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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D C 20240

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U.S. Fish & Wildlife Service
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Federal Communications Commission
Office of the Secretary

November 7, 2003

Mr. G. William Stafford, Esq.
Federal Communications Commission
Room 6329
445 12th St., SW
Washington, DC 20554

Re: U.S. Fish & Wildlife Service Comments of FCC's Notice of Inquiry, "Effects of Communication Towers on Migratory Birds"

cc: <Bill.Stafford@fcc.gov>

Dear Mr. Stafford:

The Division of Migratory Bird Management (DMBM), U.S. Fish & Wildlife Service (FWS or Service), is pleased to comment on the Federal Communications Commission's (FCC) Notice of Inquiry (NOI; WT Docket No. 03-187, FCC 03-205), "Effects of Communication Towers on Migratory Birds," published in the *Federal Register* on September 12, 2003 (volume 68(177): 53696-53702). Due to the detailed nature of the request for comments, as well as the overlap in many of the issues raised in this NOI, the Service will attempt to consolidate our response in an effort to avoid redundancy.

STATUTORY AUTHORITY

The issues addressed in this NOI include the take of migratory birds and endangered species. Therefore, we are providing our comments pursuant to the Migratory Bird Treaty Act (MBTA; 16 U.S.C. 703-712), the Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668-668d), and the Endangered Species Act (ESA; 16 U.S. C. 1531 *et seq.*). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by FWS. The word "take" is defined as, "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect." The unauthorized taking of even one bird is legally considered a "take" under MBTA and is a violation of the law. Bald and Golden Eagles are afforded additional legal protection under BGEPA.

Section 9 of the ESA prohibits the take of any Federally listed animal species by any person subject to the jurisdiction of the U.S. The term "person" is defined as, "... an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal government, of any State, municipality, or political subdivision of a State, or any other entity subject to the jurisdiction of the United States." Section 11 of the Act provides for both civil and criminal penalties for those convicted of Section 9 violations. As defined in ESA, take means, "... to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" in the definition of take means an act which kills or injures wildlife. Such acts may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR Part 17.3). "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

FWS COMMENTS ON FCC's NOI

III. Request for Comments. A. 13. <u>Current State of Scientific Information</u>. While the Service acknowledges that the *overall extent* to which communication towers kill migratory birds is not well known, we point out that the exponential growth in communication tower construction only began in the United States in the late 1990s, thus only making this a major recent issue. Action by the FWS was precipitated by reports of a bird kill of significant proportions brought to our attention by members of the environmental community shortly after they documented a 3-tower event (possibly augmented by ground lighting) on January 22, 1998, in western Kansas. Between 5,000- 10,000 Lapland Longspurs (a migratory songbird) and other species were estimated killed in a single night at these structures. Members of the conservation community requested that we take action in response to this large kill. We did with a Service meeting in Panama City, Florida, in November 1998 where we developed a tower risk model (later made available to the public), created the Communication Tower Working Group (CTWG) at a June 1999 meeting in Washington, DC, and held the first-of-its-kind workshop on avian mortality at communication towers hosted at Cornell University in August 1999. Ms. H. Berland, Esq., of your staff represented FCC at that workshop and was a presenter (her comments were published in the workshop proceedings available on DMBM's website at, http://birds.fws.gov/issues/towers/agenda.html).

The Service wishes to point out that single tower mortality events and single-tower multi-year mortality studies have been published in the popular and peer-reviewed U.S. literature since 1949 (*e g.,* Aronoff 1949, Cochran and Graber 1958, Cochran 1959, Caldwell and Cuthbert 1963, Able 1973, Herndon 1973, Clark 1973, Avery *et al.* 1976, Avery *et al.* 1977, Avery *et al.* 1978, Ball *et al.* 1995, Kemper 1996, Gauthreaux and Belser 1999, Crawford and Engstrom 2000, and Crawford and Engstrom 2001, Gauthreaux and Belser 2003, and Morris *et al.* 2003). The longest continuous on-going study, for example, began at Tall Timbers Research Station in Tallahassee, FL, at a television station in 1955. After the first 25 years of the study, 42,384 birds representing 189 species were tallied (Crawford and Engstrom 2000). On average, 1,517 birds were killed per year over the 29-year period of this study, 65% of the mortalities documented in

the fall and 20% in the spring (Crawford and Engstrom 2001). The longest study yet conducted – over 38 years, although not continuous – was performed by physician C. Kemper, beginning in 1957. Dr. Kemper collected nearly 121,560 birds representing 123 species and he still holds the all-time record for most birds collected and identified from a single-night tower strike. More than 12,000 birds were retrieved one night in 1963 from the base of a television tower in Eau Clair, WI, not accounting for almost certain scavenging of dead and injured birds by wild and domestic predators (Kemper 1996).

