National Audubon Society chapter toolkit for engaging in wind energy at the local level

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Introduction

Climate change is as a top threat, if not the top threat, to long-term bird conservation. A review of more than 130 scientific studies found that if climate change proceeds as expected, one in six species worldwide could face extinction. Audubon's Birds and Climate Change Report confirmed that 314 North American species stand to lose more than 50 percent of their current ranges by 2080. Renewable energy will be an integral part of any solution to this ever-worsening problem, and wind energy is a significant renewable energy tool, both in the United States and abroad. Audubon's position on wind energy development is as follows:

> *"Audubon strongly supports properly sited wind power as a renewable energy source that helps reduce the* ***threats posed to birds*** *and* ***people*** *by climate change. However, we also advocate that wind power facilities should be planned, sited, and operated in ways that minimize harm to birds and other wildlife, and we advocate that wildlife agencies should ensure strong enforcement of the laws that protect birds and other wildlife."*

Additional background on Audubon's policy regarding with is available here: https://www.audubon.org/content/audubons-position-wind-power.

Avian mortality and other negative impacts at wind turbine projects varies greatly between projects, seasonally, and at the micro-scale within a given project (Erickson et al. 2002). It follows that siting is vitally important to minimizing mortality and preventing habitat disruption or avoidance behavior. Some projects need to be prevented at all costs, if a threat to a rare species is severe, or if large congregations of more common species present a unique threat, for example. Others can be deemed safer, not presenting as significant of a risk. Audubon chapters interested in resolving these issues need to develop a broad understanding of the causes of bird mortality and pair that with a local knowledge of the avifauna of the specific project area in question, before moving forward.

Developing a sound basis for proper wind siting is critically important to mitigating bird risk at each proposed wind facility. Without local expertise, even the best efforts to comply with the federal Land-based Wind Energy Guidelines will fall short for at least some species. And since the federal guidelines (and, currently, all state guidelines) are voluntary, regulation is only possible *at the local level* in the Great Lakes region. This places a *critical responsibility on local citizens* to gain and effectively communicate the expertise necessary to mitigate harm to local bird populations. This is a daunting task, as the science is both complex and incomplete, placing a great responsibility on local Audubon chapters and activists who must work to compile and disseminate species-specific information. Such an assessment must be done on a windfarm-by-windfarm basis so that such information can be built into local ordinances for each project as appropriate to the local species of greatest potential threat. Alternatively, if it is possible, a chapter can pursue voluntary compliance of the power company involved rather than local regulation. This document is intended to guide chapter leaders through the often complex process of engaging with local wind projects in the most effective capacity to reduce impact to

birds and other wildlife. We provide a summary of relevant data sources and other resources for identifying the most problematic species and habitats at each site, a summary of risk profiles for avian guilds commonly found in the Great Lakes region, three detailed case studies from existing chapter wind projects, and additional resources. Each chapter should expect to dedicate one or more staff or volunteers to this process, and to be involved in the process for as long as is required to achieve the desired outcome. Many have spent years on this issue, and many have succeeded in reducing threats.

Federal and State Guidelines

Currently the U.S. government does not regulate wind power *per se*. Instead, it offers voluntary guidelines. Incidental (unintended) take of species is rarely prosecuted under the Migratory Bird Treaty Act (which protects all native species from killing/disturbance). However, Bald and Golden Eagles (protected under the Bald and Golden Eagle Protection Act), and endangered species (protected under the U.S. Endangered Species Act), both currently do engender prosecution and fines. In order to provide guidance and have control over wind power development policies in the United States, the U.S. Fish and Wildlife Service, in collaboration with Audubon and a large number of agency and university professionals and NGOs produced the 2012 Land-based Wind Energy Guidelines, available here:

https://www.fws.gov/ecological-services/es-library/pdfs/WEG_final.pdf

This document is the current standard-bearer for protecting wildlife at windfarms, and its provisions are wholly supported by Audubon. We strongly urge compliance with this document at all U.S. windfarms, and we urge chapters to have a basic understanding of this document and push to ensure it is followed at the local level. The guidelines are voluntary, but companies generally do comply in order to show due diligence and to protect themselves from post-construction lawsuits or later mitigation attempts of regulators (if a project is deemed too damaging to wildlife). Take permits (five-year) are available for developers, which absolve the company of prosecution in the event of eagle/endangered species mortality if they comply with all of the guidelines. A 2013 attempt to extend the take permits to 30-years was ultimately blocked in Congress, so currently the take permits again last only five years. Most developers who fear any chance of an eagle mortality at their windfarm will take this option, and this has led to better overall compliance with the voluntary guidelines. Still, rogue companies do exist and some windfarms (such as the Garden Wind Farm in Delta, Co. MI; Heritage Wind Energy) are constructed without obtaining a take permit, and thus risk significant potential legal consequences if eagle mortality is discovered at the windfarm.

Local chapters unfortunately do not stand to make much progress on the issue of wind at the federal level, as the guidelines are well-respected and any large changes in federal policy are going to be extremely time-consuming and difficult to achieve without protracted legal battles. Rather, local chapters should *concentrate on increasing compliance with these guidelines* if companies are not already doing so. Provisions can be inserted into local ordinance to force compliance with this document and cooperation with the U.S. Fish and Wildlife Service if necessary.

