity at 60 actual and potential nest sites across the state (Table 4). Data were also collected by the United States Geological Survey's (USGS) Bird Banding Laboratory researchers and volunteer birders throughout the state, using falcon webcams or standard bird watching practices. Frequently, color band codes were observed with binoculars and reported. Through repeated observations, often accompanied by photos, peregrine falcon individuals were confirmed. All data was stored in databases and annually reported in PGC Peregrine Falcon Research/Management Program annual reports.

Nest Site Monitoring

For each occupied nest site, nest site and structure data was collected. Evidence of breeding was determined and collected, including successful pairs producing fledged young; active pairs producing nestlings, eggs or incubating; or territorial pairs defending territory during nesting season.

Banding

Since 1991, all known peregrine falcon nestlings hatched at accessible nest sites within the state have been banded by PGC employees (Brauning 1994 - 2002, McMorris and Brauning 2003 – 2010, McMorris 2011 – 2013). All birds were fitted with USGS silver bands (size 6 for males and 7A for females) on the right leg and an alphanumerically coded colored band (black/red or black/green) on the left leg.

During banding, data collected included county, site location, banding date, sex, USGS band number, auxiliary color band number, weight and tape color placed on USGS band (Fig. 5). Annually, when possible, identities of nesting adults at occupied nests were recorded including nest site, sex, USGS band number, auxiliary color band number, banding and hatch dates, banding site and age. Date, recovery and mortality counts also collected. Annual band encounters collected including banding site, date, USGS band number, auxiliary color band number, sex, encounter date and site and status. Whenever possible, unhatched eggs found during banding visits (i.e. 20-30 days after expected hatch) are collected, stored at -20°C, and shipped to a collaborating laboratory for contaminant analysis. Construction and maintenance activities at nest sites are recorded, along with outreach activities and overall recommendations. Counts of hatched and unhatched eggs, nestlings, banded, fledged and dispersed also recorded along with mortality counts of nestlings and fledglings.

The study area includes peregrine falcons from 13 Eastern and Midwestern states that were either banded in Pennsylvania and nesting in or out of state or banded out of state and nesting in state (Fig. 7, Table 4). The regional area includes Connecticut, Delaware, Illinois, Maryland, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Wisconsin, Vermont and Virginia, along with Ontario, Canada.

During the 19-year period of the study (1994-2013), PGC banded 566 peregrine falcons (Table 5). The vast majority (490) of peregrine falcons (93%) were banded on urban structures, such as buildings, bridges, smokestacks and other structures. PGC banded thirty peregrine falcons on cliffs (6%) and 9 peregrine falcons were banded at unreported locations in 1999 (1%) (Fig. 5).

Data Guidelines and Movements

Using the banding and band encounter data, sex-based dispersal distances were measured using Google Earth v. 7.1 (2013). To ensure consistency and reliability, straight line distances, in kilometers, were measured from banding to nesting site using the "add path" and "ruler" functions in Google Earth. Without the use of satellite telemetry, beyond the project's scope, and since archived data were used, the precise movement pattern of each bird is unknown. Guidelines were used to maintain consistency and ensure reliability.

- When the exact location of the nest site was unknown and the data simply indicates a city or a particular bridge, the center point was used as a close estimate.
- The reported nesting site was considered as the bird's first breeding site, regardless of the bird's age.
- The banding site and structure for each bird was reported, regardless of whether the bird was hatched, hacked or translocated to the site.

Hypothesis Testing

The null and alternative hypotheses were established, as listed below to test each prediction.

- Null/ H_0 - There is no difference in preference for anthropomorphic versus natural nest sites by peregrine falcons in Pennsylvania. (H_0:μ=0.05)

- Alternative/Hα – There is a difference in preference for anthropomorphic versus natural nest sites by peregrine falcons in Pennsylvania. (H_1: $\mu<0.05$)
- Null/H_0 - There is no difference in dispersal distances between male and female peregrine falcons in Pennsylvania. (H_0:$\mu_1=0.05$)
- Alternative/Hα – There is a difference in dispersal distances between male and female peregrine falcons in Pennsylvania. (H_1: $\mu<0.05$)

Inferential statistics were used to identify and examine patterns in the data; identify correlations and make inferences about dispersal distances and habitat imprinting. Two statistical tests were used for data analysis. Using the Fisher Exact test of independence, the researcher determined nest site preferences.

$$\frac{(a+b)!\,(c+d)!\,(a+c)!\,(b+d)!}{n!\,a!\,b!\,c!\,d!} < 0.05$$

Fisher Exact tests are used when the variables are multiple and categorical, such as the different kinds of nesting structures, including bridges, buildings, cliffs or smokestacks and when the sample size is small. In this study, all urban structures were combined and compared with cliff nesters. The significance level or alpha was 0.05. Finally, based on this calculation, the significance level determined whether or not the null hypothesis was accepted or rejected.

A *t-test* is used to identify any statistically significant difference between the means in two unrelated groups. In this study, the independent variable was the sex of the bird, and the dependent variable was the dispersal distance. After entering the data—banding and nesting location structures for the individual birds—and determining the significance level, the results from the statistical tests determined whether or not the null hypothesis could be accepted. To identify differences in dispersal distances between male and female falcons, a one-paired *t-test* in Microsoft Excel was conducted.

RESULTS

Nest Site Preferences

Out of the 566 fledglings banded from 1994 to 2013, 519 (92%) were banded on urban structures, 30 (5%) on cliffs, and 9 (2%) on undisclosed sites. Ultimately, 87 (15%) peregrine falcons nested successfully by fledged young (N= 87). At these 87 nest sites, 9 (10%) of the fledglings were banded on cliffs and 78 (90%) were banded on various other urban structures. Eighty-four (98%) of the birds ultimately nested on urban structures and three (2%) nested on cliffs (P=0.03) (Fig. 6, 7; Table 4). Two of the three cliff nesting peregrine falcons switched habitats as banded on urban structures and the other cliff nesting bird was banded on a cliff. The remaining six birds were hacked and banded on cliff sites, but ultimately nested on urban sites (Fig. 8).

Sex-Biased Dispersal Distances

Males had a mean dispersal distance of 111.2 km for males (n=32) which was less than females of 243.7 km (n=54) (P<0.0001) (Fig. 2, 3, 4; Table 4). Note that one peregrine falcon, color band *X/*7, was not included in the analysis, as the sex was “unknown” during banding.

DISCUSSION AND MANAGEMENT IMPLICATIONS

The peregrine falcon population has expanded rapidly over the past three decades, with the urban population growing particularly fast. These findings suggest that peregrine falcons banded on urban structures show significant patterns of preference or imprinting to urban habitats for breeding, based on banding location and experience. Habitat imprinting seems to influence selection of a breeding nest site. The habitat imprinting or preferences was significant, although not absolute, as there was evidence of habitat switching. Wildlife managers should consider these findings when making management decisions for cliff repopulation. Specifically, such decisions may include translocations, targeted vegetation removal, white washing or nest box placement (Watts 2006). Based on these findings, Pennsylvania's peregrine falcon population likely will continue to require human management assistance for ongoing bridge, building and other repairs and maintenance needs.

A potential confound in the study's design is the use versus availability of nest sites. Since the data collected spanned a large, regional geographic area, it is unknown the exact number of available nest sites, and these data are missing. Perhaps, if working in a smaller geographic area, like a specific city, a researcher could use Google Earth, ArcGIS or another software program to identify possible nest sites to determine nest site availability. Further research is needed to determine nest site availability. For example, in terms of potential bridge nest sites, there are roughly 25,000 bridges in the state. Approximately, 10-30% of these bridges are similar in length to Clark's Ferry, Pittston and McElhattan which have successful nests (Brauning et al. 2013). While early in the recovery era peregrine falcons nested on only the tallest of bridges, currently there are successful nests about roughly 60' above the river level in the Wilkes-Barre area (Brauning et al. 2013).

Based on historical nest site data, along the Delaware River, there were 5 nest sites on cliffs before 1941 (Brauning et al. 2013; Table 1). Presently, there are 36 bridges that may serve as potential nest sites with suitable habitat and abundant prey (Delaware River Basin Commission 2004). During the study's timeframe, Delaware River bridges supported 12 peregrine falcons. However, additional information on potential urban structures, aside from skyscrapers, including lower building locations, smokestacks, church steeples, water towers, lighthouses and nuclear power plants should be assessed (Brauning et al. 2013).

Imperfect detection is another potential confound in the study's design. The data consisted of only known peregrine falcons and nest sites. However, there probably are other peregrine falcon nest sites not identified. Because of this confound skewing the small sample size, the significant result (P=0.03), may not be absolute. Also, it is likely that detecting a nest in an urban area is greater than a rural area simply because there are more people to observe and report a sighting and nest. This also may be some observer bias favoring confirming movement from rural to urban sites, because urban birds are readily observed or recovered more often than those breeding at more remote cliffs (Kauffman et al. 2003). While long-term standardized observational counts have been shown to provide a good index of population trends (Bednarz et al. 1990), expanding a standardized network of volunteer monitors, citizen scientists and other researchers into the rural areas may reduce observer bias and imperfect detection.

Opportunistic data is the final potential confound in the study's design. Birders and other researchers often identify birds by viewing color band codes through binoculars or over webcams. These observational reports may not be entirely precise or accurate. Reading color band codes can be difficult because of a variety of factors, including lighting, weather, falcon's

behavior and the precision of the binoculars. That said, through multiple reports and photos, resightings can be confirmed.

Because of their highly territorial nature, peregrine falcon populations are believed to regulate the number of breeding sites in the region (Hickey 1942, Hunt 1988, Ratcliffe 1993, Kauffman et al. 2003). For example, at a building nest site in Harrisburg, the current, closest active nest is 19 km at the Clark's Ferry Bridge in Duncannon (Brauning and McMorris 2013). In prior years, there was a nest site on Three Mile Island, 18 km away (Brauning and McMorris 2011). In 2005, researchers in Switzerland discovered evidence of urban peregrine falcons nesting on buildings exceptionally close—520 m in 2003 and 1130 m in 2005. Cliff nesting peregrine falcons in Greenland have been reported nesting approximately 3 km away from a neighboring nest site (Wightman and Fuller 2007). Consequently, there is potential for peregrine falcons, particularly urban birds, to successfully reproduce and fledge young in densely populated areas (Kéry et al. 2005). Because of this, it may increase the increase the ultimate carrying capacity of an area and slow any dispersal to cliff sites.

Research (Katzner et al. 2012) suggests that peregrine falcons will eventually disperse out of urban areas and repopulate natural cliff sites when carrying capacity is reached. Ultimately, it may be difficult to determine when a carrying capacity of a city, state or region is reached. Given habitat imprinting, site fidelity, amply productivity, abundance of prey and potential urban nest sites, mixed genetic structure and the ability to successfully nest close, it may be decades until carrying capacity of an urban area is reached. Even when reached, evidence is limited that peregrine falcons will begin nesting on cliff sites. However additional research into dispersal patterns from urban to rural sites is needed.

Additionally, even with cliff repopulation, active management, monitoring and public education will need to continue. Public education is particularly important during the breeding season, as exposed rock faces are often prone to human disturbance by rock climbers, hikers and other recreational users. Disease, toxins, nest site disturbance, fledging hazards, falconry and predation can all have a negative impact on population growth and recovery (Peregrine Fund 1990).

From the data, the sex-biased dispersal of the state's peregrine falcon population was statistically significant with females dispersing longer distances than males. Longer flying distance females are common among other bird species (Greenwood 1980) and reported in other peregrine falcon studies (Tordoff and Redig 1997; Kazner et al. 2012; Faccio et al. 2013). By periodic review of dispersal distances, wildlife managers may be able to determine when the population reaches the carrying capacity in the state (Katzner et al. 2012). Dispersal distances have broader implications for population management as well. Since the peregrine falcon remains a state-listed endangered species, potential delisting decisions are made when the population reaches an adequate size and stability. Studying these dispersal distances can aid wildlife managers with this task.

This study was done to better understand peregrine falcon habitat imprinting and dispersal. Because Pennsylvania's peregrine falcon population is likely representative of other eastern United States populations, there are broader implications. Peregrine falcons will likely continue to grow considerably in urban areas. Urban nest sites deserve careful monitoring to minimize nest site disturbances and other population limiting factors. Citizen scientists and volunteer monitors are needed to observe rural sites to report nest sites. Measuring dispersal distances and cliff recolonization may be an indicator when the population reaches its carrying

capacity; however more research is needed to determine nest availability, evidence of habitat switching and density. This is relevant as peregrine falcons remain on the state endangered species list, and the delisting decision is predicated on meeting population goals of adequate size and stability.