You cite a literature review conducted for DMBM by Dr. P. Kerlinger which was provided to us in March 2000 relating to a paucity of literature on avian-tower collision issues. The likely reason little research was published during the period 1995-1999 was because exponential tower growth only began near the end of that literature review period, and thus there likely was little incentive or funding to further study the problem.

The NOI characterizes most of the body of literature published prior to 1985 as "anecdotal" and that the literature itself was not "examined analytically." These statements are simply incorrect. A good deal of the literature was, in fact, published in credible, peer-reviewed scientific journals (*e.g* , Able 1973, Aldrich *et al.* 1975, Aronoff 1949, Avery *et al* 1976, Avery *et al.* 1977, Avery *et al.* 1978, Banks 1979, Caldwell and Cuthbert 1963, Cochran 1959, Cochran and Graber 1955, Crawford 1981, Crawford and Engstrom 2001, Herndon 1973, and Tordoff and Mengel 1956). This, and other literature has been reviewed analytically by DMBM (Manville 2001a and 2001b, Manville 2003) and previously by FWS (Banks 1979), and others (Evans 1998), to compare numbers, instances, and dates of large mortality events. There is credible published information regarding the evidence of large kills (Cochran and Graber 1958, Cochran 1959, Caldwell and Cuthbert 1963, Able 1973, Herndon 1973, Kember 1996, Crawford and Engstrom 2000, Erickson *et al.* 2001, Crawford and Engstrom 2001, Morris *et al* 2003). Shire *et al.* (2000) provide a good overview of the problem within the U.S. What is lacking, however, is the consistent use of a standard research study protocol to conduct these studies, and a more detailed attempt to assess what caused large single-night passerine kills. The etiology of bird-tower mortality is a current major research need.

A. 14. Regarding estimates of avian mortality at communication towers, former FWS staff member Dr. R. Banks reviewed avian mortality at some 505 of the then existing 1,010 tall radio and television towers in the U.S. in 1975, estimating mortality at 1.25 million birds killed/year at the towers (Banks 1979). The Service published an estimate of nationwide human-caused annual mortality which Banks (1979) depicted as196 million bird deaths caused by human activity. This estimate represented 1.9 percent of the then existing projected bird population in North America. Of the 196 million estimated deaths, 61 percent were from hunting, 32 percent from collisions with structures, and 2 percent from pollution and poisoning. Evans (1998) reassessed mortality based on increased numbers of tall towers considerably greater in number than what Banks had studied in 1975, estimating 2-4 million bird deaths per year. Manville (2001a, from a December 1999 evaluation) estimated annual mortality at 4-5 million birds, while Manville (2001b, based on a December 2000 assessment) again cited the 4-5 million figure but indicated that mortality could range as high as 40-50 million. He cautioned that only a cumulative impacts study would assess the true magnitude of the problem and again raised

concerns over impacts on already imperiled bird species.

The FWS mortality estimates are for all communication towers – short cellular communication towers to tall digital television towers – nationwide. The Service acknowledges that any tall structure can potentially kill birds, a sentiment also expressed by Crawford and Engstrom (2000) and others. The vast majority of bird deaths are reported east of the Rocky Mountains which may be an artifact of the mass migration fronts of some 350 species of passerines (generally neotropical migratory songbirds) that have been most heavily impacted by towers in the East. In the Rocky Mountains and west to the Pacific Coast, spring and fall songbird migrations are not as enormous as those found in the East (Gauthreaux and Belser 2003), although considerable songbird migration appears to take place along and immediately adjacent to the West Coast as birds – including songbirds, shorebirds, hummingbirds, colonial waterbirds, waterfowl, and raptors migrate down from and move back to Alaska and Canada. Only one mortality study (unpublished) was recently conducted in Sacramento County, California, in at a 1,600+/- foot television tower owned by Richland Tower. The 2001 review took place for only 1 month in spring and while about 10 birds deaths were documented, weather conditions were good throughout the study. If the Service's conservative estimate of 4-5 million bird deaths per year is correct, this level of mortality represents a significant and unacceptable impact on avian populations, particularly warblers (Parulidae), thrushes (Muscicapidae) and vireos (Vireonidae) which – based on mortality studies – appear to be the most vulnerable (Manville 2001a) . Early this fall, a Federally endangered female Kirtland's Warbler was retrieved at a 700-foot tower in South Carolina along with some 200 other songbirds. The kill, representing the most recent significant documented tower kill, is being investigated by the Service's Office of Law Enforcement.