The situation at the state level is similar. States do not currently regulate wind power, but in some cases do offer voluntary guidelines. Ohio, for example, has its own state regulatory authority: the Ohio Power Siting Board (OPSB), which can be a valuable resource for chapters in that state. Chapters should familiarize themselves with the organizations and guidelines specific to their state governments, and do what they can to maximize compliance with these guidelines. Finding this information is often challenging, but Strickland et al. 2011 is currently the best single source:

https://www.nationalwind.org/wp-content/uploads/assets/publications/Comprehensive_Guide_to_Studying_Wind_Energy_Wildlife_Interactions_2011_Updated.pdf

The Association of Fish and Wildlife Agencies (Kathy Boydston) is also compiling a state-by-state policy summary which can be accessed here:

http://www.fishwildlife.org/files/AFWAWindPowerFinalReport.pdf

Without question, the best opportunities for local chapters to engage the issue of wind are at the local level, either by: 1) influencing the production of robust local ordinances; or 2) catalyzing voluntary compliance with wildlife-sensitive wind siting procedures in lieu of such ordinances.

Categories of Avian Impact

Raw avian mortality at turbines is low compared to other threats such as glass, cats, tall lit structures, high tension wires, cars, and pesticides (Loss et al. 2014, Erickson et al. 2002). Turbines were initially thought to kill approximately two individual birds per turbine per year (Erickson et al. 2002), or thousands to tens of thousands of birds annually. This number is now thought to be in the hundreds of thousands (Loss et al. 2014). However, low raw numbers do not equate to low conservation impact if the species' affected are rare or endangered, as many of the most important species at Great Lakes windfarms are. This especially includes the large raptors, such as Bald and Golden Eagles, and imperiled non-migratory large grouse such as Sharp-tailed Grouse and Greater Prairie-Chickens. Beyond these examples, there are dozens of species of concern which are conspicuous potential problems for windfarms. Many of these species occur in large groups, which presents the added concern of potentially large mortality events. American Golden-Plovers in Indiana and Illinois during spring migration and Tundra Swans in the thumb of Michigan each spring and fall are two examples.

Turbines negatively affect birds in three ways:

1) Direct mortality
2) Accumulating impacts of mortality affecting populations not just individuals
3) Direct and indirect loss of habitat due to turbines

Our understanding of these factors is far from perfect, and data continue to roll in real-time. Still, many generalities are already well-understood and can be made use of by Audubon chapters at the local level.

About 60% of mortality observed at wind projects involves small songbirds (AWWI 2014). Fortunately, at the currently observed levels, turbine-caused mortality is thought not to pose a threat to most songbird species (AWWI 2014). Chapters involved in windfarms near Great Lakes lakeshore, will want to consider the importance of three to five mile buffers from shore, as passerines do concentrate in nearshore areas during migration, especially in the first mile from shore (D. Ewert, unpub. data). Raptors such as eagles constitute a smaller percentage of observed mortality, though these taxa still may experience the most significant population-level impacts (though this has proven frustratingly difficult to quantify). Waterbirds and waterfowl, shorebirds, terns and gulls, and other groups are found at far lower levels. Newer turbines lacking the lattice structure, and with slower rotations per minute (rpm) appear to kill fewer raptors than previous turbines.

Large, diurnal raptors present a significant conservation challenge for wind. These species are vulnerable to collision with the blades, at times even when visibility is high. At most projects, raptor mortality has historically been low to absent (Erickson et al. 2002), but there are exceptions, most notably Altamont Pass, California, where Golden Eagles, Burrowing Owls, and other wintering raptors were killed in large numbers, apparently due to exceptional abundance of rodent prey combined with the lattice structure of the turbines (instead of the newer monopole design). Fortunately, lattice structures are no longer used in most cases. Eagle mortality continues to be documented at new wind projects, particularly Golden Eagles in the arid west, and Bald Eagles in the east (where Golden Eagles are rarer). However, much uncertainty as to the actual population level impacts on eagles and all other species still exists (Loss et al. 2012). For this reason the Land-Based Wind Energy Guidelines provides guidance on how to monitor potential population level impacts to eagles, which most developers already voluntarily comply with.

Additive vs. Compensatory Mortality

All populations experience some mortality at all times. As new sources of mortality appear, a population may or may not cause decrease. In compensatory mortality, the population is able to overcome the increase in mortality. In additive mortality, it is not, and the population becomes negatively affected, at least locally. Determining whether any wind project will produce a compensatory or additive mortality is usually very difficult, especially at the local scale. However, the Land-Based Wind Energy Guidelines, if properly followed, do provide guidance for producing such analyses, and chapters should encourage all local ordinances to ensure this happens, particularly where eagles are known to experience high use at any time of year.

Raptor Populations

Raptors are high likelihood species for adverse population level impacts in the Great Lakes, especially Bald and Golden Eagles. The Land-Based Wind Energy Guidelines require pre- and post-construction monitoring to take place, but as detailed above, have limited ability to gauge actual local population level impact. Post-construction monitoring, as recommend in the Land-Based Wind Energy Guidelines, is highly recommended so that realized mortality can be measured, and if necessary, mitigated. Some raptors appear to be sensitive to local displacement and mortality related to windfarms, such as White-tailed Eagles in Norway (Dahl et al. 2012) and it is likely these effects could impact Bald and Golden Eagles in a similar manner in the Great Lakes.

Species Risk Profiles for the Great Lakes region

Waterfowl

A growing body of literature, primarily from Europe, suggests that most waterfowl avoid turbines, including at offshore wind projects, so long as the turbines are *visible*. This likely means that during low visibility (ie. nighttime or fog/precipitation) these species will be less able to detect the structures, increasing the risk of collision. A recognition of the life history attributes of these species in each wind project area is necessary to fully inform the local planning board as to how to best approach this issue.