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APPENDIX

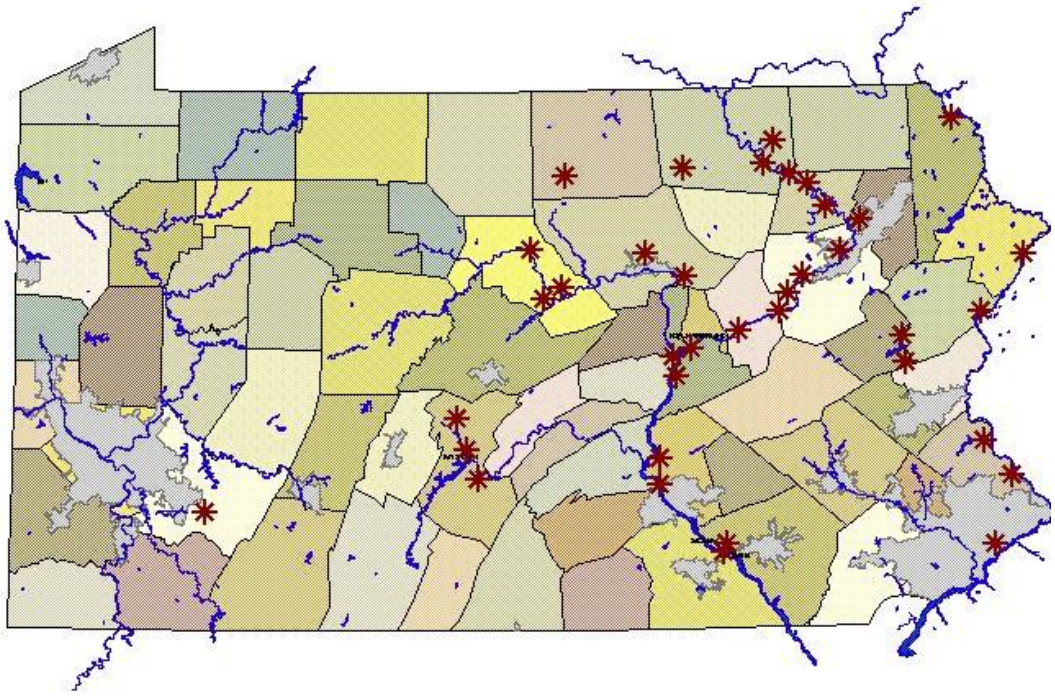

Figure 1. Historic (pre-DDT) peregrine falcon nest site locations (Brauning et al. 2013).

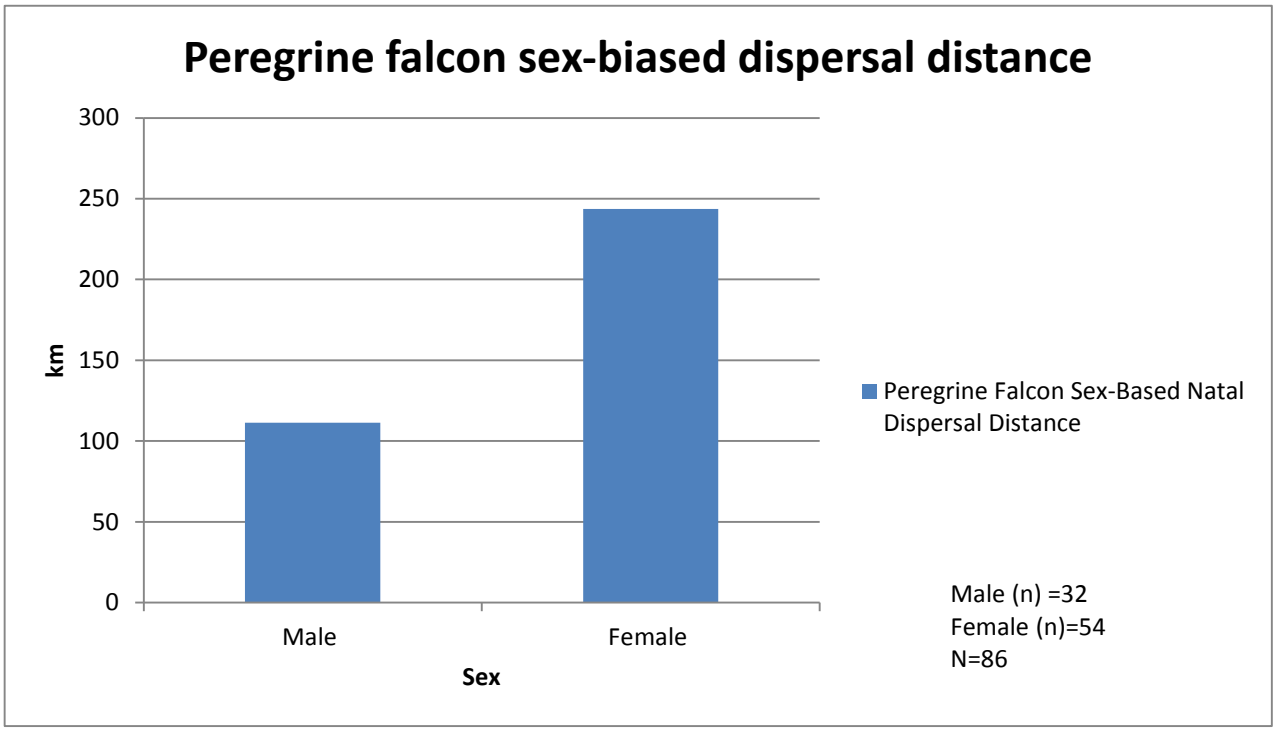

Figure 2. Bar graph showing the mean dispersal distances of male and female peregrine falcons during study. The data only considered dispersal from Pennsylvania banding site to breeding site.

Figure 3. Map showing the area and peregrine falcon dispersal during study.

Figure 4. Map showing male and female peregrine falcon dispersal during study.

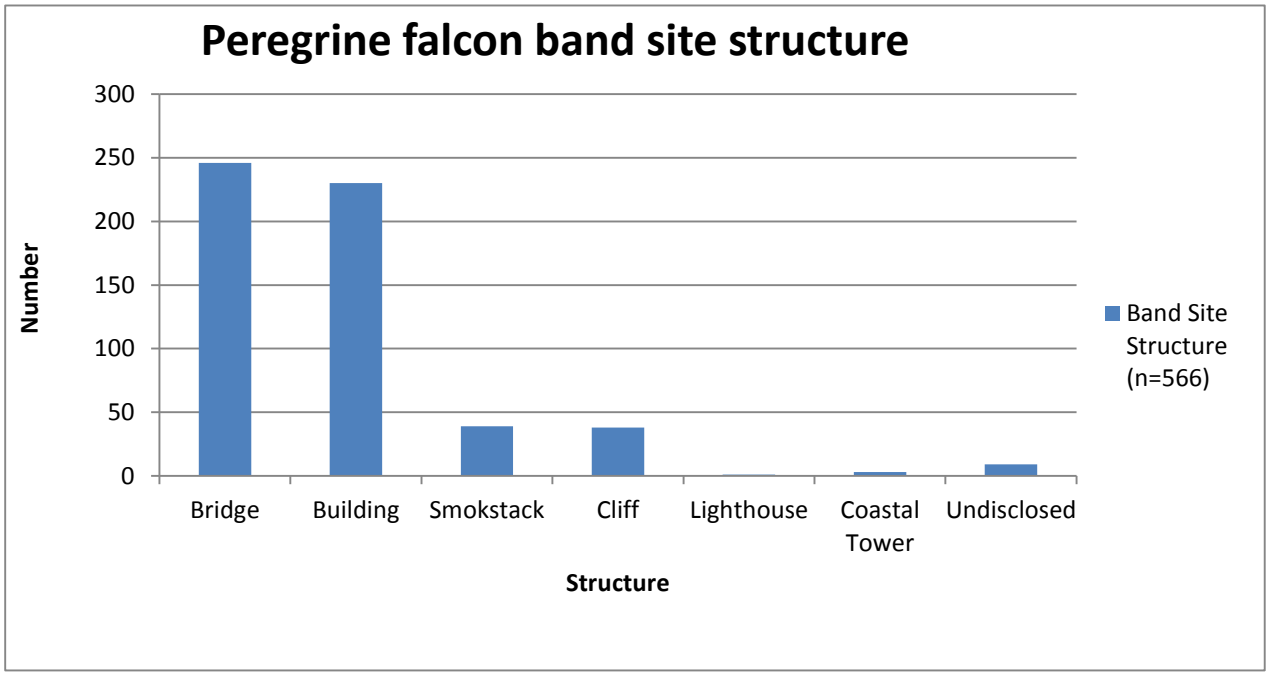

Figure 5. Bar graph showing the number of peregrine falcons banded between 1994 to 2013 by structure type.

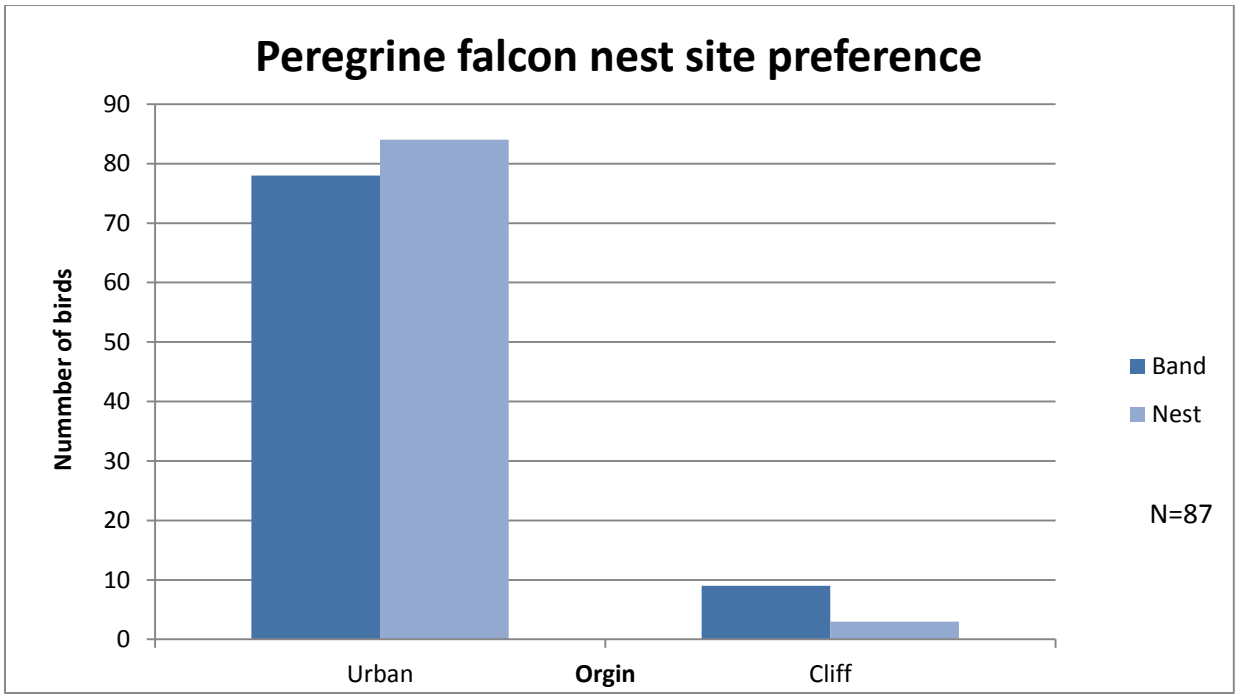

Figure 6. Bar graph showing the number of peregrine falcons banded and nesting in state and out of state from 1994 to 2013.

