

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Icebreaker)	
Windpower, Inc. for a Certificate to Construct a)	
Compatibility and Public Need for a)	Case No. 16-1871-EL-BGN
Wind-Powered Electric Generation Facility)	
In Cuyahoga County, Ohio)	

**PRE-FILED TESTIMONY OF DR. JEFFREY C. GOSSE, PH.D.
ON BEHALF OF INTERVENORS W. SUSAN DEMPSEY AND ROBERT MALONEY**

1 Q. Please state your name and home address.

2 A. Jeffrey C. Gosse, Ph.D., 2245 124th Street, New Richmond, WI 54017.

3 Q. What is the purpose of your testimony?

4 A. At the request of Benesch, Friedlander, Coplan & Aronoff, LLP, I have conducted an
5 assessment of all filings (the "Submitted Materials") that Icebreaker Windpower, Inc.
6 ("Icebreaker") has submitted to the Ohio Power Siting Board (the "Board") in this case
7 since October 2, 2018, and the Revised Joint Stipulation and Recommendation (the
8 "Revised Stipulation") (together with Submitted Materials, the "Current Record") filed
9 on May 15, 2019, to render expert opinions as to whether the Current Record sets forth
10 scientifically valid data or identifies validated methodologies sufficient for the Board to
11 determine: (1) "[t]he nature of the probable environmental impact" of the proposed
12 Icebreaker project (the "Project") on birds and bats (R.C. 4906.10(A)(2)); or (2) "[t]hat
13 the [project] represents the minimum adverse environmental impact" to birds and bats
14 (R.C. 4906.10(A)(3)). I also have reviewed the pre-filed testimony (the "Pre-Filed
15 Testimony"), dated July 26, 2019, submitted to the Board by Icebreaker and Board Staff.

16 Q. On whose behalf are you submitting this testimony?

17 A. On behalf of the Bratenahl Residents, intervenors in this case, and at the request of their
18 counsel, Benesch, Friedlander, Coplan & Aronoff, LLP.

19 Q. Please summarize your education.

20 A. My resume is attached hereto as Exhibit 1. I obtained a Bachelor of Science degree in
21 Zoology from the University of Wisconsin, Madison, in 1971; a Master of Science degree
22 in Fishery Biology from Utah State University in 1978; and a Doctor of Philosophy
23 degree in Wildlife Science (Fishery Biology) Utah State University in 1981.

24 Q. Please summarize your professional work experience.

25 A. My resume contains a more detailed summary of my professional experience. For
26 purposes of my testimony in this case, my most relevant professional experience occurred
27 during my employment with the United States Fish and Wildlife Service ("FWS"). I

1 began my employment with FWS in October 1987. I retired from FWS on March 30,
2 2018. At the time I retired, my title was “Regional Energy Coordinator” for Region 3
3 (covering the states of Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin).
4 I have substantial professional experience and expertise in conducting avian radar and bat
5 acoustic studies. In reverse chronological order, my FWS professional experiences most
6 relevant to my testimony are as follows.
7

8 **Title: Regional Energy Coordinator, Region 3 (Oct. 2009 - March 30, 2018)**

9 **Duties:** My professional duties as Regional Energy Coordinator focused on studying
10 energy projects (primarily oil and gas pipelines and electrical transmission lines) that
11 presented a potential to adversely impact FWS trust resources (most often birds, bats, and
12 aquatic wildlife). While I was the Coordinator, FWS Region 3 received a grant through
13 the Great Lakes Restoration Initiative to conduct a study of bird and bat migration along
14 and across the Great Lakes. I supervised a team of three to four FWS technicians to
15 conduct this study. FWS purchased two avian radar units and multiple acoustic monitors
16 that we used to study avian and bat migration. We typically deployed both radar units
17 and the acoustic monitors to study avian and bat migration around and across the Great
18 Lakes for the spring and fall migration seasons that were the subject of the respective
19 studies, beginning with the 2011 spring migration and continuing to the present. Our
20 team has produced nine (9) seasonal reports and one journal article to date, which were
21 distributed and made available on FWS’s website (<https://www.fws.gov/radar/>). I and an
22 assistant also worked on other energy projects with the objective of avoiding adverse
23 impacts of those projects on FWS trust resources, and to mitigate adverse impacts when
24 they were not avoided. I also coordinated and provided support to FWS Field Office and
25 Endangered Species personnel in connection with their activities relating to energy
26 projects.