For example, in Huron County Michigan, Tundra Swans gather in large numbers each spring and each fall, as they migrate between their artic nesting areas and Atlantic coast wintering grounds. By day the birds utilize the farm fields of western Huron Co., up to 15 miles inland, to forage and rest. By night, all 12,000 of these individual birds fly out into Saginaw Bay for the night roost, where they are safer from mammalian predation. As a result, during daylight hours, this species is abundant, and often flies within the rotor swept height. Audubon delivered a position statement (See attached “Audubon Huron County Wind Position Statement”) informing the Huron County planning commission of this threat, specifying that the migration window is in March-April, and again in mid-October to mid-December, and that about 12,000 individual birds were involved. This phenomenon is highly-localized and highly seasonal, and the local planning board needs to be aware of it so that they can incorporate sufficient counter provisions into their ordinance. Species-specific threats, including the time of year, the behavior of the birds during their stay, and suggested verbiage for reducing threats, are highly recommended in these cases. Local commissions very likely will be totally unaware of such information, and many commissions will welcome the input, if it is provided early enough in the process that it can be easily incorporated.

Raptors

Day-migrating raptors (hawks, eagles, falcons, vultures, Osprey, etc.) migrate by day in both spring and fall, often at altitude, usually singly but with notable exceptions (eg. fall Broad-winged Hawks which kettle in the thousands). Most species are incapable of crossing large

water bodies, though there are exceptions (eg. Rough-legged Hawk, Bald Eagle, most falcons, Osprey, and Snowy Owls). As these water-averse species encounter the Great Lakes shore, they stack up in large numbers and get trapped in peninsulas (north-facing peninsulas in spring, south-facing in fall) as well as concentrate along bottleneck areas such as the northwest corner of Lake Erie in fall and along the Lake Michigan shore of both Michigan and Wisconsin/Illinois during favorable wind conditions. This creates huge congregations of birds in very small areas, especially at times of peak spring and fall migration. Developing a knowledge of local migration timing and bottlenecks is vitally important to informing local wind siting recommendations. We currently strongly recommend that all projects institute the federally-suggested three mile setback from all Great Lake shoreline for all turbines on all projects, if not a five mile setback.

Day-migrating Songbirds

Though the majority of songbird species migrate at night, many taxa do migrate by day. Icterids, robins, swallows, longspurs, waxwings, jays and crows, chickadees, larks, and finches are the primary examples in the Great Lakes. There are few if any data on these species' risk profiles to wind turbines. It is likely that many of these species are able to see the turbines and avoid them when visibility is good. It is very likely that these species risk profiles will get increasingly worse in conditions of low visibility, especially fog and heavy precipitation. If known concentrations of any of these occur, as is often the case within a mile of the lakeshore, or at key migration stopover sites, relevant setbacks should be recommended to local planning commissions.

Night-migrating Landbirds

A large number of taxa migrate exclusively or primarily at night. These species are highly vulnerable to any tall lit structures. Nighttime orientation is heavily influenced by lunar and celestial cues, and any anthropogenic source of light confuses the individual birds. On nights where the cloud ceiling is lower than the height of buildings or towers, birds descend to fly underneath the ceiling and closer to the lit structures. They fly toward the light source and endlessly circle the light, until either daybreak or death/injury results from collision with the light, the structure itself, other birds, or guy wires. For this reason, all turbines pose a secondary risk to these species *simply because they are tall lit structures*.

Night-migrating taxa include some waterfowl, some herons, rails, some shorebirds, cuckoos, owls, nightjars, flycatchers, vireos, wrens, kinglets, thrushes, warblers, sparrows, grosbeaks, orioles, tanagers, and Bobolink, among other species. These species ascend into the atmosphere at dusk, migrate in a broad front rather than in flocks, and then as dawn begins, descend down onto the landscape in an attempt to identify acceptable habitat in which to spend their day foraging and resting. For birds that find themselves above land at daybreak, the first hour or two of morning is spent flying around investigating habitat patches before settling in to whichever patch they prefer. This is referred to as 'morning reorientation' and allows the birds to comfortably select the best available patches of habitat within a few miles of their location. Most inland sites have a similar density of migratory landbirds by day, with larger concentrations only in most isolated habitat oases (such as a lone forest patch among a sea of urbanized or agricultural landscape). However, for birds which find themselves over a Great

Lake at daybreak, the situation is more perilous. These species must get to land as quickly as possible, at times as far away as 35-50 miles. Since their airspeed is around 25 mph, it can take up to two to three hours for the birds to reach land. During these frantic flights these birds have to successfully avoid capture by Herring Gulls, Ring-billed Gulls, Peregrine Falcons and Merlins (which will hunt up to several miles offshore), Cooper's and Sharp-shinned Hawks, and other predators. These predators are highly tuned in to these morning flights during which songbirds are extremely vulnerable. Many of these birds do make it to land, and this creates a tremendous concentration of landbirds in the first mile of shore inland, where bird densities are much higher than those farther inland. For this reason, habitats within one mile of shore are particularly valuable to landbird migrants, and the more fragmented these habitats are (for example in city- or corn/soybean-dominated landscapes), the more important the remaining patches of natural habitat.

Audubon strongly supports a minimum three mile setback from Great Lakes shores for all turbines at all times. Audubon also recognizes that increasingly isolated patches of habitat, whether forest, shrub, grassland, marsh or other native cover, become increasingly concentrated with landbird migrants the closer to the shore one gets, especially in the final three to five miles from shore. The habitats within the first mile back from the lakeshore are the most concentrated. Such habitats should be avoided completely for wind turbine siting.