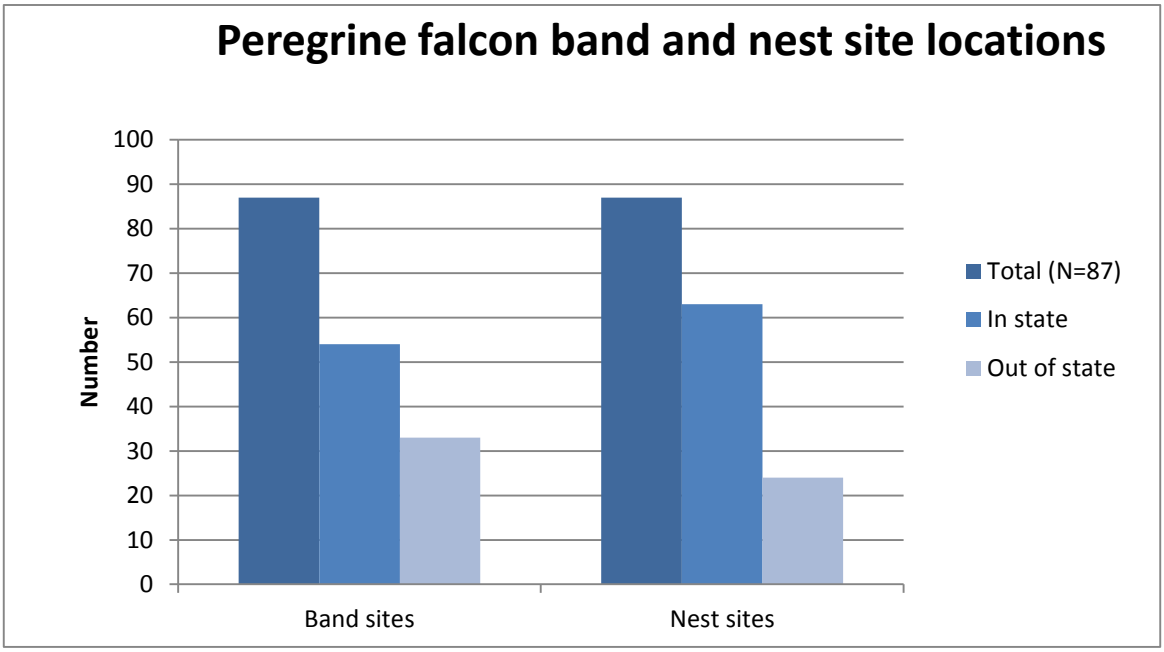

Figure 7. Bar graph showing peregrine falcons' urban nest site preferences when banded on an urban structure.

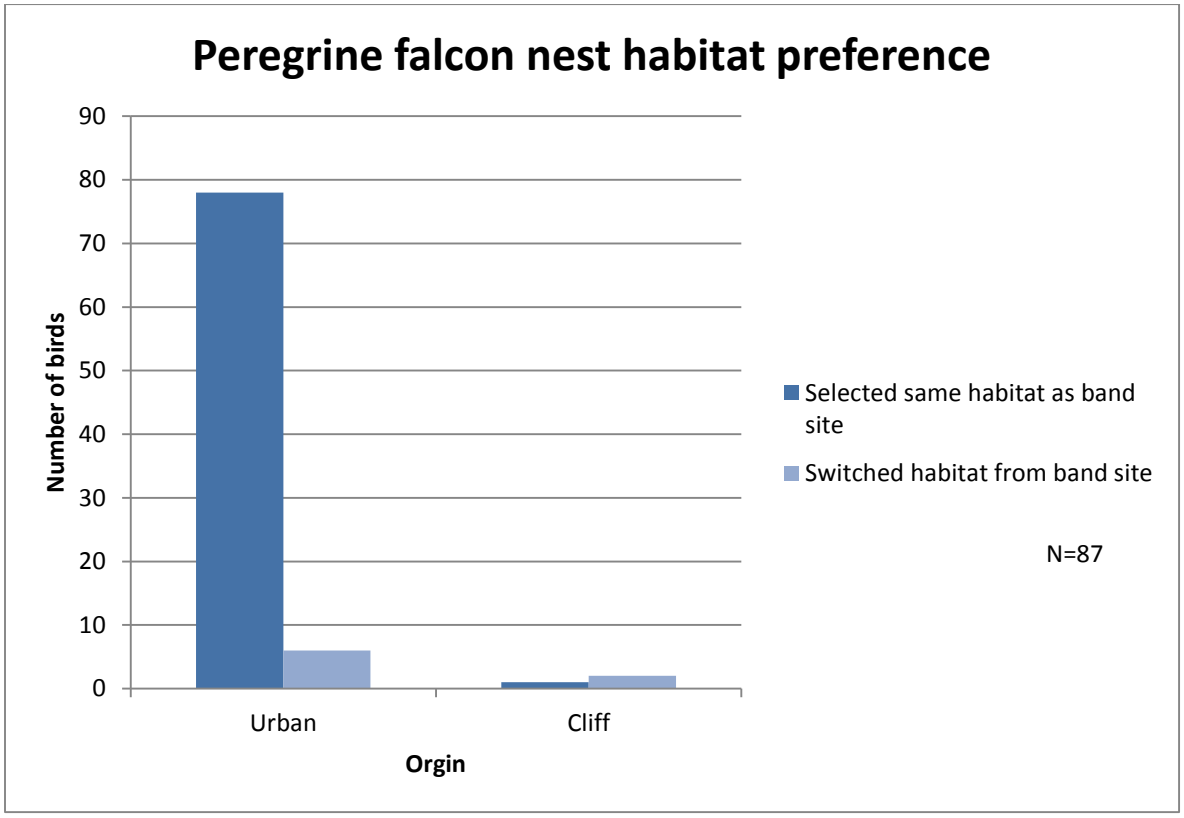

Figure 8: Bar graph showing peregrine falcons' nesting site preference selecting either the same or switching habitat types from the band site.

Table 1. Historical peregrine falcon breeding locations by county (Brauning et al. 2013)

County	Name	Location	Last year	Breeding evidence
Bradford	Wysox	No details	1940	Young
	Canton	S. of Bradley Wales Pk, E. side of Creek	1937	Young
	Wyalusing	Opposite Wyalusing, 5 mi. south	>1939	Eggs
	Towanda	Near Towanda	1941	Young
Bucks	Uhlertown	Tinicum Township	1915	Pair
	Kintnersville	"The Narrows," 12 mi. south of Easton	1941	Young
Carbon	Lehigh Gap	Palmerton on Lehigh River, nest of Devils Pulpit	1912	Eggs
	Lehigh Gorge	Above Mauch Chunk	1944	Young
Centre	Bellefonte	Unknown, site known to Craigheads		
Clinton	Salona	No specifics; on Bald Eagle Mt.	1938	Pair
	Hyner	Below Hyner on north side of river	1939	Pair
	Grove Run	No details	1895	Eggs
	High Rocks	Below falls of McElhatten Run; 1 mi. south of McElhatten	1929	Eggs
	Farransville	5 mi. NW of Lock Haven – never confirmed	1929	Eggs
Columbia	Catawissa	'at town'	1940	Pair
Dauphin	Dauphin	Dauphin Narrows, on Peters Mountain	1940	Young
	Millersburg	Between Millersburg and Paxton	1940	Pair
Huntingdon	Spruce Creek	Opposite tunnel across Juniata River	1936	Young
	Huntingdon	Never confirmed	1928	Pair
	Mapleton	No details	1921	Young
Lackawanna	Scranton	On 2 large cliffs east of town	1921	Young
Lancaster	Chickies Rock	North of Columbia	No details	Pair
	Columbia	Not precisely known; same as Chickies Rock? (possibly York County side of river)	1841	Young
Luzerne	Towberry Knob	W. Nanticoke	1930	Pair
	Pond Hill	2.25 mi. north of town, faces southwest	1941	Young
	Wapwallopen	North of town, cliff faces west	1940	Young
	Shickshinny	Opposite town of Shickshinny	1941	Young
	Campbell Ledge	Pittston Township, local name Mt. Eagle	No details	No details

Table 1 (cont.)

County	Name	Location	Last year	Breeding evidence
Luzerne	Campbell Ledge	Above Pittston facing southwest	1941	Young
Lycoming	Montgomery	West side of river, 4 mi. south of Montgomery	1938	No details
	Loyalsock	At Loyalsock Creek; at Sandy Bottom	1932	Young
Northampton	Delaware Water Gap	Minsi Cliff, faces southeast	1941	Young
Northumberland	Fishers Ferry	South of Fishers Ferry on east bank of Susquehanna River	1938	Present
	Danville	'a few miles upstream of Sunbury'	1938	Young
Philadelphia	City Hall	On the City Hall tower	No details	No details
Pike	Milford	South of Milford, north of Dingman's Ferry	1940	Young
Snyder	Northumberland	Shikellamy State Park	No details	No details
Tioga	Leonard Harrison State Park	Two cliffs opposite look-out on west side	1938	Young
Wayne	Hawks Nest	4 m. northwest of Hancock, faces east on Delaware River	No details	No details
Westmoreland	Jacobs Creek	2.5 m. above Jacobs Creek	1914	Pair
Wyoming	Skinners Eddy	Cliff 1 mile long	1940	Young
	Tunkhannock	Between Falls and Skinners below town on north side	No details	No details
	Mehoopany	East of Mehoopany facing north	1938	Young
	Laceyville	North of Skinners Eddy	1939	Young

Table 2. Costs and benefits of long- and short-range dispersal.

Long-Range Dispersal

Costs	Benefits
Dangerous—opportunities for territorial battles, collisions or other chances for injury or mortality.	Inbreeding avoidance
Delayed breeding for some individuals searching for nest site	Biologically, a larger body size tends to have longer dispersals (Paradis et al. 1998)
In merlins (*Flaco columbarius*), birds with historically poor reproductive success have longer dispersal distances (Wiklund 1996)	May be a characteristic of a higher density population (Wakamiya and Roy 2009), which can be a possible clue into reaching carrying capacity of an area
Unfamiliar with local environment	

Short-Range Dispersal

Costs	Benefits
Reduced genetic diversity	Similar habitat providing increased predator recognition
Greater mortality based on site	Abundant quality habitats for prey and reproduction (Paradis et al. 1998).
May be a characteristic of a lower density population (Wakamiya and Roy 2009), indicating the population has not reached carrying capacity.	Habitat selection based upon reproductive performance of conspecifics (Danchin et al. 1998, Brown et al. 2000)
Energetic limitations based upon the individual (Orians and Wittenberger 1991)	Habitat selection based upon conspecific attraction for mate (Muller et al. 1997, Hanley et al. 1999);
	Familiar with local environment (e.g. Yoder et al. 2004)

Table 3. Costs and benefits of urban and cliff nesting sites

Urban nesting sites

Costs	Benefits
Structures require human management or maintenance; prone to human disturbances	Reduced predation
Higher mortality after fledging without human intervention	Higher prey abundance (Kauffman et al. 2003)
Increased exposure to the protozoan infection, trichomoniasis.	Existing nest boxes from reintroduction effort; imprinting (Brown et al. 2013)
Habitat quality may decline with increases in population densities (Kauffman et al. 2003)	Higher density of breeding birds for mates (Kauffman et al. 2003)
Regulated by site dependence—peregrine falcons may experience a decrease per capita in productivity over time (Kauffman et al. 2003)	With increased urban development, abundant possible nest sites available
Becoming too familiar with humans and the associated cues in habitat (sounds, structural features) making peregrine falcons less protective of nest site and young (Stamps and Swaisgood 2007)	

Cliff nesting sites

Costs	Benefits
Nest sites impacted by weather-related problems, such as excessive rain washing out scrapes	Higher prey abundance of diverse species
Predation by mammalian and avian predators	Historic nest sites primarily along major rivers
Some areas prone to human disturbances by rock climbers or hikers	Minimal human disturbances
Unfamiliar habitats	Possible reduced exposure to trichomoniasis from infected Rock Doves (*Columba livia*)

Table 4. Dispersal distances of nesting peregrine falcons (1994-2011)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Allentown, PA, PPL GO Bldg.	40.6026	-75.4729	Building	5/31/2006	F	1807-76454	07/Z	Bl/Gr	Worcester MA, Fallon Building,	42.2654	-71.8038	Building	357.4
Bethlehem, PA	40.6126	-75.3469	Building	5/7/2010	M	2206-80689	28/S	Bl/Gr	Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	69.7
Bethlehem, PA	40.6126	-75.3469	Building	5/27/2009	F	1687-10883	51/AE	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	133.5
Bristol, CT, Otis Elevator Building	41.7084	-72.7886	Building	5/29/2009	F	1687-10889	57/AE	Bl/Gr	Yardley, PA, Scudder Falls Bridge	40.2586	-74.8472	Bridge	215.2
Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	5/30/2002	F	1807-63442	*S/2	Bl/Rd	Castleton-on-Hudson, NY	42.5333	-73.4940	Bridge	283
Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	5/19/2003	M	2206-24692	*4/*R	Bl/Gr	Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	36.3
Brookpark, OH Rocky River Metropark,	41.4773	-81.8300	Bridge	5/27/2009	F	1687-10881	49/AE	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	441.6
Burlington, NJ, Burlington-Bristol Bridge,	40.0800	-74.8690	Bridge	6/15/2006	F	1687-10816	87/U	Bl/Gr	Martin's Creek, PA, Martin's Creek PPL Plant	40.7984	-75.1064	Smokestack	84
Cabin John, VA, American Legion Bridge	38.9690	-77.1795	Bridge	5/12/2004	M	2206-80603	none		Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	245
Chester, PA, Commodore Barry Bridge	39.8309	-75.3740	Bridge	5/1/2010	F	1687-02845	08/AE		Gloucester City, NJ, Walt Whitman Bridge	39.9052	-75.1295	Bridge	22.4
Chester, PA, Commodore Barry Bridge	39.8309	-75.3740	Bridge	6/13/2005	F	1807-02711	04/V	Bl/Gr	Mockhorn Island, VA	37.2387	-75.8881	Tower	291.3
Chester, PA, Commodore Barry Bridge	39.8309	-75.3740	Bridge	6/18/1996	M		A/Y	Bl/Rd	Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	16.7
Chester, PA, Commodore Barry Bridge	39.8309	-75.3740	Bridge	5/1/2010	F	1687-02845	08/AE	Bl/Gr	Philadelphia, PA, Walt Whitman Bridge	39.9052	-75.1295	Bridge	22.6
Cleveland, OH	41.4984	-81.6942	Building	6/8/2004	F		*P/*8	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	183.8

