BLACK SWAMP BIRD OBSERVATORY

13551 W. State Route 2 ▲ Oak Harbor, Ohio 43449 ▲ 419 898-4070 ▲ www.bsbo.org

TEAMING RESEARCH WITH EDUCATION TO PROMOTE BIRD CONSERVATION

November 16, 2017

ATTN: IAD

Asim Z. Haque, Chairman
Public Utilities Commission of Ohio
180 E. Broad Street
Columbus, Ohio 43215-3793

To the Ohio Power Siting Board (OPSB):
Re: In the Matter of the Application of Icebreaker Windpower, Inc for a Certificate to Construct a Wind-Powered Electric Generation Facility in Cuyahoga County, Ohio. Case No. 16-1871-EL-BGN

Dear Mr. Haque:

Black Swamp Bird Observatory (BSBO) and American Bird Conservancy (ABC) appreciate the opportunity to comment to the OPSB process on the Icebreaker Wind Energy Project, case number 16-1871-EL-BGN.

BSBO is an Ohio-based nonprofit dedicated to research and education for bird conservation. We have over 35 years of field experience and research on bird migration in and around Lake Erie (www.bsbo.org).

ABC is the only organization in the Western Hemisphere with a single and steadfast commitment to achieving conservation results for birds and their habitats throughout the Americas (www.abcbirds.org).

Many parties have testified in support of this project, and many of them have mentioned the "low risk to the environment." However, as the OPSB is aware, the studies to determine the potential impacts are still being conducted. Because these supportive comments cannot be based on conclusive studies, they merely reflect successful public relations marketing by LEEDCo.

As such, the following comments are submitted on behalf of BSBO and ABC—two organizations uniquely qualified to advise the OPSB on this risk assessment.

Based on our extensive knowledge of bird migration, we present these points for consideration.

BSBO and ABC acknowledge the need to diversify the nation's energy portfolio to address the threat of anthropogenic climate change. However, there are many other potential ways of addressing climate change beyond poorly sited wind turbines, including limiting deforestation, promoting biodiversity conservation, energy efficiency and distributed solar on our already built environment (e.g., parking lots, houses, etc.). When we do use wind energy, proper siting is crucial.

We applaud the OPSB and ODNR Memorandum of Understanding (MOU) process for evaluating this project. We recommend that this process—with more scientific rigor and transparency, added—should be used for all wind industry applications in Ohio.

We support complete enforcement of the MOU and of our state and national wildlife protection laws, including the Endangered Species Act, Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as well as the National Environmental Policy Act (NEPA). Although this MOU is not perfect, we definitely support the requirement that all pre-construction risk assessments must complete a minimum of one full year of data collection, although three years would be better to assess annual variation in migration patterns and weather.

Radar study requirements have already been lost for fall 2017, so pre-construction studies must continue at least until November 2018 in order to comply with the MOU. In addition, analysis of this complicated methodology will take months before any conclusions can be drawn.

We recommend that the Certificate of Operation should not be issued until the applicant has completed the studies required by the MOU, has demonstrated peer reviewed concurrence of low to no expected risk, and has presented a scientifically sound mechanism for conducting post-construction bird and bat mortality studies, which are particularly difficult over open water, and involve technologies yet to be fully tested for their efficacy. The results of these studies should be transparent and open for public scrutiny.

With the immense bird activity on and above Lake Erie, the precedent-setting nature of this project, and the inadequate field work conducted for the project, it is obvious the Environmental Assessment completed by the Department of Energy (DOE) fails to assess the true risk to birds and bats.

Massive numbers of waterbirds use the central basin of Lake Erie. For some species, such as Red-breasted Merganser and Bonaparte's Gull, more than 40 percent of the world's population may be present on the lake at the same time.

Migratory songbirds and shorebirds gather by the millions along the shoreline and many fly directly across Lake Erie, most of them flying at night. This is supported by ongoing U.S. Fish and Wildlife Service (FWS) radar research along Lake Erie.
https://www.fws.gov/radar/documents/Avian%20Radar%20Sp2012%20Erie%20Full.pdf.

Species present include endangered species such as Kirtland's Warbler and Piping Plover, and other birds listed as Endangered, Threatened or species of Conservation Concern.

The EA for the project does not reflect any of these points. We strongly recommend the DOE step back, follow the original recommendation of the FWS, and complete a full Environmental Impact Statement (EIS) prior to requesting a Certificate of Operation.

The EA on the Icebreaker WEP has ignored NEPA guidelines to address cumulative effects of any known or projected expansions. And although the applicant has consistently stated that this is just a small demonstration project, clearly, the true objective is to support the construction of thousands of turbines in Lake Erie. This has been part of the applicant's public information campaign as well. This was evident when the proponents who provided written comments and/or testimony at the 8 November hearing indicated that they are not looking at this project as a 6-turbine demonstration, but as the complete build-out of thousands of turbines. During their testimony they based their support on the thousands of jobs that the project would bring to the Cleveland area. Six turbines will not accomplish these goals. Ignoring the potential cumulative impacts could result in legal action, which could delay this project for many years.

For all these reasons, we implore you to judge this project on the cumulative risk to birds and bats posed by the potential for thousands of turbines in Lake Erie, and require appropriate independent risk assessment by an EIS before discussion of issuance of any Certificate of Operation.

Please find attached, our review of the DOE Environmental Assessment and its supporting documents concerning birds and bats. A link to our comments is, here:
http://www.bsbo.org/uploads/3/0/8/0/30807041/doe_ea_comment_document_bsbo_abc.pdf

We believe the EA to be inadequate to assess the risk to birds and bats, and we further point out that that the U.S. Fish and Wildlife review of the EA echoes most of our serious concerns.
http://dis.puc.state.oh.us/TiffToPDf/A1001001A17K07B60053H01374.pdf

There are numerous studies documenting the impact to birds and bats from poorly-sited wind energy, with hundreds of thousands being taken annually at minimum. Until we can legally prevent the industry from developing wind energy in Globally Important Bird Areas, we believe Ohio should establish a standard by which we proceed only with a surplus of knowledge and an abundance of caution.

Respectfully submitted,

Kimberly Kaufman, Executive Director
Black Swamp Bird Observatory

Michael Hutchins, Ph.D.
Director, Bird Smart Wind Energy Campaign
American Bird Conservancy

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TEAMING RESEARCH WITH EDUCATION TO PROMOTE BIRD CONSERVATION

October 5, 2017

Buffalo District U.S. Army Corps of Engineers
Regulatory Branch
ATTN: Joseph W. Krawczyk
1776 Niagara Street
Buffalo, NY 14207-3199

U.S. Department of Energy
Golden Field office, NEPA Division
15013 Denver West Parkway
Golden, CO 80401

To Whom It May Concern:

Black Swamp Bird Observatory (BSBO) and the American Bird Conservancy (ABC) jointly reviewed the Department of Energy's (DOE) draft document *Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio*, co-authored by the U.S. Coast Guard and the U.S. Army Corps of Engineers, and we submit the attached comments in critique of the draft.

In summary, it is our opinion that the draft Environmental Assessment (EA) is founded upon invalid, misleading, and erroneous studies presented by both Tetra Tech and Western EcoSystems Technology (WEST) on behalf of LEEDCo which are not supported by the data. Further, we find that because the Kirtland's Warbler, a federally designated Endangered Species, is known to be present in the project area during migration, and because the project area is within the confines of a Globally Important Bird Area, an EA is not sufficient to fulfill the requirements of the National Environmental Policy Act (NEPA), and that a more comprehensive Environmental Impact Statement (EIS) is required.

Please find attached our comments related specifically to four documents: (1) the draft EA, (2) Appendix J of the EA (WEST NEXRAD Analysis), (3) Appendix K of the EA (Tetra Tech Bird Survey Report), and (4) Appendix L of the EA (WEST-Icebreaker Wind: Summary of Risks to

Birds and Bats). We believe the details contained in these comments support our findings and our conclusions calling for an EIS to be completed instead of an EA.

Thank you for the opportunity to comment. We look forward to further discussions and are available for questions.

Respectfully submitted,

Mark Shieldcastle, Research Director
Black Swamp Bird Observatory

Michael Hutchins, Ph.D.
Director, Bird Smart Wind Energy Campaign
American Bird Conservancy

REVIEW

ENVIRONMENTAL ASSESSMENT

October 5, 2017

Black Swamp Bird Observatory (BSBO) and American Bird Conservancy (ABC) submit the following review of the Draft *Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio* report prepared by U.S. Department of Energy (DOE); U.S. Coast Guard; U.S. Army Corps of Engineers (ACE).

Text in blue indicates passages taken directly from the above-named document, unless otherwise indicated. This review focuses exclusively on the areas of expertise of the author organizations. Therefore, comments are primarily associated with risk to birds and bats.

Page 1-1 Section 1.1 last paragraph – DOE states that this EA is to provide information to make an informed decision about the Proposed Action. It is our contention that this cursory Environmental Assessment (EA) does not accomplish this goal and therefore, must be replaced with a more detailed Environmental Impact Statement (EIS).

Page 1-4 Section 1.4.2 – The EA indicates the ACE has determined that this project is for "energy generation". However, the EA only considers two possible alternatives of building the project or not. This does not meet the definition as offered. We suggest that additional alternatives, including but not limited to distributed solar on our already-built environment (buildings, parking lots, roads), wave action, and experimental (bladeless) turbine design, that may provide less negative environmental impacts be included in the final draft of what should be an EIS.

Page 2-2 Section 2.2.1 Figure 2.1 – Text in 2.2.1 indicates six turbines make up the project, however the map in Figure 2.1 indicates seven turbines. Please confirm the actual number.

Sections 2.2.2.2 to 2.2.9 are outside our area of expertise and we offer no comments for consideration.

Page 2-22 Section 2.4.1 – A dated 2009 feasibility study does not take into account the designation of the Central Basin of Lake Erie as a Globally Important Bird Area (IBA). This designation is multiple levels above the Cleveland Lakefront Audubon IBA that was mentioned in importance of state and federally-protected native birds as a statutory natural resource. This designation is recognized by the National Audubon Society and Bird Life International and is accepted as a criterion by many governmental agencies to trigger additional environmental

review. This suggests ACE should consider additional alternatives, other than wind, that do not have well -documented environmental impacts on birds and bats.

Page 2-23 Section 2.4.1 – Bullet point 3 of paragraph 2 indicates LEEDCo used bird and bat risk assessments as late as 2016, after the Global IBA designation. This constitutes a failure of this EA to meet a primary criterion of providing information to make informed decisions as stated on page 1-1, Section 1.1 by utilizing the most recent information.

Page 2-29 Section 2.5.2 – Comments from the U.S. Fish and Wildlife Service (FWS) were extensive and blunt in the need for a detailed environmental assessment. Comments included but were not limited to:

1) This project should meet greater rigor than land based projects because of its added uncertainty.

2) The radar study of 2010 was completely inadequate and recommended additional work be completed in 2017. As of this writing this work has not been initiated.

3) LEEDCo studies were completely inadequate to assess risk to the Bald Eagle

4) That a valid approved post-construction monitoring plan must be developed. This has not been accomplished.

5) That the FWS provided citations from CEQ NEPA regulations and recommended that an EIS level analysis be completed and not an EA. The basis for this was well documented in FWS comments. This has not been accomplished.

Page 2-30 Section 2.6.1.a – The EA contends that no “conservation lands” are involved in this project. While we have not been able to ascertain the actual definition of “conservation lands” as designated here, we contend that the Global IBA designation meets that definition and therefore should be addressed in an EIS for this project. Public interest in this project is high and should not be ignored by DOE or ACE. The air column is now openly recognized as essential habitat for migrating birds and bats and should be afforded similar protection as land-based habitats (Davy et al. 2017).

Page 2-35 Section 2.7.2 – The EA mentions the MOU with the state ODNR, but does not include that LEEDCo’s failure to fully comply may result in termination of the project. Language concerning compliance with appropriate laws protecting migratory birds and bats, such as the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act and the Endangered Species Act, should be mentioned as a prerequisite for approval and for DOE financing should be in the final document.

Sections 3.0 to 3.3 are outside our area of expertise and/or present no concerns and we offer no comments for consideration.

Page 3-29 Section 3.4.1.3 Migratory Birds – The EA states that “The Proposed Project would be located between 8 to 10 miles off the coast of Cleveland, a location that provides minimal or negligible habitat for anything other than migratory transit”. This is an inaccurate statement and

must be changed. Considerable flyover, stopover, roosting, and feeding occurs for many species in the project area. Details will be supported later in the appropriate section.

A correction needs to be made to include “Global” to the statement “The Proposed Project would also be located within the Lake Erie Central Basin Global IBA”.

Page 3-29 Section 3.4.1.3 Bald and Golden Eagles – The EA fails to mention trading flights that occur regularly between Ohio and Ontario. This needs to be mentioned here and addressed in the appropriate section. The EA has failed to address important parts of the Bald Eagle life cycle and how it utilizes the habitats of the area.

Page 3-29 Section 3.4.1.3 Project Area Studies – The EA indicates the Diehl et al. (2003) study supports that there are more than 2 times the number of birds over land than water along Lake Erie. This statement is inaccurate and needs to be struck from this EA. There was no statistical significance between land and water due to small sample size. Direct conversation with Dr. Diehl supported misinterpretation of his study. Dr. Diehl stated “This paper cannot support or refute the risk to migrating birds from turbines in Lake Erie”. Simply put, NEXRAD, is not capable of estimating numbers or risk over Lake Erie. For one thing, it does not measure flight altitude, a key factor in risk, especially under varying weather conditions, such as high winds, fog, or low cloud cover. The same shortcomings are present in the WEST (2017) analysis. Appendix J contains a review of that supporting document.

In paragraph two of this section, the EA states the WEST NEXRAD study strengthened the data. While this study used more recent data and included three years instead of one, this improved sample design is negated by other flaws. For example, the study area was no more in the sample area than Diehl and was constrained by the inadequacies of NEXRAD for this particular question. A more in depth review of the WEST study is included in Appendix J. Despite statements to the contrary, this study does not support or refute any level of risk to birds and bats.