27 The reports our team produced relating to the foregoing Great Lakes avian and bat studies
28 include the following:

29 • **Draft -- Fall 2017 Lake Erie Study**

30 Gosse, J. C., Heist, K.W., Rathbun, N.A., Wells, M.T. 2018. Draft Great Lakes
31 Radar Technical Report at Cleveland, Ohio, Fall 2017. Fish and Wildlife Service,
32 Region 3.

33 • **Spring 2012 Lake Erie Study**

34 Horton, R. L., N. A. Rathbun , T. S. Bowden, D. C. Nolfi, E. C. Olson, D. J.
35 Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report Lake
36 Erie Shoreline: Erie County, Ohio and Erie County, Pennsylvania, Spring 2012.
37 U.S. Department of Interior, Fish and Wildlife Service, Biological Technical
38 Publication FWS/BTP--R3012-2016

1 • **Spring 2013 Lake Ontario Study**

2
3 Rathbun N. A., T. S. Bowden, R. L. Horton, D. C. Nolfi, E. C. Olson, D. J.
4 Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report;
5 Niagara, Genesee, Wayne, and Jefferson Counties, New York; Spring 2013. U.S.
6 Department of Interior, Fish and Wildlife Service, Biological Technical
7 Publication FWS/ BTP-3012-2016

8 • **Spring 2018 Lake Superior Study**

9 Rathbun, N.A., Heist, K.W., Wells, M.T., and Rigby, E.A. 2019. Great Lakes
10 Radar Technical Report Lake Superior, Spring 2018. U.S. Department of Interior,
11 Fish and Wildlife Service.

12 • **2018 Lake Michigan Publication**

13 Heist, Kevin W., Tim S. Bowden , Jake Ferguson , Nathan A. Rathbun , Erik C.
14 Olson , Daniel C. Nolfi , Rebecca Horton , Jeffrey C. Gosse , Douglas H. Johnson
15 and Michael T. Wells. 2018. Radar quantifies migrant concentration and Dawn
16 reorientation at a Great Lakes shoreline. Heist et al. Movement Ecology (2018)
17 6:15.

18 • **Fall 2015 and Spring 2016 Lake Huron Study**

19
20 Wells, M.T., T. S. Bowden, K.W. Heist, R. L. Horton, D. C. Nolfi, E. C. Olson,
21 Rathbun N. A., and J. C. Gosse. 2018. Great Lakes Avian Radar Technical Report
22 Lake Huron Lakeshore: Alcona and Presque Isle, MI, Fall 2015 and Spring 2016.
23 U.S. Department of Interior, Fish and Wildlife Service, Biological Technical
24 Publication FWS/BTP-XXXXX-2018

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26 • **Fall 2016 Lake Ontario Study**

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28 Heist, K.W., N.A. Rathbun, M.T. Wells, E. Olson, and J. C. Gosse. 2018. Great
29 Lakes Avian Radar Technical Report Lake Ontario Shoreline, Jefferson County,
30 Niagara County, and Wayne County, New York, Fall 2016. U.S. Department of
31 Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-
32 BTP-R3017-2018

33
34 • **Fall 2012 Lake Michigan and Lake Huron Study**

35
36 Rathbun, N.A., R.L. Horton, T. S. Bowden, E. C. Olson, D. C. Nolfi, D. J. Larson,
37 and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report Delta County,
38 MI Iosco County, MI, and Huron County, MI Fall 2012. U.S. Department of
39 Interior, Fish and Wildlife Service, Biological Technical Publication
40 FWS/BTPBTP-R3016-2017

1 • **Fall 2014 Lake Superior Study**

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3 Rathbun N. A., T. S. Bowden, R. L. Horton, D. C. Nolfi, E. C. Olson, D. J.
4 Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report Lake
5 County, MN, Bayfield County, WI, and Keweenaw County, MI, Fall 2014. U.S.
6 Department of Interior, Fish and Wildlife Service, Biological Technical
7 Publication FWS/BTP-R3015-2017
8

9 • **Fall 2011 Lake Michigan and Lake Huron Study**

10
11 Bowden, T. S., E. C. Olson, N. A. Rathbun, D. C. Nolfi, R. L. Horton, D. J.
12 Larson, and J. C. Gosse. 2015. Great Lakes Avian Radar Technical Report Huron
13 and Oceana Counties, Michigan. U.S. Department of Interior, Fish and Wildlife
14 Service, Biological Technical Publication FWS/BTP-2015

