



AVIAN RESOURCES EVALUATION

Date: April 22, 2014

**Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford CT 06108**

APT Project No.: CT1411620

**Re: Proposed Trumbull SE 4 Facility
60 Commerce Drive
Trumbull, Connecticut**

Cellco Partnership d/b/a (“Verizon”) proposes to construct a new wireless telecommunications Facility (“Facility”) at 60 Commerce Drive in Trumbull, Connecticut (the “host Property”), identified as Tax Assessor Parcel ID # Map 9 Lot 20. The host Property consists of 14.02± acres and is currently developed with a vacant corporate office building (formerly occupied by Pilot Pen) and associate landscaped and impervious surfaces. The proposed Facility is located adjacent to the existing building in an area currently being maintained as grass/lawn at a ground elevation of approximately 170 feet above mean sea level (“AMSL”). Verizon proposes to install an 80-foot tall monopole and ground equipment enclosure within a 24-foot by 77-foot gravel compound area surrounded with an 8-foot tall chain link fence. A 12-foot wide gravel access drive will be utilized to gain admission to the Facility from the existing paved access and parking lot at the rear of the building.

The purpose of this evaluation is to document the proposed Facility’s proximity to avian resource areas and its compliance with recommended guidelines of the United States Fish and Wildlife Service for minimizing the potential for telecommunications towers to impact bird species.

All-Points Technology Corporation, P.C. (“APT”) reviewed several publicly-available sources of avian data for the state of Connecticut to provide the following information with respect to potential impacts on migratory birds associated with the proposed development. This desktop analysis and attached graphics identify avian resources and their proximities to the host Property. Information within an approximate 2-mile radius of the host Property is graphically depicted on the attached Avian Resources Map. Some of the avian data referenced herein are not located in proximity to the project area and are therefore not visible on the referenced map due to its scale. However, in those cases the distances separating the host property from the resources are identified in the discussions below.

Proximity to Important Bird Areas

The National Audubon Society has identified 27 Important Bird Areas (“IBAs”) in the state of Connecticut. IBAs are sites that provide essential habitat for breeding, wintering, and/or migrating birds. The IBA must support species of conservation concern, restricted-range species, species vulnerable due to concentration in one general habitat type or biome, or species vulnerable due to their occurrence at high densities as a result of their congregatory behavior¹. The closest IBA to the host Property is Milford Point/Wheeler Marsh in Milford located approximately 4 miles to the south. The Wheeler Marsh Wildlife Management Area is a ±615-acre *Spartina alterniflora*-dominated low marsh at the mouth of the Housatonic River. The marsh, sandbars, and barrier beach are some of the most important shorebird migratory stopover areas on Long Island Sound, providing foraging areas and resting areas for tens of thousands of shorebirds each year, including nesting habitat for several species of regional and national concern. Numbers of some species of migrating shorebirds (especially Semipalmated and Black-bellied Plovers) may elevate this area to the level of national or continental significance. Due to its distance from the site, this IBA would not experience an adverse impact resulting from the proposed development of the Facility.

Supporting Migratory Bird Data

Beyond Audubon’s IBAs, the following analysis and attached graphics also identify several additional avian resources and their proximities to the host Property. Although these data sources may not represent habitat indicative of important bird areas, they may indicate possible bird concentrations² or migratory pathways.

Critical Habitat

Connecticut Critical Habitats depict the classification and distribution of 25 rare and specialized wildlife habitats in the state. It represents a compilation of ecological information collected over many years by state agencies, conservation organizations and individuals. Critical habitats range in size from areas less than one acre to areas that are tens of acres in extent. The Connecticut Critical Habitats information can serve to highlight ecologically significant areas and to target areas of species diversity for land conservation and protection but may not necessarily be indicative of habitat for bird species. The nearest Critical Habitat to the proposed Facility is an eustuarine intertidal marsh area, denoted as Fowler Island located approximately 2 miles to the east. Based on the distance separating this resource from the proposed Facility, no adverse impacts are anticipated.