Paragraph three refers to the ODNR aerial survey. WEST took considerable and unsupported liberty with findings from this survey as well. A more detailed review of WEST’s assumptions are covered in Appendix L. There was considerable variability in bird locations and abundance, and no data were collected during winter. Furthermore, the survey covered only diurnal movement, yet this area is known to be used by nocturnal migrants. The graphs reproduced by WEST from the study are therefore highly misleading and represent low estimates of bird abundance.

The Tetra Tech studies are examined in Appendix K. Simply put, these studies were poorly designed at best. Even WEST commented in the open house that these studies were poorly designed and conducted.

Page 3-30 Section 3.4.1.3 Project Area Studies – Raptors and Eagles - The EA utilizes Appendix L to support its conclusions that the project poses little or no risk to eagles or other raptors. Our comments on this section are covered in Appendix L. WEST relied on extensive unsubstantiated opinion. There is movement between Ohio and Ontario by resident eagles and Peregrine Falcons have been found on the Cleveland Crib; this species was mentioned in the

EA as an exception. Neither the boat survey, nor the ODNR aerial survey were designed to account for this group of species, so should not be cited in support of “no activity”. In addition, soaring, migrating raptors are known to be attracted to offshore wind farms in Europe, especially during adverse weather (Skov et al. 2016).

Page 3-30 Section 3.4.1.3 Project Area Studies – Songbirds - As mentioned above, Diehl did not document twice the number of birds over the shore compared to water. There was no statistical difference between the two as confirmed by Dr. Diehl by phone. The data reported by WEST (Appendix L) were taken out of context, as this study represents only a single snapshot taken over a few days. It therefore does not and cannot represent the entire night migration, which may show extremely different results, especially during less than ideal weather conditions. Consequently, these data do not support low risk to migrating birds. This incorrect and unsupported conclusion of the EA is contrary to that of the recent FWS advanced radar studies around the Great Lakes. The FWS studies also mention the severe limitations of NEXRAD radar in assessing risks to birds and bats from wind energy development. There is a general understanding that birds do congregate along the coastline as a response to this formidable migration barrier. However, this in no way infers that large numbers of birds are not flying across the lake. Considerable data collected in the Western Basin of Lake Erie, between Long Point, Ontario and Presque Isle, Pennsylvania, and Rondeau Point, Ontario and Cleveland green spaces suggest there is massive lake crossing. Recent Motus tower studies have recently found that large numbers of migratory bats are also flying across the lakes (Mackenzie, pers. com.).

A review of Appendix J is included in this analysis. That document does not support the EA conclusions. In particular, there are huge limitations in the use of NEXRAD radar as previously mentioned as well as problematic comparisons presented by WEST based on Central and Eastern Lake Erie assumptions. None of these studies support low risk to birds, in fact, the FWS advanced radar studies refute WEST and have been used by the FWS to suggest that no turbines should be placed in the Great Lakes or within 5-10 miles of the shorelines.

Page 3-31 Section 3.4.1.3 Project Area Studies – Graphs - WEST has taken these graphs out of context for a visual misrepresentation favorable to the developer. The original ODNR study had different objectives. These graphs are thus inappropriate for the purpose expressed in this EA (i.e., to assess the risk to migrating or resident birds) in the following ways:

- The title says “Total bird observations”. In fact these graphs represent only diurnal observations. Most migrant songbirds are moving at night.

- Timing of surveys are ignored which fails to include behavior and then timing of various species’ migratory movements.

-The surveys were conducted entirely during good weather, but bad weather is known to increase risk, as flight height is variable under conditions of heavy rain, high winds, fog and low cloud cover.

- The visual presentation uses scale to downplay large numbers of birds occurring farther from the shoreline. This EA should not be concerned with bird numbers away from the study area as this EA is not a “lesser of two evils” document.

- Large variability in the two years, which support more years of data to get at averages, if that is the parameter that is to be used to assess risk.

- Mean numbers should not be used to assess risk; high counts and/or median parameters with ranges would be more realistic for evaluation of risk.

- Graphs lump all species. This should be provided at species level for risk of various species to ensure that a few highly abundant species do not cloud the analysis for species of high conservation concern (e.g. the endangered Kirtland’s Warbler). This is possible using marked animals and Motus towers and/or acoustic surveys.

- Results include all data including those from the Western Basin which is different in bird behavior attributes from the Central Basin.

- Study includes transects of various lengths, biasing the data towards areas closer to shorelines.

- Measures of density should use number of birds per mile of transect, not total birds by distance.

Page 3-32 Section 3.4.1.3 Project Area Studies – Waterfowl and Waterbirds - Based on the ODNR surveys, the EA states that only six bird species occur in the vicinity of the proposed project (see EA for list). This is a gross misrepresentation of ODNR scientific data. The ODNR study was not designed to look at species diversity at all times of the day, night and year. The best that can be stated would be “diurnal activity of large waterfowl and waterbirds indicated (those six) species were the only ones consistently reported during the study period.” The results of that study cannot be generalized to include the nocturnal movements of any bird or bat species, including those six species, and was not designed to detect any other bird or bat groups. While, we commend the EA for acknowledging that they extrapolated the ODNR data to try to fit the project area, there was no attempt to conduct and analyze surveys in the area during the time period particular species are expected in Lake Erie. As a result, the EA grossly underestimates the potential risk to birds by:

- Condensing the entire survey results instead of considering occurrence of various species in the region.

- Making assumptions on species risk without any nocturnal data, or data collected during varied weather conditions.

- Not accounting for detectability or variability of detecting and counting individuals of various species using visual sampling methods with transects.

- Making assumptions about the presence or absence of species risk with limited spring and fall data and no winter data.

- Making no reference to the number of Common Loon, Horned Grebe, and Bonaparte's Gull per mile being actually higher in the project area. Common Loon in particular is a species of elevated concern.

- Making no mention of the potential of turbines attracting birds during the winter or the potential of the turbines creating ice leads that could attract birds, such as waterfowl and waterbirds.

Page 3-32 Section 3.4.1.3 Project Area Studies – Bats - The EA suggests that the project will be of low risk to bats. First, all conclusions are based on Tetra Tech surveys (Appendix K) that are of highly suspect sample design and field compliance. A more complete review of these deficiencies is included in Appendix K. Second, the EA does not account for call rate variation of bats in a simple environment compared to one that is more complex. It is believed bats call less frequently when few structures are present such as over water, than when in a variable environment with trees and buildings. The Tetra Tech study thus fails to meet scientific merit or rigor to make any assumptions about the risk to bat populations as required by the EA. Detector nights and bats per night are reported in error in the EA as all four offshore detectors are located in one location, which means they essentially represented only one location versus four locations onshore. This brings into question the statement in the EA that bats of state concern were recorded more than twice as often onshore as offshore when, in fact, just the opposite might be true. Recent yet to be published studies using Motus towers and marked individuals by Bird Studies Canada indicate large numbers of migratory bats crossing the Great Lakes (Mackenzie, pers. comm.).

A variety of factors invalidate the EA's conclusion of low risk to bats including the following:

- Only one year of data from Tetra Tech was collected. This is inadequate in any study of scientific merit.

- Downplays the fact that the same species were recorded offshore as onshore.

- Ignores the dependency of the four detectors all being in the same location. This resulted in one quarter of the potential land mass being sampled.

-Concludes more migration onshore and little offshore, but the data do not support that conclusion.

-Concludes the study area is not an important migration corridor, even when more calls were recorded offshore for migratory bats when dependency is applied.

- Concludes 10 times more onshore activity, but includes migratory and resident periods. This is not a valid comparison for risk.

- Concludes that with the crib closer to shore that even fewer bats would occur in the study area. There are no data supplied by the EA to support this conclusion. Recent unpublished data from Motus towers conducted by Bird Studies Canada (Taylor et al. 2017, Mackenzie, pers. comm.) indicates considerable movement of migratory bats across Lake Erie.

Page 3-33 Section 3.4.1.4 Insects – Monarch - The EA does not make a conclusion on risk to migrating monarch butterflies. This needs to be addressed.

Page 3-34 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - Federal listed or protected species - The EA states that there are no candidate or proposed listed species in the project area. This is an incorrect statement. For example, the Golden-winged Warbler is under review for listing at this time. In addition, recent studies have shown that the endangered Kirtland's Warbler is known to cross Lake Erie during its migration to the boreal forests of Michigan to breed, then again to return to the Bahamas (Cooper et al. 2017). Migrating Kirtland's Warblers have been seen along the shorelines of Lake Erie (Petrucha et al. 2013). This must be addressed in an EIS.

Page 3-35 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - Indiana Bat – The EA has concluded that the Indiana Bat is unlikely to be in the project area. This is based on Tetra Tech studies, the shortcomings of which have been discussed above and in the review of Appendix K. With the inability to distinguish calls from other *Myotis* species and the extremely inept Tetra Tech studies relied on in this EA, it is irresponsible to conclude low risk as this EA does.

Page 3-37 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - Kirtland's Warbler – The EA used extremely dated information on bird migratory movements. This has resulted in an inadequate picture of potential risk to this species. The EA totally ignores new information on Kirtland's Warbler in the project area and bases its support of low risk on a newspaper article (McCarty 2012). This is scientifically unacceptable. New information (Cooper et al. 2017), Indicates that a substantial portion of the population passes through the Central Basin during fall migration. Being a federally listed species, its likely presence should automatically trigger an EIS for this project.

Page 3-38 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - Piping Plover – The EA has failed to demonstrate support of low risk for this species. The boat survey is not an appropriate sample design to indicate risk to any species, let alone an endangered species. Inadequacies of that study are covered in Appendix K. No support for the acoustic monitoring is given on call rates and detectability to indicate the survey method has any bearing on risk assessment. While sightings are rare, they are annual along Lake Erie from the Western Basin to Conneaut.

Page 3-38 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - Rufa Red Knot – The EA provides as support for low risk the Tetra Tech studies that are of inadequate sample design. They cannot be used in any manner to assess species risk. As a result, the EA fails to address this federally protected species.

Page 3-39 Section 3.4.1.5 Aquatic and Terrestrial Protected Species - State Listed Species – The EA provides no data concerning this list of species. A vast number of migratory birds, many of conservation concern, as well as several of the migratory bat species, can be expected to pass through the project area. To simply state that the database does not include any records in the project area only indicates that no data has been collected or study completed in the area.

Absence of data does not indicate absence of species. LEEDCo studies (Appendix K) have been shown to be inadequate to make any risk statements for any of these species.

Page 3-48 Section 3.4.2.3 Birds and Bats – The scientific failings of WEST (Appendix L) are covered in detail in our review. This review will document failings in evaluation of risk levels to both birds and bats, post-construction monitoring, and identification of ecological resources. The EA does not provide scientifically supported evidence of low risk to bird and bat resources. A full EIS will, therefore, be required for this project. Since many of the same text is utilized in this EA for both Construction and Operation and Maintenance under this section, comments are consolidated below sub-headings.

Page 3-48 Section 3.4.2.3 Birds and Bats – Displacement Effects – The EA makes assumptions that are not supported by the science, ignores bird life cycles, and fails to address nocturnal movements and daily bird activities. Points of failure in this EA include:

- There is no discussion of daily feeding activities of identified species that could be substantially adversely affected by this project. This concern is supported by cautionary statements in Masden (2009) and discussed in our review of Appendix L.

- Makes assumptions of effects being negligible based on ODNR's seasonal aerial survey, which includes no data for the winter period.

- Fails to adequately review the ODNR study for actual risk by using all surveys instead of relevant surveys during migration.

- Makes assumptions off of LEEDCo baseline data that has been discarded as unscientific by state and federal wildlife agencies and by our review of Appendix K.

Page 3-49 Section 3.4.2.3 Birds and Bats – Behavioral Avoidance – The EA makes multiple unsubstantiated assumptions to support low risk to birds and bats. There were no supportive data from the project area included in the EA. The failings of Appendix L are covered in detail in attached documents. The EA makes unsupported assumptions of European studies, extrapolating beyond the scope of the original studies.

Specific failings include:

- The EA (from Appendix L) states avoidance behavior would be negligible. WEST extrapolated from Masden (2009), without any scientific support. The species are different between Denmark and Lake Erie. Masden calculated the entire migratory path whereas WEST made no attempt to complete the same analysis for Lake Erie species. Therefore, to assume negligible avoidance is not supported.

- Madsen made strong statements that if feeding flights were involved with the migratory species it would entirely change the conclusions of their manuscript. For Lake Erie species, foraging flights are strongly involved and must be incorporated in studies to ascertain their importance before making any risk assessment.

- Repeating the assumption that migration across the Lake is lower than on land. That assumption has already been addressed. It is not supported as presented by the EA.

- The EA does provide scientific support for the red-flashing light system proposed for the turbines in reducing attraction for nocturnal migrants. In addition, there is no discussion of attraction to the platform lights used on the turbine bases. Associated lighting has been documented to result in large mortality events at wind facilities and offshore oil drilling platforms. This needs to be addressed in the EA.

- There is no mention of ice leads forming around turbine bases during winter. The resulting open water could attract birds, increasing collision risk for waterfowl, waterbirds, and Bald Eagles. This needs to be addressed in the environmental review process.

Page 3-50 Section 3.4.2.3 Birds and Bats – Collision Effects – The EA bases its conclusions of low risk and minor impacts primarily off of Appendix L. The fallacies of that document have been discussed multiple times in this review and in more depth in our review of that document. Technically the EA provides no information of scientific merit to support its conclusions. The statement that the proposed project is not likely to generate population-level effects for any species ignores a key principle of the Migratory Bird Treaty Act (MBTA). The MBTA does not require population level effects to be enforced. The DOE has made it clear that LEEDCo must meet the legal requirements of the MBTA. The loss of even one listed bird under MBTA is illegal and could result in prosecution or fines. That negates even mentioning population-level effects in this document. The EA fails to provide scientific support for the conclusion of low impact and therefore an EIS, not a cursory EA, is necessary.