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Columbia, PA, Rt. 462 Bridge	40.0276	-76.4633	Bridge	5/14/2010	F	1807-65014	09/AD	Bl/Gr	Old Rag Mountain, Shenandoah National Park, VA (hacked); James River Bridge, VA	38.5517	-78.3157	Cliff	226
Columbia, PA, Rt. 462 Bridge	40.0276	-76.4633	Bridge	5/17/2006	F	1807-02717	10/V	Bl/Gr	Hawksbill, VA (hacked); Richmond VA	38.5554	-78.3950	Cliff	230
Columbia, PA, Rt. 462 Bridge	40.0276	-76.4633	Bridge	5/27/2004	M	816-69321	*1/*3	Bl/Gr	Harper's Ferry, MD (hacked); Southmarsh I. WMA, MD	39.3306	-77.7218	Cliff	130
Conowingo, MD, Conowingo Dam	39.6609	-76.1733	Building	5/17/2011	M	2206-79747	28/AP	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	91.3
Conowingo, MD, Conowingo Dam	39.6609	-76.1733	Building	5/31/2011	F	1687-00563	43/AR	Bl/Gr	Philadelphia, PA, Walt Whitman Bridge	39.9052	-75.1295	Bridge	93.4
Duncannon, PA, Clark's Ferry Bridge	40.3994	-77.0090	Bridge	5/21/2008	F	1687-10854	A/50	Bl/Gr	Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	185.8
East Pittsburgh, PA, George Westinghouse Memorial Bridge (Rt. 30)	40.3924	-79.8364	Bridge	6/18/2005	F	1687-01648	66/C	Bl/Gr	Canton, OH, Bank One	40.7982	-81.3755	Building	141.3
East Pittsburgh, PA, George Westinghouse Memorial Bridge (Rt. 30)	40.3924	-79.8364	Bridge	5/22/2009	F	1687-30246	68/H	Bl/Gr	Ironton, OH, Ironton-Russell Bridge	38.5330	-82.6866	Bridge	320.7
Elyria, OH, LTV Steel Building	41.3529	-82.1107	Building	5/4/1999	F	1807-44144	S/*W		Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	203.1
Erie, PA, Donjon Shipbuilding	42.1385	-80.0813	Building	5/28/2008	M	1126-06438	B/79	Bl/Gr	Cleveland, OH, I-90 Bridge, Cuyahoga River	41.4786	-81.6731	Bridge	147
Erie, PA, Former Penelec Stack	42.1367	-80.0865	Smokestack	5/29/2007	F	1687-01203	72/U	Bl/Gr	Buffalo, NY, Statler Towers Building	42.8874	-78.8772	Building	129.7
Etna, PA, 62nd St. Bridge	40.4896	-79.9463	Bridge	5/20/2002	F	987-51249	9/B	Bl/Gr	Stony Man, Shenandoah NP, VA (hacked); Bridge Nest in Hopewell, VA	38.6115	-78.3637	Cliff	249

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Etna, PA, 62nd St. Bridge	40.4896	-79.9463	Bridge	6/2/2004	M	2206-01259	*4/*5	Bl/Gr	Boston, MA, Fed. Reserve Bank	42.3527	-71.0534	Building	771
Glenfield, PA, I-79 Ohio River Bridge	40.5162	-80.1520	Bridge	5/20/2010	F	1687-30441	62/H	Bl/Rd	Canton, OH, Bank One	40.7982	-81.3755	Building	111
Greentree, PA, Greentree Water Tower	40.4162	-80.0515	Water Tower	5/19/2011	F	1687-00522	74/AE	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	8.92
Hamilton, ON, Burlington Lift Bridge	43.2991	-79.7954	Bridge	5/22/2006	M	2206-80611	3/K	Bl/Gr	Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	301
Hamilton, Ontario, Canada	43.2500	-79.8660	Building	6/7/1999	F	1807-44149	*7/5	Bl/Rd	Wilkes Barre, PA	41.2482	-75.8860	Bridge	404.1
Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	5/21/2009	F	1687-10880	48/AE	Bl/Gr	Bristol, PA, PA/NJ Turnpike Bridge	39.9052	-75.1295	Bridge	175
Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	5/29/1998	F	2206-24657	*4/*4	Bl/Rd	Philadelphia, PA, Girard Point Bridge	39.8928	-75.1973	Bridge	151
Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	5/19/2003	M	2206-24690	*W/*V	Bl/Rd	Philadelphia, PA, Walt Whitman Bridge	39.9052	-75.1295	Bridge	155
London, Ontario, Canada	42.9870	-81.2432	Building	4/24/2000	F	1807-44152	*7/0	Bl/Rd	Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	295.3
Luzerne County Cliff, PA	41.1404	-75.9928	Cliff	6/15/2006	M	2206-80632	3/Z	Bl/Gr	Martin's Creek, PA, Martin's Creek PPL Plant	40.7984	-75.1064	Smokestack	85
Manayunk Section of Philadelphia, PA, St. John the Baptist Church	40.0249	-75.2199	Building	5/14/2009	M	2206-80670	45/AC	Bl/Gr	Philadelphia, PA, Girard Point Bridge	39.8928	-75.1973	Bridge	14.8

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Manayunk Section of Philadelphia, PA, St. John the Baptist Church	40.0249	-75.2199	Building	5/30/2008	F	1687-02809	Y/44	Bl/Gr	Elizabeth, NJ, Union Co. Courthouse	40.6623	-74.2156	Building	110
Martin's Creek, PA, Martin's Creek PPL Plant	40.7984	-75.1064	Smokestack	5/27/2009	F	1807-76470	23/Z	Bl/Gr	Amherst, MA, DuBois Lib., U. Mass., Hawksbill Mt., Shenandoah National Park, VA (hacked 6/3); BB&T Building, Richmond VA	42.3901	-72.5283	Building	272
McElhattan, PA, McElhattan Bridge	41.1639	-77.3659	Bridge	5/19/2005	F	987-51296	8/W	Bl/Gr		38.5554	-78.3950	Cliff	303
McKees Rocks, PA, McKees Rocks Bridge	40.4776	-80.0464	Bridge	6/28/1999	M	2206-35777	V/H	Bl/Gr	Cleveland, OH, Terminal Tower	41.4984	-81.6942	Building	180
Monaca, PA, Monaca-East Rochester Bridge	40.6935	-80.2668	Bridge	6/23/2003	F	1807-91956	26/B	Bl/Gr	Chicago, IL, 125 S. Wacker St.	41.8797	-87.6364	Building	631
Monaca, PA, Monaca-East Rochester Bridge	40.6935	-80.2668	Bridge	6/2/2008	F	1687-10845	A/42	Bl/Gr	Ironton, OH, Ironton-Russell Bridge	38.5330	-82.6866	Bridge	326
Monaca, PA, Monaca-East Rochester Bridge	40.6935	-80.2668	Bridge	5/24/2006	F	1687-10824	75/Y	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	291
Montgomery, PA, Cliff	41.1704	-76.8769	Cliff	6/20/1996	M	2206-25639	*G/5	Bl/Rd	Williamsport, PA, hack site	41.2408	-77.0055	Building	13.6
Mt. Clemens, MI	42.5973	-82.8780	Building	6/3/2003	F	1807-44184	*H/*4	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	336.7
NY Presby. Hospital, NY, NY	40.7582	-73.9856	Building	5/19/2003	F	1807-44183	H/3	Bl/Gr	Philadelphia, PA, Girard Point Bridge	39.8928	-75.1973	Bridge	129

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Pennsauken Township, NJ, Betsy Ross Bridge	39.9846	-75.0655	Bridge	5/24/2005	M	2206-80614	3/P	Bl/Gr	Bristol, PA, PA/NJ Turnpike Bridge	40.1199	-74.8467	Bridge	26.5
Philadelphia, PA, Ben Franklin Bridge	39.9527	-75.1331	Bridge	6/23/2003 (Fledge date)	F	1807-62116	25/E	Bl/Gr	Cleveland, OH, LTV Steel Bldg.	41.3529	-82.1107	Building	581
Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	5/29/2001	F	987-98027	*H/*S	Bl/Rd	Boston, Downtown, MA	42.3598	-71.0525	Building	429.3
Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	5/29/1998	F	1807-44141	*7/2	Bl/Rd	Philadelphia, PA, Girard Point Bridge	39.8928	-75.1973	Bridge	0.28
Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	5/22/2003	F	1807-37492	*K/*V	BL/Rd	Ocean Gate, NJ	39.9285	-74.1360	Tower	89.6
Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	2004	M	present	none	none	Philadelphia area, PA, Possibly from Walt Whitman Bridge, Girard Point bridge or PA/NJ Turnpike connector bridge	39.9052	-75.1295	Bridge	15.3
Philadelphia, PA, Schuylkill Expwy.	40.0261	-75.2299	Bridge	5/25/2001	F	1807-63374	*U/*7	Bl/Rd	NY, NY, NY Presbyterian Hosp.	40.7582	-73.9856	Building	140
Philadelphia, PA, Wachovia Bank	39.9043	-75.1713	Building	4/17/2009	M	2206-80665	40/AC	Bl/Gr	Comcast Center, Philadelphia, PA	39.9549	-75.1685	Building	1.2
Philadelphia, PA, Wachovia Bank	39.9043	-75.1713	Building	6/13/2006	F	987-95673	60/Y	Bl/Gr	Tuckahoe River Tower (WMA), NJ	39.3088	-74.7225	Tower	88.9
Philadelphia, PA, Walt Whitman Bridge	39.9052	-75.1295	Bridge	6/13/1994	M	816-11879	U/3	Bl/Rd	Trenton, NJ	40.2165	-74.7433	Building	48
Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	5/8/1998	F	1807-44139	*6/7	Bl/Rd	Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	0
Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	5/24/2007	F	1687-01853	M/93	Bl/Gr	Akron, OH, Landmark Building	41.0815	-81.5190	Building	147

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	6/11/2002	M	2206-24689	*4/*E	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	3.46
Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	6/15/1999	F	1807-77607	5/*A	Bl/Gr	Milwaukee, WI, Firstar Building	43.0381	-87.9021	Building	734
Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	5/17/2005	M	2206-80608	*5/*4	Bl/Gr	Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	3.46
Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	6/20/1998	M	2206-35752	*T/W	Bl/Rd	Columbus, OH, Rhodes Bldg.	39.9623	-82.9989	Building	261
Pittston, PA, Campbell's Ledge	41.3609	-75.7952	Cliff	6/7/2007	F	1687-17684	V/21	Bl/Gr	Hamden, CT West Rock Cliff	41.3627	-72.9702	Cliff	240
Pittston, PA, Ft. Jenkins Bridge (US 11)	41.3258	-75.7894	Bridge	6/2/2000	M	2206-24673	*X/L	Bl/Rd	Wilkes-Barre, PA, Cross Valley Expressway	41.2671	-75.8663	Bridge	9.25
Reading, PA, Downtown	40.3357	-75.9269	Building	5/26/2005	M	2206-80617	3/T	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	81
Rochester, NY	43.1610	-77.6109	Building	5/31/2007	F	1687-00506	81/Y	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	357.8
Rocky River, OH, Hilliard Road Bridge	41.5022	-81.7017	Bridge	6/5/2009	F	1687-10877	45/AE	Bl/Gr	McKees Rocks, PA, McKees Rocks Bridge	40.4776	-80.0464	Bridge	188.2
Safe Harbor, PA, Railroad Bridge	39.9240	-76.3839	Bridge	5/23/2007	F	1687-10829	A/62	Bl/Gr	Bristol, PA, PA/NJ Turnpike Bridge	39.9052	-75.1295	Bridge	135
Scranton, PA, Downtown	41.4090	-75.6624	Building	5/28/2008	M	2206-79715	77/X	Bl/Gr	Pittston, PA, Pittston Bridge	41.3258	-75.7894	Bridge	14.5