When the Service refers to conservative mortality estimates of 4-5 million, we recognize that probably all communication towers kill birds each year, especially at night under conditions of inclement weather such as heavy fog, low cloud ceilings, and rain. While short (< 200 feet above ground level [AGL]), unguyed, and unlit towers (including monopoles and lattice structures) *may* be the least problematic to birds, no systematic research has been conducted on the overall impacts of short towers on birds. The U.S. Forest Service began a study this past summer at 3 National Forests in Arizona to assess mortality from cell phone towers each for a 3-year period. No preliminary results are yet available. More research is needed elsewhere. Because so few studies – at both short and tall towers – are ongoing, it is somewhat meaningless to debate the realistic impact and true mortality caused by communication towers on birds until systematic research is conducted nationwide. The figures we have devised are based on the best available previous models with current estimates updated to reflect the exponentially growing numbers of towers.

For studies that are being conducted, scavenging and predation can be extensive (92% loss of carcasses in 1 night as witnessed by Crawford in northern Florida [Crawford 1971, Crawford and Engstrom 2000]). An average of 79% loss of songbird carcasses in agriculture fields was tallied over a 24 h period by Balcomb (1986). Researchers must be collecting carcasses before dawn, as well as conducting well designed scavenging and searcher efficiency studies to determine the level of carcasses that simply are never retrieved by researchers. The Tall Timbers study

(Crawford and Engstrom 2000 and 2001) set the standard for scavenging and carcass retrieval. Ground was mowed around the Tallahassee television tower, numbers of scavengers were controlled as much as possible, bird carcass searches were conducted on a daily basis, kills were plotted on maps, weather records were maintained, and dead birds were speciated. Performing a similar protocol at other study sites may simply not be feasible, as evidenced by the body of literature documenting mortality.

Birds are impacted by many forms of mortality, natural and human-caused. The populations of many North American birds – especially passerines – are in trouble and any additional anthropocentric impacts may result in additive mortality beyond which the avian species – already under tremendous human impacts from power lines, buildings, automobiles, domestic cats, pesticides, contaminants, oil spills, habit loss and degradation, and other factors – may simply not be able to recuperate. If tower kills create a biological breeding threshold below which an avian species will simply stop breeding (similar to what happened to the Passenger Pigeon in the early 1900s), we may lose other species to extinction. Of the 836 species managed by the FWS as a trust resource, fully 223 (26%) are in trouble (131 listed in the Service's *Birds of Conservation Concern 2002* [FWS 2003] and 92 listed on ESA) and the status of another 1/3 is simply not known. Numbers of both listed species and birds of conservation concern continue to increase – not a good sign. In studies conducted over 29 years at 3 television towers by A. Clark in Buffalo, New York (Morris *et al.* 2003), Clark noted a gradual decrease in the number of bird kills at the towers he had studied – ranging from a high of 4,787 in 1982 to a low of 6 in 1992. The authors hypothesized the decline in the rate of mortality to several factors. These included an overall decrease in the migratory bird populations, changes in weather patterns and wind, increases in predation and scavenging around tower bases, and changes in migration patterns. Until other studies are conducted to assess avian mortality, the etiology of bird-tower mortality will remain in question.

Mortality studies have been conducted in various ways, with no concise and consistent study protocols. While scavenging can be accounted for in various ways by using catchment nets, retrieving bird carcasses, and conducting searcher efficiency studies, there does not appear to be an agreed-upon, consistent research protocol for determining mortality – probably in large part due to insufficient funding, inadequate personnel, and lack of equipment. The published studies previously listed therefore probably represent *minimum* mortality figures. Unfortunately, most of the body of research done regarding bird strikes with structures only reviews carcass counts and species vulnerability, not – with but few exceptions (see lighting, beyond) – the presumed or suspected causes of bird collisions.

While tower kills may be having a population impact on some species, statutes including MBTA, BGEPA, and ESA don't differentiate between single versus massive takes. One "take" of even 1 bird may be a criminal violation under these statutes.

A. 15. The research previously conducted and published in the peer-reviewed scientific literature is – in the opinion of the FWS – reliable and scientifically valid. It, however, is far from adequate since most studies were not replicated, and causes of mortality (see lighting issues beyond) were not more carefully examined by replicating analyses elsewhere and carefully

attempting to tease out issues dealing specifically with lighting, weather, height, topography, location, and other variables. The parties who previously conducted this research are some of the best names involved with avian assessment, radar ornithology, and avian-tower interactions – names likes Avery, Banks, Belser, Caldwell, Cassel, Clark, Cochran, Crawford, Cuthbert, Gauthreaux, Graber, Kemper, Larkin, Robbins, Springer, and others.