Page 3-50 Section 3.4.2.3 Birds and Bats – Collision Effects – Raptors and Eagles – Study design used in this EA is not appropriate to draw any conclusions on risk to eagles and other raptors. Short comings of Appendices K and L are attached in our review of these documents. The EA provides no documentation to support its conclusion that it would be unlikely the turbine sites would provide an ice free environment. The EA does not even discuss flights of Bald Eagle or Peregrine Falcon between Ohio and Ontario. Casual observations have documented eagle crossings and Peregrines have been observed hunting in the area and on the crib in the interior of Lake Erie. It also failed to mention that soaring, migrating raptors have been attracted to offshore wind turbines in Europe, thus increasing risk (Skov et al. 2016). The EA fails to supply the scientific rigor or merit to conclude low risk for these species.

Page 3-51 Section 3.4.2.3 Birds and Bats – Collision Effects – Songbirds – paragraph 1 – Appendix L is discussed in more detail in our attached review of this document. We agree with the EA conclusion that most collisions with man-made structures take place at night and generally in inclement weather. However, this EA has not supplied any documentation of bird use of the study area in inclement weather. Radar studies of LEEDCo were confined to “clear air” conditions and are therefore irrelevant to any discussion of risk to migrating birds. Recent advanced radar studies by the FWS around the Great Lakes all conclude high risk to migrating nocturnal songbirds from turbine development in the region. The EA mentions lighting plans but does not discuss the platform lighting that could attract birds to the turbine site.

Page 3-51 Section 3.4.2.3 Birds and Bats – Collision Effects – Songbirds – paragraph 2 – The EA has misrepresented the findings of the Diehl manuscript. That paper does not indicate twice as many birds over land as over water, in fact it indicates no difference. In personal communication, Dr. Diehl indicated his study and NEXRAD in general cannot support or refute risk to migrating birds. It is simply the wrong radar type for this question scientifically. Both the Diehl study and the 2017 WEST analysis fail to provide project area-specific data to form any conclusions on bird or bat risk. The proposed project area is at the boundary or actually beyond the affective distance for the NEXRAD radars used in the EA. In fact, both the Diehl study and those of the FWS indicate a dawn assent phenomenon that likely support the hypothesis that birds are crossing Lake Erie below the radar beam (especially NEXRAD) and are rising up into the beam sweep near shore. This means that actual bird risk is likely greater than that indicated by the EA. The NEXRAD radar studies do support vast bird numbers in the region, but do not support the EA statement that birds avoid flying across the lake. All studies support the concept that songbirds are reluctant to cross the Lake, especially if they are in poor condition. Regardless of condition, birds stop at the lakeshore to feed and get ready for the remainder of their flight. Birds that have the energy to cross the Lake are at an advantage, since they will be the first to the breeding grounds and have their pick of courtship and nesting sites.

Page 3-51 Section 3.4.2.3 Birds and Bats – Collision Effects – Songbirds – paragraph 3 – The EA makes several assumptions in Appendix L that are not supported by data or scientific rigor. A more in-depth review of Appendix L is included in our review of this document. However, the following weaknesses are clear:

- There are ongoing independent reviews of projected mortality rates that indicate consultants are greatly biasing their pre-construction estimates of actual mortality downward. The fact that there is a very weak correlation between pre-construction risk studies and post-construction mortality for both birds and bats provides evidence for this conclusion (Ferrer et al, 2011; Lintott, 2016). There are a series of data manipulations that have been identified that will result in a more realistic mortality estimates once correct and honest analyses are completed on the data sets (Johnson et al. 2016).

- Assumptions in Appendix L ignore that the volume of birds at risk in the project area is much greater than land sites that were used in their analyses.

- Use of the estimate of 2.1 to 3.35 birds per MW per year is under review and will most likely be raised substantially following analysis. Please consider that the vast majority of previous data on bird mortality at wind energy sites have been collected by paid consultants to the industry—a direct conflict of interest (Johnson et al. 2016).

- The EA comes up with an estimate of 21 to 42 total bird fatalities per year for the proposed project. Using the present figure of 2.1 to 3.35 birds per MW per year and multiplying that times 21 MW for the project it seems the numbers would be much greater (44 to 70).

Page 3-51 Section 3.4.2.3 Birds and Bats – Collision Effects – Songbirds – paragraph 4 – Data presented in this EA and the supporting document in Appendix L does not support the EA's conclusions.

- Data do not support a complete “preference” to migrate along the shoreline, but does ignore that large numbers of birds do cross the lake.

- While a lighting program for the turbines has been adopted to reduce attractiveness, the EA fails to address the potential of attracting nocturnal migrants by lighting the platforms. Major mortality events have been associated with this type of lighting, and even the supporting documents indicate a concern that lighting of the crib may attract birds and bats, hence “influencing” the observed bird and bat records of pre-construction LEEDCo studies. It is difficult to support any position while trying to have it both ways.

- This is touted as a demonstration project for the feasibility of a major build out by LEEDCo. The DOE, and Fred Olsen must consider the cumulative impacts of any future development and by other developments proposed around the Great Lakes in both the U.S. and Canada. Consideration of the cumulative impacts is another reason for a full blown EIS.

- The EA does not address the issue that flight altitude of migratory birds and bats across open water may be lower than thought and place a greater risk of those species being within the rotor swept zone of large wind turbines. This is likely especially true during bad weather, such as heavy rain, strong winds, fog or low cloud cover and must be addressed in the EIS.

The above points support a failure of the EA to demonstrate low bird risk and that a more detailed EIS, rather than a cursory EA, must be conducted to address MBTA, BGEPA, and ESA concerns.

Page 3-51 Section 3.4.2.3 Birds and Bats – Collision Effects – Waterfowl and Water Birds – Short falls of Appendix L are covered in detail in our review of that document. The relationship of bird numbers by distance from shore is irrelevant. This EA should address only the risk to birds in the project area or any potential areas to be developed in the future.

- In actuality several important species (e.g. waterbirds) are more abundant in the proposed project area than near shore.

- The EA does not discuss the risk to foraging and flying flocks of waterfowl by the project. This must be completed as a primary species is the Red-breasted Merganser of which over half the world’s population occurs in the Central Basin of Lake Erie at one time. This was one factor leading to the designation of the area, including the project area, as a Globally Important Bird Area. This alone should trigger the need for an EIS.

- The EA does not discuss nocturnal movements of waterfowl while staging in Lake Erie. This must be discussed. Studies from Lake St. Clair and western Lake Erie indicate considerable movement for foraging, resulting in large concentrations of birds at night (Shirkey 2012).

- The EA does not discuss the altitude of waterfowl during foraging and movement flights either diurnally or nocturnally.

- The EA does not discuss waterfowl and waterbird activity during the winter time frame when large numbers of birds may be present.

- The EA does not provide scientific support for low risk during winter when ice leads may be created by the turbines, a potential attractant to some types of birds.

- Appendix L fails to provide the scientific rigor needed to support any risk assessment made by this EA. Therefore an EIS needs to be conducted.

Page 3-52 Section 3.4.2.3 Birds and Bats – Collision Effects – Bats – The EA has formed a number of conclusions based on false assumptions or made definitive statements where little or nothing is known. The failures of Appendix L are covered in the separate review attached, but the following weaknesses are evident:

- Assumptions made in Appendix L utilized extremely biased and inadequate studies done by LEEDCo's, paid consultants, a direct conflict of interest.

- Correction of those errors would alter WEST's analysis and push risk estimates upwards, possibly by magnitudes.

- As explained in our Appendix L review, WEST made invalid assumptions to assign mortality estimates per MW to attain the 21-83 total fatalities when accounting for studies that supplied both pre-construction acoustics and mortality data.

- Under WEST's "worse case" scenario of 20-30 bats taken per MW per year, this would translate into 400-630 bats a year with only 6 turbines. This would be greater than almost all other facilities made up of 50+ turbines.

- To make the assumption that this would only raise mortality to moderate risk is a biased and unsupported statement at best.

- From data presented in this EA, there is no support for the conclusion that impacts would be minor. An EIS must therefore be conducted.

Page 3-54-55 Section 3.4.2.5 Aquatic and Terrestrial Protected Species – Collision Effects – Kirtland's Warbler – The EA uses very dated information on presence of the Kirtland's Warbler in the project area. It does not refer to data after 2004, but does refer to a resource that was a newspaper article rather than scientific literature. Major changes in our scientific knowledge have occurred since then. The EA also does not include recent telemetry data for the species that supports the project area as a primary migration pathway.

- The FWS model needs to be updated with the new telemetry data. It is extremely dated and irrelevant until new scientific literature is incorporated into the model.

- The FWS advanced radar studies (Bowden et al. 2015; Horton et al., 2016; Rathbun et al. 2016; Rathbun et al. 2017) do not reinforce the assumption that birds avoid crossing large bodies of water. They support the observation that birds stop prior to crossing to feed and rest, not that they do not cross.

- The altitude songbirds fly across open water is not documented. Inclement weather is also thought to play a major role in flight altitude. Kerlinger and Guarnaccia (2013) do not incorporate

open water scenarios nor do they address biases in reported radar altitude estimates. The recent FWS advanced radar studies have invalidated Kerlinger's and Guaranaccia's statements and indicate that the radar estimates for altitude need to be adjusted for air column bias with height. This alone can make major changes in risk assessments.

- The EA purports no population level effects, which again, is irrelevant under the MBTA.

The EA fails to provide scientific valid arguments to support low risk for the Kirtland's Warbler. Neither the MBTA or ESA are based on population-level effect. With the new telemetry data now available and the observed migration route an EIS is required. . As a highly endangered species, the loss of even small numbers of these birds could have a population-level effect.

Page 4-2 Section 4.1.2 Offshore Projects – The EA indicates there are no known or reasonably foreseeable offshore wind projects in Lake Erie. This is a patently false statement with the purpose to mislead readers. Icebreaker has been touted as a demonstration project designed to determine the feasibility of additional wind projects in or around Lake Erie. Fred Olsen (the applicant) has publicly announced plans for several thousand turbines in Lake Erie. Ontario has suspended the building of several thousand turbines in Lake Erie depending on the outcome of Icebreaker. The long-term impacts of all these projects on Lake Erie and the Great Lakes in general could be devastating. Yet, the future of wind energy development in the Great Lakes is not addressed in the EA. This omission alone should alter the conclusion of no major impacts and must be corrected through the completion of an EIS. These known anticipated projects could have major impacts on our native migratory birds and bats, resources that are worth billions of dollars to the U.S. economy through their ecological services, including pest control, pollination and dispersal (Sekerciglu et al., 2016). North America's native birds are already in serious trouble and, with wind energy development, we are adding yet another anthropogenic cause of mortality. The 2016 State of the Birds report indicated that fully one-third of all our native birds will need concerted conservation action in order to ensure their future (North American Bird Conservation initiative, 2016). Our nation's ecologically and economically valuable birds and bats should not be collateral damage in our efforts to address climate change. When it comes to wind energy siting is everything, and it must be kept away from large concentrations of birds or bats in order for it to be considered truly "green." This project and others like it in or around the ecologically sensitive Great Lakes are drawing international criticism from conservationists (Minor 2016, Hutchins 2017).

Page 4-2 Section 4.2 Cumulative Impacts – Biological Resources – Birds and Bats – The EA failed to recognize the identified and anticipated offshore projects in Ohio and Ontario and throughout the Great Lakes and therefore, for the reasons explained in the above section, has violated the NEPA review process, which requires consideration of cumulative impacts. An EIS is therefore required before further consideration. Failure to do so could result in legal challenges to the project, thus resulting in cancellation, further delaying its development by many years.

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APPENDIX J REVIEW

Black Swamp Bird Observatory (BSBO) and American Bird Conservancy (ABC) submit the following review of the NEXRAD Analysis by WEST – Appendix J of the Draft *Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio* report prepared by U.S. Department of Energy (DOE); U.S. Coast Guard; U.S. Army Corps of Engineers (ACE).

This review focuses exclusively on the areas of expertise of the author organizations. Therefore, comments are primarily associated with risk to birds and bats.

Page 4 - Methods – NEXRAD and Radar Sample Areas - There are many concerns that create considerable uncertainty as to what the NEXRAD results may actually imply. These include:

- The Project Area is at the very fringe or beyond the usefulness of NEXRAD radar for answering the question being posed.

- Dr. Diehl, whose paper is heavily referred to here, indicated in personal communication that this radar type is not useful for determining risk to birds at wind facilities. The FWS Advanced Radar Team had similar comments. The long distance between shore and the project area greatly reduces targeting capabilities. Furthermore, there are physical structures in the way that compromised the radar beam between its source and the project area.

- There is virtually no overlap between NEXRAD radar beam height and the rotor swept risk zone of the proposed turbines. NEXRAD measurements are simply too high to draw meaningful conclusions about risk from this study.

- The differences of the relative altitude from land polygons and lake polygons are of more consequence than related here as the Cleveland NEXRAD radar is well above lake level in relation to surrounding land masses.

- NEXRAD cannot determine target heights with accuracy needed to assess risk, especially since there is almost no overlap between the rotor-swept area of the turbines (risk zone) and radar beam.

- There are more variables in bird activity and height than just distance from the radar. This includes behavior, atmospheric conditions, wind direction and timing just to mention a few. These need to be investigated and eliminated from consideration prior to drawing conclusions.

- WEST has included the Buffalo site to simulate a paired test with the Cleveland radar. However, the Buffalo radar polygons deviate considerably from the project area polygon, including orientation to migration and distance from shore.

Page 6 - Methods – Data Selection – WEST only collected and analyzed data during clear, mild weather ("Clear air"). The title of this study should therefore be changed to: "NEXRAD Clear Air Bird Migration Analysis." It is in no way a complete and realistic estimation of bird migration throughout the project area. While precipitation is a major drawback to radar monitoring of bird and bat migration, this decision essentially eliminated times of peak migration, thus greatly biasing the results. Not only are peak migration movements associated with low pressure systems, the height of such movements are governed by atmospheric and weather conditions. This study has ignored key periods in the project area, thus making it useless for determining annual risks to birds and bats from wind turbine operation.