¹ http://web4.audubon.org/bird/iba/iba_intro.html

² “bird concentrations” is related to the USFWS *Interim Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* (September 14, 2000) analysis provided at the end of this document

Avian Survey Routes and Points

Breeding bird survey routes and points monitor the status and trends of various bird populations. A relative abundance index for bird species is generally produced from these surveys as complete counting data of breeding bird populations is not collected. The results of these surveys are valuable in evaluating the increasing and decreasing range of bird populations which can be a key point to bird conservation efforts. These survey routes and points likely do not identify concentrations of bird populations but may provide an indication of migratory flyways, particularly for the raptor survey routes and points.

Breeding Bird Survey Route

The North American Breeding Bird Survey is a cooperative effort between various agencies and volunteer groups to monitor the status and trends of North American bird populations. Routes are randomly located to sample habitats that are representative of an entire region. Each year during the height of the avian breeding season (June for most of the United States) participants skilled in avian identification collect bird population data along roadside survey routes. Each survey route is approximately 24.5 miles long and contains 50 stops located at 0.5-mile intervals. At each stop, a three-minute count is conducted. During each count, every bird seen or heard within a 0.25-mile radius is recorded. The resulting data is used by conservation managers, scientists, and the general public to estimate population trends and relative abundances and to assess bird conservation priorities. The nearest survey route to the host Property is the Long Hill Breeding Bird Survey Route (Route #18013) located approximately 5 miles to the west. This \pm 25-mile long bird survey route begins on the Easton/Trumbull town line and generally winds its way north through Monroe, Newtown, and Southbury before terminating in Roxbury.

Hawk Watch Site

The Hawk Migration Association of North America (“HMANA”) is a membership-based organization committed to the conservation of raptors through the scientific study, enjoyment and appreciation of raptor migration. HMANA collects hawk count data from almost 200 affiliated raptor monitoring sites throughout the United States, Canada and Mexico, identified as “Hawk Watch Sites.” In Connecticut, Hawk Watch Sites are typically situated on prominent hills and mountains that tend to concentrate migrating raptors. The nearest Hawk Watch Site, Boothe Memorial Park, is located in Stratford, approximately 1.9 miles to the southeast of the proposed Facility. The park sits high above the Housatonic River providing a good vantage point for viewing migrating raptors.

Bald Eagle Site

Bald Eagle Sites consist of locations of midwinter Bald Eagle counts from 1986 to 2005 with an update provided in 2008. This survey was initiated in 1979 by the National Wildlife Federation. This database includes information on statewide, regional and national trends. Survey routes are included in the database only if they were surveyed consistently in at least four years and where at least four eagles were counted in a single year. A Bald Eagle Site survey route begins in the Town of Monroe approximately 9 miles north of the host Property and extends north along Route 133 to the Massachusetts border.

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Flyways

The project area is located in Fairfield County, approximately 5 miles north of Long Island Sound. The Connecticut coast lies within the Atlantic Flyway, one of four generally recognized regional primary migratory bird flyways (Mississippi, Central and Pacific being the others). This regional flyway is used by migratory birds travelling to and from summering and wintering grounds. The Atlantic Flyway is particularly important for many species of migratory waterfowl and shorebirds, and Connecticut's coast serves as vital stopover habitat. Migratory land birds also stop along coastal habitats before making their way inland. Smaller inland migratory flyways ("secondary flyways") are often concentrated along major riparian areas as birds use these valuable stopover habitats to rest and refuel as they make their way further inland to their preferred breeding habitats. The Connecticut Migratory Bird Stopover Habitat Project (Stokowski, 2002)³ identified potential flyways along the Housatonic, Naugatuck, Thames, and Connecticut Rivers. This study paralleled a similar earlier study conducted by the Silvio O. Conte National Fish & Wildlife Refuge (Neotropical Migrant Bird Stopover Habitat Survey⁴), which consisted of collection of migratory bird data along the Connecticut River and the following major Connecticut River tributaries: Farmington, Hockanum, Scantic, Park, Mattabesset, Salmon, and Eight Mile Rivers. Of these potential flyways, the nearest to the host Property is the Housatonic River, located approximately 2 miles to the east. This major riparian corridor may provide secondary flyways as they likely offer more food and protection than more exposed upland sites, particularly during the spring migration⁵.