Reports on tower mortality were first published in the U.S. in 1949. Mortality research was first conducted on communication towers in1955, and since then an extensive body of data exists documenting mortality at tall towers. However, much is simply not known about the impacts of communication towers on birds today – even with the databases from many previous studies. The questions raised by Morris *et al.* (2003) about apparent declining levels of bird-tower mortality can only be answered by further research. Many other questions remain including impacts of communication towers on birds west of the Rocky Mountains; what specifically about lighting attracts birds during inclement weather; the impacts of short towers on birds; effects of tower radiation on birds nesting, roosting or feeding near, next to, or on towers (DiCarlo *et al.* 2002, Balmori 2003); the relationship between tower height, lights, guys, and avian mortality; impacts of towers on birds close to wetlands; and the effects of bird deterrents. To make for meaningful research, the Service agreed at its 1998 meeting in Panama City, Florida, that at least 3 years of study (continuous spring and fall migration and periodic summer breeding) were necessary. Ideally, migration studies should begin and end when migration chronologies are known. In some areas, this may mean monitoring for fall migrations from July until November (or perhaps even longer depending on the site). By conducting research into the issues just discussed, it is hoped that results will answer questions about lighting, height, guy wires, tower structure, deterrents, topography, and weather. This, in turn, will help future developers and their tower owners and licensees take steps – based on new research results – that may minimize mortality, disturbance, and site avoidance. Specifically, it is hoped that answers to questions about lighting, guys, height, tower structure, and siting can be determined. Where weather becomes a factor in siting towers, we recommend that such sites be avoided if it can be shown that birds will be adversely impacted (recommended within our Service guidance).

At the June 2000 meeting of the CTWG, all parties represented at that meeting – including the FCC – acknowledged the need for a nationwide, comprehensive avian-tower study. It was suggested that about 250 towers be studied nationwide, based on different locations, varying topography, different heights, different lighting regimes, guyed *v.* unguyed support, different weather patterns, and other variables. Technologies such as radar, infrared camera, acoustic, and GIS were all suggested as important tools – taken as a whole, likely to provide important new information (see, Gauthreaux and Belser 2003). That research need has yet to be addressed.

Long-term, single tower mortality studies provide a snapshot of long-term mortality at a particular tower, correlations to bad weather and large bird-kill events, and an assessment of mortality over long periods of time (Morris *et al.* 2003). However, taken alone, they would be insufficient for the FCC to change its rules and processes. Additional research is imperative.

A. 16. There is no standard, accepted research protocol for studying the number of birds killed at specific towers. While Crawford and Engstrom (2000) probably set the design standard for a

research protocol in their television tower study at Tall Timbers Research Station, FL, other studies have been based on modified protocols. Avery *et al.* (1976, 1977, and 1978), for example, in studying a U.S. Coast Guard Loran tower in North Dakota, used catchment nets to retrieve bird carcasses under this tower since vegetation was not conducive to mowing and topography was varied. The Forest Service is using a modified version of a catchment net protocol borrowed from Avery *et al.* (1978) and designed by DMBM (Manville 2002) in their Arizona National Forest cellular tower studies. Scavenging studies have been conducted on wind turbines at Buffalo Ridge, MN, sites but carcasses were retrieved only weekly (Johnson *et al* 2002). It is generally agreed that carcass searches – whether on the ground, in catchment nets, or both – must be conducted beginning 30 minutes before sunrise to minimize impacts and biases from scavenging by diurnally active predators. It also is generally agreed, at least by Service biologists, that mortality must be monitored throughout the period of both spring and fall migrations. Once weekly is unacceptable and monitoring for only portions of the migratory period may completely miss impacts to migrants that move through the tower site when it is not being monitored – creating a possible skew or bias in the data set. Whether nets and/or scavenger placement studies are conducted, searcher efficiency studies need to be conducted to determine searcher efficiency and bias. These issues are discussed by Anderson *et al.* (1999) with some recommendations, although the recommendations focus on wind turbine assessments.