15
16 **Title: Regional Hydro and Wind Power Coordinator, Region 3 (Oct. 2005 - 2009)**

17 **Duties:** In this position, I served as FWS's regional coordinator for wind energy projects
18 and assisted eight (8) FWS field offices with review of wind energy projects. I led calls
19 among FWS Region 3 wind energy staff and the staff of departments of natural resources
20 from seven states relating to the impacts of wind energy projects on wildlife. Also, I
21 participated in or led wind energy related calls with other FWS Regions. I was the
22 Region 3 lead for programmatic Environmental Impact Statement matters for proposed
23 wind energy projects in the Upper Great Plains. I participated in multiple meetings
24 leading to formation of the Great Lakes Wind Collaborative and served as FWS's
25 representative on the Steering Committee, Advisory Committee, and as chair of Wind
26 Atlas Workgroup of that group. Also, I served as Regional Coordinator for all Federal
27 Energy Regulatory Commission (FERC) actions, including hydropower, hydrokinetics,
28 and gas pipeline projects; and as lead on negotiations for four state gas pipelines,
29 resulting in the first mitigation payment (\$4.15 million) made for loss of upland forest
30 habitat related to development of a project. Finally, I kept field stations informed of new
31 directives from the Washington FWS Office and of pertinent developments in other
32 Regions and was the regional lead on review of transportation projects.

33 Q. What are your primary findings, conclusions, and opinions in this case?

34 A. My professional opinion, to a reasonable degree of scientific certainty, is that neither the
35 Current Record nor the Pre-Filed Testimony sets forth scientifically valid data or
36 identifies validated methodologies sufficient for the Board to make findings and
37 determinations: (1) as to the nature of the probable environmental impact of the Project
38 on birds and bats as required by R.C. 4906.10(A)(2); or (2) that the Project represents the
39 minimum adverse environmental impact to birds and bats as required by R.C.
40 4906.10(A)(3).

1 Q. Does Condition 15 of the Revised Stipulation ensure that the Project will have the
2 minimum adverse environmental impact on birds and bats?

3 A. No.

4 Q. Why not?

5 A. The Current Record and the Pre-Filed Testimony do not present any indication that
6 Icebreaker has identified a specific technology that it proposes to use for pre- or post-
7 construction radar monitoring for birds and bats, or for post-construction collision
8 detection for birds and bats, much less that Icebreaker has performed any validation
9 testing of any such proposed technologies and presented the testing results to the Board.
10 As a result, there is no basis for the Board to make findings and determinations as to the
11 probable environmental impact of the Project on birds and bats as required by R.C.
12 4906.10(A)(2), or that the Project represents the minimum adverse environmental impact
13 to birds and bats as required by R.C. 4906.10(A)(3).

14 Q. Does Condition 18 of the Revised Stipulation ensure that the Project will have the
15 minimum adverse environmental impact on birds and bats?

16 A. No.

17 Q. Why not?

18 A. For the same reasons stated as to the deficiencies regarding Condition 15.

19 Q. Does Condition 20 of the Revised Stipulation ensure that the Project will have the
20 minimum adverse environmental impact on state or federally listed endangered or
21 threatened species?

22 A. No.

23 Q. Why not?

24 A. Nowhere in the Current Record or the Pre-Filed Testimony do Icebreaker or Staff explain
25 how Icebreaker will detect whether state or federally listed endangered species
26 “encounter” the Project. The Ohio Department of Natural Resources (“ONDR”) does not
27 explain how it can enforce this condition absent Icebreaker’s ability to detect whether
28 state or federally listed endangered species have encountered the Project.

29 Q. Does Condition 21 of the Revised Stipulation ensure that the Project will have the
30 minimum adverse environmental impact on birds and bats?

31 A. No.

32 Q. Why not?

1 Q. For the same reasons stated in my answers regarding Conditions 15, 18, and 20. In
2 addition, with respect to Conditions 21(c) and (f), the requirement to produce viable data
3 75% or greater of the hours of survey time is to be calculated across the entire period
4 from April 1 to November 1 (the "Survey Period"). There is no requirement that the 75%
5 standard be met separately for each of: the portion of the spring bird and bat migration
6 season that falls within the Survey Period; for the summer season; and for the portion of
7 the fall bird and bat migration season that falls within the Survey Period. One season
8 does not inform what is occurring in the other two seasons, and therefore an average,
9 taken over the three seasons combined within the Survey Period, is not biologically
10 meaningful. Pursuant to the Revised Stipulation, Icebreaker could be in compliance with
11 these conditions by achieving very high percentages (e.g., 90+% data records) during
12 calm summer months, but substantially lower percentages during the critical spring and
13 fall migration seasons. These conditions of the Revised Stipulation do not ensure that the
14 Project will either determine the probable environmental impact of the Project on birds
15 and bats or that it represents the minimum adverse impact to birds and bats.