Siting of tower structures within flyways can be a concern, particularly for tall towers and even more particularly for tall towers with guy wires and lighting. The majority of studies on bird mortality due to towers focuses on very tall towers (greater than 1000 feet), illuminated with non-flashing lights, and guyed. These types of towers, particularly if sited in major migratory pathways, do result in significant bird mortality (Manville, 2005)⁶. The proposed Facility is not this type of tower, being an unlit, unguyed monopole structure only 80 feet in height. More recent studies of short communication towers (<300 feet) reveal that they rarely kill migratory birds⁷. Studies of mean flight altitude of migrating birds reveal flight altitudes of 410 meters (1350 feet), with flight altitudes on nights with bad weather between 200 and 300 meters above ground level (656 to 984 feet)⁸.

No adverse impacts to migrating bird species are anticipated with the Project, based on the significant distance separating the host Property from both the Housatonic potential flyway corridor and the short (80-foot) height of the unlit and unguyed Facility.

³ Stokowski, J.T. 2002. Migratory Bird Stopover Habitat Project Finishes First Year. Connecticut Wildlife, November/December 2002. P.4.

⁴ The Silvio O. Conte National Fish & Wildlife Refuge Neotropical Migrant Bird Stopover Habitat Survey <http://www.science.smith.edu/stopoverbirds/index.html>

⁵ The Silvio O. Conte National Fish & Wildlife Refuge Neotropical Migrant Bird Stopover Habitat Survey. http://www.science.smith.edu/stopoverbirds/Chapter5_Conclusions&Recommendations.html

⁶ Manville, A.M. II. 2005. Bird strikes and electrocutions at power lines, communications towers, and wind turbines: state of the art and state of the science - next steps toward mitigation. Bird Conservation Implementation in the Americas: Proceedings 3rd International Partners in Flight Conference 2002. C.J. Ralph and T.D. Rich, editors. USDA Forest Service General Technical Report PSW-GTR-191. Pacific Southwest Research Station, Albany CA. pp. 1-51-1064.

⁷ Kerlinger, P. 2000. Avian Mortality at Communication Towers: A Review of Recent Literature, Research, and Methodology. Prepared for U.S. Fish and Wildlife Service Office of Migratory Bird Management.

⁸ Mabee, T.J., B.A. Cooper, J.H. Plissner, D.P. Young. 2006. Nocturnal bird migration over an Appalachian ridge at a proposed wind power project. Wildlife Society Bulletin 34:682-690.

Waterfowl Focus Areas

The Atlantic Coast Joint Venture (“ACJV”) is an affiliation of federal, state, regional and local partners working together to address bird conservation planning along the Atlantic Flyway. The ACJV has identified waterfowl focus areas recognizing the most important habitats for waterfowl along the Atlantic Flyway. Connecticut contains several of these waterfowl focus areas. The nearest waterfowl focus area to the host Property is the Lower Housatonic River - Great Meadows area, located approximately 2 miles to the east. Please refer to the attached Connecticut Waterfowl Focus Areas Map. Based on the distance of these resources to the project area, no direct impacts would occur from development of the proposed Facility.

CTDEEP Migratory Waterfowl Data

The Connecticut Department of Energy and Environmental Protection (“CTDEEP”) created a Geographic Information System (“GIS”) data layer in 1999 identifying concentration areas of migratory waterfowl at specific locations in Connecticut. The intent of this data layer is to assist in the identification of migratory waterfowl resource areas in the event of an oil spill or other condition that might be a threat to waterfowl species. This data layer identifies conditions at a particular point in time and has not been updated since 1999.

No migratory waterfowl areas are located within the Town of Trumbull. The nearest migratory waterfowl area (Housatonic River at Nells Island in Stratford-Milford, CT) is located approximately 3.5 miles to the southeast of the proposed Facility. The associated species are identified as American wigeon, American black duck, bufflehead, Canada goose, canvasback, goldeneye, mallard, and green wing teal. Based on its distance to the host Property, no impacts to migratory waterfowl habitat are anticipated to result from development of the proposed Facility.

CTDEEP Natural Diversity Data Base

CTDEEP’s Natural Diversity Data Base (“NDDDB”) program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state listed species and to help landowners conserve the state’s biodiversity. State agencies are required to ensure that any activity authorized, funded or performed by a state agency does not threaten the continued existence of endangered or threatened species. Maps have been developed to serve as a pre-screening tool to help applicants determine if there is a potential impact to state listed species.