A. 17 and 18. <u>Tower Lighting</u>. Light appears to be a key attractant for night-migrating songbirds, especially on nights with poor visibility, low cloud ceilings, heavy fog, or various forms of precipitation associated with either passing or stationary cold fronts (Tordoff and Mengel 1956, Ball *et al.* 1995). Its attractant effects were first reported in Forest and Stream (1874) and later Allen (1880, cited in Cochran 1959) reported birds killing themselves by flying against lighthouse lights. Cochran and Graber (1958) and Cochran (1959) reported that songbirds were heavily attracted to red incandescent lights at a television tower during inclement weather. In 2 studies where lighted towers attracted songbirds, and the lights were extinguished, birds continued on their migrations leaving previously lit, cloud enshrouded towers (Cochran and Graber 1958, Avery *et al.* 1976). In both studies, when the lights were turned back on, within minutes birds began circling the towers in large numbers. Gauthreaux and Belser (1999) showed a greater proportion of bird attraction to red flashing incandescent lights than to white strobes; strobes still attracted some birds compared to unlit controls that attracted none. When nighttime weather conditions and visibility improved, in all cases reported in the literature, the birds left the lighted towers, apparently continuing on their migrations. While tall lighted towers appear to be a major problem, in bad weather, bird strikes have been recorded near or at the ground level, usually associated with lighting. James (1956) retrieved 2,421 dead birds of 39 species (mostly warblers) beneath light poles on a coastal island following a single stormy spring night in 1951 on South Padre Island, TX. Lord (1951) reported 200 birds of 23 species killed after apparently being confused by floodlights and striking a lodge on the Blue Ridge Parkway during a foggy night in the fall 1950.

While the Service incorporated lighting recommendations in our voluntary communication tower guidance, we did so based on the best – albeit limited – research into lighting. Research findings and concerns have been raised by Cochran and Graber (1958), Cochran (1959), Kemper (1964), Aldrich *et al.* (1966), Avery *et al.* (1976, 1977, and 1978), Telfer *et al* (1987), Reed (1987),

Podolsky *et al.* (1998), Gauthreaux and Belser (1999), and in personal communications with Dr. R. Beason (USDA National Wildlife Research Laboratory, Sandusky, OH, 2000), Dr. M. Avery (National Wildlife Research Laboratory, Gainesville, FL, 2000), Dr. S. Gauthreaux (Clemson University, 2000), Dr. R. Larkin (IL Natural History Survey, 2000), and others. These studies were reviewed by FWS and their findings incorporated into our voluntary guidance on use of lights. We continue to recommend using minimum intensity, maximum "off" duration between flashes (currently 3 seconds between flashes are allowed by the FCC and Federal Aviation Administration [FAA]), white strobe lights for towers requiring lighting (those > 199 ft. AGL, those within 3.8 statute miles of airports, and those along major highway travel corridors). Lighting studies have now begun with the development and use of a portable lighting trailer being tested by W. Evans *et al.* (W. Evans, Old Bird, 2002 pers. comm.) this past spring and this fall, and lighting studies are about to begin at 17 Michigan State Police towers next spring, as well as lighting studies at several of 20 U.S. Coast Guard "Rescue 21" towers next spring on the East Coast. However, until more definitive lighting determinations are reached based on credible, statistically-significant, peer-reviewed science, the Service will not modify its voluntary lighting guidance nor will we make recommendations to the FCC and the Federal Aviation Administration (FAA) to modify their standards until new discoveries are made.

Because the nighttime attraction of birds to lights during inclement weather is such a key issue, determining what specifically about light attracts birds will need more research. While some of us (Manville 2001a) feel the duration of light that is emitted (*e.g.*, solid *v.* pulsating *v.* strobed light, and the duration a strobe light is "off") is the key lighting issue, more research is also needed into the attraction of light color (white *v.* red *v.* mixture), type (incandescent *v.* strobe *v.* neon), and intensity (lumen output). Large bird kills, however, do not necessarily occur during inclement weather conditions, as evidenced by a kill of some 450 songbirds (most notably 145 Yellow-rumped Warblers, 114 Orange-crowned Warblers, and 37 Nashville Warblers) at a red blinking television tower near Topeka, KS, in early October 1999. The skies were clear until approximately 3:00 am the night of the tower kill (S. Jones, FWS, 1999 pers. comm.). How many birds died during the clear weather conditions before 3:00 am is unknown (Manville 2001a). Laser light guns have been shown to deter birds like Double-crested Cormorants and other species. Whether they will work to deter songbirds at communication towers is unknown. Because the retina of the bird's eye contains more cones than that of the human eye, birds are more sensitive to the red spectrum and at least some birds tested can see in the ultraviolet spectrum (Beason 1999; R. Beason, USDA National Wildlife Research Center, Sandusky, OH, 2000 pers. comm.). What the human eye perceives may be quite different than that perceived by birds

If conditions are right and nighttime visibility is zero (*e.g.*, complete obsuration of the sky by fog or stormy conditions), lights can draw birds right to or near the ground (*e.g.*, as reported by Lord 1951, James 1956, and Herndon 1973). Regardless of tower height, lighting – even at very low elevations above ground – can therefore be problematic.