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Tarentum, PA, Tarentum-New Kensington Bridge	40.5989	-79.7561	Bridge	5/22/2008	F	1807-02774	69/Z	Bl/Gr	Stony Man, Shenandoah NP, VA (hacked); Hopewell, VA, Benjamin Harrison Bridge	38.6115	-78.3637	Cliff	251
Tarentum, PA, Tarentum-New Kensington Bridge	40.5989	-79.7561	Bridge	5/31/2005	M	2206-80647	35/X	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	23
Toledo, OH, University of Toledo	41.6621	-83.6127	Building	6/3/2003	F	1807-44185	*H/*5	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	338.4
Toronto, Ontario, Canada	43.6532	-79.3832	Building	5/3/2002	M	2206-24680	*4/*B	Bl/Gr	Pittsburgh, PA, Gulf Tower	40.4425	-79.9953	Building	361.2
Toronto, Ontario, Canada	43.6532	-79.3832	Building	6/20/1994	F		6/S	Bl/Rd	Reading, PA, hack site	40.3357	-75.9269	Building	472.1
Washingtonville, Montour PPL Plant	41.0702	-76.6676	Smokestack	5/25/2006	M	2206-80627	64/X	Bl/Gr	Duryea, PA, Campbell's Ledge	41.3609	-75.7952	Cliff	80
Water Tower, Warren, OH	41.2376	-80.8184	Water Tower	5/31/2007	M	2206-79709	70/X	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	112.7
Wilkes Barre, PA	41.2668	-75.8632	Bridge	7/19/1996	M	2206-24643	*P/5	Bl/Rd	Williamsport, PA, hack site	41.2408	-77.0055	Building	93.8
Wilkes Barre, PA, Market Street Bridge	41.2482	-75.8840	Bridge	5/28/1997	F	987-63774	8/Y	Bl/Rd	Fairlee Palisades Cliff, VT	43.9125	-72.1444	Cliff	426
Williamsport, PA, Market Street Bridge	41.2334	-77.0300	Bridge	5/10/2006	M	2206-79763	37/S	Bl/Gr	Washingtonville, Montour PPL Plant	41.0702	-76.6676	Smokestack	33.8
Wilmington, DE, Brandywine Building,	39.7473	-75.5502	Building	5/16/2002	U	1807-44173	*X/*7	Bl/Rd	Philadelphia, PA, Girard Point Bridge	39.8923	-75.1975	Bridge	36
Wilmington, DE, Brandywine Building,	39.7473	-75.5502	Building	5/22/2008	F	1687-10857	A/53	Bl/Gr	Harrisburg, PA, Rachel Carson State Office Building	40.2625	-76.8799	Building	131

Table 4 (cont.)

Nest Site	Latitude	Longitude	Structure	Banding Date	Sex	USFWS Band	Aux. Band Number	Color	Banding Site	Latitude	Longitude	Banding Site Structure	Dispersal Distance (km)
Wrightsville, OH, Killen Power Station	38.6882	-83.4809	Building	5/26/2009	F	1687-10872	40/AE		Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	363.1
Yardley, PA, Scudder Falls Bridge	40.2586	-74.8472	Bridge	5/31/2005	M	2206-80618	3/U	Bl/Gr	Philadelphia, PA, Schuylkill Expy. Bridge	40.0261	-75.2299	Bridge	46
Yardley, PA, Scudder Falls Bridge	40.2586	-74.8472	Bridge	6/2/2006	F	1807-99741	32/W	Black	Hamilton, Ontario, Sheraton Hotel,	43.2579	-79.8740	Building	525
York Haven, PA, Brunner Island PPL Plant	40.0984	-76.6969	Building	5/28/2008	F	1687-00509	84/Y	Bl/Gr	Pittston, PA, Fort Jenkins/US 11 Bridge	41.3258	-75.7894	Bridge	164.5
Youngstown, OH	41.0998	-80.6495	Building	6/3/2003	M	2206-24698	*4/*W	Bl/Gr	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	40.4443	-79.9533	Building	90.1