The NDDDB maps represent approximate locations of endangered, threatened and special concern species and significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by CTDEEP staff, scientists, conservation groups, and landowners. In some cases an occurrence represents a location derived from literature, museum records and/or specimens. These data are compiled and maintained in the NDDDB. The general locations of species and communities are symbolized as shaded areas on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowner’s rights whenever species occur on private property.

According to the CTDEEP NDDB, there are no known extant populations of state of federal endangered, threatened or special concern avian species at or near the host Property. According to NDDB information provided in a February 10, 2014 letter, records exist in the vicinity of the host Property for a non-avian species: state species of special concern eastern box turtle (*Terrapene carolina Carolina*). Verizon has committed to implementing protective measures during construction to avoid impacts to this non-avian species.

USFWS Communications Towers Compliance

The U.S Fish and Wildlife Service (“USFWS”) prepared its *Interim Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* (September 14, 2000), which recommends the 12 voluntary actions below be implemented in order to mitigate potential bird strikes that could result by the construction of telecommunications towers. APT offers the following responses to each of the USFWS recommendations.

1. *Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communications tower or other structure (e.g., billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.*

Collocation opportunities on existing towers, buildings or non-tower structures are not available in the area while achieving the required radio frequency (“RF”) coverage objectives of Verizon.

2. *If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (e.g., use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Administration regulations permit.*

The proposed Facility would consist of an 80-foot monopole structure which requires neither guy wires nor lighting.

3. *If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.*

Multiple towers are not proposed as part of this project.

4. *If at all possible, new towers should be sited within existing “antenna farms” (clusters of towers). Towers should not be sited in or near wetlands, or other known bird concentration areas (e.g., state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.*

There are no existing “antenna farms” in the area. The proposed Facility is not within wetlands, known bird concentration area, migratory or daily movement flyway, or habitat of

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threatened/endangered species. According to a February 10, 2014 letter from the CTDEEP Natural Diversity Data Base NDDDB, there are no known extant populations of state or federal threatened or endangered avian species or state special concern avian species at or proximate to the host Property. The proposed Facility is located within an existing cleared maintained lawn area, approximately 180 feet from the nearest wetland/watercourse (west end of retaining wall to wetland flag WF 1A-04; the west side of the compound is 190 feet away). The proposed Facility will not result in a significant adverse impact to the wildlife habitat function (including avian habitat) being supported by this nearby wetland area provided appropriate erosion controls are installed and maintained during construction.

In Connecticut, seasonal atmospheric conditions can occasionally produce fog, mist and/or low ceilings. However, high incidences of these meteorological conditions, relative to the region, are not known to exist in the vicinity of the host Property.

5. *If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used.*

The proposed Facility height (80 feet AGL) is less than 199 feet and would not require any aviation safety lighting.

6. *Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species.*

The proposed Facility would be free-standing and would not require guy wires or visual marking.

7. *Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint." However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.*

The proposed Facility is sited, designed, and would be constructed to accommodate proposed equipment and to allow for future collocations within the smallest footprint possible. The site is located within areas subject to existing development associated with a corporate office building and therefore will not result in habitat fragmentation.

8. *If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal; restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.*

The proposed tower construction area consists mainly of maintained lawn adjacent to the industrial building. The slope to the north contains shrub growth dominated by autumn olive, staghorn sumac, fox grape and Japanese knotweed. No mature trees are located on the slope; forest habitat starts at the

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top of the slope extending further north off the host Property. Due to the lack of avian habitat, significant numbers of breeding, feeding, or roosting birds are not anticipated to use the proposed tower construction areas at the host Property.

9. *In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.*

The proposed Facility has been designed in general accordance with this guidance, as it could accommodate a total of two antenna platform positions, the Town's emergency communications system antennas and will be designed to allow for a 20-foot extension should additional carriers be interested in collocating on this Facility. The proposed, free-standing Facility would be neither lighted nor guyed.

10. *Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.*

Security lighting for on-ground facilities would be down-shielded using Dark Sky compliant fixtures set on motion sensor with timer.

11. *If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct, dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.*

With prior notification to Verizon, USFWS personnel would be allowed access to the proposed Facility to conduct evaluations.

12. *Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.*

If the proposed Facility was no longer in use or determined to be obsolete, it would be removed within 12 months of cessation of use.