16 Q. Does this conclude your testimony?

17 A. Yes it does. However, I reserve the right to submit supplemental testimony as new
18 information subsequently becomes available or in response to positions
19 taken by other parties.

Jeffrey C. Gosse

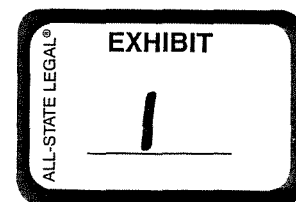
Telephone (M): 952-297-5676

OTHER QUALIFICATIONS

Life member in American Fisheries Society; Minnesota AFS chapter; USFWS Quality Performance Award: 1992, 1993, and 1994; Region 3 Management Training Program - 1993; certified scuba diver with approximately 1,500 professional dives.

WORK EXPERIENCE:

A Title: Regional Energy Coordinator Grade: GS-482-13
Employer: U.S. Fish and Wildlife Service, 5600 American Blvd. West, Suite 990,
Bloomington, MN 55437
Supervisor: Robert Krska, 612-713-9436
Duration: October, 2009- 2018
Hours/week: 40
Duties: Focus on energy projects with potential impact to Service trust resources. primarily
oil and gas pipelines and electrical transmission lines. Received a grant through the Great



Lakes Restoration Initiative to study bird and bat migration along and across the Great Lakes. Purchased two avian radar units and multiple acoustic monitors to study avian and bat migration. Supervised a team of three to four technicians to conduct the study. Typically deployed both units for spring and fall migration beginning in spring 2011 and continuing to the present. Produced seasonal and other reports which were distributed and made available on our website (<https://www.fws.gov/radar/>). Supervised an assistant to help with energy projects. Our purpose was to avoid and minimize impacts of energy development on trust resources and to seek mitigation when impacts remained. Coordinated and provided support to Field Offices on these projects in addition to Endangered Species personnel.

B Title: Regional Hydro and Wind Power Coordinator Grade: GS-482-13
Habitat Conservation Staff

Employer: U.S. Fish and Wildlife Service, 1 Federal Drive, Ft. Snelling, MN 55111

Supervisor: Robert Krska, 612-713-9436

Duration: October, 2005 - 2009

Hours/week: 40

Duties: Serve as Regional wind coordinator and assist eight field offices with review of wind projects. Lead Regional wind calls which include field offices and DNR personnel from seven states working on wind projects. Participate or lead wind calls with other FWS Regions, participate in review of national Federal Advisory Committee Act (FACA) guidelines for wind development. Regional lead for Programmatic EIS on wind development in Upper Great Plains. Received grant to update a decision support tool for linking bird species to habitat types in the Midwest to assist in review of wind projects. Received grant for supplemental bird fatality studies of wind facility near major bird concentration area. Participated in multiple meetings leading to formation of the Great Lakes Wind Collaborative and serve as FWS represent on Steering Committee, Advisory Committee, and as chair of Wind Atlas Workgroup. Serve as Regional Coordinator for all Federal Energy Regulatory Commission (FERC) actions, including hydropower, hydrokinetics, and gas pipeline projects. Served as lead on negotiations for four state gas pipeline, resulting in first mitigation payment (\$4.15 million) for loss of upland forest habitat. Review recommendations and mandatory conditions provided by field offices prior to sending on to Departmental environmental officer. Keep field stations informed of new directives from Washington Office and of pertinent developments in other Regions. Regional lead on review of transportation projects.