Avoidance Behavior by Resident Species

Avoidance of tall structures is a major problem for some species, especially the open land-inhabiting grouse species of the Plains and Great Basin (Greater Prairie-Chicken, Lesser Prairie-Chicken, Greater Sage-Grouse, Gunnison Sage-Grouse, Sharp-tailed Grouse, etc.) These non-migratory species avoid areas with tall perches because they perceive a greater risk of predation from Golden Eagles and other sit-and-wait predators. So once turbines are erected within eyesight of their territory, they will abandon the territory altogether. Only two of these species currently inhabit the Great Lakes region: Greater Prairie-Chicken and Sharp-tailed Grouse. There are many other species for which such avoidance behavior is possible, but is yet unknown. American Golden-Plovers in Indiana, for example, appear not to avoid towers according to preliminary data (See attached case study #2).

Greater Prairie-Chickens are extirpated from a great number of their former sites in the Great Lakes presently, with two primary relict populations: Buena Vista grasslands, Wisconsin and southeastern Illinois at Prairie Ridge State Natural Area in Jasper and Marion Counties. Wind projects in these areas should be prevented at all costs.

Sharp-tailed Grouse also occur in specific grassland landscapes in the northern Great Lakes. Currently they inhabit grassy/agricultural areas of northern Minnesota, Wisconsin, and Michigan, but tend to be localized. Because many of these areas also happen to be the only open landscapes amongst the forests of the north, they have been specifically targeted for wind development. These projects need to be tracked carefully with concern for resident Sharp-tailed Grouse populations discussed with the companies and planning commissions. As the science for this species progresses, and its predilection for avoidance behavior becomes clearer,

Audubon's stance will adjust properly. If the species is shown to be display strong avoidance behavior to turbines, our stance will be strongly against turbine siting in known Great Lakes grouse areas.

Data Sources

Identifying the most critical species threats for a specific project can be difficult, and will often require a significant investment of time in correspondences and data mining, but this is one of the most important aspects of local chapter involvement in wind projects so chapters really need to get this right. There are many sources of data, and chapters often need to get creative in order to ensure no species are overlooked.

In many cases, local birders and bird experts will have a good idea what species are the potentially worst affected by wind. Consulting with local experts and checking local bird distributional publications is often a good first step. Local concentration points and species or groups of species in the area of the turbines will often come to light by simply talking to the right person.

After this has been done, we recommend chapters obtain eBird occurrence data for affected counties or IBAs. These data, and data from several other sources, can be accessed via the Avian Knowledge Network (AKN) here:

http://www.avianknowledge.net/index.php?page=data

Remember that eBird is a crowdsourced, non-systematic dataset (ie. birders submit information based on where and when they bird, not randomly across the landscape), and that resultingly there are holes in the dataset in areas where birders do not frequently bird or submit data. Chapters will have to dig further to locate all potentially impacted species in such areas.

At times, species specific threats may have to be uncovered by looking into specific research projects. For example, in the thumb of Michigan, Tundra Swans were known generally to concentrate in both spring in fall in the region's agricultural fields. However, satellite data discovered in an online search, showed that individual birds used the same path in both spring and fall, migrating between Nunavut and North Carolina. There is no formula for detecting such information. Chapter leaders must solicit data from all known sources, and push forward until they feel confident that they have uncovered all of the most problematic species. Chapters should feel free to contact leaders within Audubon's science team if they feel they are unable to determine which species present the highest potential threat.

The American Wind Wildlife Institute (AWWI) has produced an exceptionally powerful dataset for informing wind siting, called the Landscape Assessment Tool (LAT). It provides not just bird data, but a large variety of important landscape-scale features of relevance to power companies in the early stages of planning. Though most companies will use it on their own, it is a good idea to check for relevant bird data here. The tool can be accessed here:

http://www.wind.tnc.org/#

Finally, if the chapter isn't already aware of local Important Bird Areas (IBAs), they should check the National Audubon Society IBA database for all local IBAs, and solicit the full dataset from each trigger species. Simply zoom to this map to the area of the windfarm in question:

http://netapp.audubon.org/IBA/Map/All

and click on the IBA, then on the "website" link to be taken to the data summary for each site. Any IBA trigger species listed should be checked carefully to make sure it doesn't present a unique potential threat. If a species is found which may present such a threat, we recommend doing a literature search and consulting with Audubon and other regionally-recognized bird experts to gather more information about the species' occurrence and behaviors while using the site.

This is far from an exhaustive list of available data sources. Beyond these tools, we cannot predict where else a chapter might find relevant data, but with sufficient effort the chapter should be able to assemble a robust list of the species presenting the greatest potential threat.

Engaging in Wind

Once a chapter has identified the species and habitats it is most concerned about for a given windfarm, devising a successful strategy for influencing local siting and voluntary compliance with the federal and state guidelines and any local recommendations for problem species is the next step. One can either approach the company directly and ask for voluntary compliance, or approach the local policymaking board/commission and influence the creation of an effective local ordinance to force the company to comply.

Collaborating with Power Companies for Voluntary Compliance

Windfarms represent an exceptional financial investment for a company, and the companies are doing it to create a profit. There will be varying degrees of commitment to wildlife protection, and each company will be unique. If a project is caught early enough, quite often companies can be motivated to comply with requests voluntarily, either out of genuine concern for wildlife impacts, positive public relations value to the company, or both. However, once a company begins securing leases from property owners they become far less likely to be able to change course.