Summary and Conclusions

Based on the results of this desk-top evaluation, no migratory bird species are anticipated to be impacted by Verizon's proposed development. The proposed Facility is not proximate to an Important Bird Area and would comply with the USFWS guidelines for minimizing the potential impacts to birds.

Figures

- Avian Resources Map
- Connecticut Waterfowl Focus Areas Map

Avian Resources Map

Proposed Verizon Wireless Communications Facility

60 Commerce Drive Trumbull, Connecticut

Legend

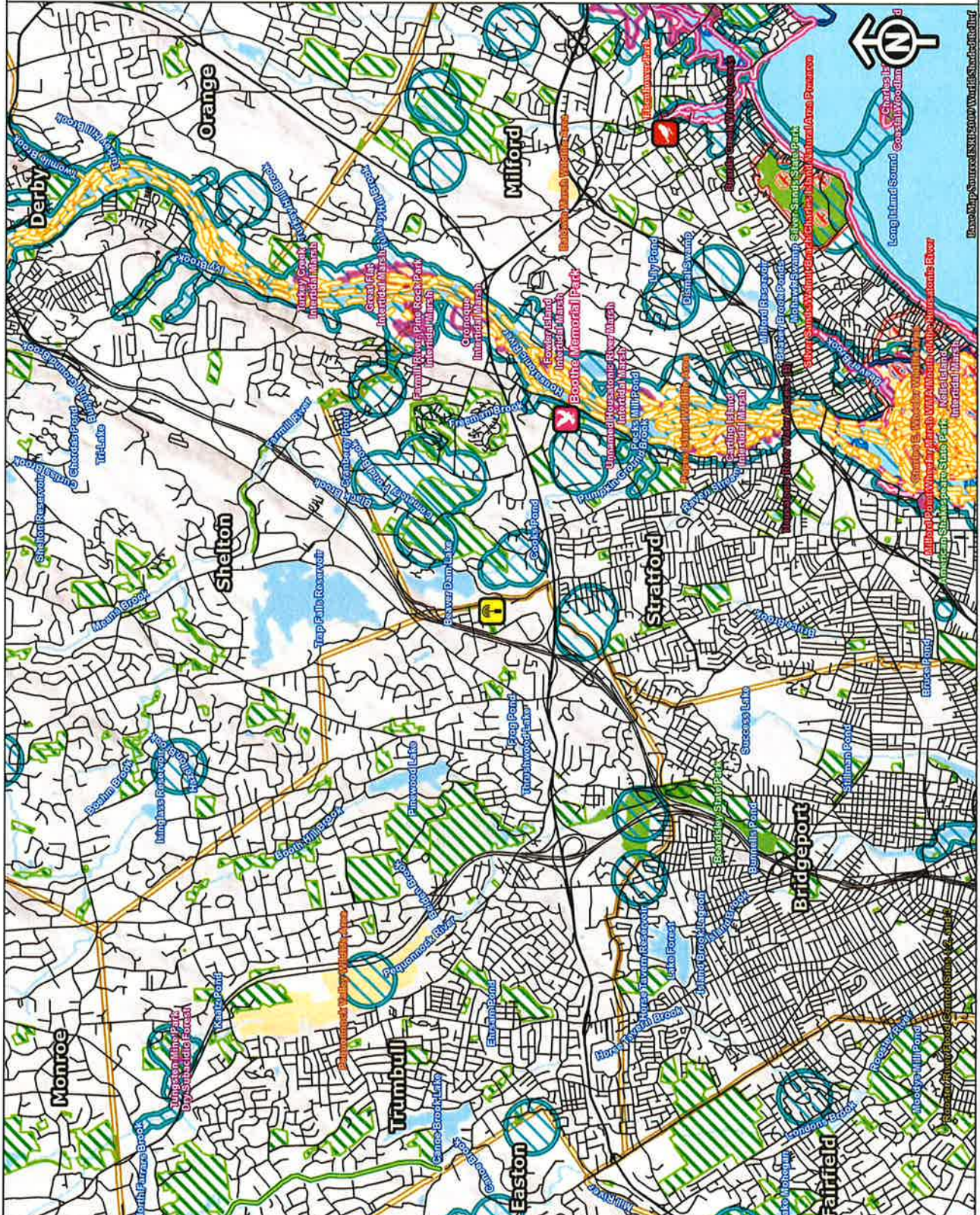
- Proposed Tower Location
- Hawk Watch Site
- Bald Eagle Watch Site
- Important Bird Site
- Bald Eagle Survey Route
- Breeding Bird Survey Route
- Important Bird Area
- Migratory Waterfowl (CT DEEP, 1999)
- National Diversity Outburst Area (CT DEEP, 122013)
- Critical Habitat (CT DEEP, 07/2009)
- Federal Property (CT DEEP, 2004)
- Municipal and Private Open Space (CT DEEP, 1997)
- DEP Property (CT DEEP, 2010)
- State Forest
- State Park
- State Park Scenic Reserve
- State Park Trail
- Natural Area Preserve
- Wildlife Area
- Wildlife Sanctuary
- Historic Preserve
- Flood Control
- Fish Hatchery
- DEP Owned Waterbody
- Water Access
- Other
- Waterbody
- Town Boundary
- State Boundary
- Road