C Title: Regional Environmental Coordinator Grade: GS-482-13
Regional Hydropower Coordinator (from 2/2000 to 6/2001)

Employer: U.S. Fish and Wildlife Service, 1 Federal Drive, Ft. Snelling, MN 55111

Supervisor: T. J. Miller, 612-713-5334

Duration: February 27, 2000 - 9/2005

Hours/week: 40

Duties: Responsible for ensuring that all internal actions taken within the Region meet NEPA compliance. Concur on categorical exclusion decisions. Review and comment on development of Environmental Assessments and Environmental Impact Statements. Ensure

that NEPA documents are noticed in the Federal Register and arrange for posting on Service NEPA web site. Work with all Service divisions within the Region along with State, Tribal, and private groups when involved with Service projects, approval, or permits. Advise Regional Director on major actions which involve NEPA compliance and sign off on all final NEPA documents prior to decision by Regional Director. Serve as Regional Coordinator for all Federal Energy Regulatory Commission (FERC) actions regarding relicensing of hydropower projects. Review recommendations and mandatory conditions provided by field offices prior to sending on to Departmental environmental officer. Keep field stations informed of new directives from Washington Office and of pertinent developments in other Regions.

D Title: Fishery Biologist

Grade: GS-482-12

Employer: U.S. Fish and Wildlife Service, 1 Federal Drive, Ft. Snelling, MN 55111

Supervisor: Bradley Johnson, 612-713-5130

Duration: August, 1988 - January, 1994 and again from April, 1994 - February, 2000

Hours/week: 40

Duties: Responsible for processing Federal Aid fishery projects submitted by three to four states in our Region. Determine if projects meet Federal Aid requirements and ancillary compliance such as NEPA, Historic and Cultural Preservation, endangered species, and wetlands. Traveled routinely to states where I had direct responsibility for projects and to other regional states when problems arise. Gave presentations at three national meetings and at many regional and internal FA meetings. Lead the original effort to develop a Local Area Network (LAN) in Federal Aid and facilitated the merger with Ecological Services. Played a key role in recommending establishment of a Wide Area Network (WAN) with the States and assisted in selecting a technical expert to lead this effort. Served on two inter-agency teams which were responsible for improving the distribution and efficiency of FA document processing in the Region (Wolves) and for enhancing our use of the WAN along with improving our use of electronic technology (COGs). Participated in the Region 3 Management Training Program in 1993. Was responsible for working with all Regional States on the Clean Vessel Act grant program and served as the Regional program administrator. Served as Federal Aid representative to the Service's Ohio River Valley Ecosystem Team and provided funding for special GIS workshop for the group, including state participants.

E Title: Fishery Biologist

Grade: GS-482-13

Employer: U.S. Fish and Wildlife Service, 1 Federal Drive, Ft. Snelling, MN 55111

Supervisor: Robert Lange, 202-205-0931

Duration: January, 1994 - April, 1994

Hours/week: 40

Duties: Served as the Fish Team leader on a temporary assignment while the selection process was conducted for a permanent replacement. Supervised four other fishery biologists at the GS 11/12 level. Represented the Fish Team needs to the Federal Aid Management team and to upper management. Served on the FA Management team to help provide guidance for the overall concerns of Federal Aid. Served as acting Deputy Assistant

Regional Director - FA on a rotational basis when needed. Reviewed fish Team documents for completeness, consistency, appropriate tone, and provided official approval. Supported and assisted Fish Team members with problems. Called and facilitated regular Fish Team meetings to address mutual concerns and to facilitate exchange of information. Worked closely with individual who alternated as temporary Team leader to ensure that he would be fully knowledgeable and that our process would be consistent over these transitions.

F Title: Fishery Biologist

Grade: GS-482-11

Employer: U.S. Fish and Wildlife Service, 1 Federal Drive, Ft. Snelling, MN 55111

Supervisor: Michael Vanderford, 612-713-5148

Duration: October, 1987 to August, 1988

Hours/week: 40

Duties: Responsible for reviewing fishery development projects submitted for approval or closure by half of the states in the Region. Also assisted with fishery research projects during peak periods. Determined if projects met FA requirements and ancillary compliance requirements. Interacted with state coordinators when questions or problems arose.

Recommended action on projects and wrote conditions for projects, when necessary, to ensure compliance. Determined if completed projects met the original grant objectives of a project agreement. Wrote relevant correspondence regarding projects, trip reports, and position papers. Participated in team and solo reviews of states, including close-out meetings. Assisted in setting up microcomputers, installing and modifying necessary software, instructing staff personnel on computer use, and changing data base from mainframe to microcomputer.