Chapters should always make an attempt to contact the renewable energy team staff of the power companies in the early planning stages for a windfarm, and assess their receptiveness to collaboration. Chapters need to present themselves in a collaborative way, not an adversarial one. We must establish that our aim is not to stop the windfarm, but to lessen its impacts on wildlife while allowing a return on investment. We need to go in with solutions, not complaints. If a company believes that the chapter is only interested in fighting, the chance for

collaboration will be reduced. If the only proposed solution to a proposed windfarm is absolute resistance, it very likely will require burning the bridge with the power company and fighting them with a local ordinance banning wind. This is only recommended in the most egregious cases, and we highly recommend chapters involving Audubon science staff before going to this extreme. Any project that is problematic to bird conservation ought to be addressed by Audubon itself rather than a single chapter.

Once you have an idea whether a company is willing to collaborate, get a sense of how far into the investment they are, and to what extent it is possible for them to modify the siting of turbines. Provide them an incentive that motivates them to take action, potentially including the benefit to wildlife, the safety of knowing that if they satisfy your requests you will no longer stand in the way of the project, or positive public relations. Which of these will motivate a particular renewable energy team depends on personalities and personal relationships. Sycamore Audubon of Indiana had great success collaborating with power companies in relation to an American Golden-Plover IBA, and achieved total voluntary compliance (See attached case study #2).

If a project is too far along to adjust siting, it may still be possible to ask for post-construction monitoring. Generally speaking companies are not required to hire a third party consultant to do the monitoring or share the data resulting from such consulting. This creates a dangerous conflict of interest, where companies have incentive not to collect data at all, and not to share what mortality they do document. If the relationship is robust enough, we recommend asking for voluntary compliance with hiring a third party consultant and sharing the data with the public commission, state and federal wildlife agencies, and Audubon. Sycamore Audubon was able to achieve this by offering to help with the hiring process and also helping with data collection (See attached case study #2).

Beyond this, what a chapter will ask of a renewable energy team depends completely on what the highest potential risks are for a project. If, for example, raptor mortality is a major concern, the chapter may ask for changes to micrositing (such as avoiding the lakeshore or a known Bald Eagle nest) (eg. the U.S. Fish and Wildlife Service recommends a three mile buffer from the lakeshore and a five mile buffer from active eagle nests), curtailment of turbines during the peak periods of migration (potentially including an active radar system or even a paid consultant to detect incoming raptors, though these systems are still early in their development), or other mitigation. In extreme cases, observed mortality may merit removal of turbines, which most companies will resist. This likely will have to be dealt with by a local ordinance or federal prosecution for take of eagles or endangered species.

Some projects will require an Environmental Impact Statement. Unfortunately many projects are not discoverable until after such a statement goes public, after which time the company will not likely voluntarily change course. Many renewable energy teams will comply, especially if they view the chapter as a collaborator willing to assist them through the process (See attached case study #2).

Finally, this is an excellent phase in the process in which to ask for voluntary setbacks from important areas for species the chapter is especially concerned about. For example, a local wetland with 10,000 staging Sandhill Cranes (See attached case study #1). A large agricultural expanse where 12,000 staging Tundra Swans occur twice per year (See attached letter to the Huron County Michigan planning commission), or a known corridor for migrating raptors, or a Sharp-tailed Grouse lek. In such cases, micrositing can make a large difference to the project, and some companies will comply if they see it as a path toward moving the project forward.

A list of other mitigation options for problematic windfarms is available on pages 49-52 of the Land-Based Wind Energy Guidelines.

Affecting Local Planning Commissions with the Development of Effective Ordinances

Local commissions require the expertise of bird, bat, and other wildlife professionals to address wildlife impact of wind projects. Each commission must understand 1) the risks, as best they are understood, to each species and guild of concern, 2) which species and guilds are most relevant to the individual project, 3) how to write an effective ordinance with sufficient authority to ensure lessened impact on wildlife, or sufficient contingencies for mitigation or even removal of problematic turbines, and 4) how to require meaningful setbacks and pre- and post-construction monitoring to ensure mitigation is possible.

Pre- and Post-Construction Monitoring

The Land-Based Wind Energy Guidelines are variable but generally recommend three years of pre-construction monitoring and three years of post-construction monitoring. This should allow for sufficient between year variation in bird occurrence to be captured by the dataset, as well as a clear picture of what the actual observed mortality is after construction. Again, if the company voluntarily follows the Land-Based Wind Energy Guidelines, this may be a moot point. But if they do not, local commissions can institute an ordinance forcing the companies to do so.

It is vital that the monitoring be done by an independent third party contractor hired by the township/county and paid for by the company, and that all mortality data be shared with the commission. Many commissions have instituted such language.

Early Detection of New Projects

Most chapters which have successfully engaged wind projects repeatedly mention the importance of detecting a project as early as possible. Generally, companies are not required to post anything publicly until well into the process when an environmental impact statement is produced, for example. This is well past the necessary time to hope for voluntary compliance. The greatest chance for early detection seems to be developing personal relationships with both local commissioners and officials from the power companies, such that they come to you as a resource whenever they learn about a new project. Sometimes, local newspapers or other media outlets will discover and publicize a project early on, but this doesn't happen often. Landowners who have signed leases generally have every reason not to publicize the project as it presents a threat to the income they stand to gain from it.

Companies generally have dozens of potential projects they are considering, especially when the federal subsidies for wind make it profitable to start windfarms. We cannot overstate the importance of developing productive, collaborative relationships with the most important players, as this greatly increases a chapter's likelihood of minimizing risk of future projects to birds and other wildlife.

Establish Credibility and Select Representatives Carefully

Companies often hear from a small number of vocal activists who vehemently oppose their windfarms. At times, including from the birding community, people will take an inflexible anti-wind position against all windfarms. We must understand that taking this approach will lead to a lower probability of success mitigating impact to wildlife, by ensuring an adversarial atmosphere in which the company will put a lot of energy into fighting compliance with the guidelines, and against the creation of important local ordinance.