The study also only used data from 30 minutes after sunset to 30 minutes before sunrise. Why was this decided? This could affect results on volume, orientation to, and distance from land.

Page 11-14 - Results – Migration Direction – Migration direction showed tremendous variability, so much so, that firm conclusions could not be drawn. It would have been helpful and possibly very enlightening if WEST had included wind direction as a co-variable and/or broke the data analysis down into time periods related to distance from lift off points.

Page 14 - Results – Migration Intensity – Migration intensity is the most important variable that WEST uses to support their conclusions. They concluded that volume is much lower over the project area than over any of the other sample polygons, thus implying low risk. However, there are a host of explanations for these findings that actually support the exact opposite of WEST's conclusions. The following explanation summarizes scenarios that WEST (or the EA) failed to address before drawing their potentially erroneous conclusions. If nothing else, these add to the uncertainty.

- In all cases reflectivity was greater at the 0.5 degree band than in the 1.5 degree band. This supports Diehl's contention that NEXRAD at this distance is inadequate to address migration intensity.

- Data suggest that a much greater migration volume is occurring below NEXRAD, which supports the dawn ascent phenomenon reported by Diehl and others. In this scenario, birds rise to higher altitudes initially as they near coastlines. This would have the effect of overestimating numbers of birds and bats in the shore polygons compared to those in the project area.

- Birds flying through the water polygons are in actuality much higher than the polygons over land. The land masses and radar units are well above water level at the similar distance.

- The seasonal variation of any dataset that occurs among years, stations, or seasons should not be lumped together for averaging without first testing for differences. The importance of time of night differences was not analyzed in this study and could have considerable effect on the different polygons.

- Migration intensity is greatly affected by weather and It must be kept in context that this is “clear air” only analysis, not a comprehensive migration analysis.

Page 23 – Discussion – Caveats – We question the first assumption made by WEST. Lake effect weather patterns are common along Lake Erie. The same may be true for Lake Ontario. So to assume the wind speed and direction is uniform over a large scale is likely invalid. Consequently, this should be tested. There are a considerable number of NOAA weather stations in the region to allow for that analysis.

Other limitations offered by WEST are not trivial in their importance. For example, the inability to distinguish individual targets precludes conclusions on density or intensity. The failure to cover the entire air column jeopardizes all conclusions drawn from NEXRAD-based radar studies. As pointed out by Diehl (pers. comm.) and the FWS Advanced Radar Team, it is an inappropriate radar type to address the questions posed by LEEDCo and its consultants. The use of side-cast marine radar would get at the concerns raised and provide useful information about risks. Four recent studies conducted by the FWS using this radar type have all concluded that over the waters of the Great Lakes and within at least five miles of the shoreline would be particularly bad sites for wind turbine development due to the substantial risks to both birds and bats.

Page 23-25 – Discussion – Summary and Conclusions – Data from this study do not support the conclusion that collision risk is lower at the project area. While the study indicates higher bird numbers on the shoreline or inland, there are no data available from altitudes within the rotor swept area (risk zone) of the proposed wind turbines during peak migration, during the winter, or in all weather conditions. Open water could support as many birds of some types as the shoreline but they are below the radar beam of this study, and thus unlikely to be detected. Diehl (2003) actually reported no significant difference in bird activity onshore versus offshore near Cleveland as well as Buffalo. This was most likely due to small sample size, but should not be reported here as support for the consultant’s conclusions.

APPENDIX K REVIEW

Black Swamp Bird Observatory (BSBO) and American Bird Conservancy (ABC) submit the following review of the Tetra Tech Bird Survey Report – Appendix K of the Draft *Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio* report prepared by U.S. Department of Energy (DOE); U.S. Coast Guard; and U.S. Army Corps of Engineers (ACE).

Text in blue indicates passages taken directly from the above-named paper, unless otherwise indicated. This review covers the area of expertise demonstrated by the author organizations. Therefore, comments are primarily associated with risk to birds and bats.

Page i - Executive Summary – States the goal of the EA was to document species composition, overall occurrence patterns, phenology, and flight behavior of birds and bats within the study area. This review is a critical attempt to assess the EA's success of meeting any of those goals and the relevance of such findings in determining actual risk to birds and bats. This survey was conducted for only one year, a violation of sound scientific principles as it does not take into account annual variations in weather or other natural phenomena

Page i - Executive Summary – Radar Survey – The surveys were conducted during "clean air", a reference to calm water and favorable weather conditions. The results are therefore not representative of overall bird and bat occurrence patterns, phenology, or flight behavior. The study's limited sample size thus fails to assess risk under all expected annual conditions and does not meet sound scientific practices.

Indicates that data were recorded 67.5% of available time; however the 642.9 hours of data represents only 22% of the study period's available time.

Page i-ii - Executive Summary – Boat Survey and radar Validation – The boat survey was comprised of only 10 surveys during one year. As a result, actual sample size was no greater than 6 in a given season (6 in fall, 4 in spring). This survey thus fails to meet sound scientific rigor and merit for advancing any conclusions made as a result.

The survey did not identify bird species (especially at night in a moving vessel), so could not determine relative abundance, distribution, or behavior. There is no correction for species differences in size, behavior, timing, visibility, or identification. Therefore, this study cannot be used to support any of its purported goals.

The only species recorded were large diurnal birds, such as gulls. If the sample size was greater in relation to migration patterns, it might have picked up a wider variety of species.

The survey design has inherit bias in flight height, occurrence and composition and provided no detectability analysis. The design is thus biased to result in beneficial findings for the developer.

Page iii-iv - Executive Summary – Avian Acoustic Survey – This survey actually was conducted for only part of one season, thus violating all criteria for scientific rigor. The very limited sample size is expected to have a huge impact on results, greatly underestimating the variety and abundance of birds and bats moving through the area.

There is no discussion of differences in flight call behavior onshore versus offshore over open water. Do birds the same call rate (e.g. call at the same frequency) under both circumstances? Any conclusions must take that potential bias into account.

Page iv - Executive Summary – Bat Acoustic Survey – There was a considerable problem in sample design. All offshore recorders essentially represented one location, rather than multiple locations. This provided one-fourth the coverage for estimation comparisons. Bats were recorded at all seasons and locations.

Page v - Executive Summary – Conclusions – In no way does this limited study design infer a comprehensive understanding of flight patterns over the study area during spring and fall migration. Only parts of a single migration-year were surveyed and the data covered only a select subset of all possible conditions confronted by migrating birds and bats.

Given the poor study design, we can only conclude that it was intentionally meant to support the pre-conceived conclusion of low species richness. Unfortunately, the study fails to meet sound scientific design principles on all levels and thus has not accurately measured species occurrence at the proposed project site.

Page 1 – 1.1 Introduction – Study Background and Purpose – State and federal wildlife agencies determined that the 2008 feasibility study failed to meet proper design to assess risk to birds and bats and required additional site specific data. The purpose of this study was to fulfill that request. It has failed miserably. As stated, this study was undertaken to document bird and bat species composition, density, flight height, flight direction, passage rates, activity levels, temporal distribution patterns, and correlations with climate. This review suggests that Tetra Tech failed on all counts due to poor study design, use of inappropriate technology and limited fieldwork.

Page 5 – 2.0 Radar Survey – A complete and critical review of the study design and analysis was provided to LEEDCo by the FWS Advanced Radar Team. It pointed out numerous errors in design, interpretation of results, and conclusions.

Page 7 – 2.1 Radar Survey – Methods – A critical design flaw is that the radar samples were only collected on clear nights. This could grossly underestimate bird activity, as migration is often associated with low pressure and storm events.

In the second paragraph, the authors cite both 11 and 13 days of useable data. Which is correct?

The study employed no horizontal radar offshore, which is required for collecting fight direction data.

Page 11 – 2.1.2 Radar Survey – Data Analysis – Orientation of radar during this study increased the risk of missing valid data and reducing the number of targets recorded (mentioned by FWS in their critical review). As previously mentioned, the FWS Advanced Radar Team reviewed the Tetra Tech study, found numerous errors and also questioned their results and conclusions.

Page 12 – 2.2.1 - Radar Survey – Results – Onshore Radar Data – Radar surveys were only recorded in less than 1 out of 5 available hours, bringing up sample size concerns. This is compounded by limiting the hours that were recorded to clear days and nights only. This eliminates the primary migration conditions and produces biased results. Thus the study covers only a subset of available conditions, does not address any of the report's stated goals and is therefore useless in evaluating potential risk to birds and bats.

Page 12 – 2.2.1 - Radar Survey – Results – Onshore Radar Data – Target passage rates – The study states that hourly passage rates were "variable" but fails to report any measure of variation (confidence interval, standard deviation, or standard error). These must be supplied to assess the usefulness of the study. Means – certainly by themselves - - are an improper metric to use. There is no evidence, for example, of differences that might exist between days, time of day or night, or seasons.

Discussion of flight height is irrelevant considering there are only data on clear nights. Height is greatly affected by weather, especially heavy rain and wind, fog and low cloud cover, and it is not addressed in Appendix K. The sampling strategy is thus suspect and makes it impossible to draw any valid conclusions.

Page 13 – 2.2.1 - Radar Survey – Results – Onshore Radar Data – Altitudinal Distribution of Targets – The FWS's Advanced Radar Team review raised several problems with the Tetra tech study and analysis, which invalidate its usefulness. First, the radar system used was biased towards detecting targets at higher altitudes. This is because the radar beam is cone-shaped, with a smaller portion of a cylinder covered by radar near the ground and a larger portion at the top. This data needs to be adjusted (through statistical corrections) or replicated using alternative technologies (such as those used by FWS in their Great Lakes studies) to allow valid measurements. Second, Tetra Tech miscalculated the height of the radar swept zone (RSZ) by incorrectly adjusting for crib height. Just these two errors alone would change the results and conclusions in ways favorable to the developers.

Page 17 – 2.2.2 - Radar Survey – Results – Offshore Radar Data – The study design, which measured only during parts of one year (spring/fall migration seasons) fails to meet scientific rigor. As stated above, the FWS Advanced Radar Team's review found considerable sample design and analysis problems with this study, questioning the results and their use for risk assessment.

Once again, there are no confidence intervals, or standard deviation supplied with the report to show the extent of variability in the data being presented. Nor were there any tests for statistical significance.

Page 17 – 2.2.2 - Radar Survey – Results – Offshore Radar Data – Target passage rates – All data need to be adjusted to account for the areas not covered by the radar beam at different heights. Results as presented are in error and do not support Tetra Tech's conclusions.

Page 28 – 2.3 - Discussion – Data from this study suggest there was a greater passage rate offshore than onshore, completely contrary to WEST's conclusions. Amazingly, considerable time was spent refuting their own findings. In the end, the study design failed to account for the differences. One possible scenario for this data was correct, but did not fit the needs of the developer, so was not considered.

Page 28 – 2.3 - Discussion – paragraph 4 – We challenge the assumptions presented in this paragraph. Though their explanations are possible, a host of others could explain the results. Due to poor study design other options cannot be eliminated. For example, it is expected that gulls would represent much of the diurnal activity; however, the boat surveys, as mentioned earlier, fail to support this conclusion. A lack of detectability analysis, with the expected differences in detection between 4 inch long birds and 24-inch birds, is highly problematic. Nocturnal observations of songbirds would be impossible with the study design used. This report fails to address or even mention these limitations. In addition, what supports the assumption that all bird species will be calling at equal rates onshore versus offshore over open water? This study failed to properly analyze the height of passage for birds by not correcting for beam cone errors. Even so, as the FWS team pointed out, this was the wrong type of radar to use to get at this question. Mean altitude is irrelevant for assessing risk, especially in the absence of standard deviations, a measure of variability. Methodology was also restricted to clear days and nights, therefore representing only a small subset of the annual weather conditions confronted by migrants. Inclement weather is more associated with migration and these conditions were not sampled. Including such data would most likely show greater passage rates, lower flight altitude, and represents a more accurate assessment of risk.

Page 28 – 2.3 - Discussion – paragraph 5 – It is suggested that Diehl (2003) and Geomarine (2008) studies support this report's findings. This incorrect assumption has already been covered in this review. NEXRAD radar is not capable of assessing flight height and the project area is at or beyond the effective distance for any NEXRAD radar to be useful. This conclusion was supported by Diehl in personal communications and also mentioned in the FWS review. The Tetra Tech report failed to account for beam cone to properly estimate passage rates at various altitudes, thus invalidating the conclusions.

Page 29 – 3.0 Boat based Survey - This survey design, as has already been explained, fails to provide data relevant to any of the stated goals:

- It consisted of extremely small sample size (10 boat trips) over two seasons (actual sample size of 4 and 6/season).

- There was no detectability analysis conducted to account for different bird size and its impacts on migrational timing, behavior, or in observer's ability to detect them.

- The study assumes accurate visual observation was possible at a distance much greater than science would predict, especially at night.

- The study used considerably different boat systems between seasons. This was not tested to see if this resulted in disturbance differences, thus possibly affecting visibility.

- Surveys were conducted only on days with low wind speed, high mean temperature, and calm water. This represents a minor fraction of expected migration conditions. No data were collected during other conditions, greatly biasing the results.

- Species identification would be expected to be difficult, if not impossible, especially in poor light.

- Spatial and temporal distribution would be affected by survey times and small sample size. Power to detect differences would be small.

- Using the techniques employed in this study, relative abundance analysis may only be possible for gull species where the probability of detection would be higher.

- This type of survey is not designed to account for bird behavior as described here. Sample size was small and surveys were not conducted during peak migration times for important species. Samples were only collected during good weather, thus greatly biasing the results.

This survey does not meet the criteria used to assess threatened or endangered species presence. It should therefore not even be included in the discussion.

Page 30 – 3.1 Boat based Survey – Methods – paragraph 2 – It was assumed that all species could be seen equally under all light conditions - an unreasonable assumption. There is no support for this and no detectability analysis was conducted. It is highly unlikely that small songbirds could be detected at a distance greater 50 meters from a moving boat with good visibility and light. This study is assuming accurate and complete observations were being made to greater than 350 m (300m out and 200m up). What is the sampling unit, a point or a transect? That was unclear. Any conclusions drawn from this dataset are therefore highly suspect and should be deleted from any risk assessment.