G Title: Biologist II

Grade: NA

Employer: Texas Parks and Wildlife, Inland Fisheries Division, 4200 Smith School Road, Austin, TX 78744

Supervisor: Tim Schlagenhaft, 651-345-3365

Duration: February, 1987 - September, 1987

Hours/week: 40

Duties: Assisted in writing annual Federal Aid reports on survey lakes, special project lakes, and on fish kill investigations. Assisted in data analysis, producing computer graphics, and tables. Assisted in collecting field data from electrofishing, gill netting, and trawling and in conducting creel surveys. Work was primarily with reservoirs and with warm and cool water species. Had primary responsibility for installing microcomputer, printers, and software and instructing other district personnel on use. Was also responsible for designing and implementing district data base. Assisted in completing special projects on restricting certain fishing gear and on writing a pre-impoundment plan. The latter included recommending instream flow requirements, impacts on a downstream lake, and a recreational facility plan. Attended public hearings, sport shows, and responded to information requests from the public.

H Title: Owner

Grade: NA

Employer: Aqua-Tech Biological Consulting Firm, P.O. Box 742, Logan, Utah 84321

Hours/week: 55

Duties: Established and directed a biological consulting firm. Research emphasis was on providing microhabitat information for evaluation of stream flow alterations and for use in various habitat models. responsible for administration duties including personnel selection and supervision, writing and submitting cost and technical proposals, contract negotiations, and for supervising budget and bookkeeping system. Was also responsible for supervising and conducting field collections, performing data and statistical analysis including writing all computer programs. Was responsible for writing technical reports and maintaining communications with concerned agencies. Have worked in conjunction with U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service along with five western State wildlife agencies. Work was conducted in the tailwaters of dams located in five states and dealt primarily with four species of trout along with some benthic and macrophyte data. Research data was collected on four rivers which were all components of the Colorado River system, including the Green River in Wyoming and Utah, the Gunnison River in Colorado, the San Juan River in New Mexico, and the Colorado River below Glen Canyon Dam. The firm employed up to five full-time employees (MS and BS) and several part-time employees.

I Title: Graduate Research Assistant **Grade:** NA

Employer: Dept. of Fisheries and Wildlife, Utah State University, Logan, Utah 84322

Supervisor: Dr. William Helm, deceased

Duration: May, 1978 - June, 1979

Hours/week: 40

Duties: Studied the effects of altered stream flows on brown trout microhabitat in the Provo River, Utah... Wrote the initial technical and cost proposals along with developing the required safety plan. Participated in all contract negotiations with the funding agency: U.S. Bureau of Reclamation. Responsible for monitoring contract budget (cost reimbursable) and for making all major expenditures (personnel, travel, per diem, equipment). selected, supervised, and trained all personnel. Selected study sites, conducted field work, wrote required computer programs, performed data and statistical analysis. Redesigned previous computer programs to provide statistical analysis for T-tests, analysis of variance, and chi-square distributions. Wrote interim reports and was principle author of the final report. Negotiated contract extension. Supervised three full-time technicians (BS) and four part-time undergraduate employees.

J Title: Graduate Research Assistant **Grade:** NA

Employer: Dept. of Fisheries and Wildlife, Utah State University, Logan, Utah 84322

Supervisor: Dr. William Helm, deceased

Duration: July, 1977 - March, 1978

Hours/week: 40

Duties: Conducted a study to determine microhabitat of brown trout, mountain whitefish, and mottled sculpin in rivers. Developed an original technique for determining microhabitat in the field. Funding was obtained from the U.S. Fish and Wildlife Service as a direct result of

the initial development of this technique. Participated in designing budget and study plan and participated in the meeting for obtaining funding. Responsible for selecting and training technicians, selecting study sites, conducting field collections, data analysis, developing necessary computer programs and producing the final report. Supervised two full-time technicians (BS or MS) and four part-time undergraduate employees.