Chapters must be willing to concede that if proper science is done, and the results of the science show limited impact to birds, that the project can proceed. The company needs to know the chapter will hold true to this, or it removes their incentive to collaborate. Chapters should identify scientists and other well-respected members and representatives that will bring solutions to the table and therefore become a valuable source of information for both developers and commissioners.

The person/people who ultimately represent the chapter should be very well-informed on the species and threats they wish to speak about, and on the legal considerations to which a company is subject. They should anticipate the questions they are likely to be asked ahead of time, and have ready-made answers, to the extent this is possible. If it is not possible, the representative should take the time to find the answer and get back to the questioner. Chapter representatives must expect to spend a great deal of time working on these issues and attending meetings and developing relationships, if they hope to achieve success.

Choose Battles Wisely

There are times when compromise is a necessary component of collaboration with a power company or a planning commission. Much as it may be disappointing not to receive a desired provision, it is important to achieve as much positive impact as possible, and sometimes certain provisions may have to be given up in order to attain the higher priority ones.

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Additional Recommended Resources

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Audubon wind power chapter case study #1

Chapter: Michigan Audubon, Lansing, MI

Wind Projects: Convis Twp. private developer, Calhoun Co., MI

Related Important Bird Areas: Bernard W. Baker Sanctuary, Calhoun Co., MI

Bernard W. Baker Sanctuary, owned and managed by Michigan Audubon Society, supports Michigan's largest concentrations of staging Sandhill Cranes, with over 12,000 individuals spending up to six to seven weeks there each October and November. During this time, cranes spend the night in the interior portions of Big Marsh Lake, where they are safer from mammalian predators. But by day, the birds spread out over a large area to forage in the area's large agricultural fields. While flying between these the marsh and the fields, birds are often within the rotor swept height area for modern wind turbines.

In 2012 Rachelle Roake, Conservation Science Coordinator of Michigan Audubon, was informed of a proposed private windfarm three miles southwest of Bernard W. Baker Sanctuary. The landowner had proposed five commercial-grade turbines on his large private property in an agricultural landscape used by Sandhill Cranes staging at the sanctuary (See attachment "Baker Sanctuary Potential Wind Development.pdf"). The potential threat to cranes was unknown, but constituted a serious concern worthy of exploration and immediate engagement in the issue.

Rachelle approached the Convis Twp. planning commission and they had already been contacted by the landowner and were in the process of drafting an ordinance to address the issue. The first version, under consideration by the commission and obtained by Rachelle, contained the following omissions:

1) Guy wires were not specifically prevented from use.
2) No setback from the sanctuary.
3) No setback from significant ecological habitats in close approximation to the turbine sites.
4) No provision requiring the developer to demonstrate that the project will not adversely impact wildlife and habitat.
5) No requirement to consult with the U.S. Fish and Wildlife Service or follow the voluntary Land-Based Wind Energy Guidelines.
6) No requirement that the project comply with the Michigan Endangered Species Protection Act.
7) No requirement for an Environmental Impact Statement (EIS) or wildlife impact statement addressing specific concerns related to greater Sandhill Cranes, Bald Eagles, and Trumpeter Swans.
8) No requirement for pre-construction or post-construction monitoring by a third party professional consultant.
9) No requirement to share mortality data with the commission and the public.
10) No requirement for mitigation if a significant adverse impact to birds, bats, and other wildlife is found.
11) No requirement that the turbines be placed on monopole structure lacking ladders or other perceived raptor perches.

Rachelle found that the township commission was up front about their lack of knowledge on bird and bat issues. The commission expressed a strong desire for more information and collaboration from bird experts including Michigan Audubon, with the goal of crafting an effective ordinance to ensure proper siting and minimization of adverse impacts to all wildlife.

Rachelle attended a series of meetings of the commission over a one and half year period, during which time the ordinance underwent a series of revisions. Michigan Audubon presented a formal letter to the commission on July 23, 2015 (see attachment “Convis Wind Ordinance_Roake Requested Edits.doc”) suggesting changes to all eleven items bulleted above. Each one provided a reasonable option that would not blockade the development while at the same time providing necessary protections for Sandhill Cranes.

The response to these proposed revisions was varied. The landowner pushed back on several of the items, and was able to get several concessions implemented. However, the commission held steady and after consideration and discussions with Rachelle decided to incorporate the following provisions either in their entirety or in a similar wording:

1) A ban on guy wires.
2) A required EIS and collaboration with the U.S. Fish and Wildlife Service to minimize impact to birds, bats, and wildlife.
3) Inclusion of the Michigan Endangered Species Protection Act into the provisions of the EIS
4) One year of pre-construction monitoring during the winter, breeding, and migratory period by a third party consultant hired by the township but paid for by the developer.

5) One year of post-construction carcass searching (birds and bats) also by a third party consultant hired by the township but paid for by the developer.

The following provisions, all suggested by MAS, were not incorporated into the final ordinance:

1) A setback of three miles from Baker Sanctuary.
2) A setback of two times turbine height from wetlands, sensitive habitats, fragile ecosystems, or historical/cultural sites and antiquities.
3) An impact analysis addressing flight patterns of greater Sandhill Cranes, Trumpeter Swans, and Bald Eagles using the sanctuary.
4) A quarterly report to the township summarizing and publishing all biological survey data plus carcasses found within 500 feet of a turbine.
5) A mitigation plan (in the event of "significant adverse impact to birds, bats or other wildlife") to be developed with the U. S. Fish and Wildlife Service, paid for by the developer.
6) Requirement of monopole construction design.