19. <u>Air Safety, Navigation, and FAA Lighting Standards</u>. The Service wants to clearly state for the record that we have no intention of requesting modifications to lighting and marking standards that would negatively impact pilot, passenger, and air traffic safety and navigation.

However, where more bird-friendly lighting and bird deterrents can be discovered through new research, we will encourage both the FCC and the FAA, through their 2000 FAA *Obstruction Marking and Lighting Advisory Circular* (AC 70/7460-1K 2000, currently being updated), to incorporate these new standards. An Ad Hoc Interagency Lighting Working Group – consisting of FAA, FCC, FWS, and the Council on Environmental Quality – was created in late 2002 to begin informally addressing this lighting issue. There is much more need for interagency cooperation and coordination regarding lighting and deterrents. As new findings are discovered, the Service will likely come to the FCC and FAA with recommendations. The FAA's *Advisory Circular*, while considerably detailed, needs to be rewritten in more lay terminology, perhaps with an executive summary highlighting the specific recommendations for communication towers, wind turbines, and other tall structures. Bird issues need to be incorporated as part of the new circular, particularly as new research discoveries determine bird-friendly lighting, provided those lighting discoveries do not compromise pilot safety. The FCC could help make this recommendation to our sister agency.

While specific research on bird deterrents has been conducted on high tension transmission lines (*e.g.,* Brown and Drewien 1995, Savereno *et al.* 1996) and other structures, their utility on tower guy wires is unknown. To the Service's knowledge, no peer-reviewed studies have been published in the professional literature that address the efficacy of guy-wire deterrents for either diurnally active or nocturnally-migrating birds. These deterrent devices are commercially available but have not been scientifically tested and their results validated. The USCG "Rescue 21" tower study should begin to get a handle on this issue. This is one of the many issues that will be reviewed in the USCG study. While modifications in paint color and paint luminescence (*e.g.,* by using UV gel coats) have been tested on wind turbine blades, the deterrent effects of tower paint marking on birds are unknown.

A. 20 and 21. <u>Tower Height</u>. The Service has depicted a worst case tower scenario, part of which deals with the issue of height (Manville 2001a). Such a tower might look like the following. The tower in question would be 1,000+-feet in height (*e.g.*, a DTV tower), multiple guyed, multiple solid-lighted with red incandescent lights, situated next to a wetland, with a known songbird migration corridor, with the presence of several Federally listed endangered songbirds documented in and around the area, in a location with a history of fog, especially during the spring and fall. While there are quite possibly towers that fit this description, tower height alone may not necessarily be a critical issue that results in mortality. Admittedly, some of the largest kills have been historically documented at tall television towers. However, virtually no studies have been conducted at shorter towers, including those less than 200 ft. AGL, unguyed and unlit. While some have argued that there is a likely height threshold beyond which avian mortality will be significant, the Service points out that studies previously cited have documented nighttime bird attraction to lights at or nearly at ground level during inclement weather. Until studies are conducted on a range of tower types and heights, in varying conditions of topography and weather, and assessing different regimes of lighting, it is premature to assume that height alone is the critical factor to avian mortality. Height, guys, lights, and bad weather in combination, however, may paint a different scenario. The literature certainly supports this hypothesis. More research is needed. Because songbirds migrate in broad fronts – generally much wider than the 4 designated waterfowl flyways within the U.S. – and these

frontal migrations can change between seasons and years, a tower that may not affect birds during one season or year may become a problem during another.

22. **Antenna Structure and Tower Design**. As previously stated, most of the historic tower studies have been conducted on tall, guyed, lighted radio and television towers. Cellular telecommunication towers are only a recent apparition on the landscape so research into risk would not be expected until very recently. The CTWG had approved a short-tower study which had been peer-reviewed in 2000 by several ornithologists affiliated with the Ornithological Council which would have allowed research on an Enron gas pipeline right-of-way (and its towers). Unfortunately, with the bankruptcy of Enron Corp., no alternative funding has yet become available to study short tower impacts on migratory birds, except in Arizona where the Forest Service is requiring the providers to pay the cost of the 3-year studies which began earlier this year.

From a risk perspective, the Service's voluntary communication tower guidance recommends several common sense options. First, don't build a new tower if collocating a transmitter on an existing structure is an option. If this is not possible, try constructing a tower less than 200 feet AGL (to avoid lighting it), keep it unguyed, and construct the tower in either a monopole or lattice format. The literature strongly suggests that guys wires can be disastrous for birds, especially at night in conjunction with lighting, bad weather, and tower height (Manville 2003).