Page 30 – 3.2.1 – Results – Weather – How did the conditions of the surveys relate to the diversity of weather conditions occurring during the two seasons in which data were collected? The assessment should have included weather data for each season and an analysis to confirm or refute the assumption that the boat surveys represented a full range of seasonal conditions. Without this, it must be assumed that the sample design, collected only during clear and mild weather, does not represent an adequate sample of conditions faced by migrating birds and bats. Being a one year study also calls into question annual variability in weather conditions. At least three years of surveys should be conducted during a wide range of weather conditions to obtain an adequate sampling.

Page 30 – 3.2.2 – Results – Spring 2010 Observation Totals and Abundance – One year is not scientifically valid for making assumptions about bird and bat populations. A sample size of 4 transects does not provide the power to support or refute any assumptions. All surveys were conducted over 20 day period out of a nearly 100 day period. It is mentioned that there were considerable numbers of unidentified birds, which eliminates the ability to determine species composition.

Page 34 – 3.2.3 – Results – Spring 2010 Observation Temporal Distribution – Sample design of this study precludes any conclusions about temporal distribution of migrating birds and bats. Surveys only covered a 20 day period out of approximately 100 days of spring migration time. There were no surveys in March or April. This reduces the probability of detecting waterfowl as migration is over by May. Cormorants would be similarly affected by the mid-May survey time frame. This methodology is not designed to sample night-time migrant songbirds so is therefore immaterial for drawing any conclusions about this group, though it is probably the group of most conservation concern. Gulls would be the only bird group expected to be sampled sufficiently by this study design. If the survey personnel could not identify the majority of gulls, there is no reason to assume the single songbird was indeed a sparrow. The percentage of birds detected during the surveys had an extremely high proportion of "unidentified"; thus, any conclusions on species diversity are invalid. In fact, most migratory songbirds are traveling at night, when the visual surveys would have been ineffective.

Page 34 – 3.2.4 – Results – Spring 2010 Spatial Distribution – With the large number of unidentified birds, it is not appropriate to draw any conclusions on species composition. With the small sample size of 4 transects, it is questionable if any conclusions can be based on north versus south segments. This should have been examined for statistical significance using a two-sample t-test.

Page 34 – 3.2.4 – Results – Spring 2010 Spatial Distribution – paragraph 4 – While the unreliable nature of assigning heights and detectability has already been discussed, there is the question of all heights over water adding up to 92.5% of the observations. What were the other 7.5%?

Page 35 – 3.2.5 – Results – Fall 2010 Observation Totals and Abundance – Only six surveys were conducted from mid September to mid-October. The fall migration season occurs from at least mid-August to late December each year. So, only 6 days were sampled within a 135 day migration period. This sample size fails to represent the entire fall migratory season as well as only covering a small portion of a single year. At least three years should have been studied to obtain an adequate sample. The sample size of 6 is further divided between evening (4) and morning (2) surveys. No explanation was provided to support the authors lumping these together for analysis. The time frames surveyed covered almost no part of waterfowl migration, and therefore cannot be used to draw conclusions about that group. The same goes for songbirds, which are primarily nocturnal migrants. This survey method does not have the power to make any statements on the presence or absence of state- or federally endangered or threatened species, which makes it virtually useless for determining risks to protected wildlife.

Page 36 – 3.2.6– Results – Fall 2010 Observation Temporal Distribution – Valid results are not to be expected considering the poor sample design deployed. Composition would have been very different had the survey truly represented the entire fall migration season. Waterfowl would have just been beginning to arrive when the survey was completed. The Bonaparte's Gull, documented with its highest count on the last survey, would have been just arriving in the Central Basin. No conclusions on temporal distribution can be inferred from this study. It is therefore useless as a measure of risk to birds or bats.

Page 37 – 3.2.7 – Results – Fall 2010 Spatial Distribution – This study concludes that more birds were located further out in the open water of Lake Erie. This is contrary to assumptions made by WEST and the EA. However, there was no comparative analysis to determine if the differences were valid. Neither was there any analysis of evening versus morning surveys. In any case, the sample size is far too small and unrepresentative to draw general conclusions study-wide let alone in specific sub-divisions. While highly flawed, it should be pointed out that the location of Bonaparte's Gull observations is directly contrary to assumptions made by WEST and the EA.

As discussed under the spring season sample methodology, given a lack of detection analysis, evaluating the probability of detecting various species was impossible. So, any conclusions on flight height of various species is highly suspect and not defendable.

Page 38 – 3.2.8– Results – Spring and Fall 2010 Combined Temporal Distribution – As already noted, the study design precludes drawing any conclusions on temporal distribution. Sample timing eliminated all but large gulls as expected targets. The study design is not conducive to survey songbirds due to timing, visibility, and detection. The report states passerines were only recorded in the spring. This consisted of one record. Being nighttime migrants, this is not unexpected, especially since all samples were conducted during daylight and during good weather.

Page 38 – 3.2.9– Results – Spring and Fall 2010 Combined Spatial Distribution – As already stated, the study design precludes any conclusions on spatial distribution. Sample timing eliminated all but large gulls as expected targets. The study design is not conducive to survey passerines due to timing, visibility, and detection. The report states passerines were only recorded in the spring. This consisted of one record. Being nighttime migrants, this is not unexpected. Sample size is not adequate to allow for seasonal comparisons and should not be included in any risk assessment.

The report indicates problems with assessing flight height due to obvious concerns, but no effort was made to account for those variables. The report indicates an observation rate was calculated for each point. However, the graphs appear to be simply a tally of observations and not a calculated rate with mean and standard error.

Considering the poor study design, poor analysis, and a long list of unaccounted for variables, drawing any valid conclusions on spatial distribution from this report is impossible.

Page 41 – 3.3 Discussion - Many of the problems with this report have been covered in the individual sections. Beyond the detection of many large gulls in the study area, little can be concluded from this report.

The report draws conclusions about the origins of Herring and Ring-billed Gulls in the study area. These are inaccurate. Ring-billed Gulls that summer in the Lake Erie region have been shown (from band recoveries) to winter mostly in Florida. Winter gulls are from more northern breeding grounds. Band recoveries from Lake Erie-raised Ring-billed Gulls show a northward dispersal migration into late August, a true migration back into Lake Erie in September and October and exiting to the East Coast and arriving in Florida around December.

Page 44 – 4.1 Avian Acoustic Surveys – Methods – The report indicates the microphone for the acoustic system is capable to record up to 300m vertical and 250m horizontal; however, smaller migrants, such as warblers and kinglets cannot be heard at this distance. Many warblers are of conservation concern.

Page 45 – 4.2.1 Avian Acoustic Surveys – Results – Spring results – The study design did not allow for comparisons between onshore and offshore sites, which precludes very important distinctions for risk assessment. There is considerable disagreement or uncertainty on call rates among and between species as well as different environments. For example, what is known on call rate over open water for various species? Is there any support for them being the same as along a shoreline where large concentrations of birds may exist, as well as environmental features, such as brush and trees as they are over open water?

It is interesting to note in Table 4.2 that there were more warbler calls recorded onshore between April 7-12. This is a time when species diversity is extremely low in that taxon group. Were these all Yellow-rumped Warblers that may have a more consistent call rate? It is very strange that all calls were recorded in two short time frames. What information is available to ensure the equipment indeed functioned properly for 49 days?

Page 47 – 4.2.2 Avian Acoustic Surveys – Results – Fall results – The study relegated acoustic monitoring to part of one season during a single year. It is difficult to draw any conclusions based on such a limited sample size.

Page 47 – 4.3 Avian Acoustic Surveys – Discussion – While the discrepancy between onshore and offshore has some merit, differences could also be related to species composition and habitat effects on call rates. This report does not include specific identification for any birds. To provide just “warblers” does not allow for interpretation of collected data and raises concern over any conclusions made for composition or risk. Why were these identifications not included?

Page 49 – 5.1 Bat Acoustic Surveys – Methods – There were considerable sample design flaws in this study. For example, it was the intention to have 4 replicates of detectors onshore and 4 offshore. However, the design employed resulted in one replicate offshore. All analysis needed to account for this dependency and treat offshore as one site and onshore as four for

comparisons. For scientific rigor, at least three years of data should be collected and analyzed to account for annual variation.

Page 51 – 5.1.1 Bat Acoustic Surveys – Methods – Data Analysis – The analysis did not account for dependency of all four detectors offshore. Without this, all results were heavily biased towards detecting birds onshore versus offshore.

Page 51 – 5.2.1 Bat Acoustic Surveys – Results – Spring Results – Dependency of offshore detectors makes results and conclusions invalid as written.

Page 52 – 5.2.1 Bat Acoustic Surveys – Results – Spring Results – last paragraph – Utilizing the dependency correction, 15 times more calls occurring onshore than offshore drops to 4 times the number of calls. This would also change the Index of Activity measure dramatically. The results would still show a considerably higher call rate onshore even with these corrections. However, it is unknown whether call rates are similar onshore versus offshore. It is, for example, known that bats call more frequently in complex environments. The open water of Lake Erie is a very simple environment compared to the onshore environment, which is covered by trees and buildings.

Page 57 – 5.2.2 Bat Acoustic Surveys – Results – Summer/Fall Results – The same flaws as discussed in the spring analysis were present in fall analysis. Offshore detectors were dependent and need to be counted as one site, rather than four sites. When correcting for dependency, offshore detectors recorded 38% more Hoary and Eastern Red Bat call sequences than onshore detectors. This would completely change conclusions as derived by Tetra Tech for this report. Dependency analysis and detection probabilities should be completed to determine its effects on actual call sequences. The study assumes that call rates are similar over open water as compared to onshore. Age of bats cannot be accounted for in this method.

The comparison of onshore and offshore is confounded by combining summer data in this report. There should be a separation of the seasons to match behavioral changes and to accurately address risk.

Page 61 – 5.3 Bat Acoustic Surveys – Discussion – paragraph 1 - As discussed above, dependency of the offshore detectors calls into question the conclusion of nearly twice as many long-distance migratory bat species onshore. These data do not infer that migration occurs to lesser extent over Lake Erie, as discussed in our evaluation of the EA. The assumption that this is not a major migratory corridor is also not supported by the data.

Page 62 – 5.3 Bat Acoustic Surveys – Discussion – paragraph 3 - The report states that this method is not inherently well suited to identify risk to migratory bats from wind development. If so, why was this method chosen if not a sound method?

Page 62 – 5.3 Bat Acoustic Surveys – Discussion – paragraph 4 - The report acknowledges the dependency of the detectors on the crib but chooses to ignore the effect and concludes larger activity onshore. Instead, the authors try to explain the presence of bats over the lake. As mentioned in our review of the EA, there is now evidence that large numbers of migratory bats cross the lake.

Page 63 – 5.3 Bat Acoustic Surveys – Discussion – Conclusions are not valid with the dependency problems already identified. Data do not support the conclusion of greater bat activity onshore versus offshore during migration. The report acknowledges that there is bat activity even during the summer period.

The conclusion that no federally listed species were present in the study area is not supported by the data. It was reported that *Myotis* species could not be separated; therefore Indiana Bat could not be ruled out. Additionally, since the surveys could not identify species or did not study nighttime migration, the possibility of Kirtland's Warblers being in the study area cannot be ruled out, especially since recent studies have shown radio-marked birds traveling through this area, as mentioned in our review of the EA. The absence of data does not prove absence of species, especially when appropriate sampling did not occur.

Page 64 – 6.0 Conclusions – Due to a variety of poor sample design techniques, this report cannot be used to provide baseline data or to assess risk.

Page 64 – 6.0 Conclusions – paragraph 3 – Diehl's study increased our knowledge of bird activity along the lake shore. It does not support the idea that birds do not cross the lake, as these authors claim. The dawn ascent could explain the more true south migration in the fall and liftoff for migration northwards in spring. The Diehl data do not indicate greater migratory bird occurrence on land as suggested in this report. In fact, no significant difference was found by location due to small sample size.

Page 64 – 6.0 Conclusions – paragraph 4 – This report attributes bird occurrence to the lights on the crib. If this is of concern, then platform lighting of wind turbines would have these same attractions and be of considerable concern, as it might increase the probability of collisions.

Page 65 – 6.0 Conclusions – paragraph 2 – The sample design, including small sample size collected during limited portions of the year and/or migration season, and use of inappropriate technology (e.g. boat-surveys and NEXRAD), were pre-ordained to support the conclusions of Kerlinger and Guarnaccia, paid consultants to LEEDCo. As we point out in our review of the EA, there is a problem with scientific integrity when the people doing the research have a vested interest in its outcome.

Page 65 – 6.0 Conclusions – paragraph 3 – Use of Norris and Lott (2011) in this context is going beyond the scope of that work. For this purpose, species should be analyzed separately. When looking at the data on a species-by-species level, several important ones (Horned Grebe, Common Loon, and Bonaparte's Gull) all indicate as high or higher activity in the project area.

Page 65 – 6.0 Conclusions – paragraph 4 – The report discounts its own results/conclusions on acoustic studies due to poor sample design.

Page 65 – 6.0 Conclusions – paragraph 5 – The assumption that songbirds were migrating too high for detection on boat surveys is highly problematic. This ignores the fact that visual surveys would not have detected these smaller birds even at a fraction of the heights they indicated it

would. These data do not support the conclusions made in this report, especially since data were not collected during bad weather (e.g., in heavy rain and strong winds, fog, low clouds) that is known to affect flight height.

In conclusion, this poorly designed study cannot determine risk to birds or bats by the Icebreaker Project. We recommend that the entire study be redone using advanced radar units (such as those used by the FWS in their Great Lakes studies), Motus towers and radio-tagged individuals of various protected species known to be in the area, acoustic studies, new techniques using thermal tracking, and other techniques designed to assess real risk, not the cursory studies that have been conducted to date. Even more critical, these studies should be conducted by independent experts over a three year period under a wide variety of weather conditions.