Losing some of these provisions in the ordinance was disappointing to Michigan Audubon, and there were several likely reasons the commission did this. Rachelle found that the commission, in the final round of revisions, simply lost patience at the prospect of another revision to the ordinance. Commission members audibly groaned when told that if they decided to accept additional revisions (ie. the above ones Rachelle was publicly asking for) that it would require additional discussion and voting at the next meeting. So they settled for the existing verbiage even though many of the members would have voted to adopt many of her revisions. This was very frustrating for the chapter, and elucidates another, unexpected, reason it is so important to be involved in wind projects as early as possible.

Rachelle attended these meetings alone, as a professional conservationist (ie. an employee) representing Michigan Audubon. Some commission members appeared not to fully respect a younger woman's opinions, at times interrupting and speaking down to her at the public meetings. The commission overall gave in to some of the provisions, possibly to try to satisfy her so she would stop asking for additional revisions, which required a lot of commission's time and would necessarily delay the process for months longer. The commission was made up entirely of older men who had worked together as a group for a long time, and apparently were not used to collaborating with younger women. This presented a difficult dynamic for Michigan Audubon. Chapters should be aware of this type of dynamic and strategize how best to effectively work around it. As always, chapters must take into consideration that most commissions are answering to many competing stakeholders, and as a result chapters must strategize how best communicate their desires in a way in which they will be favorably received. Most commissions are composed of non-experts with limited time and energy, so messaging is very important.

Michigan Audubon was able to significantly reduce the potential threat to birds and bats and the chapter felt strongly their involvement was an overall success. The developer has publicly stated that he believes his project is very unlikely to move forward, in large part because the ordinance put too many limitations on him to make the project profitable. This was not the goal of the chapter, and is not solely due to the wildlife provisions encouraged by Michigan Audubon. Other interests presented at the commission meetings by other stakeholders concerned about shadow flicker, sound effects, and setbacks from adjacent people's properties. These concerns were also implemented into the final ordinance. The combination of all of these provisions is ultimately responsible for making the windfarm less likely to become a reality, not just the chapter. Time will tell whether or not the project proceeds.

Key take home action steps:

1) Many local planning commissions have little to no knowledge of wildlife impacts and welcome input from experts. Contact them as early as possible and attempt to gauge their level of receptivity.
2) Select representatives carefully. Be very well-informed to maintain credibility.
3) Beware of individuals who proclaim themselves the representatives of the birding community then simply oppose all wind at all costs. This can paint the chapter in a bad light, preventing useful collaboration. Make it clear to the commission who represents the chapter and who does not.
4) Face time is important. Although a significant time commitment is necessary, building in person relationships and showing up for commission hearings and standing up to the public podium go a long way toward exerting influence with the ordinance.
5) If possible, assemble a well-informed group of chapter members and constituents and have them attend commission meetings. This establishes credibility to the cause and prevents burnout of a single person.
6) Utilize the USFWS guidelines. The land-based wind energy guidelines constitute a robust approach to mitigating wildlife impacts, and impose much-needed restrictions to passive take of important species such as Bald and Golden Eagles, if the developer does not have a take permit. There is much ready-to-use language in the guidelines that can be adopted into the ordinance easily, preventing the time-consuming task of coming up with original language.
7) Identify species of concern and habitats of concern, and communicate these potential threats as precisely as possible, so that the commission can build an ordinance which best minimizes these threats.
8) Personalize the issue. Inspire the commission to care about local wildlife resources by teaching them about the species and habitats, and informing them about how many local constituents already care deeply about it.
9) Pick battles wisely. Taking issue with every wind project or demanding every piece of language is adopted by the commission is aggressive and unlikely to be productive. Be flexible, and prioritize the most important provisions carefully and be willing to compromise some of the lower priority provisions if necessary to get the more important ones adopted. Renewable energy, whether it ultimately comes from wind or another source, is a necessary component of protecting birds from the long-term effects of climate change, and should be encouraged when done wisely.

Audubon wind power chapter case study #2

Chapter: Sycamore Audubon, West Lafayette, IN

Wind Projects: Meadow Lake windfarm (White Co., IN), Hoosier Wind Park windfarm (Benton Co., IN), and Fowler Ridge windfarm (Benton Co., IN)

Related IBAs: American Golden-Plover Staging Grounds Important Bird Area, Benton Co. IN

In the early 2000s, Sycamore Audubon became aware of three proposed windfarms in west central Indiana, via articles in a local newspaper. At the time, chapter members became alarmed by the potential development because of the results of a 1998 research project (Braile 1999) documenting the annual presence of American Golden-Plovers (*Pluvialis dominica*) each spring in the areas slated for wind development. The project observed approximately 10,000 birds in one spring, but extrapolation over the larger region suggested that 42,000-84,000 golden-plovers might use the fields in this region. The global population estimate at the time was 150,000 individual birds, so a minimum of approximately 28% of the population may have been using these fields each spring. (Note: more recent estimates suggest the population maybe be as high as 500,000 individuals). This 1998 project repeated surveys done a decade earlier by local members of the Sycamore Audubon chapter (Erickson 1992), which found similar numbers of plovers during the mid-1980s. Combined, these studies suggested that the golden-plovers were consistently using the portions of west-central Indiana slated for wind-energy development as a stopover site during spring migration. Any potential impact to this species was unknown. Chapter members suspected the birds might display avoidance behavior to the turbines (similar to that shown by prairie grouse of the American west), but this impact was unknown and needed further study to make an informed recommendation to the power companies, consultants, and local policymakers.