23. **Antenna and Tower Location**. Wetlands are known concentration areas for resident, breeding, nesting, feeding, roosting, and migrating birds of many different species and families – colonial waterbirds, marshbirds, shorebirds, raptors, passerines, waterfowl, and other species. The Service feels that wetlands are possibly some of the worst places to site towers, and we included that concern in our risk model developed in 1998 in Panama City, FL. How far from wetlands to construct towers, however, remains a question. It is hoped that studies on Michigan State Police towers, as well as USCG "Rescue 21" towers along the U.S. coastline and next to the Great Lakes will begin to get a better handle on risk when siting towers in, around or near wetlands.

Since virtually all large tower kills have been directly related to bad weather events (*i.e.,* fog, rain, drizzle, and low cloud ceilings or zero visibility), as referenced in the literature previously cited, the Service's guidance recommends against siting and placing towers in areas with historically bad weather, especially during spring and fall migrations. The USCG study should begin to give us an updated overview of the impacts of coastal weather, especially fog, on birds. Other studies are also needed.

The impacts to birds of communication towers situated on ridges, mountains, and other high ground are not well known. Studies on cell towers in the National Forests in Arizona should begin to provide some useful data regarding this issue, but other studies will be needed. Part of the CTWG's nationwide tower study was proposed to look at this issue. Since no funding has yet become available to implement this study, there is nothing yet to report.

B. 25, 26, 27, 30, and 31. Need for and Scope of Additional Study; Minimizing Impacts.

The CTWG, at both its April (Research Committee) and June (full Working Group) 2000 meetings discussed, agreed to, and published (see Manville 2001b) the summary of a research protocol that would study some 250 communication towers nationwide. Lighting would be the key focus of the research, but other issues including avian mortality, tower height, tower type, impacts of guys, topography, proximity to wetlands, weather conditions, and deterrents would also be assessed. Industry, including one telecommunications trade association, expressed interest in reviewing a proposal for such a study from the CTWG, but acknowledged that funding would be a challenge. The "back of an envelope" estimate of cost ranges from $15-20M, or more, for such an initiative. Members of the CTWG discussed the time line and duration for such research. Service biologists would like to see at least 3 years (6 migrating seasons and 3 intermittent summer breeding, nesting and rearing assessments) of research conducted to make such a study meaningful. This minimum period of time would also help account for the vagaries of bad weather, which can fluctuate considerably between years. Pilot studies are also very helpful and often critical to conducting valid, large-scale research efforts. Ongoing research in Arizona (Forest Service) and in the Midwest (Evans *et al.*), and research about to begin in Michigan (including the pilot study that was initiated there this past September) and on the East Coast (USCG) should provide information for this "pilot" effort. Recognizing that a full-blown, 250-tower nationwide study is – under the current economic climate – likely infeasible, then smaller studies like those in Michigan, Arizona, and along the Coast may provide important and significant results that will enable the FCC to make changes in rulemaking and policy.

While tower mortality monitoring can be important, unless it is done regularly (throughout the migration period), consistently, diligently, and without various biases (*e.g.*, using different observers, some trained, some not, with no adjustments for bias), the data collected may be without much meaning. For example, getting data about a large bird kill from a single night event provides us information about the kill, the species content and body counts, the weather, the tower, and its location, but gives us no information about seasonal mortality, correlations to other kills and weather conditions, degree of scavenging, relationships to adjacent towers, and other issues.

The surveys conducted by DMBM and other Regional FWS field offices do not generally involve communication towers. The Service is directly involved with and helps in the coordination of surveys like waterfowl breeding and recruitment studies – key to developing waterfowl hunting regulations each year, point counts critical to conducting Breeding Bird Surveys (BBS), Christmas bird counts, seabird breeding colony counts, and other studies. With perhaps the exception of BBS, which can provide an estimate of avian trends within a particular area where a tower is being proposed to be sited, none of the other surveys would be of much help to FCC in studying bird presence at communication towers. Surveys using thermal imaging and fixed vertical beam radars, high resolution BIRDRAD, Doppler weather radars (*e.g.*, WSR-88D; Gauthreaux and Belser 2003), acoustic monitoring (W. Evans, Old Bird, 2003 pers. comm.), GIS (R. Tankersley, TVA, 2002 pers. comm.), and GPS are all technologies – used singly or in concert – that can provide highly meaningful survey data for specific communication towers.