Table 5. Listing of Pennsylvania peregrine falcon banding information—date, sex, band numbers, site and structure (1994-2013)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/20/1994	F		6/S	Reading, PA, hack site	Building
6/20/1994	M		P/2	Reading, PA, hack site	Building
6/20/1995	M	2206-24627	A/S	Harrisburg, PA (hack)	Building
5/28/1996	F		E/*W	Pittsburgh, PA, Gulf Tower	Building
5/28/1996	M		*A/5	Pittsburgh, PA, Gulf Tower	Building
6/18/1996	M		A/Y	Philadelphia, PA, Girard Point Bridge	Bridge
6/20/1996	M	2206-25639	*G/5	Williamsport, PA, hack site	Building
7/19/1996	M	2206-24643	*P/5	Williamsport, PA, hack site	Building
7/19/1996	F		L/*W	Williamsport, PA, hack site	Building
6/14/1997	M		1/2	Williamsport, PA, hack site	Building
5/8/1998	F	1807-44139	*6/7	Pittsburgh, PA, Gulf Tower	Building
5/29/1998	F	2206-24657	*4/*4	Philadelphia, PA, Girard Point Bridge	Bridge
5/29/1998	F	1807-44141	*7/2	Philadelphia, PA, Girard Point Bridge	Bridge
5/4/1999	F	1807-44144	S/*W	Pittsburgh, PA, Gulf Tower	Building
5/4/1999	F	1807-44145	W/*W	Pittsburgh, PA, Gulf Tower	Building
6/7/1999	F	1807-44149	*7/5	Wilkes Barre, PA	Bridge
4/24/2000	F	1807-44152	*7/0	Pittsburgh, PA, Gulf Tower	Building
4/24/2000	F	1807-44153	*7/7	Pittsburgh, PA, Gulf Tower	Building
4/24/2000	M	2206-24665	*W/B	Pittsburgh, PA, Gulf Tower	Building
4/24/2000	M	2206-24666	*W/C	Pittsburgh, PA, Gulf Tower	Building
5/23/2000	F	1807-44154	P/*P	Philadelphia, PA, Girard Point Bridge	Bridge
5/23/2000	M	2206-24668	*W/E	Philadelphia, PA, Girard Point Bridge	Bridge
5/23/2000	M	2206-24667	*W/D	Philadelphia, PA, Philadelphia City Hall	Building
5/25/2000	F	1807-44155	None	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/25/2000	F	1807-44156	None	Philadelphia, PA, Walt Whitman Bridge	Bridge
6/1/2000	F	1807-44157	U/*L	Harrisburg, PA, Rachel Carson State Office Building	Building
6/1/2000	F	1807-44158	V/*L	Harrisburg, PA, Rachel Carson State Office Building	Building
6/1/2000	M	2206-24670	*7/8	Harrisburg, PA, Rachel Carson State Office Building	Building
6/1/2000	M	2206-24671	*W/G	Harrisburg, PA, Rachel Carson State Office Building	Building
6/2/2000	M	2206-24673	*X/L	Wilkes-Barre, PA, Cross Valley Expressway	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/2/2000	F	1807-44160	*U/P	Wilkes-Barre, PA, Cross Valley Expressway	Bridge
6/2/2000	M	2206-24672	*W/L	Wilkes-Barre, PA, Cross Valley Expressway	Bridge
5/6/2001	F	1807-44163	W/*P	Pittsburgh, PA, Gulf Tower	Building
5/6/2001	F	1807-44164	X/*P	Pittsburgh, PA, Gulf Tower	Building
5/6/2001	M	2206-24676	*W/P	Pittsburgh, PA, Gulf Tower	Building
5/6/2001	M	2206-24677	*W/K	Pittsburgh, PA, Gulf Tower	Building
5/24/2001	F	1807-44161	*X/*3	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/24/2001	F	1807-44162	*X/*2	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/24/2001	F	1807-44165	V/*P	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/30/2001	F	1807-44166	*W/*5	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2001	F	1807-44167	*W/*4	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2001	F	1807-44168	*W/*3	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2001	M	2206-24674	*W/Y	Harrisburg, PA, Rachel Carson State Office Building	Building
6/4/2001	M	2206-24675	*W/R	Chester, PA, Commodore Barry Bridge	Bridge
6/7/2001	M	2206-24678	*W/T	Philadelphia, PA, Bell Atlantic	Building
5/3/2002	M	2206-24680	*4/*B	Pittsburgh, PA, Gulf Tower	Building
5/3/2002	F	1807-44169	*W/*2	Pittsburgh, PA, Gulf Tower	Building
5/3/2002	F	1807-44170	*W/*7	Pittsburgh, PA, Gulf Tower	Building
5/3/2002	M	2206-24679	*4/*A	Pittsburgh, PA, Gulf Tower	Building
5/16/2002	F	1807-44171	*X/*4	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/16/2002	F	1807-44172	*X/*5	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/16/2002	U	1807-44173	*X/*7	Philadelphia, PA, Girard Point Bridge	Bridge
5/16/2002	F	1807-44174	*Y/*1	Philadelphia, PA, Girard Point Bridge	Bridge
5/16/2002	M	2206-24682	*4/*P	Philadelphia, PA, Girard Point Bridge	Bridge
5/16/2002	U	2206-24683	*4/*M	Philadelphia, PA, Girard Point Bridge	Bridge
5/21/2002	F	1807-37378	*D/*Y	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/21/2002	F	1807-37379	*K/*A	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/21/2002	F	1807-37380	*K/*B	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/21/2002	M	2206-20262	S/*3	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/30/2002	F	1807-44175	*Y/*2	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	F	1807-44176	*Y/*3	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24685	*W/U	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24686	*4/*C	Harrisburg, PA, Rachel Carson State Office Building	Building
6/11/2002	M	2206-24689	*4/*E	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	F	1807-44180	*Y/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24687	*4/*D	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24688	*4/*H	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/14/2003	F	1807-44177	*Y/*5	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44178	*Y/*7	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44179	*Y/*8	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/15/2003	F	1807-37490	*K/*T	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	F	1807-37491	*K/*U	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20271	*8/*C	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20272	*8/*D	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/19/2003	M	2206-24692	*4/*R	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	F	1807-44183	H/3	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24693	*4/*S	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24690	*W/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44181	*Y/*9	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44182	*H/*2	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	M	2206-24691	*4/*K	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/21/2003	F	1687-00548	31/AR	Harrisburg, PA, Rachel Carson State Office Building	Building
5/21/2003	F	1687-00549	32/AR	Harrisburg, PA, Rachel Carson State Office Building	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/21/2003	F	1947-07015	80/AR	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2003	F	1807-44187	*8/*W	Montgomery, PA, Cliff	Cliff
6/3/2003	F	1807-44184	*H/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/30/2002	F	1807-44176	*Y/*3	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24685	*W/U	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24686	*4/*C	Harrisburg, PA, Rachel Carson State Office Building	Building
6/11/2002	M	2206-24689	*4/*E	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	F	1807-44180	*Y/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24687	*4/*D	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24688	*4/*H	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/14/2003	F	1807-44177	*Y/*5	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44178	*Y/*7	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44179	*Y/*8	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/15/2003	F	1807-37490	*K/*T	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	F	1807-37491	*K/*U	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20271	*8/*C	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20272	*8/*D	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/19/2003	M	2206-24692	*4/*R	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	F	1807-44183	H/3	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24693	*4/*S	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24690	*W/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44181	*Y/*9	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44182	*H/*2	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	M	2206-24691	*4/*K	Philadelphia, PA, Walt Whitman Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/21/2003	F	1687-00548	31/AR	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	F	1807-44176	*Y/*3	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24685	*W/U	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24686	*4/*C	Harrisburg, PA, Rachel Carson State Office Building	Building
6/11/2002	M	2206-24689	*4/*E	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	F	1807-44180	*Y/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24687	*4/*D	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24688	*4/*H	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/14/2003	F	1807-44177	*Y/*5	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44178	*Y/*7	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44179	*Y/*8	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/15/2003	F	1807-37490	*K/*T	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	F	1807-37491	*K/*U	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20271	*8/*C	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/15/2003	M	2206-20272	*8/*D	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/19/2003	M	2206-24692	*4/*R	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	F	1807-44183	H/3	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24693	*4/*S	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2003	M	2206-24690	*W/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44181	*Y/*9	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	F	1807-44182	*H/*2	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/19/2003	M	2206-24691	*4/*K	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/21/2003	F	1687-00548	31/AR	Harrisburg, PA, Rachel Carson State Office Building	Building
5/21/2003	F	1687-00549	32/AR	Harrisburg, PA, Rachel Carson State Office Building	Building
5/21/2003	F	1947-07015	80/AR	Harrisburg, PA, Rachel Carson State Office Building	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/30/2003	F	1807-44187	*8/*W	Montgomery, PA, Cliff	Cliff
6/3/2003	F	1807-44184	*H/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/30/2002	F	1807-44176	*Y/*3	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24685	*W/U	Harrisburg, PA, Rachel Carson State Office Building	Building
5/30/2002	M	2206-24686	*4/*C	Harrisburg, PA, Rachel Carson State Office Building	Building
6/11/2002	M	2206-24689	*4/*E	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	F	1807-44180	*Y/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24687	*4/*D	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/11/2002	M	2206-24688	*4/*H	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/14/2003	F	1807-44177	*Y/*5	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44178	*Y/*7	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2003	F	1807-44179	*Y/*8	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/15/2003	F	1807-37490	*K/*T	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
6/3/2003	F	1807-44185	*H/*5	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/3/2003	M	2206-24698	*4/*W	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/3/2003	M	2206-24699	*4/*X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/4/2003	F	1807-44188	*Y/*6	Harrisburg, PA, Rachel Carson State Office Building	Building
6/4/2003	F	1807-44189	*8/*X	Harrisburg, PA, Rachel Carson State Office Building	Building
6/4/2003	M	2206-24694	*4/*V	Harrisburg, PA, Rachel Carson State Office Building	Building
6/4/2003	M	2206-24695	*4/*U	Harrisburg, PA, Rachel Carson State Office Building	Building
6/5/2003	F	1807-44190	*8/*Y	Pittston, PA, Pittston Bridge	Bridge
6/5/2003	F	1807-44191	*P/*1	Pittston, PA, Pittston Bridge	Bridge
6/5/2003	M	2206-70225	3/A	Pittston, PA, Pittston Bridge	Bridge
6/12/2003	M	2206-24696	3/B	Middletown, PA, Three Mile Island	Building
7/1/2003	F	1807-44192	*2/*P	Pittsburgh, PA, Gulf Tower	Building
7/1/2003	F	1807-44193	*P/*3	Pittsburgh, PA, Gulf Tower	Building
7/1/2003	F	1807-44192	*2/*P	Pittsburgh, PA, Gulf Tower	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
7/1/2003	F	1807-44192	*P/*4	Pittsburgh, PA, Gulf Tower	Building
7/1/2003	M	2206-70227	3/E	Pittsburgh, PA, Gulf Tower	Building
2004	M	present	none	Philadelphia area, PA, Possibly from Walt Whitman Bridge, Girard Point bridge or PA/NJ Turnpike connector bridge	Bridge
5/12/2004	M	2206-80603	none	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/12/2004	F	1687-0801	none	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/12/2004	M	2206-80601	none	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/12/2004	M	2206-80602	none	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/12/2004	F	1687-10803	none	Philadelphia, PA, Girard Point Bridge	Bridge
5/12/2004	U	1687-10802	none	Philadelphia, PA, Girard Point Bridge	Bridge
5/12/2004	M	2206-80604	none	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/12/2004	M	2206-80605	none	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/12/2004	M	2206-80606	none	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/24/2004	F	987-95618	U/*S	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/24/2004	M	2206-75707	*3/*7	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/24/2004	F	1807-44195	*P/*5	Pittsburgh, PA, Gulf Tower	Building
5/24/2004	F	1807-44196	*P/*6	Pittsburgh, PA, Gulf Tower	Building
5/24/2004	F	1807-44197	*7/*P	Pittsburgh, PA, Gulf Tower	Building
5/24/2004	M	2206-70226	*1/*5	Pittsburgh, PA, Gulf Tower	Building
5/27/2004	F	1687-00501	*U/*2	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2004	M	2206-79701	*5/*7	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2004	M	2206-79702	3/C	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2004	M	2206-79703	*5/*8	Harrisburg, PA, Rachel Carson State Office Building	Building
6/3/2004	F	1687-00504	*U/*5	Pittston, PA, Pittston Bridge	Bridge
6/3/2004	M	2206-79704	3/D	Pittston, PA, Pittston Bridge	Bridge
6/3/2004	M	2206-79705	3/G	Pittston, PA, Pittston Bridge	Bridge
6/8/2004	F	1807-44198	*8/*P	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/8/2004	F	1687-00502	*U/*3	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/8/2004	F	1807-44198	*8/*P	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/8/2004	F	1807-44199	*9/*P	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/24/2004	M	2206-75707	*3/*7	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	F	987-95634	*A/*U	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95635	*A/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95636	*A/*W	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	M	2206-75712	*8/*C	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95637	*A/*X	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	F	987-95638	*A/*Y	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	F	987-95639	none	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	M	2206-75713	*8/*D	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	M	2206-80608	*5/*4	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	M	2206-80607	*5/*3	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	M	2206-80609	*5/*5	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	F	987-95634	*A/*U	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95635	*A/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95636	*A/*W	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	M	2206-75712	*8/*C	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95637	*A/*X	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	F	987-95638	*A/*Y	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	F	987-95639	none	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/17/2005	M	2206-75713	*8/*D	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/17/2005	M	2206-80608	*5/*4	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	M	2206-80607	*5/*3	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	M	2206-80609	*5/*5	Pittsburgh, PA, Gulf Tower	Building
5/17/2005	F	987-95634	*A/*U	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95635	*A/*V	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/17/2005	F	987-95636	*A/*W	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/24/2005	M	2206-80614	3/P	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/24/2005	F	1687-10811	82/U	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/25/2005	F	1687-10812	83/U	Duryea, PA, Campbell's Ledge	Cliff
5/25/2005	M	2206-80615	3/R	Duryea, PA, Campbell's Ledge	Cliff
5/26/2005	M	2206-80617	3/T	Harrisburg, PA, Rachel Carson State Office Building	Building
5/26/2005	F	1687-10813	84/U	Harrisburg, PA, Rachel Carson State Office Building	Building