References

Diehl, R.H., R.P. Larkin, and J.E. Black. 2003. Radar Observations of Bird Migration Over the Great Lakes. Auk 120: 278-290.

Geo-Marine, Inc. 2008. Analysis of WSR-88D Data to Assess Nocturnal Bird Migration Offshore of Cleveland, Ohio. Final Report. Prepared for Curry and Kerlinger, LLC by Geo-Marine, Inc.

Norris, J. and K. Lott. 2011. *Investigating Annual Variability in Pelagic Bird Distributions and Abundance in Ohio's Boundaries of Lake Erie*. Final Report for Funding Award #NA10NOS4190182 from the National Oceanic and Atmospheric Administration, US Department of Commerce, through the Ohio Coastal Management Program, Ohio Department of Natural Resources, Office of Coastal Management.

APPENDIX L REVIEW

Black Swamp Bird Observatory and American Bird Conservancy submit the following review of Appendix L: *Icebreaker Wind: Summary of Risks to Birds and Bats* prepared by Caleb Gordon and Wallace Erickson, consultants for WEST.

Text in blue indicates passages taken directly from the above-named paper, unless otherwise indicated. The first part of this review pertains to the Executive Summary. Comments may be repeated in the body of the text, or later expanded upon.

Page *i*; Para 1 - This conclusion stems largely from two principal observations: 1) the Project is small in scale, consisting of six turbines; 2) the level of use of this area by birds and bats is low compared to bird and bat use of terrestrial or nearshore environments.

We question both conclusions. This project cannot be viewed or reviewed in the limited context of just the 6 turbines in the initial phase. LEEDCo has repeatedly stated that this "experimental" project is just the first phase of what will ultimately be over 1,000 turbines in the lake. Risk analysis, therefore, must include a review of the full build-out. Second, the limited and biased data presented here do not support a finding of "low risk" to birds and bats from this project. This topic will be the primary focus of the comments throughout this review.

Page *i*; Para 2 - There's a misuse of statistics in this analysis. The authors calculated averages of all the surveys, which can be expected to bias the results. Some species were not present on all the surveys; therefore, data should be stratified to migration and/or wintering periods. This would increase the number and diversity of birds in the area at certain times of the year and thus estimate risk better than the mean for the whole project. This section also should include standard deviations, confidence intervals and p-values to indicate levels of trust in the data. The implied assumption that bird activity is "in transit or just passing through" is ultimately not supported for waterbirds and waterfowl by actual on-the-ground knowledge of the Central Basin of the Lake.

Page *i*; Para 2 - At such low densities, statistically significant displacement effects would not likely be detectable with a realistic survey effort. For the same reason, there is not a reasonable likelihood that any such effects could be biologically significant for any species.

This opinion is not supported by the limited data set and sampling strategy. It is the responsibility of the industry to base their conclusions on science and not to make highly speculative statements. LEEDCo's own surveys are embarrassing, and other cited studies are not being interpreted correctly or do not support their conclusions.

Page *i*; Para 3 - Although the passage rates of migrating birds through the Project area are expected to be lower than on land, along the shore of Lake Erie, or in nearshore waters

Data presented here do not support this conclusion. This is an opinion and not supported by the studies cited. They do admit the project has the potential to attract birds and bats and/or cause behavioral avoidance.

Page *i*; Para 3 - In such cases, the additional energy expenditure of this avoidance behavior is expected to be negligible, as has been demonstrated at offshore wind projects in Europe.

There is absolutely no basis for this over-reaching statement. Our local bird species and their metabolic profiles are different from those in the European study. We will further discuss this later in our review.

Page *ii*; Para 2 – Here the authors draw questionable conclusions from the literature, at the same time demonstrating a tendency towards downplaying collision risk. This is a common problem with non-independent, industry-paid consultants, which is pointed out in our review of the EA.

Page *ii*; Para 2 - The Project is not likely to generate population-level effects for any species. These conclusions are based primarily on the low use of offshore environments within the central Lake Erie basin by birds and bats, as well as the small size of the Project, and are also influenced by known patterns of taxon-specific collision susceptibility and species' geographic ranges.

This section raises several questions. First, the Migratory Bird Treaty Act (MBTA) is not based on "population-level effects." This is something the wind industry keeps trying to promote incorrectly. They ignore cumulative impacts of multiple developments in the region and the MBTA guidelines which make the take (killing) of even one individual bird illegal. As mentioned earlier their conclusion of "low use" is not supported by this study. Second, this consultant continues to try to present this project as a small demonstration project consisting of only 6 turbines, even as LEEDCo continues to talk about ultimately having over 1000 turbines in the Lake (Minor 2015). This was brought to the attention of C. Gordon at the open house, and he admitted this point. NEPA requires consideration of cumulative impacts in the assessment – another reason why a full blown EIS should be required for this project, rather than a cursory EA.

Page *ii*; Para 3 – Where is the assessment of raptor risk? Actual visual confirmation exists of eagles crossing the lake, not only in migration, but in common movement between Ontario and Ohio. In three of BSBO's last four pelagic boat trips (2015-2016) out of Cleveland, we have observed Bald Eagles coming from the north over the lake to the Ohio shore. It is well known that Bald Eagle, Osprey, and Peregrine Falcon readily cross Lake Erie. Sample design and

sample size of Tetra Tech's ground surveys were not adequate to make any statement on risk to raptors.

Page *ii*; Para 4 - For waterfowl and other waterbirds, baseline aerial survey data have shown that the spatial utilization pattern of such birds is largely restricted to the first three to six miles (five to 10 km) from shore in the central/southern Lake Erie basin, with minimal or negligible density of waterfowl and other waterbirds in the vicinity of the proposed Project area.

This is a misrepresentation and not what the aerial study actually says. This conclusion is taking the data beyond its design. For Horned Grebe, Common Loon, and Bonaparte's Gull, the concentrations were as great in the vicinity of the LEEDCo project as they were closer to land. The DOW study did not cover the winter period, so there are no data to support low risk for waterbirds during that time period.

Page *ii*; Para 4 – This section draws general conclusions that are, in actuality, unsupported opinions on potential collision risk. There are no data specifically related to this taxon group. We do not have adequate data on which to base a conclusion of "low risk."

Page *ii*; Para 4 - Additional insight into the potential for such effects can only be gained from post-construction observations.

This may be at least be partially true. However, by that time, the damage would have already been done. In addition, WEST has offered no methodology for collecting mortality or displacement data post-construction. There are no tested methods to accurately assess mortality over open water at offshore wind energy facilities (e.g., see Flowers et al., 2014), We are therefore curious to see what LEEDCo has in mind. Given the risks involved, the FWS and Ohio DNR must be satisfied in the developer's ability to collect such data with any degree of accuracy or independence. Otherwise the precautionary principle should kick in and the project cancelled. The fact that no adequate plan has been provided for consideration to date speaks volumes about the developer's inability to accomplish this task.

Page *iii*; Para 1 - The overall bat collision risk is low for Icebreaker Wind, nonetheless, because even if the Project results in fatality rates that are toward the upper end of the distribution of per megawatt bat fatality rates at regional land-based wind projects, the small size of the Project limits the total (facility-wide) bat fatality rate to one that would be moderate, at worst, in relation to land-based wind energy projects in the Great Lakes region.

With the present downward trend in bat populations (wind turbines are the second biggest killer of bats after White-nose Syndrome), to shrug off anything considered "moderate mortality" is irresponsible. To suggest that it's useless to gather additional baseline data ignores the potential for employing now available Motus towers which are already being used in the Great Lakes Region to track radio-tagged individuals (Taylor et al, 2016). Preliminary studies are documenting considerable movements of migratory bats over the Lake (Mackenzie, pers. comm.). This type of data should be required before any construction begins. Again, WEST has ignored the admitted intentions of LEEDCo to ultimately have over 1000 turbines in Lake Erie, and should review risks to bats within this larger context.

Page *iii*; Para 2 - Nocturnally migrating songbirds and similar birds may be exposed to collisions with Icebreaker Wind's turbines as they migrate across Lake Erie in spring and fall, though the terrestrial habitats of bird species in this category naturally restricts potential collision exposure to migratory flights.

To cite terrestrial habitats as a reason to assume low risk is inappropriate. The habitat used in migration and foraging movements is the air column. As we have pointed out in our review of the EA, both migratory songbirds and bats are crossing the Lake in large numbers and flight height can vary tremendously with weather conditions—conditions which have not been studied during any part of this limited assessment. Large numbers of waterbirds are using the Central Basin of the Lake at certain times of the year as well. Collisions with offshore structures in the North Sea are estimated to kill hundreds of thousands of birds annually (Hüppop et al. 2016).

Page *iii*; Para 2 - As a group, nocturnally migrating songbirds and similar birds exhibit low general susceptibility to collisions with wind turbines.

This conclusion is based on industry prepared reports that are hidden from public scrutiny. Do not trust that actual data supports this conclusion. For example, in one well-known case nearly 500 migrating songbirds were killed in one foggy night at the Laurel Mountain Wind Farm in West Virginia (Wald 2011). The birds actually collided with the buildings holding the battery and other infrastructure for the project. Events like this could easily occur during bad weather on the lake. Collisions with offshore structures in the North Sea are estimated to kill hundreds of thousands of birds annually (Hüppop et al. 2016). We do not consider that to be "low risk".

Page *iii*; Para 2 - NEXRAD radar data performed by an independent research team of government and academic scientists demonstrated that the density of songbird migration over the central Lake Erie basin was less than one half of what it was over terrestrial environments within the region.

This is not what the study said. We talked to the author and found that the table C. Gordon used was based on a single screenshot taken at midnight. In reality, there were 5 sample dates from spring and 13 from fall. Taking all this data into consideration, no statistical difference between land and water was actually indicated. More likely is that Gordon strategically chose a small sample size in order to support a pre-determined assumption.

Page *iii*; Para 2 - Recent studies employing marine radars in shoreline environments have demonstrated relatively high densities of nocturnal migrant birds along the shorelines of Lake Erie and Lake Ontario, reinforcing our understanding of the tendency of such migrants to concentrate along coastlines and avoid flying over large water bodies, such as Lake Erie, if possible.

Again, this is not the conclusion of the recent studies (especially the FWS study which is the most comprehensive to date). Rather, it's a total misrepresentation of the studies. All studies indicate a high volume of passage over the lake. As we have pointed out, the distance of the project from any NEXRAD radar unit has biased the data and resulted in questionable

conclusions. In reality, the FWS study, the Diehl NEXRAD study, the Buler study, and others all support the hypothesis of *dawn accent*, a phenomenon which gives the impression that birds are typically flying below the reach of radar, and only rise up into it as they approach the shore. This may indicate more risk at the distance of the project, not less.

Page *iii*; Para 2 - And also in light of the small size of the Project, we conclude that the collision risk for nocturnally migrating songbirds and similar birds is low.

Once again, this consultant is attempting to downplay the real truth behind the ultimate plans for this project. This study should take into account the cumulative impact of LEEDCo's future plan for over 1000 turbines in the Lake, as well as other projects planned for the region (e.g., on the Canadian side), not just the initial building of 6 "experimental" turbines in isolation.

Page *iii*; Para 2 – The consultants projected mortality figures are typically downplayed as they are in every pre-construction risk assessment we have encountered by paid consultants to the wind industry and as well-documented by Lintott et al., (2016) and Ferrer et al. (2011) for both birds and bats. In addition, the citations utilized indicate improper interpretation of third party studies for their purposes, totally inadequate and poorly designed LEEDCo data (C. Gordon admitted at open house that Tetra Tech data is very poor), and extremely suspect industry mortality data that repeatedly underestimates mortality. WEST continues to refer to only population-level impact as a concern, ignoring MBTA regulations, which make the take of even a single individual illegal. The same is true of the Endangered Species Act and Bald and Golden Eagle Protection Act, unless the developer has obtained an incidental take permit. Given the potential presence of eagles and endangered migratory songbirds in the project area, applications for such permits should be another prerequisite for approval.

Page 1 Para 1 – The original findings by Schuster et al. (2015) are not as strongly worded as this paragraph implies. Again, being terrestrial animals (which is not necessarily true for waterfowl and waterbirds) is not relevant; migratory birds utilize the air column, whether over water or land.

Page 1 Para 1 – Indicates a desire to build to learn for future development. Certainly we can learn by doing, but at what expense? We should not be killing large numbers of birds and bats simply to learn new information. In fact, if this project is a research project, rather than an energy production project, it would involve obtaining a totally different set of permits in order to kill protected wildlife. Unfortunately, this project is predicated on extremely poor pre-construction risk studies and has absolutely no plan for post-construction mortality studies. A viable plan for these studies is necessary before any construction should be allowed.

Page 1 Para 2 – GeoMarine conducted a NEXRAD review which has been discounted by many in the field. Svedlow is a Tetra Tech study which was extremely poor in design. Kerlinger's reports have been desktop studies of his own analysis and were reviewed very critically in the first EA. All of these studies were disputed as inadequate by science-based wildlife agencies and interested conservation organizations, such as BSBO and ABC. The reviewer does not know what Kerlinger (2016) may say as that article has not been available to review. WEST has

used only data collected by Tetra Tech and Kerlinger, supplemented with its own unverified opinions and interpretations of DOW's and Diehl's studies.

Page 2 Para 2 – In the case of Icebreaker Wind, there is minimal potential for displacement effects, as there is minimal to negligible utilization of the Project area by any bird or bat species for anything other than transit. This pattern was documented through an aerial baseline survey effort conducted over a two year period (2009-2010 and 2010-2011) by the Ohio Department of Natural Resources (ODNR) over a large portion of the south-central Lake Erie basin, including the Project area (Norris and Lott 2011).

There are two problems with using this study to conclude that there is low risk for displacement effects (avoidance of foraging, roosting, breeding, or wintering habitats). First, the DOW study did not include winter in its sample design. Second, it was not possible from the survey method used to assess bird activity (such as transit vs. stopover, roosting, or foraging). There were observations of foraging, but not enough to validate the assumptions made by WEST. In actuality, several species of special interest (Horned Grebe, Common Loon, and Bonaparte's Gull) had as high of concentrations in the project area as near shore. This was ignored by WEST, also suggesting that the consultant's interpretations were biased in favor of the developer.