- K Title:** Graduate Research Assistant **Grade:** NA
Employer: Dept. of Fisheries and Wildlife, Utah State University, Logan, Utah 84322
Supervisor: Dr. William Helm, deceased
Duration: September, 1974 - June, 1977
Hours/week: 50
Duties: Determined the effects of various stream channel alterations on salmonid populations and production. Developed fishery portion of the study design. Organized and conducted a meeting of riparian landowners in order to gain access to study sites. Obtained necessary equipment including vehicles from DOD surplus property. Selected study sites and was responsible for field collections. Supervised up to twelve undergraduate students and three technicians. Initiated safety training program for electrofishing. Participated in obtaining contract extension with funding agency: U.S. Fish and Wildlife Service. Developed analytical methods including a modified population estimator, wrote necessary computer programs, performed data and statistical analysis. Wrote chapter on trout for final report.
- L Title:** Graduate Teaching Assistant **Grade:** NA
Employer: Dept. of Fisheries and Wildlife, Utah State University, Logan, Utah 84322
Supervisor: Dr. John Kadlec, 801-750-2460
Duration: March, 1975 - December, 1979
Hours/week: 25
Duties: Assisted in teaching Fishery Techniques course for three quarters (Fall 75, 76, and 77). Also assisted with Limnology lab (Spring 75) and with limnology lecture (Fall 79). For Fishery Techniques, assisted in restructuring class design and grading system. Initiated and gave a lecture series as part of the class. Initiated a survival swimming session. Instructed students in backpack and boat electrofishing, use of seines, frame nets, vertical and horizontal gill nets, trammel nets, and trawls. Also taught stream habitat surveys and several population estimates. Taught use of computers for data analysis and wrote or modified necessary programs for class use. For Limnology Lab, was responsible for demonstrating and supervising proper method of conducting standard water quality tests. Was also responsible for assisting students in designing, implementing, and writing special laboratory projects. For Limnology Lecture, was responsible for grading test papers and for grading the term paper, which was graded for scientific accuracy and style, and for proper grammar.

PUBLICATIONS:

Heist, Kevin W., Tim S. Bowden , Jake Ferguson , Nathan A. Rathbun , Erik C. Olson , Daniel C. Nolfi , Rebecca Horton , Jeffrey C. Gosse , Douglas H. Johnson and Michael T. Wells. 2018. Radar quantifies migrant concentration and Dawn reorientation at a Great Lakes shoreline. Heist et al. *Movement Ecology* (2018) 6:15.

Wells, M.T., T. S. Bowden, K.W. Heist, R. L. Horton, D. C. Nolfi, E. C. Olson, Rathbun N. A., and J. C. Gosse. 2018. Great Lakes Avian Radar Technical Report Lake Huron Lakeshore: Alcona and Presque Isle, MI, Fall 2015 and Spring 2016. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-XXXXX-2018

Gosse, J. C., Heist, K.W., Rathbun, N.A., Wells, M.T. 2018. Draft Great Lakes Radar Technical Report Lake Erie, Fall 2017. U.S. Department of Interior, Fish and Wildlife Service.

Heist, K.W., N.A. Rathbun, M.T. Wells, E. Olson, and J. C. Gosse. 2018. Great Lakes Avian Radar Technical Report Lake Ontario Shoreline, Jefferson County, Niagara County, and Wayne County, New York, Fall 2016. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-BTP-R3017-2018

Rathbun, N.A., R.L. Horton, T. S. Bowden, E. C. Olson, D. C. Nolfi, D. J. Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report Delta County, MI Iosco County, MI, and Huron County, MI Fall 2012. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTPBTP-R3016-2017

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Horton, R. L., N. A. Rathbun , T. S. Bowden, D. C. Nolfi, E. C. Olson, D. J. Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report Lake Erie Shoreline: Erie County, Ohio and Erie County, Pennsylvania, Spring 2012. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP--R3012-2016

Rathbun N. A., T. S. Bowden, R. L. Horton, D. C. Nolfi, E. C. Olson, D. J. Larson, and J. C. Gosse. 2016. Great Lakes Avian Radar Technical Report; Niagara, Genesee, Wayne, and Jefferson Counties, New York; Spring 2013. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/ BTP-3012-2016

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CERTIFICATE OF SERVICE

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Counsel:

cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com
jsecrest@dickinsonwright.com
sjodka@dickinsonwright.com

mleppla@theoec.org
tdougherty@theoec.org
ctavenor@theoec.org

mjsettineri@vorys.com
glpetrucci@vorys.com

paul@ptblaw.com

John.jones@ohioattorneygeneral.gov
Thomas.lindgren@ohioattorneygeneral.gov
Cameron.simmons@ohioattorneygeneral.gov
Ina.avalon@ohioattorneygeneral.gov

Administrative Law Judges:

Megan.addison@puco.ohio.gov
Nicholas.walstra@puco.ohio.gov

/s/ John F. Stock

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Summary: Testimony PRE-FILED TESTIMONY OF DR. JEFFREY C. GOSSE, PH.D. ON BEHALF OF INTERVENORS W. SUSAN DEMPSEY AND ROBERT MALONEY electronically filed by John F Stock on behalf of W. Susan Dempsey and Robert Maloney