5/26/2005	M	2206-80616	3/S	Harrisburg, PA, Rachel Carson State Office Building	Building
5/31/2005	M	2206-80618	3/U	Philadelphia, PA, Schuylkill Expy. Bridge	Bridge
5/31/2005	F	1687-10814	85/U	Philadelphia, PA, Schuylkill Expy. Bridge	Bridge
5/31/2005	F	1687-10815	86/U	Philadelphia, PA, Schuylkill Expy. Bridge	Bridge
5/31/2005	M	2206-80647	35/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/3/2005	F	1807-44186	*H/*7	Middletown, PA, Three Mile Island	Building
6/6/2005	F	1687-10804	*U/*4	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/6/2005	F	1687-10805	*U/*6	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/6/2005	M	2206-80610	3/H	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/8/2005	M	2206-24697	*2/*5	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/27/2005	M	2206-80619	3/V	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/27/2005	M	2206-80620	3/W	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/10/2006	M	2206-79763	37/S	Washingtonville, Montour PPL Plant	Smokestack
5/22/2006	M	2206-80611	3/K	Pittsburgh, PA, Gulf Tower	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/22/2006	M	2206-80621	3/X	Pittsburgh, PA, Gulf Tower	Building
5/24/2006	F	1687-10824	75/Y	Harrisburg, PA, Rachel Carson State Office Building	Building
5/24/2006	F	1687-10823	74/Y	Harrisburg, PA, Rachel Carson State Office Building	Building
5/24/2006	F	1687-10825	76/Y	Harrisburg, PA, Rachel Carson State Office Building	Building
5/25/2006	M	2206-80627	64/X	Duryea, PA, Campbell's Ledge	Cliff
6/15/2006	F	1687-10816	87/U	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/15/2006	M	2206-80632	3/Z	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/24/2005	M	2206-80614	3/P	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/24/2005	F	1687-10811	82/U	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/25/2005	F	1687-10812	83/U	Duryea, PA, Campbell's Ledge	Cliff
5/16/2007	F	987-95675	62/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	F	987-95676	63/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	M	2206-75739	49/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	M	2206-75740	*I/*M	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	F	1687-00503	A/60	Pittsburgh, PA, Gulf Tower	Building
5/16/2007	M	2206-79706	67/X	Pittsburgh, PA, Gulf Tower	Building
5/16/2007	M	2206-79707	68/X	Pittsburgh, PA, Gulf Tower	Building
5/16/2007	M	2206-79708	69/X	Pittsburgh, PA, Gulf Tower	Building
5/23/2007	F	1687-10829	A/62	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/23/2007	F	1687-10830	A/63	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/23/2007	F	1687-10831	A/64	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/23/2007	F	1687-10832	A/65	Philadelphia, PA, Girard Point Bridge	Bridge
5/23/2007	F	1687-10833	A/66	Philadelphia, PA, Girard Point Bridge	Bridge
5/23/2007	M	2206-80624	75/X	Philadelphia, PA, Girard Point Bridge	Bridge
5/23/2007	F	987-95678	65/Y	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/23/2007	F	987-95679	*I/*U	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/23/2007	F	987-95680	66/Y	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/23/2007	M	2206-75744	*I/*V	Philadelphia-New Jersey, Betsy Ross Bridge	Bridge
5/24/2007	F	1687-10834	A/67	Harrisburg, PA, Rachel Carson State Office Building	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/24/2007	F	1687-10835	A/68	Harrisburg, PA, Rachel Carson State Office Building	Building
5/24/2007	M	2206-80631	20/X	Harrisburg, PA, Rachel Carson State Office Building	Building
5/24/2007	M	2206-80633	21/X	Harrisburg, PA, Rachel Carson State Office Building	Building
5/29/2007	F	1687-10836	A/69	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/30/2007	M	2206-80634	22/X	Pittston, PA, Pittston Bridge	Bridge
5/30/2007	M	2206-80635	23/X	Pittston, PA, Pittston Bridge	Bridge
5/30/2007	M	2206-80636	24/X	Pittston, PA, Pittston Bridge	Bridge
5/30/2007	M	2206-80637	25/X	Pittston, PA, Pittston Bridge	Bridge
5/31/2007	F	1687-00507	82/Y	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/31/2007	M	2206-79711	72/X	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/16/2007	F	987-95675	62/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	F	987-95676	63/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/16/2007	M	2206-75739	49/Y	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/31/2007	F	1687-00506	81/Y	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/31/2007	M	2206-79709	70/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/31/2007	F	1687-00505	80/Y	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/31/2007	M	2206-79710	71/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/4/2007	F	2206-70224	*4/*Y	Middletown, PA, Three Mile Island	Building
6/4/2007	F	1687-10837	A/70	Washingtonville, Montour PPL Plant	Smokestack
6/7/2007	F	1687-10838	A/71	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/7/2007	F	1687-10839	A/72	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/7/2007	M	2206-80638	26/X	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/31/2007	F	1687-00506	81/Y	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/31/2007	M	2206-79709	70/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/31/2007	F	1687-00505	80/Y	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/31/2007	M	2206-79710	71/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
6/4/2007	F	2206-70224	*4/*Y	Middletown, PA, Three Mile Island	Building
6/4/2007	F	1687-10837	A/70	Washingtonville, Montour PPL Plant	Smokestack
6/14/2007	M	2206-80639	27/X	Reading, PA, Downtown	Building
6/14/2007	M	2206-80640	28/X	Reading, PA, Downtown	Building
5/14/2008	F	1687-00508	83/Y	Washingtonville, Montour PPL Plant	Smokestack
5/14/2008	M	2206-79712	74/X	Washingtonville, Montour PPL Plant	Smokestack
5/14/2008	M	2206-79713	73/X	Washingtonville, Montour PPL Plant	Smokestack
5/14/2008	M	2206-79714	76/X	Washingtonville, Montour PPL Plant	Smokestack
5/19/2008	F	1687-10844	A/40	Pittsburgh, PA, Gulf Tower	Building
5/19/2008	M	2206-80645	33/X	Pittsburgh, PA, Gulf Tower	Building
5/21/2008	F	1687-10854	A/50	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/21/2008	F	1687-10855	A/51	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/21/2008	M	2206-80655	11/S	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/21/2008	M	2206-80656	12/S	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/22/2008	F	1687-10857	A/53	Harrisburg, PA, Rachel Carson State Office Building	Building
5/22/2008	F	1687-10856	A/52	Harrisburg, PA, Rachel Carson State Office Building	Building
5/22/2008	F	1687-10859	A/55	Harrisburg, PA, Rachel Carson State Office Building	Building
5/22/2008	U	1687-10858	A/54	Harrisburg, PA, Rachel Carson State Office Building	Building
5/23/2008	F	1687-10860	A/56	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/27/2008	F	1687-10846	A/41	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/27/2008	M	2206-80646	34/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/27/2008	M	2206-80647	35/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/28/2008	F	1687-00509	84/Y	Pittston, PA, Fort Jenkins/US 11 Bridge	Bridge
5/28/2008	M	2206-79715	77/X	Pittston, PA, Pittston Bridge	Bridge
5/29/2008	M	2206-79718	79/X	Union Co., PA, Shikellamy Cliff	Cliff
6/2/2008	F	1687-10845	A/42	Monaca, PA, Monaca-East Rochester Bridge	Bridge
6/2/2008	F	1687-10847	A/44	Monaca, PA, Monaca-East Rochester Bridge	Bridge
6/2/2008	F	1687-10848	A/45	Monaca, PA, Monaca-East Rochester Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/2/2008	M	2206-80648	36/X	Monaca, PA, Monaca-East Rochester Bridge	Bridge
6/2/2008	F	1687-10862	A/58	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/2/2008	F	1687-10863	A/59	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/2/2008	M	2206-80659	15/S	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/3/2008	F	1687-10864	A/77	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/3/2008	F	1687-10840	A/73	Middletown, PA, Three Mile Island	Building
6/3/2008	F	1687-10840	A/73	Middletown, PA, Three Mile Island	Building
6/9/2008	F	1687-10867	A/80	Allentown, PA, PPL GO Building	Building
6/9/2008	F	1687-10868	A/81	Allentown, PA, PPL GO Building	Building
6/9/2008	F	1687-10869	A/82	Allentown, PA, PPL GO Building	Building
6/9/2008	M	2206-80661	17/S	Allentown, PA, PPL GO Building	Building
6/10/2008	M	2206-79719	*5/*6	Montgomery, PA, Cliff	Cliff
6/10/2008	M	2206-79720	85/Y	Montgomery, PA, Cliff	Cliff
6/13/2008	F	1687-10870	A/83	Wilkes-Barre, PA, Market Street Bridge	Bridge
6/19/2008	M	2206-80662	18/S	Chester, PA, Commodore Barry Bridge	Bridge
6/19/2008	M	2206-80663	19/S	Chester, PA, Commodore Barry Bridge	Bridge
6/3/2008	F	1687-10840	A/73	Middletown, PA, Three Mile Island	Building
6/3/2008	F	1687-10840	A/73	Middletown, PA, Three Mile Island	Building
6/9/2008	F	1687-10867	A/80	Allentown, PA, PPL GO Building	Building
6/9/2008	F	1687-10868	A/81	Allentown, PA, PPL GO Building	Building
6/9/2008	F	1687-10869	A/82	Allentown, PA, PPL GO Building	Building
6/9/2008	M	2206-80661	17/S	Allentown, PA, PPL GO Building	Building
6/10/2008	M	2206-79719	*5/*6	Montgomery, PA, Cliff	Cliff
6/10/2008	M	2206-79720	85/Y	Montgomery, PA, Cliff	Cliff
6/13/2008	F	1687-10870	A/83	Wilkes-Barre, PA, Market Street Bridge	Bridge
6/19/2008	M	2206-80662	18/S	Chester, PA, Commodore Barry Bridge	Bridge
6/19/2008	M	2206-80663	19/S	Chester, PA, Commodore Barry Bridge	Bridge
6/3/2008	F	1687-10840	A/73	Middletown, PA, Three Mile Island	Building
6/23/2008	F	1687-10871	A/84	Yardley, PA, Scudder Falls Bridge	Bridge
6/28/2008	M	2206-79716	78/X	Pittston, PA, Pittston Bridge	Bridge
4/17/2009	M	2206-80665	40/AC	Comcast Center, Philadelphia, PA	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/14/2009	M	2206-80670	45/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	F	1687-10878	46/AE	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	M	2206-80671	46/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	M	2206-80672	47/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2009	U	1687-00552	86/Y	Montgomery, PA, Cliff	Cliff
5/19/2009	F	1687-10851	A/47	Pittsburgh, PA, Gulf Tower	Building
5/19/2009	M	1687-10850	A/46	Pittsburgh, PA, Gulf Tower	Building
5/19/2009	F	1687-00551	A/61	Washingtonville, Montour PPL Plant	Smokestack
5/19/2009	M	2206-79761	08/S	Washingtonville, Montour PPL Plant	Smokestack
5/19/2009	M	2206-79762	09/S	Washingtonville, Montour PPL Plant	Smokestack
5/21/2009	F	1687-10880	48/AE	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/21/2009	F	1687-10879	47/AE	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/21/2009	M	2206-80673	48/AC	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/21/2009	M	2206-80674	49/AC	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/26/2009	F	1687-10872	40/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/26/2009	F	1687-10852	A/48	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/26/2009	F	1687-10853	A/49	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/26/2009	M	2206-80649	37/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/26/2009	M	2206-80675	50/AC	Reading, PA, Downtown	Building
5/26/2009	M	2206-80676	51/AC	Reading, PA, Downtown	Building
5/26/2009	M	2206-80677	52/AC	Reading, PA, Downtown	Building
5/26/2009	M	2206-80678	53/AC	Reading, PA, Downtown	Building
5/27/2009	F	1687-10883	51/AE	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2009	F	1687-10881	49/AE	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2009	F	1687-10882	50/AE	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2009	F	1687-10884	52/AE	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2009	M	2206-80679	54/AC	Harrisburg, PA, Rachel Carson State Office Building	Building
5/28/2009	F	1687-10885	53/AE	Philadelphia, PA, Philadelphia City Hall	Building
5/28/2009	F	1687-10886	54/AE	Philadelphia, PA, Philadelphia City Hall	Building
6/23/2008	F	1687-10871	A/84	Yardley, PA, Scudder Falls Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/28/2008	M	2206-79716	78/X	Pittston, PA, Pittston Bridge	Bridge
4/17/2009	M	2206-80665	40/AC	Comcast Center, Philadelphia, PA	Building
5/14/2009	M	2206-80670	45/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	F	1687-10878	46/AE	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	M	2206-80671	46/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/14/2009	M	2206-80672	47/AC	Philadelphia, PA, Girard Point Bridge	Bridge
5/19/2009	U	1687-00552	86/Y	Montgomery, PA, Cliff	Cliff
5/19/2009	F	1687-10851	A/47	Pittsburgh, PA, Gulf Tower	Building
5/28/2009	F	1687-10887	55/AE	Philadelphia, PA, Philadelphia City Hall	Building
5/28/2009	M	2206-80680	55/AC	Philadelphia, PA, Philadelphia City Hall	Building
5/29/2009	F	1687-10873	41/AE	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/29/2009	F	1687-10874	42/AE	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/29/2009	M	2206-80650	38/X	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/29/2009	F	1687-10889	57/AE	Yardley, PA, Scudder Falls Bridge	Bridge
5/29/2009	F	1687-10888	56/AE	Yardley, PA, Scudder Falls Bridge	Bridge
5/29/2009	F	1687-10890	58/AE	Yardley, PA, Scudder Falls Bridge	Bridge
6/1/2009	F	1687-10891	59/AE	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/1/2009	F	1687-10892	60/AE	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/1/2009	M	2206-80681	56/AC	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/2/2009	F	1687-10893	65/AE	Duryea, PA, Campbell's Ledge	Cliff
6/2/2009	M	2206-80682	57/AC	Duryea, PA, Campbell's Ledge	Cliff
6/2/2009	F	1687-10894	66/AE	Luzerne County, PA, Cliff	Cliff
6/2/2009	F	1687-10895	67/AE	Luzerne County, PA, Cliff	Cliff
6/2/2009	M	2206-80683	58/AC	Luzerne County, PA, Cliff	Cliff
6/5/2009	F	1687-10877	45/AE	McKees Rocks, PA, McKees Rocks Bridge	Bridge
6/5/2009	F	1687-10875	44/AE	McKees Rocks, PA, McKees Rocks Bridge	Bridge
6/5/2009	F	1687-10876	43/AE	McKees Rocks, PA, McKees Rocks Bridge	Bridge
6/11/2009	F	1687-10896	A/85	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/11/2009	M	2206-80684	23/S	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/11/2009	M	2206-80685	24/S	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/1/2010	F	1687-02845	08/AE	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/7/2010	M	2206-80689	28/S	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/7/2010	F	1687-10899	A/88	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/7/2010	F	1687-10900	A/89	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/7/2010	M	2206-80689	28/S	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/10/2010	F	1687-00553	87/Y	Washingtonville, Montour PPL Plant	Smokestack
5/10/2010	M	2206-79763	37/S	Washingtonville, Montour PPL Plant	Smokestack
5/18/2010	F	1687-00516	68/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/18/2010	F	1687-00517	69/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/18/2010	M	2206-80652	05/S	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/18/2010	M	2206-80653	06/S	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/18/2010	M	2206-80654	07/S	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/19/2010	F	1687-00510	A/90	Duryea, PA, Campbell's Ledge	Cliff
5/19/2010	M	2206-80690	29/S	Duryea, PA, Campbell's Ledge	Cliff
5/19/2010	M	2206-80691	30/S	Duryea, PA, Campbell's Ledge	Cliff
5/19/2010	F	1687-00512	A/92	Luzerne County, PA, Cliff	Cliff
5/19/2010	F	1687-00512	A/92	Luzerne County, PA, Cliff	Cliff
5/19/2010	U	1687-00511	A/91	Luzerne County, PA, Cliff	Cliff
5/20/2010	F	1687-00513	A/93	Philadelphia, PA, Girard Point Bridge	Bridge
5/20/2010	F	1687-00514	A/94	Philadelphia, PA, Girard Point Bridge	Bridge
5/20/2010	M	2206-80692	31/S	Philadelphia, PA, Girard Point Bridge	Bridge
5/21/2010	F	1687-00515	A/95	Reading, PA, Downtown	Building
5/21/2010	F	1687-00534	A/96	Reading, PA, Downtown	Building
5/21/2010	M	2206-80693	32/S	Reading, PA, Downtown	Building
5/21/2010	M	2206-80694	33/S	Reading, PA, Downtown	Building
5/25/2010	F	1687-00554	88/Y	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2010	M	2206-79764	10/S	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2010	M	2206-79765	38/S	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2010	M	2206-79766	39/S	McElhattan, PA, McElhattan Bridge	Bridge
5/27/2010	M	2206-80695	34/S	Harrisburg, PA, Rachel Carson State Office Building	Building
5/27/2010	M	2206-80696	35/S	Harrisburg, PA, Rachel Carson State Office Building	Building