Page 3 Para 1 – In order for Icebreaker Wind to have the potential to generate a displacement effect, the Project area must be utilized by wildlife species prior to the construction of the facility. Data from both years of the ODNR survey effort indicate that the abundance of birds was negligible (Year 1) or minimal (Year 2) at distances between eight and 10 miles from shore, corresponding to the zone in which the Project has been proposed (Figures 2 and 3).

Figures 2 & 3 are very misleading to the lay person, due to the scale used. Actually, thousands of birds were observed in the vicinity of the proposed project. However, the totals were dwarfed by large Merganser and large gull totals in the near-shore area. Thousands of birds are not "negligible" or "minimal" for the species of interest mentioned above. In addition, this study only assessed diurnal bird activity. Nothing is known about nocturnal activity of songbirds, waterbirds or waterfowl in this area throughout the year. Winter observations were not made in any of the cited studies, so it is unknown what WEST used to support its conclusions or if they were just stating an opinion.

The authors used the mean for the species of the entire dataset. Actual analysis should have used maximum values, or at the least the mean of surveys conducted during the time period of presence with their standard deviations. Using the mean of all data purposely lowers expectations of risk. This is flagrant misuse of statistics to downplay risk. They did not address winter or ice effects in this analysis. Ice leads could increase risk by providing open water near the turbines. This has not been taken into account.

Page 5 Para 2 – In the case of Icebreaker Wind, the potential for adverse effects on wildlife from behavioral avoidance is negligible, as the additional energetic expenditure required for migrating birds or bats to fly around the Project will be negligible. This conclusion is based on the findings of Masden et al. (2009), who found that the additional energetic expenditure required for

migrating birds to circumvent the Nysted Offshore Wind Energy Facility in the Danish Baltic Sea was negligible in relation to the overall energetic cost of their migratory journey. The Project will occupy a relatively small above-water footprint, consisting of a linear array of six turbines and measuring roughly two miles (three km) in length, substantially smaller than the dimensions of the facility studied by Masden et al. (2009). In addition, the Project's turbines would be spaced at approximately 600 meter intervals, providing space for birds to fly between turbines.

Several conclusions are made here that are not supported by the data or the citations. First, once again, the contractor focuses on the initial six turbines when really we should be considering the eventual cumulative impact of more than1,000 turbines. This is a much larger scope than the Nysted facility, so the comparisons are invalid.

Second, Madsen used full migration length to calculate negligible energetic expenditure. WEST has made no effort to calculate migration length for the species involved here, and therefore cannot assume conclusions similar to Madsen's study. Madsen's calculations also assumed distance was a straight line flight between endpoints. Madsen also indicated (ignored in WEST's report) that energetic cost would be different if in a stopover area where birds are making daily or multiday trips, stopping intermittently to rest and feed. It may be a different story when birds have to fly all the way across the Lake in a single flight. In such circumstances, even small deviations may result in increased energetic expenditures that impact at least some individuals. Therefore, using Madsen to support "no risk" is really not justified, neither by the data nor by the studies cited. Madsen also indicated that more farms (with more turbines) would greatly change their conclusion of no effect. An eventual expansion is exactly what LEEDCo is proposing, thus also changing the conclusions.

Third, the WEST statement of "providing space for birds to fly between turbines" is exactly opposite of their conclusion in comparing their case to Nysted's. Nysted's turbines were 850m apart and birds still went around the facility, rather than flying through it. LEEDCo states Icebreaker' turbines will be 600m apart, which is a smaller distance. This, in turn, implies less space to fly between turbines, which would create more of a barrier. Also, Icebreaker is oriented north-south, meaning a 2-mile barrier with just six turbines. It will therefore be a potential barrier to predominant east-west directional flight. This would be greatly compounded by the ultimate intentions of LEEDCo to include over 1000 turbines along the southern edge of the Lake. Madsen's findings actually support the concern that the project could result in high risk through avoidance – the exact opposite of WEST's conclusions.

Page 5 Para 3 – Similar to behavioral avoidance, behavioral attraction to offshore wind turbines may have both beneficial and adverse effects on flying wildlife. Beneficial effects may include increased availability of roosting and/or foraging sites in an otherwise inhospitable or unfavorable environment. Adverse effects may include increased exposure to collision risk.

This conclusion fails to consider all effects. It does not address the impacts of ice leads on bird activity. It mentions perching, but really should address waterbird and waterfowl roosting in open water.

Page 5 Para 4 – Only used wind industry papers. WHY?

Page 6 Para 1 – For birds, recent reviews of bias-corrected fatality rate estimates have indicated a fairly consistent pattern, with an overall average US rate of roughly four to five birds killed per MW of installed wind capacity per year (4.11 birds/MW/year reported by Loss et al. 2013).

This assumption is based on biased wind industry reports, and only those made public. Most mortality data is hidden from the public and concerned conservation organizations, and the raw data is not available to assess the industry analysis. This is the source of considerable tension between the public, conservation organizations and wind energy companies. There are real problems with this, as scientific integrity and data standardization are lacking (Carroll et al. 2017). This is precisely why the FWS and state of Hawaii now requires that all mortality data at wind facilities be collected by *independent* experts using standardized methods. The FWS has also adopted similar restrictions in its new 30-year eagle take guidelines for wind energy projects.

Page 6 Para 2 – Strickland works for WEST. The paper used industry-collected data, so it still lacks scientific integrity. Their conclusion here is sound, but the data upon which it is based raises the question of "risk". The Blue Creek study (which WEST conducted) shows evidence of multiple attempts to downplay and underestimate risk at this site – a site that was assumed by most to be safe for turbine placement. Horned Lark, Killdeer, and Golden-crowned Kinglets, strictly a migrant, had the three highest mortality rates. Over 40 species were confirmed killed at the site, with well over a third being migrants for that location. Their sample design also precluded a true estimate of mortality at the species level, as it covered only parts of migration and ignored winter movements.

Page 7 Para 1 – Mark Desholm and colleagues developed the Thermal Animal Detection System (TADS), and deployed it at the Nysted Offshore Wind Energy Facility in the Danish Baltic Sea. In vertical (collision) viewing mode, the system's infrared monitoring field of view covered roughly one third of the rotor of a single turbine, and it was deployed in this way for intensive monitoring periods during the peak period of spring and fall sea duck migration over a three year period (2004-2006; Desholm 2006).

C. Gordon concludes that there were no collisions when the study monitored 1/3 of the sweep zone of one turbine. That is equivalent to 0.46% of the zone of possible collision in a facility with 72 turbines. This was over open water, where there was no way to confirm any potential collisions. Despite this, the developer wants to proceed with Icebreaker without any tested effective methodology to monitor collisions over open water. We could find nothing on detectability confidence for the TADS system. Does it detect with a confidence of 100%, or is there another layer of uncertainty that has to be placed on that one-half of one percent of survey area? Gordon indicates that Europe is not even trying to develop the methods, preferring to employ an untested theoretical modeling system, which utilizes a vague "bird passage rate" and an even vaguer "collision avoidance rate" to assess risk.

Page 7 Para 1&2 – Avian impact studies at European offshore wind energy facilities in recent years have focused on collision risk modeling efforts, in which bird passage rates are combined with collision avoidance rates to "predict" collision fatality rates (Cook et al. 2014). Quite a bit of liberty has been taken with Cook's conclusions. Cook states "The selection of appropriate avoidance rates for use in collision risk models at offshore windfarms is often a key part of the Environmental Impact Assessment process. Ideally, these avoidance rates should reflect the behavioral responses of birds to turbines. However, they are often used as a 'fudge-factor' to incorporate aspects of model error. The situation is further complicated by a lack of data for marine birds and offshore windfarms. As a consequence, present guidance is based on values that have been derived for terrestrial species at onshore windfarms. This study reviewed data that have been collected from offshore windfarms and consider how they can be used to derive appropriate avoidance rates for use in the offshore environment." The species used in the Cook study were Northern Gannet, Black-legged Kittiwake, Lesser Black-backed Gull, Herring Gull and Great Black-backed Gull. Only the Herring Gull and Greater Black-backed Gull are really of importance to Lake Erie. None of the top priority species (Red-breasted Merganser, Common Loon, Horned Grebe, Ring-billed Gull or Bonaparte's Gull) were reviewed.

Extremely telling is Cook's conclusion: "Based on the available data, it was not possible to derive species-specific avoidance rates for three of the five priority species. Of particular concern is the lack of within-windfarm avoidance data for northern gannet given that it is taxonomically distinct from the other four species, all of which are gulls." Cook also adds further caution to indicate that rates are probably affected by weather, species, and visibility. Cook indicated a lot of variation between studies and sites. This would seem to preclude the application of ocean-based data from Europe to a lake-based North American situation in order to predict risk.

Page 7 Para 3 – The level of collision risk for eagles or any other species of raptor at Icebreaker Wind is low, primarily because no species of eagle or other raptor regularly utilizes offshore environments eight to 10 miles from shore.

This conclusion was based on LEEDCo's boat surveys and the DOW aerial survey. Neither survey was designed to detect raptors. DOW"s surveys were limited in time of year, and the effort spent within 10 miles of the project area was minimal. The boat survey consisted of 10 surveys at or near nighttime, with a very suspect sample design. Detectability was not assessed and is likely very low. Neither survey supports C. Gordon's conclusions. In response, three of the past four BSBO Pelagic Field Trips (in Nov 2015, Dec 2015, Nov 2016, and Dec 2016) have noted Bald Eagles coming in off the lake from some unknown destination. Lake Erie is not a major barrier to this species, or to the Peregrine Falcon which those same surveys have found perching on the crib. The minimal effort expended on this survey could just as easily support the exact opposite of WEST's conclusion. Indeed, WEST fails to mention that soaring, migratory raptors were attracted to offshore wind farms in Europe, which increased the risk of collision (Skov et al. 2016).

Page 8 Para 1 – The potential for Bald Eagles or other raptors to be exposed to any risk of collision with Icebreaker's turbines is therefore almost exclusively limited to migratory transits of these species across Lake Erie.

For the Bald Eagle, this is not accurate. Crossing could occur at any time of year, since both sides of Lake Erie are major habitats for non-breeders. Nothing is known about how much time Peregrines may spend over the lake. It's also important to note that Bald Eagles frequently use ice along the edge of open water as hunting perches, exactly the type of "habitat" the Icebreaker Project could create. They often prey on gulls, which would also be attracted to the project area due to the creation of ice leads during winter.

Page 8 Para 2 – This paragraph should recognize that wind turbines are just now moving into Bald Eagle habitat. There is a strong possibility that numbers of eagles reported killed by turbines are well below reality, thanks to the FWS's self-policing policy. Turbines have killed over 2,000 Golden Eagles in the infamous Altamont Wind Energy Area in California (Smallwood and Thelander 2008).

Page 8 Para 3 – The level of collision risk for waterfowl, or other water-affiliated bird species at Icebreaker Wind is low, overall, with some variation among waterbird taxa.

The assumptions used by WEST here raise several concerns. A major concern is basing their conclusion off aerial surveys (mean/survey) which is not the proper metric. The authors should have used surveys based upon when the species is present, in order to obtain more accurate density estimates. It's easy to lower detection rates by conducting surveys when a species is not present – this effectively underestimates true risk. There were no data presented for the winter timeframe. Nocturnal movements were also neglected. Furthermore, Cook et al (2014) for the most part, did not review the species of concern in Lake Erie and also indicated considerable variability in studies in Europe.

Page 9 Para 1 – We have similar concerns about WEST's conclusions on waterfowl and waterbirds such as loons and grebes. Using the mean/survey metric is very misleading, as this group is mostly migratory; this means that they are only present during part of the year and present during times when there were no surveys. The contractors should stratify surveys to a more appropriate timeframe to acquire more accurate samples. Nocturnal movement of these species was not evaluated at all. Boat surveys are not useful at all for this group. The birds are disturbed and avoid boats even farther than best case scenario during visual surveys. Also, WEST totally ignored actual findings of the ODOW report, which indicated that density levels for Common Loon and Horned Grebe are as large in the project area as near the shore.

Page 9 Para 1 – Although protected by the Migratory Bird Treaty Act, it should be noted that Double-crested Cormorants have been actively managed as a pest species in recent years in the Great Lakes region, as this species' recent population growth is believed to have negatively impacted fish populations (USFWS 2003); hence some collision risk for this species from Icebreaker Wind does not represent a significant concern from a biological or conservation perspective.

This statement does acknowledge the importance of MBTA, but also indicates a belief from WEST that adding mortality to the cormorant is a project benefit. This betrays the consultants' strong lack of concern for the wildlife resources of the region. Also, this does not address what subpopulation of cormorant may be affected. If the population includes migrant birds, it has nothing to do with management within Lake Erie's resident breeding populations.

Page 9 Para 3 – WEST provides no data to back up their conclusions here, and do not address the question of the formation of ice leads during winter. Ice leads may be the result of wind refraction around any object (such as a turbine base). The open water created can attract many birds, including Bald Eagles. Why did they choose 96% as a breaking point for their conclusions? This conclusion should be based on the number of days the Central Basin near shore areas are affected by ice. Such conditions would put many bird species farther out into open water. Their choice of criteria suggests pre-determination of results favorable to the developer. BSBO personnel have extensive knowledge (from flying many aerial surveys over Lake Erie) that open leads in the ice attract birds to the site.

Page 11 Para 2 – A lot of questionable assumptions were made here. Why does WEST only state "combined with calm winds"? Wind could keep water around the turbines open due to the turbulence created. Cherry-picking scenarios is not addressing a wide range of possible causative agents.

