



**TALL STRUCTURES:  
Best Management Practices for Bird-friendly Tall Buildings, Towers, and Bridges –  
U.S. Fish & Wildlife Service Recommendations to Address the Problems**

**Presentation at the Conference on *Birds and Buildings: Creating a Safer Environment***

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**TRUST RESOURCES**

- Migratory birds trust resource: FWS trust agency responsible conservation and management 836 species migratory birds.
- Part trust responsibility codified 1916 Migratory Bird Treaty with Great Britain for Canada.
- Migratory Bird Treaty Act (MBTA) of 1918, as amended now implements treaties Canada, Mexico, Japan, and Russia.

**AVIAN POPULATION STATUS**

- Status: U.S. bird populations of concern. 1995, FWS listed 124 “non-game species of management concern.” Represents early warning system since possible next step is listing birds as “candidates” under Endangered Species Act (ESA) – train wreck we’d prefer to avoid.
- 2003, FWS published “2002 birds of conservation concern,” as mandated by law. Number of bird populations in trouble increased from 124 to 131 species – not good news. In addition, “bird conservation concern” currently list 77 endangered and 15 threatened birds on Endangered Species Act – figures that continue to increase.
- Recapping, of 836 species migratory birds, more than 223 are in trouble. On top of this, Service essentially lacks data on status 1/3 North American bird populations. Challenges make management very difficult.

**REVERSING POPULATION DECLINES**

- As trust agency tasked to protect and manage migratory birds, FWS must do everything we can to reverse populations trends – vast majority human-caused – whether impacts appear large or small.
- Issue involves cumulative impacts – which “straw” will eventually break the camel’s back?

**HISTORICAL STRUCTURAL IMPACTS**

- Structural-caused mortality 1st documented U.S. 1874 at lighthouses and lamps (*Forest and Stream* 1874), and 1876 at telegraph wires (Coues 1876). Lighthouses further studied (Allen 1880, Barrington 1900, Lewis 1927, Squires and Hanson 1927).



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- Extensive numbers nocturnal migrants striking Washington Monument (Overton 1936).
- 4-day 25-story-tall building strike estimated 107,000 mostly passerines fall 1954 (Johnston and Haines 1957).
- 2,421 dead birds 39 species (mostly warblers) retrieved beneath light poles following stormy night (James 1956).
- 200 birds 23 species killed, apparently confused by floodlights at lodge Blue Ridge Parkway, NC, foggy night fall 1950 (Lord 1951).
- 1,801 birds 44 species killed 2 foggy nights fall 1972 at 125-ft. and 85-ft. towers and floodlit building (Herndon 1973).
- 3-day ~1,000-ft. television tower bird kill, >33,000 birds (> 12,000 1 night), 1963, Eau Clair, WI (Kemper 1996).
- 4-year study 2 smokestacks in Ontario > 8,500 mostly passerines (Weir 1976); average 2,300 birds killed/yr. lighted smokestacks, Kingston, Ontario. Change to white strobes, kills ended (Broderick 1995).
- 1st FWS attempt estimate nationwide human-caused annual mortality to birds published 1979 (Banks 1979) where he estimated 196 M bird deaths – 61% hunting, 32% collisions structures, 2% pollution and poisoning.

### **“STRAWS” THAT MAY BE BREAKING THE PROVERBIAL CAMEL’S BACK**

- Building window strikes huge “straw.”
  - -- 97.6- 976 million birds/yr. striking building windows (Klem 1990 model).
  - -- 97-970 million birds/yr. (O’Connell 1998 model).
- Communication towers another problem.
  - 4-5 million to 40-50 M/yr. estimate (Banks 1979; Evans 1998; Manville 2001, 2002, 2005).
- Power transmission line strikes.
  - Hundreds thousands - ~175 M/yr. (Koops 1987, Manville 2005).
- Power distribution line electrocutions.
  - Tens of thousands to hundreds thousands/yr. (Manville 2005).
- Smoke stack casualties.
  - tens to hundreds thousands/yr. (Manville 2005).

### **STATUTORY RESPONSIBILITIES: THE LAWS**

- Some have asserted that architects, designers, building owners, and building lessees “exempt” from Federal statutes that protect birds, bats and other trust wildlife resources, and therefore would not be subject to possible prosecution for “takes.” While unaware case law, not wise or responsible conclusion to reach.



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### ▪ **What you need to know:**

#### **Endangered Species Act**

Fish & Wildlife Service is responsible for providing protection to most listed species and their critical habitats impacted by buildings, bridges, monuments, towers.

*Federal Nexus, e.g., Public Lands*

- If proposed site is on Federal lands, or Federal licensing permit, or Federal funding, strongly recommend that applicable Federal agency (or designated non-Federal representative) consult with FWS under Section 7.
  - Consultation easily done through 1 of 78 FWS Ecological Services Field Offices
- If proposed site on private land, where no Federal permit or funding involved, suggest architects, designers, or building owners contact local ES Field Office for guidance under Section 9 and Section 10 (ESA) at outset.
  - Section 9 makes unlawful for person to “take” listed species – “harm, injure, or kill...”
  - Section 10 allows private individuals and companies to acquire permit for “incidental take” which could occur through otherwise legal activity, such as construction of bridge, communication tower, or monument, and which would *not* cause species become further imperiled.
  - Section 10 allows development “habitat conservation plans” (HCP) on private land. Private landowners who develop and implement approved HCPs by providing for conservation of species can receive incidental take permit allowing development go forward.