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/27/2010	M	2206-80697	36/S	Harrisburg, PA, Rachel Carson State Office Building	Building
5/28/2010	M	2206-79767	00/AP	Montgomery, PA, Cliff	Cliff
5/1/2010	F	1687-02845	08/AE	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/7/2010	M	2206-80689	28/S	Bristol, PA, PA/NJ Turnpike Bridge	Bridge
5/7/2010	F	1687-10899	A/88	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/7/2010	F	1687-10900	A/89	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/28/2010	M	2206-80698	10/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/28/2010	U	1687-00535	A/97	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/28/2010	M	2206-80699	11/AP	Philadelphia, PA, Wachovia Bank	Building
5/28/2010	U	1687-00536	A/98	Philadelphia, PA, Wachovia Bank	Building
6/3/2010	F	1687-00537	A/99	Chester, PA, Commodore Barry Bridge	Bridge
6/3/2010	F	1687-00538	21/AR	Chester, PA, Commodore Barry Bridge	Bridge
6/3/2010	M	2206-80700	12/AP	Chester, PA, Commodore Barry Bridge	Bridge
6/7/2010	M	2206-80651	39/X	Pittsburgh, PA, Gulf Tower	Building
6/8/2010	M	2206-79732	13/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/7/2010	M	2206-80666	41/AC	Pittsburgh, PA, Gulf Tower	Building
6/7/2010	F	1687-00518	70/AE	Pittsburgh, PA, Gulf Tower	Building
6/7/2010	F	1687-00519	71/AE	Pittsburgh, PA, Gulf Tower	Building
6/7/2010	M	2206-80667	42/AC	Pittsburgh, PA, Gulf Tower	Building
6/8/2010	M	2206-79733	14/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/11/2010	F	1687-00539	22/AR	Allentown, 8th St. Bridge	Bridge
6/11/2010	F	1687-00540	23/AR	Allentown, 8th St. Bridge	Bridge
6/11/2010	F	1687-10841	A/74	Middletown, PA, Three Mile Island	Building
6/16/2010	M	2206-79721	59/AC	East Pittsburgh, PA, George Westinghouse Memorial Bridge (Rt. 30)	Bridge
6/16/2010	M	2206-79722	60/AC	East Pittsburgh, PA, George Westinghouse Memorial Bridge (Rt. 30)	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/16/2010	M	2206-79723	61/AC	East Pittsburgh, PA, George Westinghouse Memorial Bridge (Rt. 30)	Bridge
7/7/2010	M	2206-24700	*5/*9	York Haven, PA, Brunner Island PPL Plant	Building
7/7/2010	M	2206-80641	29/X	York Haven, PA, Brunner Island PPL Plant	Building
7/13/2010	F	1687-00541	24/AR	Columbia, PA, Rt. 462 Bridge	Bridge
7/13/2010	M	2206-79734	15/AP	Columbia, PA, Rt. 462 Bridge	Bridge
5/3/2011	F	1907-03525	79/AD	SE of Baltimore, MD, Range Lighthouse	Lighthouse
5/16/2011	F	1687-00550	33/AR	Elverson, PA, French Creek State Park	Cliff
5/16/2011	F	1687-00555	34/AR	Elverson, PA, French Creek State Park	Cliff
5/16/2011	F	1687-00556	35/AR	Elverson, PA, French Creek State Park	Cliff
5/17/2011	M	2206-79747	28/AP	Harrisburg, PA, Rachel Carson State Office Building	Building
5/18/2011	F	1687-00557	36/AR	Philadelphia, PA, Philadelphia City Hall	Building
5/18/2011	M	2206-79748	29/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/18/2011	M	2206-79749	30/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/18/2011	M	2206-79750	31/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/19/2011	F	1687-00522	74/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/19/2011	F	1687-00520	72/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/19/2011	F	1687-00521	73/AE	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/19/2011	M	2206-80668	00/AR	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/19/2011	M	2206-80668	00/AR	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/24/2011	F	1687-00558	37/AR	Yardley, PA, Scudder Falls Bridge	Bridge
5/24/2011	F	1687-00559	38/AR	Yardley, PA, Scudder Falls Bridge	Bridge
5/25/2011	F	1687-00588	11/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2011	F	1687-00589	14/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2011	F	1687-00590	12/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2011	F	1687-00591	13/AR	McElhattan, PA, McElhattan Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/25/2011	F	1687-00560	39/AR	Reading, PA, Downtown	Building
5/25/2011	M	2206-79751	32/AP	Reading, PA, Downtown	Building
5/26/2011	F	1687-00561	40/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	F	1687-00562	42/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	F	1687-00564	41/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	M	2206-79752	33/AP	Allentown, 8th St. Bridge	Bridge
5/26/2011	F	1687-00565	44/AR	Duryea, PA, Campbell's Ledge	Cliff
5/26/2011	F	1687-00566	45/AR	Luzerne County, PA, Cliff	Cliff
5/26/2011	F	1687-00567	46/AR	Luzerne County, PA, Cliff	Cliff
5/26/2011	M	2206-79756	37/AP	Luzerne County, PA, Cliff	Cliff
5/26/2011	F	1687-00523	01/AR	Pittsburgh, PA, Gulf Tower	Building
5/26/2011	F	1687-00524	02/AR	Pittsburgh, PA, Gulf Tower	Building
5/26/2011	F	1687-00525	03/AR	Pittsburgh, PA, Gulf Tower	Building
5/26/2011	M	2206-79724	43/AC	Pittsburgh, PA, Gulf Tower	Building
5/26/2011	F	1687-00561	40/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	F	1687-00562	42/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	F	1687-00564	41/AR	Allentown, 8th St. Bridge	Bridge
5/26/2011	M	2206-79752	33/AP	Allentown, 8th St. Bridge	Bridge
5/26/2011	M	2206-79725	44/AC	Pittsburgh, PA, Gulf Tower	Building
5/27/2011	F	1687-00556	62/AC	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/27/2011	M	2206-79735	16/AP	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/27/2011	M	2206-79736	17/AP	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/27/2011	M	2206-79739	18/AP	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/31/2011	F	1687-00569	48/AR	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/31/2011	M	2206-79754	35/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/31/2011	M	2206-79755	36/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/31/2011	M	2206-79755	36/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/31/2011	M	2206-79757	38/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/31/2011	F	1687-00563	43/AR	Philadelphia, PA, Walt Whitman Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/31/2011	F	1687-00568	47/AR	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/31/2011	M	2206-79753	34/AP	Philadelphia, PA, Walt Whitman Bridge	Bridge
6/3/2011	F	1687-00570	49/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/3/2011	F	1687-00571	50/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/3/2011	M	2206-79758	39/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/3/2011	M	2206-79759	40/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/26/2011	M	2206-79725	44/AC	Pittsburgh, PA, Gulf Tower	Building
5/27/2011	F	1687-00556	62/AC	Monaca, PA, Monaca-East Rochester Bridge	Bridge
6/15/2011	F	1687-10842	A/75	Middletown, PA, Three Mile Island	Building
6/15/2011	F	1687-10843	A/76	Middletown, PA, Three Mile Island	Building
7/14/2011	F	1687-00575	54/AR	Columbia, PA, Rt. 462 Bridge	Bridge
7/14/2011	F	1687-00576	55/AR	Columbia, PA, Rt. 462 Bridge	Bridge
5/4/2012	F	1687-00577	56/AR	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/4/2012	F	1687-00578	57/AR	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/4/2012	M	2206-79760	41/AP	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/4/2012	U	1687-00579	58/AR	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/9/2012	M	2206-79768	42/AP	Harrisburg, PA, Rachel Carson State Office Building	Building
5/9/2012	M	2206-79769	43/AP	Harrisburg, PA, Rachel Carson State Office Building	Building
6/15/2011	F	1687-10842	A/75	Middletown, PA, Three Mile Island	Building
6/15/2011	F	1687-10843	A/76	Middletown, PA, Three Mile Island	Building
7/14/2011	F	1687-00575	54/AR	Columbia, PA, Rt. 462 Bridge	Bridge
5/17/2012	F	1687-00581	60/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/17/2012	M	1687-00580	59/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/18/2012	F	1687-00582	61/AR	Philadelphia, PA, Girard Point Bridge	Bridge
5/18/2012	F	1687-00583	62/AR	Philadelphia, PA, Girard Point Bridge	Bridge
5/18/2012	M	2206-79770	44/AP	Philadelphia, PA, Girard Point Bridge	Bridge
5/22/2012	F	1687-00527	04/AR	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/22/2012	F	1687-00527	04/AR	Monaca, PA, Monaca-East Rochester Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/22/2012	M	2206-79726	63/AC	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/22/2012	M	2206-79727	64/AC	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/22/2012	M	2206-79728	65/AC	Monaca, PA, Monaca-East Rochester Bridge	Bridge
5/23/2012	M	2206-79771	45/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/23/2012	M	2206-79772	46/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/23/2012	M	2206-79773	47/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/23/2012	M	2206-79774	48/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/23/2012	M	2206-79729	66/AC	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/23/2012	M	2206-79730	67/AC	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/23/2012	M	2206-79731	68/AC	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/25/2012	U	1687-00584	63/AR	Allentown, 8th St. Bridge	Bridge
5/25/2012	U	1687-00585	64/AR	Allentown, 8th St. Bridge	Bridge
5/25/2012	U	1687-00586	65/AR	Allentown, 8th St. Bridge	Bridge
5/25/2012	F	1687-00592	15/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2012	F	1687-00593	16/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2012	F	1687-00594	17/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2012	F	1687-00595	18/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2012	M	2206-79779	01/AP	McElhattan, PA, McElhattan Bridge	Bridge
5/25/2012	F	1687-00587	66/AR	Reading, PA, Downtown	Building
5/25/2012	M	2206-79775	49/AP	Reading, PA, Downtown	Building
5/30/2012	M	1156-12512	64/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/30/2012	M	2206-79777	51/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/30/2012	M	2206-79778	52/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
6/13/2012	M	2206-79738	69/AC	Glenfield, PA, I-79 Ohio River Bridge	Bridge
6/14/2012	F	1947-07012	77/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/14/2012	F	1947-07013	78/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/14/2012	F	1947-07014	79/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/14/2012	M	1156-12513	65/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/7/2013	F	1687-00572	51/AR	Philadelphia, PA, Girard Point Bridge	Bridge
5/7/2013	F	1687-00573	52/AR	Philadelphia, PA, Girard Point Bridge	Bridge
5/7/2013	F	1687-00574	53/AR	Philadelphia, PA, Girard Point Bridge	Bridge
5/13/2013	F	1687-00528	05/AR	Duncannon, PA, Clark's Ferry Bridge	Bridge
5/13/2013	F	1687-00529	06/AR	Duncannon, PA, Clark's Ferry Bridge	Bridge
5/13/2013	M	2206-80642	30/X	Duncannon, PA, Clark's Ferry Bridge	Bridge
5/14/2013	F	1687-00530	07/AR	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2013	F	2687-00531	08/AR	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2013	M	2206-80643	31/X	Bristol, PA, PA-NJ Turnpike Bridge	Bridge
5/14/2013	F	1687-00532	09/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/14/2013	F	1687-00533	10/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/14/2013	U	1687-00542	25/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/14/2013	U	1687-00543	26/AR	Manayunk Section of Philadelphia, PA, St. John the Baptist Church	Building
5/17/2013	M	2206-80644	32/X	Pittsburgh, PA, Univ. of Pitt Cathedral of Learning	Building
5/18/2013	F	1687-00546	29/AR	Philadelphia, PA, Hospital of University of PA	Building
5/20/2013	F	1947-04791	67/AR	Luzerne County, PA, Cliff	Cliff
5/20/2013	F	1947-04792	68/AR	Luzerne County, PA, Cliff	Cliff
5/20/2013	U	1947-04793	69/AR	Luzerne County, PA, Cliff	Cliff
5/20/2013	F	1687-00547	30/AR	Philadelphia, PA, Philadelphia City Hall	Building
5/20/2013	M	2206-79739	20/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/30/2012	M	1156-12512	64/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/20/2013	M	2206-79740	21/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/20/2013	M	2206-79741	22/AP	Philadelphia, PA, Philadelphia City Hall	Building
5/21/2013	M	2206-79780	02/AP	Glenfield, PA, I-79 Ohio River Bridge	Bridge
5/21/2013	M	2206-79781	03/AP	Glenfield, PA, I-79 Ohio River Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
5/21/2013	M	2206-79742	23/AP	Harrisburg, PA, Rachel Carson State Office Building	Building
5/22/2013	F	1947-07016	81/AR	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/22/2013	M	2206-79743	24/AP	Philadelphia, PA, Ben Franklin Bridge	Bridge
5/23/2013	F	1947-07017	82/AR	Allentown, 8th St. Bridge	Bridge
5/23/2013	F	1947-07018	83/AR	Allentown, 8th St. Bridge	Bridge
5/23/2013	F	1947-07019	84/AR	Allentown, 8th St. Bridge	Bridge
5/23/2013	M	2206-79744	25/AP	Allentown, 8th St. Bridge	Bridge
5/24/2013	F	1947-07020	85/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/24/2013	F	1947-07021	86/AR	McElhattan, PA, McElhattan Bridge	Bridge
5/28/2013	F	1947-07024	89/AR	Chester, PA, Commodore Barry Bridge	Bridge
5/28/2013	M	2206-79746	27/AP	Chester, PA, Commodore Barry Bridge	Bridge
5/29/2013	F	1947-07025	90/AR	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/30/2013	F	1947-07026	91/AR	Columbia, PA, Rt. 462 Bridge	Bridge
5/30/2013	F	1947-07027	92/AR	Columbia, PA, Rt. 462 Bridge	Bridge
5/31/2013	F	1947-07028	70/AR	Reading, PA, Downtown	Building
5/31/2013	F	1947-07029	71/AR	Reading, PA, Downtown	Building
5/31/2013	F	1947-07030	72/AR	Reading, PA, Downtown	Building
5/31/2013	M	1156-12514	66/AP	Reading, PA, Downtown	Building
6/10/2013	F	1947-07031	73/AR	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/10/2013	M	1156-07031	69/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/10/2013	M	1156-12515	67/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
6/10/2013	M	1156-12516	68/AP	Martin's Creek, PA, Martin's Creek PPL Plant	Smokestack
5/28/2013	F	1947-07024	89/AR	Chester, PA, Commodore Barry Bridge	Bridge
5/28/2013	M	2206-79746	27/AP	Chester, PA, Commodore Barry Bridge	Bridge
5/29/2013	F	1947-07025	90/AR	Philadelphia, PA, Walt Whitman Bridge	Bridge
5/30/2013	F	1947-07026	91/AR	Columbia, PA, Rt. 462 Bridge	Bridge
6/17/2013	F	1687-00545	28/AR	Williamsport, PA, Market Street Bridge	Bridge

Table 5 (cont.)

Banding Date	Sex	USFWS Band	Aux. Band Number	Banding Site	Structure
6/17/2013	M	2206-79782	04/AP	Williamsport, PA, Market Street Bridge	Bridge
6/18/2013	F	1947-01306	74/AR	Ridley Park, PA, Exelon Eddystone Generating Station	Building