*None within mapped extent

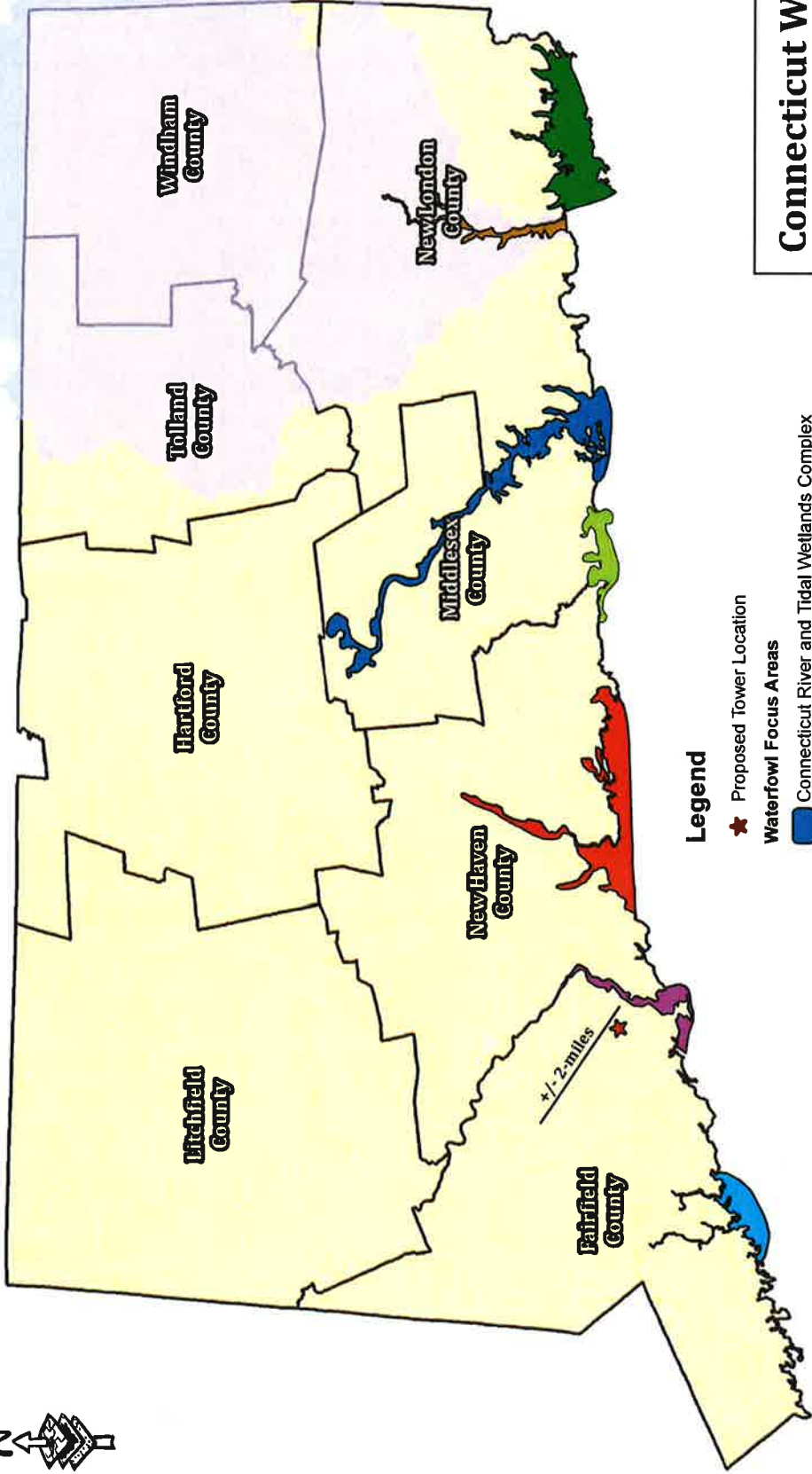
Last Updated Monday, April 21, 2014

Avian Source Information:
 Bald Eagle Sites: http://www.mnr.gov/conservation/conservation/bald_eagle/bald_eagle_sites.html
 Hawk Watch Sites: http://www.mnr.gov/conservation/conservation/hawk_watch_sites.html
 Important Bird Areas: http://www.mnr.gov/conservation/conservation/important_bird_areas.html
 Migratory Waterfowl: http://www.mnr.gov/conservation/conservation/migratory_waterfowl.html
 Breeding Bird Survey Routes: http://www.mnr.gov/conservation/conservation/breeding_bird_survey_routes.html
 Critical Habitat: http://www.mnr.gov/conservation/conservation/critical_habitat.html
 Federal Property: http://www.mnr.gov/conservation/conservation/federal_property.html
 Municipal and Private Open Space: http://www.mnr.gov/conservation/conservation/municipal_and_private_open_space.html
 DEP Property: http://www.mnr.gov/conservation/conservation/dep_property.html
 State Forest: http://www.mnr.gov/conservation/conservation/state_forest.html
 State Park: http://www.mnr.gov/conservation/conservation/state_park.html
 State Park Scenic Reserve: http://www.mnr.gov/conservation/conservation/state_park_scenic_reserve.html
 State Park Trail: http://www.mnr.gov/conservation/conservation/state_park_trail.html
 Natural Area Preserve: http://www.mnr.gov/conservation/conservation/natural_area_preserve.html
 Wildlife Area: http://www.mnr.gov/conservation/conservation/wildlife_area.html
 Wildlife Sanctuary: http://www.mnr.gov/conservation/conservation/wildlife_sanctuary.html
 Historic Preserve: http://www.mnr.gov/conservation/conservation/historic_preserve.html