The areas shown to contain the large spring concentrations of plovers had not yet been deemed an Important Bird Area (IBA), but the Indiana IBA program technical committee was actively considering potential sites throughout the state for IBA status. Members of Sycamore Audubon attended meetings of the IBA state technical committee and proposed as an IBA the township with the largest numbers of golden-plovers detected across the two survey periods. The technical committee agreed to designate a portion of Union Township as an Indiana IBA.

In order to protect the IBA and use it to best inform wind turbine siting, Sycamore Audubon worked with West Inc., an environmental consulting firm involved in the windfarm's ecological planning. West was hired by the wind energy firms to conduct initial ecological assessment of the projects, survey the distribution and numbers of the area's birds, (including the plovers), and develop an ecological impact statement. West contacted the chapter in large part because of the reputation of one of its Board members: Dr. Barny Dunning of Purdue University. Dr. Dunning was well-known for his objective approach to conservation issues, and his expertise in bird monitoring. The resulting project was that West hired local birders, including members of the Audubon chapter such as Diane Packett, a Master's student in Purdue's Department of Forestry and Natural Resources and another member of Sycamore Audubon's Board of Directors. They organized surveys of multiple townships over a three year period. The area was checked throughout the year, with special emphasis on searching for plovers before, during, and after the peak timing for plover occurrence. The study confirmed the earlier work that the greatest concentrations were located in an 18 square mile area of southern Union Twp. in Benton Co., IN, where the IBA was designated.

At first, when presented with this evidence, the energy development company said there was no evidence that the plovers would avoid the fields in which the turbines were placed, and pushed back to the suggestion that turbines should not immediately be sited in the area. The chapter responded that there was similarly no evidence that the birds would not avoid the fields, so that the best solution was more information. At this point the company developing the wind farms agreed to avoid the entire IBA for turbine siting, voluntarily (Note: the company that ultimately constructed the turbines was different from the one which purchased the land contracts). Companies also voluntarily avoided other local bird habitat, including the Celery Bog, a local migration hotspot in West Lafayette, IN, and the Jasper-Pulaski State Wildlife Management Area, a staging area for Sandhill Cranes. In return for this, the chapter and its

partners helped create a significant amount of positive public relations for the company, which created a win-win atmosphere for collaboration. This negated the need to do regulation at the local governmental scale, though some counties ultimately opted to create a wildlife buffer zone anyway (B. Dunning, pers. comm.)

A final component of this work is an ongoing study of post-construction avoidance behavior and direct mortality of American Golden-Plovers, conducted by Dr. Dunning and Wes Homoya (a Purdue graduate and Vice President of Sycamore Audubon). This project focuses on the distribution of the plover flocks now that the turbines are in place. Another localized species of interest is Smith's Longspur, which is often found in spring in the same fields. The wind energy companies and West, Inc., have cooperated in the project in part because they trust them as collaborators. Monitoring is limited to public rights-of-way, negating the need to monitor on private lands. Because pre-construction monitoring data are not available to test avoidance behavior or actual mortality, measuring these two variables was highly desired. West, Inc., also convinced the development companies into funding an extra year of surveying the project area for dead birds and bats killed by collisions with the turbines; this survey work was not required for permitting purposes. West hired trained technicians to check for carcasses in a stratified sampling protocol, and measure avoidance behavior of plovers during the spring stopover. Dr. Dunning's study is not yet complete, but preliminary results appear to show that plovers are not avoiding areas in the direct vicinity of the turbines. Further, no direct mortality of plovers has yet been observed (B. Dunning, pers. comm.).

Conclusions

Several factors aligned to create a successful campaign for Sycamore Audubon in this instance. First, the chapter created credibility for itself by putting an established scientist with a history of working with industry, not to stop development, but to minimize its impact. Second, the chapter got to the project early enough to make a difference. If the development companies had already signed land leases with landowners, there is a much lower chance the company would have changed course. Third, it established open channels of communication with the power companies and the environmental consulting firm hired to do the necessary regulatory paperwork, and even collaborated with them to design a successful pre-construction survey. An integral element of this success was the company's recognition that Sycamore Audubon's leadership would not say no to the project if the data from the studies suggested a low potential impact to American Golden-Plovers, as it did. This displays a large amount of trust on the part of the development companies, and this trust had to be built over time.

Key take home action steps:

1) Find new wind projects as early as possible. This can be challenging, and varies by state and county. Establishing relationships with local planning commissions and journalists (i.e. the first local residents to become aware of projects) often results in earlier detection.
2) Establish communications with power company personnel as early as possible.
3) Establish credibility by making it clear that the chapter does not desire *simply to oppose wind power*, but wants to help get it properly sited.
4) Make the chapter a source of valued information on minimizing avian impact for power companies, not a reflexive voice of automatic opposition to wind development.
5) If the science suggests low impact to key species, be willing to admit this and let the development take place in the low impact areas. If the companies do not trust the chapter to do this, collaboration will be far less likely.
6) Successful collaboration with power companies can negate the need for local legislation by creating voluntary compliance.

7) Post construction studies should target the species most threatened by development, and their unique biology as it pertains to the local geographical area. Chapters should solicit this information from expert ornithologists and databases, and compile it to present it to the power company.
8) The success of the IBA selection process and the use of the IBA to guide turbine siting was largely based on studies of bird habitat use and numbers conducted over the previous 15 years. Gathering baseline data (where birds are, abundances, behaviors) is a component of citizen science in which most chapters can participate, especially with programs such as eBird to make the data available. Nothing gets done without data.
9) Present bird data to the power company green teams to show high risk areas, but be honest about where data are lacking. Suggest the company collaborate on filling these information gaps to inform turbine siting.

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