#### **Migratory Bird Treaty Act & Bald and Golden Eagle Protection Act**

**MBTA** – Strict liability statute where proof of intent to violate any provision Act is not required. Congress intended to make killing even 1 bird illegal. Act allows prosecution of killing 1 bird and FWS does not issue “incidental or accidental take” permits (*unlike those issued under ESA*).

While certainly **not** first priority, enforcement may sometimes be necessary. *E.g.*, Moon Lake Electric Cooperative Assoc. (CO and UT) criminally prosecuted by DOJ for electrocuting 16 raptors at power powers not make bird-friendly. Penalties can be extensive.

To avoid problems under MBTA, contact nearest Ecological Services Field Office for guidance.

**BGEPA** – Wanton disregard; not strict liability. Contact FO for guidance w/ eagles.

#### **SO WHAT CAN BE DONE? SOME RECOMMENDATIONS**

- Service much prefers partnership approach working w/ industry – bridges, monuments, towers, turbines, tall buildings, power lines.
- Before building a tall structure, contact us through FO for assistance.
- Note overlap in recommendations between structures about to be discussed/listed below.



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### **BUILDINGS**

- Turn **off** lights at night inside (specifically outside periphery offices where lighting shines outside) and outside buildings, especially during migration – see Michael Mesure, FLAP, more detail.
- Avoid powerful solid spot lights, ceilometers, intense bright lights which attract and “trap” birds in lighted areas – especially during spring and fall songbird migrations, most especially with inclement weather at night. Turn **off** especially during these times.
- Avoid placing solid red or pulsating red incandescent lights on or near tall buildings, other structures. Evidence indicates white and probably red strobes less attractive to birds than solid light either color (Longcore *et al.* 2005, Manville 2005).
- Where lighting must be used (FAA 2000 Advisory Circular), minimum intensity, maximum off-phased (3-second between flashes) white strobes preferred. Research on red strobes promising but as yet not definitive.
- Where antennas installed on buildings, avoid guy wire supports, especially conjunction w/ incandescent lighting. Use lattice or monopole antenna tower construction.
- Although not necessarily lighting issue, avoid designs that result in raptor (*e.g.*, Red-tailed Hawk, Peregrine Falcon) nesting, followed later by nest removal and raptor eviction (*e.g.*, Red-tailed Hawk “Pale Male,” NYC).
- Where feasible, use nesting platforms developed by electric utility industry (APLIC 1996). Where nest must be removed, contact FWS Lead Permits Examiner in Service Region involved for permit application and guidance.

### **MONUMENTS**

- Avoid bright, intense spots, especially during migration, most especially during bad weather at night. Turn **off** during these situations. Alternative suggestions: use minimum intensity strobes (*e.g.*, neon), down-shield incandescent lights, reduce lumen intensity.
- Avoid scenarios referenced above for buildings.

### **BRIDGES**

- Where pilot warning/obstruction lighting not issue, use low-intensity lower wavelength blue, turquoise, or green lights (Wiltschko and Wiltschoko 2002). Tends not disrupt magnetic orientation several families birds studied. **Avoid red** and **yellow** lights.
- Specifically, use blue jelly jar LED (light emitting diodes) lights on suspension cables and rectangular blue LED lights on bridge deck – low energy consumption, produce bright but directional light (25% bright as 100W bulb), provide long-distance viewing, while minimizing light pollution which could lead bird entrapment. Operate year-round from sunset to 1:00 am.



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- Install any lights during non-nesting periods (generally August 1- January 15). Seek advice from nearest Field Office for guidance, especially when birds may be exhibiting breeding behavior. Consult w/ Peregrine Falcon monitor qualified to assess breeding behavior.
- Where nests active, establish 500-ft. buffer zone around nest. No work to be allowed until fledglings left nest.
- Consider turning off lights during spring and fall bird migration periods, especially during overcast, cloudy, hazy conditions – mass mortality associated w/ lighting during these situations.
- Once lighting installed, perform peer-reviewed research to determine any effects on migratory birds. Coordinate with DMBM and Field Office on research protocols.

### **ANTENNAS AND COMMUNICATION TOWERS**

- Most important, avoid lighted, guyed towers where possible. Collocation key.
- Use Service's 2000 voluntary communication tower guidance, <<http://birds.fws.gov/Management.htm>>, click on Avian Mortality, click on Tower Kills.

### **WIND GENERATORS**

- Where wind facilities or demo turbines proposed, perform site ranking and evaluation process to select most bird- and bat-friendly sites, perform pre- and post-construction monitoring.
- Consult w/ USFWS at outset. Use Service's interim voluntary 2003 wind turbine guidance, <<http://www.fws.gov/r9dhcbfa/windenergy.htm>>.

### **ELECTRIC UTILITY EXTERNAL STRUCTURAL WIRING**

#### ***Electrocution Avoidance***

- 60-inch spacing between energized distribution conductors and grounded hardware.
- Where spacing not feasible, cover energized parts and hardware – cover jumper wires, conductors, other equipment, install perch deterrents.
- Consider under grounding lines.

#### ***Strike Avoidance***

- Install visibility enhancement devices – marker balls, bird diverters, deterrents.
- Use Avian Power Line Interaction Committee 1994 and 1996 voluntary guidance – both documents being updated.



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**Conclusion**

- Bird strikes at buildings, monuments, towers, bridges, and turbines are individually and cumulatively significant impact on migratory birds – very likely population impact to some species.
- Working w/ FWS through partnership approach recommended way to proceed.
- In addition to benefiting our avian friends, bird-friendly efforts cut utility costs, reduce greenhouse gas emissions, lessen light pollution, avoid PR nightmares, and minimize possible investigations – in summary, simply the ***right and responsible*** thing to do.

Thank you.