Page 12 Para 1 – Questionable assumptions are made here based on studies that reviewed different species in different situations. Masden (2009) even suggested that foraging/staging flocks would have greater risk of collisions than one-pass migrants. He also indicated that additional turbines will increase risk (again, this project should be reviewed in the context of >1,000 turbines, not 6). Lake Erie's birds may be present for weeks if not months, and flying at night as well as diurnally. WEST cannot support their conclusion of "low to no risk" for waterfowl based on their limited and poorly timed studies.

Page 13 Para 1 – WEST concludes that risk is "low" while at the same time admitting that it is unknown. They base their conclusions on the small size of the initial project when they know that the ultimate plan is to eventually build around 1,000 turbines in the Lake. And this is to occur when they are unsure about the true volume of migration across the Lake or the potential attraction to the turbines of migrating birds and bats. Could bats be more susceptible to collisions, as the turbines will represent the only thing to echolocate to? Could migrating birds be attracted to the turbine platform due to lighting or as a place to rest during their long flights? They indicate that only post-construction surveys can answer these questions; however, they provide no plan for how they would accomplish this. What if they are wrong? Are they going to decommission and take down the turbines if bird and bat mortality rates are higher than predicted? How would this even be determined over open water?

Page 13 Para 2 – The most informative source of information on the level of bat activity likely to occur at Icebreaker Wind is the bat acoustic study conducted by Tetra Tech in 2010, as part of Icebreaker's wildlife baseline data gathering effort (Svedlow et al. 2012).

There are a lot of sample design questions with the cited study. For example, they are basing call rates off of 4 detectors on-shore and four offshore; of which all four offshore detectors were located on the crib. These are statistically dependent, and therefore effectively represent one detector per night. This suggests offshore call rates should be quadrupled to be comparable. They could have calculated detectability probability by using these four as duplicate

observations. They included no standard deviation or p-value in the report or in the paper. So what is the variability? What is the statistical significance? Is mean by itself a good indicator of risk, or should there be a more complex analysis? Personal communication with a bat biologist indicated that bat call rates are known to be much less frequent over open spaces, like over open water, when compared with complex environments, such as those found onshore. Therefore, offshore call rates and onshore call rates are not directly comparable. There is no indication that Tetra Tech did any detectability corrections for this potential; therefore, differences between on- and offshore are likely greatly overestimated. Ultimately, this is extremely poor science by Tetra Tech. As a result, no conclusions of risk can or should be made from this data by WEST. Once again, our recent discussions with Bird Studies Canada indicate that Motus tower tracking of radio-tagged bats confirms movement over the Lake (Mackenzie, pers. comm.).

Page 14 Para 1 – The Icebreaker Wind bat baseline acoustic study demonstrated that the bat activity level was roughly 10 times greater on land than offshore during both the spring and summer/fall study periods. We note that this comparison may overestimate the level of bat activity likely to occur at the Project site, as the location used to represent the offshore environment in this case, the Cleveland water intake crib, is located roughly three miles from shore, whereas the Project site is located between eight and 10 miles from shore where the abundance of bats is likely to be lower.

The assumption of 10 times more bat activity onshore is highly questionable. As already mentioned, there are serious design flaws with dependent recorders. Also, a troubling lack of statistics (including confidence intervals and p-values) leads to questions about the effects of small sample size. What evidence does WEST have that there would be less activity eight miles from shore versus three miles? Once again, recent Motus tower tracking of radio-tagged animals suggests that bats are migrating across the Lake, possibly in large numbers.

Page 14 Para 2 – Further insight into how the offshore bat acoustic activity data gathered at the Cleveland water intake crib by Svedlow et al. (2012) compare to onshore bat acoustic activity patterns can be gained by comparing the overall rate recorded by Svedlow et al. (2012) to rates recorded during baseline bat acoustic studies conducted for land-based wind energy projects within the region.

Comparisons of the Icebreaker site to other sites is highly questionable. What Tetra Tech's design provided was four onshore sites, one offshore site three miles out, and zero offshore sites in the project footprint. Based on this inadequate sampling, WEST then draws concise conclusions. We find this entirely inappropriate from a scientific perspective.

Page 15 Figure 6 – Some serious concerns are raised here by the "low risk" conclusion made by WEST. The Cleveland Crib actually showed a higher mean rate of detection (with no statistical analysis to determine significance) than the Timber Road Wind Energy Project, which has demonstrated one of the highest bat mortalities recorded in North America. How does WEST justify a conclusion of "low risk" given this?

Page 16 Para 1 – Figure 7 illustrates 55 bias-corrected bat fatality rates that have been produced at land-based wind energy facilities in the Great Lakes region, representing all such studies for which bias corrected bat fatality rate estimates are publicly available.

This figure does not include data from Timber Road. Only six sites are represented in both Figure 6 and 7: four at the low end and two moderate level of bat mortality. Numbers come from eyeballing the two figures - Cedar Ridge 10 calls, 24 fatalities; Forward Energy 7 calls,18 fatalities; Buffalo Ridge 2001 3 calls, 4 fatalities; Noble 2008 3 calls, 3 fatalities; Noble 2009 3 calls, 4.5 fatalities; Buffalo Ridge 2002 3 calls, 2 fatalities. There seems to be a strong correlation between call detection (Fig 6) and fatality rate (Fig 7), which is just the opposite of what WEST concludes. A rough placement of the Crib with these other facilities would be 10-15 bat fatalities/MW/Year, which would be consistent with the higher 1/3 of all sites shown in Fig 7.

Page 16 Para 2 – How did WEST come up with a figure of 1-4 bats per year? WEST simply cannot support that statement with the data they present. They need to supply standard deviations, confidence limits, and p-values for their conclusions, since they are so far removed from actual data. Based on the data utilized, they would concede that somewhere between 1-30 bats taken/MW (this does not include the Timber Road site, which appears to have a greater bat take). This could make Icebreaker the worst place on the continent for bat mortality. However, WEST concludes this to be “Moderate” at worst.

Page 19 Bullet 1 – Nocturnally migrating birds are primarily terrestrial animals, and their expected level of activity at the Project site is expected to be low, and generally restricted to migratory transits.

Migration passage is airborne, therefore “primarily terrestrial” is irrelevant. WEST’s data do not support a conclusion of “low risk” for nocturnally migrating songbirds. Indeed, they did not collect passage rate data or flight height for any migrating songbirds at the project site during a wide variety of weather conditions. Consequently, such conclusions are not only impossible, but irresponsible. Based on their own data, they have no way of knowing.

Page 19 Bullet 2 – Although substantial broad-front nocturnal migration activity occurs throughout the Great Lakes region, and extends to birds’ passage directly over the Great Lakes, including Lake Erie, nocturnally migrating birds exhibit a well-known tendency to avoid flying over large bodies of water if possible, evidenced in the central Lake Erie basin by a radar study that demonstrated that the density of nocturnal migrant bird passage was more than twice as high over land than it was over the Lake during both spring and fall migration.

BSBO contacted Dr. Diehl and he confirmed that this is not what his study concludes. The data used by WEST from the Diehl paper pertained to screenshots at midnight (not a compilation of all data throughout the night as suggested by Gordon). It thus reflected the situation prior to the peak nightly migration. While the mean indicated 2-3 times higher bird activity over land at that screenshot (midnight), the small sample size (5 spring and 13 fall nights) failed to reach statistical significance over water versus over land. Therefore, WEST is overreaching by inferring that such a difference exists. Additionally, the recent FWS advanced radar study of Lake Erie supports lake crossing at high volume. Both Diehl and the FWS advanced radar studies indicate that lake passage may be of greater importance to turbine risk than predicted,

as both indicate the dawn ascent, which causes an uplift into the radar beam. Consequently, there is absolutely nothing in the WEST report that supports a conclusion of “low risk” to migratory songbirds.

Page 19 Bullet 3 – Numerous studies of bird fatality rates at land-based wind energy facilities have demonstrated that fatality rates of nocturnal migrant birds at wind energy facilities are sufficiently low that there is no reasonable likelihood of such fatalities causing population-level impacts to any nocturnal migrant bird species.

There is strong evidence that all or most wind industry post-construction mortality reports are highly suspect and seriously underestimate mortality (Lintott et al. 2016; Ferrer et al., 2011; Johnson et al. 2016). The Blue Creek Wind Energy Project in Ohio (WEST is the consultant) mortality data appear to be suspect and the owner has sued the state to keep it secret. In addition, population-level impacts are not part of the MBTA, which is another point the industry often tries to downplay. The taking of even one migratory bird is illegal, but prosecution and fines are at the discretion of the FWS. Cumulative effects are of concern, especially with this project that touts an ultimate plan to construct over 1000 turbines. Development on the Canadian side of the Lake is also of considerable concern, as the cumulative impacts of all this development could be significant. NEPA requires that all these potential cumulative impacts on the region’s economically and ecologically important wildlife be taken into careful consideration in the development of an EA or EIS. Right now, they are not being taken into consideration, and are, in fact, being inappropriately downplayed by the developer and its paid consultants.

Page 19 Para 3 – The most informative source of information on the passage rates of nocturnally migrating birds through the Icebreaker Wind site and vicinity is a study of nocturnal bird migration density over the Great Lakes vs. over terrestrial environments within the region, published by a team of independent academic ornithologists in *The Auk* (Diehl et al. 2003).

Again, from personal communication with Dr. Diehl, NEXRAD is good for only 20-30 km (12-18 miles) from the radar unit in flat terrain. There are ridges near Hopkins Airport that may blind the radar even more at the extreme of the radar reach. This makes the LEEDCo project barely in or possibly out of range for use. As pointed out on several occasions, this radar type is limited in what it can tell us and, according to the FWS, useless for determining risk to birds and bats from wind turbine development.

Page 19 Para 3 – Diehl et al.’s (2003) analysis revealed that the density of nocturnally migrating birds was 2.72 times higher over land than it was over water in the central Lake Erie basin during the spring migration period, and 2.13 times higher over land than over the lake during the fall migration period.

This is not what the study says, per Diehl himself. There was no statistical significance between water and land due to small sample size. That table also represented a single screenshot near midnight, and not the entire picture of nighttime migration. In Diehl’s own words, “this paper cannot support or refute the risk to migrating birds to turbines in Lake Erie”.

Page 20 Para 1 – Diehl et al. (2003) were also able to document the signature of dawn ascent of migratory birds over water, as well as directional reorientation of migrating birds toward land, suggestive of these birds' tendency to avoid flying over water. These observations are consistent with recent studies by Rathbun et al. (2016) and Horton et al. (2016), who used marine surveillance radar systems deployed in shoreline environments in Lake Ontario and Lake Erie, respectively, to demonstrate high concentrations of nocturnal migrant birds in Great Lakes shoreline environments.

This is true, but birds re-orientating are also crossing the Lake. Both studies indicate a large lake crossing. Dawn ascent actually supports a greater risk, as birds are below radar until rising at dawn to reorient. The above conclusion by WEST is a misuse of Diehl and the FWS advanced radar studies. These latter studies have concluded that no turbines should be in the Lake or within 5-10 miles of its shoreline due to high risk of collisions.

Page 20 Para 3 – Figure 8 illustrates empirically-derived, bias-corrected bird fatality estimates from 42 studies conducted at operational, land-based wind energy facilities within the Great Lakes region, representing all such studies with publicly available data for the region. Reference information on the studies illustrated in Figure 8 is provided in Table 5.

As discussed many times before, these studies are suspect and the data is hidden from the public. Just the cursory views of data from Blue Creek (WEST data) indicate a series of data manipulations and lack of standardization that render such compilations inappropriate and underestimate actual mortality (see Johnson et al. 2016). In addition, any conclusions from studies that lack scientific integrity (conducted by paid consultants by the developer) are always suspect (Carroll et al. 2017).

Page 20 Para 3 – Although there appears to be a tendency toward lower bird fatality rates at land-based wind energy facilities in the Great Lakes region than for the US as a whole.

How does WEST support this? There are no data reported here, just a mean. Common statistical practice demands a confidence interval and p-values if comparing two or more sites.

Page 21 Para 1 – Given the observation that the nocturnal migrant bird passage density recorded in the offshore environment in the central Lake Erie basin was less than half of the level recorded at comparable sites over land during both spring and fall migrations (Diehl et al. 2003),

This is, quite simply, a complete misuse of Diehl's data, leading to an indefensible conclusion by WEST.

Page 21 Para 1 – This would suggest that bird fatality rates at Icebreaker in the range of 1-2 birds per megawatt of installed capacity per year

WEST has provided nothing in this report to support this conclusion. It is strictly smoke and mirrors, based on suspicious data reports from paid consultants with direct conflicts of interest. They failed to produce their own scientifically sound radar analysis (Tetra Tech, Appendix K), they conducted a boat survey that has little to no scientific merit for analysis (Tetra Tech), and

they provided biased bat and avian acoustic studies (Tetra Tech) with many design flaws. LEEDCo has spent a lot of money on poorly conducted studies with little or no scientific integrity.

Since this project is government funded, LEEDCo should be required to go back to step one and start all over with third-party, independent, scientifically sound pre-construction risk studies, as well as (if they can) provide a sound methodology for conducting accurate, post-construction mortality studies (also independent) over open water prior to being given permission to proceed. All conclusions should be couched within LEEDCo's well-known future intentions of having over 1,000 turbines as part of this project. Even if this is an "experimental" project to determine feasibility, its purpose is to expand, and its environmental cost must therefore be considered up front.

Page 21 Para 1 – At this level, or even if rates were towards the higher end of U.S. estimates, there is no reasonable likelihood that the Project could have a population level impact on any species of nocturnal migrant bird

The industry continues to try and decouple wind projects from the cumulative effects that the FWS has the regulatory responsibility for enforcing under NEPA and other legislation, including the MBTA, The Bald and Golden Eagle Protection Act, and the Endangered Species Act. Population-level effect is not mentioned in the MBTA. Even the taking of a single bird is illegal. However, enforcement is at the discretion of the FWS. There is no incidental take permit currently available under MBTA, but they are required under the Endangered Species Act and Bald and Golden Eagle Protection Act. Since this project does have the potential to kill Bald Eagles and endangered species (e.g. Kirtland's Warblers), the developer should state its intention to seek such permits to be in compliance with U.S. wildlife protection law.

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