B. 28. Cost. As previously discussed, an unverified cost for 3-years of research at 250 towers nationwide may run in the range of $15-20M, or more. The State of Michigan has committed $200K to a 2-year 17-tower study on State Police towers. Other funding is being pursued through foundation grants including the National Fish and Wildlife Foundation. The USCG has committed $350K to study 20 towers each for 3 years around the country. Other funding will also be pursued to augment this research funding, including funding from phone, tower, radio, and television companies, and their respective trade associations. The Evans *et al.* portable lighting trailer study was funded initially for $51K, with additional funds being pursued.

The FCC could be especially helpful not only in acknowledging the need for Federal appropriations from Congress for research, but also in helping convince industry of the importance of funding these studies. The FCC can also work with the FAA to help in funding studies, possibly in coordination with the FAA's Hughes Technical Center in Atlantic City, NJ. Where research study lighting variances are needed from the FAA, the FCC can also help with this need.

B. 31. The Service continues to recommend that the FCC become party to and develop and implement an MOU with the Service under Executive Order 13186, signed by President Clinton. We acknowledge that the Commission is an independent Federal agency not required to comply with Executive Orders pertaining to Cabinet level Departments. By encouraging use of the Service's voluntary communication tower guidance within an MOU would make our guidance more meaningful and provide it with substantially more clout. Until new research is conducted, the results of studies underway are analyzed, peer reviewed, and published in recognized scientific journals, the Service's interim guidance contains the best and most current science currently available. That is why the aforementioned research is so important. Many gaps still exist within our knowledge base of birds and communication towers. Because the Service takes the precautionary approach in its efforts to protect migratory birds, we must assume that *all* communication towers pose a risk to migratory birds, including those that are unguyed and unlit – until research can shed new light that would alter this hypothesis.

B. 33. For the record, the Service will make no efforts nor take any steps that could be perceived to compromise national security, or that would restrict communications for purposes of public safety or for other reasons. However, there are invariably ways to modify towers, select sites, and minimize impacts to migratory birds that will continue to allow full communication coverage. These may include building several shorter, unguyed towers in place of a single, tall, guyed structure, collocating transmitters and receivers on existing structures, or even using different technologies such as satellites. We encourage both providers and the FCC to consider all tower options, especially those that will minimally impact birds.

B. 34. The Service has been suggesting since 1999 (Willis 1999) that birds need to be considered part of the FCC's review process for towers under the National Environmental Policy Act before the FCC issues licenses to broadcasters. Unless birds are Federally ESA-listed or their habitats are critically designed under ESA, migratory birds are categorically excluded from the FCC reviews and are thus excluded. We have been requesting changes to FCC regulations since 1999, including at various workshops also represented by representatives from the FCC, in

a 2002 Service briefing to the Senior legal advisors to the FCC Commissioners, and in a Service MBTA-ESA fall 2002 training workshop. We respectfully request that the FCC make this change in determination and remove the migratory bird categorical exclusion. The cumulative impacts of each new tower must be considered a part of the review process. Those impacts are not being accounted for and efforts that could be used to mitigate these issues are not currently being addressed.

The Service has also raised concerns about the tower permit review process (Willis 1999) where the licensee/owner/consultant currently makes the determination of the need for an Environmental Assessment (EA). Licensees are certainly not going to raise issues, including concerns about migratory birds, if they can avoid such reviews – and the cost, time, and potential legal challenges in conducting an EA. This review process must be changed, with all due respect to the Commission. In addition to encouraging the industry to use the Service's voluntary guidance, we would encourage the FCC to encourage the industry to complete and return copies of our site evaluation form to our Division of Federal Program Activities (DHC; Washington, DC, office).

The Service recommends that the FCC hire at least several wildlife biologists, at least one of whom could interface directly with the Service's Washington DMBM and DHC offices, and at least one other to work with our 78 different Ecological Services Field Offices around the country. The wildlife biologists should obviously have a strong background in ornithology, habitat impacts, wildlife management, and conservation biology.

Lastly, the FCC needs to explain why statistics provided the Service in 2002 from your Antenna Structure Registry Database (FCC 2002) listed more than 138,000 towers registered with the Commission that year, of which some 106,000 were lighted, then published in this NOI a listing of, "... approximately 92,454 antenna structures" as of June 2003. Since the Service depends upon these statistics, and has used them in developing models and projections for avian mortality, it is important that we know which numbers are most accurate.

This concludes our comments. Thank you for providing the Service an opportunity to comment on this very important and timely issue. We look forward to continuing a productive and positive working relationship with the FCC.

Respectfully submitted,

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