 Flood Control: http://www.mnr.gov/conservation/conservation/flood_control.html
 Fish Hatchery: http://www.mnr.gov/conservation/conservation/fish_hatchery.html
 DEP Owned Waterbody: http://www.mnr.gov/conservation/conservation/dep_owned_waterbody.html
 Water Access: http://www.mnr.gov/conservation/conservation/water_access.html
 Other: <http://www.mnr.gov/conservation/conservation/other.html>
 Waterbody: <http://www.mnr.gov/conservation/conservation/waterbody.html>
 Town Boundary: http://www.mnr.gov/conservation/conservation/town_boundary.html
 State Boundary: http://www.mnr.gov/conservation/conservation/state_boundary.html
 Road: <http://www.mnr.gov/conservation/conservation/road.html>

1 inch equals 4,583 feet
 0 0.25 0.5 1 Miles



Map of Avian Resources in Trumbull, CT, showing various habitats, water bodies, and survey routes. The map includes labels for towns like Orange, Milford, Stratford, Bridgeport, and Fairfield, as well as specific areas like South Memorial Park and various ponds and brooks. A north arrow and scale bar are also present.



Legend

★ Proposed Tower Location

Waterfowl Focus Areas

Blue Connecticut River and Tidal Wetlands Complex

Green Fishers Island Sound Complex

Purple Greater Hammonasset Complex

Pink Lower Housatonic River - Great Meadows

Orange Lower Thames River System

Red New Haven Harbor

Light Blue Norwalk Islands

Waterfowl Planning Area

Light Blue Upper Thames River

1 inch equals 14 miles



Connecticut Waterfowl Focus Areas Map

Proposed Verizon Wireless Telecommunications Tower

60 Commerce Drive
Trumbull, Connecticut



Waterfowl Focus Areas Developed
by the Atlantic Coast Joint Venture Partnership